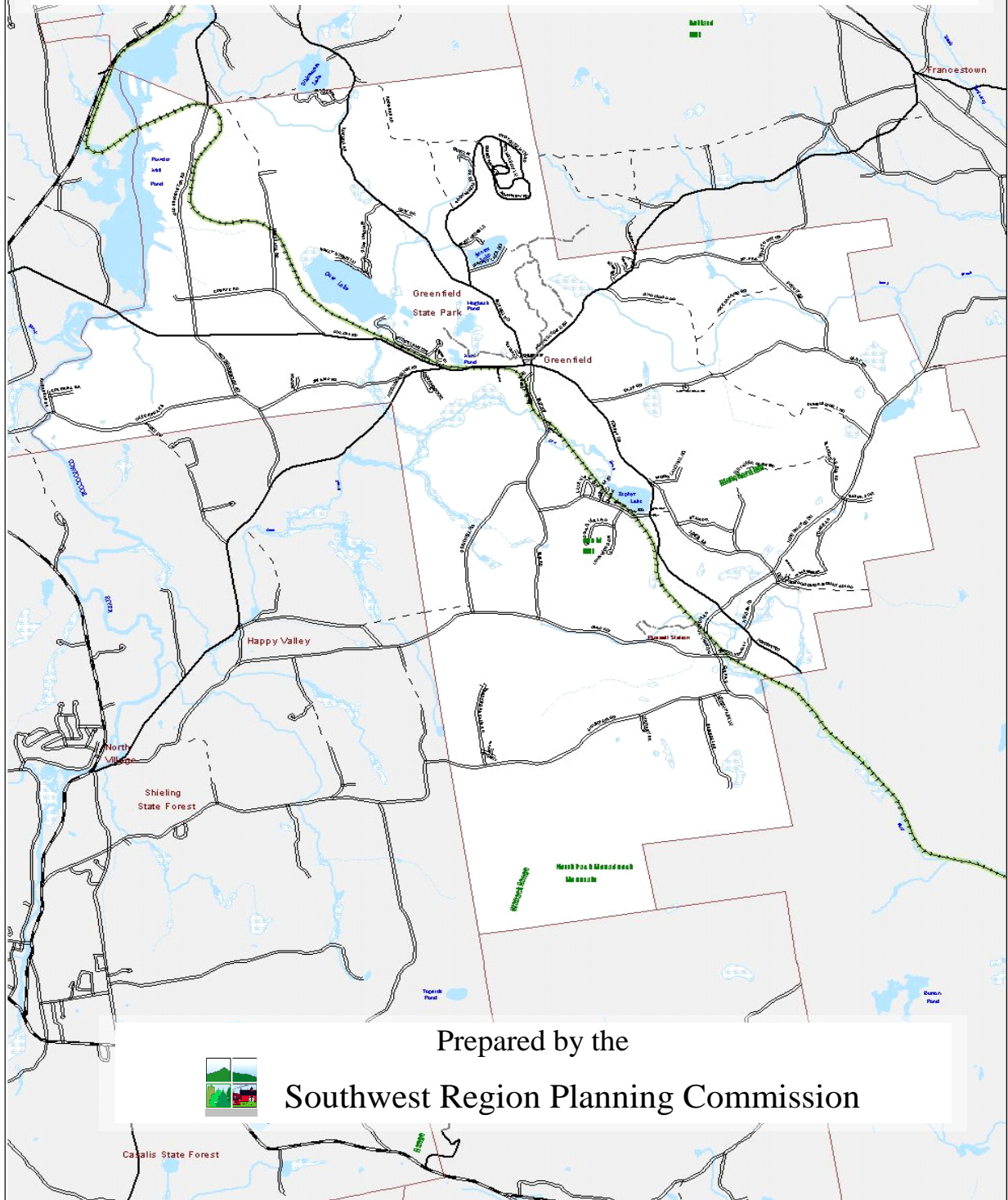


# Town of Greenfield, NH

## Master Plan



Prepared by the



Southwest Region Planning Commission

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## INTRODUCTION

New Hampshire state law mandates planning boards to “*prepare and amend from time to time a master plan to guide the development of the municipality.*”<sup>1</sup> The sole purpose of the master plan is to aid the planning board in the performance of its duties. The duties of the planning board are varied, but the only duty specifically required<sup>2</sup> is the maintenance of the town’s master plan.

The statute goes on to say that the master plan may include consideration of any areas outside of the town which, in the judgement of the planning board, bear a relation to or have an impact on the planning of the town.

### **I. WHAT IS A MASTER PLAN?**

The master plan may be comprised of a collection of reports, statements, land use and development proposals, with accompanying maps, diagrams, charts and other descriptive matter that shows as fully as is possible and practical the planning board’s recommendations for the desirable development of the town. The master plan shall include, at a minimum, the following required sections<sup>3</sup>:

- (a) “A vision section that serves to direct the other sections of the plan. This section shall contain a set of statements which articulate the desires of the citizens affected by the master plan, not only for their locality but for the region and the whole state. It shall contain a set of guiding principles and priorities to implement that vision.”
- (a) “A land use section upon which all other sections shall be based. This section shall translate the vision statements into physical terms. Based on a study of population, economic activity, and natural, historic, and cultural resources, it shall show existing conditions and the proposed location, extent, and intensity of future land use.”

The master plan may also include the following sections (RSA 674:2.III):

- (a) Transportation Section;
- (b) Community facilities section;
- (c) Economic development section;
- (d) Natural resources section;
- (e) Natural hazards section;
- (f) Recreation section;
- (g) Utility and public service section;
- (h) Cultural and historic resources section;
- (i) Regional concern section;
- (j) Neighborhood plan section;

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<sup>1</sup>RSA 674:1.

<sup>2</sup>Other planning board duties, such as subdivision and site plan review, etc., are actually allowed only if the voters at town meeting authorize the planning board to take on these responsibilities.

<sup>3</sup>RSA 674:2.

- (k) Community design section;
- (l) Housing section;
- (m) Implementation section.

Where appropriate, the Plan may contain appendices or separate reports that contain the underlying scientific and statistical data that support the various elements of the Plan.

## **II. WHAT WILL THE MASTER PLAN ACCOMPLISH?**

The Master Plan provides a framework for the Planning Board in particular and the town as a whole to use in shaping the future over a period of years (5-10 years is recommended for master plan updates<sup>4</sup>). The Planning Board should be able to refer to the town's Master Plan whenever a development proposal comes before it, to determine whether development that is being proposed is consistent with the Master Plan.

Most importantly, in order for any municipality in the State of New Hampshire to adopt a zoning ordinance, a Planning Board must have adopted, at a minimum, a general statement of goals and objectives and the land use section of a master plan. In Greenfield's case the Town does have a zoning ordinance. And, the current Master Plan was completed in 1985; in the ensuing 17 years, many changes have occurred in town. Therefore, it is incumbent on the Planning Board to bring the Master Plan up to date with current conditions.

This Master Plan represents - to the best ability of the Planning Board to determine - the wishes of the residents of Greenfield regarding the present and future vision of the town for the next 5-10 years. Throughout this process, the Planning Board has informed the public and solicited comment in order to reach the concluding recommendations.

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<sup>4</sup>RSA 674:3.II.



# The Vision of Greenfield

## Methodology

As part of the creation of a Vision Section, the Town of Greenfield took on a multi-faceted approach to gather information from as many residents as possible. The kickoff of the process began with a “Photo Exercise” in which 17 residents took pictures of seven things they “like” about Greenfield, seven things they “don’t like” and one picture of something they think may be “at risk”. A public session was held to share the results of the exercise and to engage additional residents that did not participate in the Photo Exercise but still wanted to share their vision of the community.

The next approach was to hold a Roundtable event to engage yet another group of residents who chose to participate in this style of public forum. There were 28 participants in this activity. In addition to the Roundtable and the Photo Exercise, the Planning Board conducted a survey which was made available in several locations in town and on the Town website. There were 133 responses, which were analyzed by a subcommittee of the Planning Board.

All of the information gathered from these three sources was considered and the Vision Section was created. It is a true representation of what the residents of Greenfield, who participated in these events, would like to see as the development in town continues. Participants varied in age, income levels, and household size. The compilation of data will serve as a vision into the future and should be used as a guide by the Planning Board in future land use decisions.

In the following section, a list of priorities has been established as a result of the analysis of the data from the sources mentioned above. Carrying the vision into the appropriate chapters within this Master Plan will help to ensure that they will be considered as goals to work towards.

## The Vision

The quality of life in Greenfield is defined by the rural character of the town. Maintaining slow growth will help to carry this vision for decades. The small town atmosphere and community involvement was echoed by many throughout the visioning sessions. Maintaining public facilities and town services helps to carry on the sense of pride residents feel for living in Greenfield. Community events such as the Roadside Round-up, an annual event to clean up litter accumulation along the roadways, shows the communities’ involvement and desire for continuing this vision. The residents of Greenfield have determined that the following information is important in order to achieve the desired outcomes of the future land use development:

1. **Maintain Greenfield’s Heritage and Historical Significance** – Maintaining the rural and historical character of the town was repeated by many residents. The historical buildings, cemeteries, stone walls, and gathering places should be maintained to provide protection for these significant town treasures. Finding appropriate uses for these will help to continue the heritage of Greenfield for many generations.

Attention to the Village District and the historical and cultural entities within this area of town needs to be a priority to keep the Greenfield values that are important to many.

2. **Preservation of Natural Resources, Open Space, and Farmland-** The lakes/ponds in Greenfield, as well as the numerous trails, and scenic vistas are enjoyed by many residents and

visitors. Scenic views and enjoyment of wildlife must be protected from development. Land use regulations must take into consideration the innovative ways in which development can occur while still preserving these areas. Maintaining a healthy ecosystem requires good stewardship of conservation land and monitoring of the waterbodies to protect the water quality. Farms provide fresh locally grown food and undeveloped land with scenic views. It is important to support and encourage local farming.

3. **Economic Development-** The concern by many residents about rising taxes was very high in the survey. In order to continue the current level of town services, it was acknowledged that some business growth is needed to help maintain the town budget. Attracting compatible businesses, at a growth rate that is consistent with the vision, will require some planning for the future.

Adequate internet access will help to attract potential businesses looking to establish roots in Greenfield. Without this service, the Town is at an economic disadvantage. This will also make greater opportunities for residents to work from home, thereby reducing automobile trips and negative effects on the environment.

4. **Housing Choices-** A mix of housing options, including senior housing, single family and modifications of existing structures, is needed to serve all ages and income levels of Greenfield residents. Encouraging infill development in the Village District, including mixed-use, will add workforce housing units. Concentration in this area will help to minimize the impact of sprawl development into undeveloped areas.

5. **Recreational Opportunities & Community Events-** The recreational opportunities available within the community add greatly to the enjoyment of living in Greenfield. Providing recreational options for all ages and all abilities is important and adds to the social equity of a community. Continuing efforts to maintain programs and recreational facilities should be a priority.

Community events are a great way to get to know other Greenfield residents. Local events in the village center should continue. Outreach efforts to encourage volunteers and sponsors will help achieve success of events and strengthen community relationships.

*Adopted by vote of the Planning Board following Public Hearing  
August 13, 2012*

# CHAPTER I

# TRAFFIC AND TRANSPORTATION ANALYSIS



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# **TRAFFIC AND TRANSPORTATION**

## **I. INTRODUCTION**

The state statute that addresses Master Plans, RSA 674:2, VI, calls for a transportation section that shows “. . . the location and types of facilities for all modes of transportation required for the efficient movement of people and goods into, about, and through the community.” Good transportation planning is important because of its capital-intensive nature; streets and highways typically represent the most significant public investment in a town’s infrastructure. Outside of school taxes, the highway budget is usually the largest percentage of a town’s operating costs.

The primary goal of this section, then, is to identify current issues and/or needs crucial to orderly development and the safe and efficient movement of traffic. A corollary purpose is to assist the Town of Greenfield in fully participating in all levels of transportation planning. Transportation infrastructure is heavily dependent on public funds, and the NH Department of Transportation (DOT) sets the priorities for spending through the development of a statewide Transportation Plan and Transportation Improvement Program. Both of these are required under federal legislation that prescribes the disbursements to states. In order for New Hampshire to qualify for its full allocation of funds, the NH DOT must comply with federal planning requirements.

To accomplish this task, the NH DOT requires each of the nine regional planning commissions in the state to develop a regional transportation plan that describes existing state road conditions within its region, identifies problems and concerns, declares goals and objectives for the regional network, and makes specific recommendations for improvements or new construction. Any local concerns relative to state-maintained roads must be addressed through the Regional Transportation Plan in order to be included in the State Plan. This section, therefore, takes the regional issues into account in the process of developing local goals for a safe and efficient transportation network.

## **II. LINKAGES OF TRANSPORTATION TO OTHER CHAPTERS AND PLANS**

Transportation planning considerations factor into a number of other parts of Greenfield’s Master Plan. It is important to recognize the interconnectedness to guide the growth and development of the town.

### **A. LAND USE**

Transportation connects origins to destinations and helps people access goods, services and each other. Roads will, in large part, be the basis for the development patterns of the future. Road design, functionality and placement will determine the types of land uses that will be able to occur on a parcel of land. For example, a collector road will attract a mix of uses including retail, professional offices, and residential, whereas a local road will typically provide safe access to residential development. Roads often are the basis for the development patterns of a town.

### **B. ECONOMIC DEVELOPMENT**

The ability to provide access to businesses will enhance the success of the towns’ capability to attract businesses. Direct access to major roads and parking availability are key elements to attract and retain



uses that depend on drive-by traffic. Planning for nodal development, or interspersing centers of development between roads with little development, allows communities to plan for economic and cultural activity centers that are separated by roadways designed for moving traffic. Freight transportation, or the movement of goods, is another important economic development and transportation consideration.

### **C. HOUSING/POPULATION/DEMOGRAPHICS**

The *pattern* of residential development will be determined, in part, by the roads that service them. Roadway classifications also have an effect on the *density* of development that can occur. Local roads can serve residential neighborhoods and multi-family developments safely without concerns of heavy through traffic. The use of access management helps to encourage safe transportation to denser developments. Road design standards such as width, grade, and speed are factors to consider when choosing to live in certain types of residential development. Higher density housing or low income housing may benefit by an offering of bicycle, pedestrian or transit improvements in order to maximize space and increase the affordability of the neighborhood.

### **D. NATURAL RESOURCES-ENVIRONMENTAL**

The careful consideration of locating roads away from sensitive areas such as streams and wildlife habitats is critical to the protection of our natural resources. Avoiding these areas will not only protect the wildlife that depend on large unfragmented areas, but will also add to the safety of roadway users. The use of Low Impact Development methods (LIDs) will help to reduce the length of roads, thereby reducing the amount of impervious surface. This will aid in the protection of water quality of our waterbodies and will also allow for groundwater recharge. Transportation has a significant impact on air quality and should be planned to reduce vehicle miles traveled whenever practical.

### **E. HAZARD MITIGATION**

Maintaining access to primary and secondary evacuation routes in town is an important life safety issue. Proper culvert size and installation for all road/stream crossings must be a priority for hazard mitigation in the event of heavy storm events. Bridge maintenance, erosion control, and stormwater management are also important considerations to maintain safe roadway infrastructure. Considerations such as these should be added into the Hazard Mitigation Plan and included as priority action items. An inventory of road/stream crossings should be updated annually, and erosion control methods should be used along roads with steep slopes to prevent washouts and erosion.

## **III. ROAD CLASSIFICATIONS**

Broadly, roadways in New Hampshire are classified for planning purposes into two types: State highway classification and Federal functional classification. *State highway classification* refers to the state's system of defining state and town responsibilities for road construction and maintenance. *Federal functional classification* is the system by which streets and highways are grouped into classes according to the type of service they are intended to provide. Basic to this process is the understanding that individual roads or streets do not serve travel independently; rather, travel involves movement through a

series of roadways in a logical manner by defining the part any particular road or street can play in serving traffic flow through a highway network.

Greenfield roads are managed under a series of classifications. Road systems are grouped and classified for several reasons. Some important reasons to classify roads include:

- Designing appropriate capacity, safety measures and design speed for roads;
- Guiding investment priorities for roads;
- Providing a framework for a road maintenance program; and
- Guiding land use related regulations and access management standards with frontage on the roadway system.

#### **A. STATE CLASSIFICATION (ADMINISTRATIVE) CLASSIFICATION**

All public roads in New Hampshire are classified in one of seven categories per NH RSA 229:5. Highways under state maintenance and control include Classes I, II, III and III(a). Classes IV, V, and VI highways are under the jurisdiction of municipalities. The following provides a description of various administrative classes.

Class I: Trunk Line Highways. These belong to the primary state highway system, and the state assumes full control and responsibility for construction and maintenance.

Class II: State Aid Highways. These belong to the secondary state highway system. The NH DOT assumes full control and responsibility for construction and maintenance.

Class III: Recreational Roads. These consist of all roads leading to and within state reservations designated by the NH Legislature. The NH DOT assumes full control and responsibility for construction and maintenance.

Class III-a: Boating Access Roads. These consist of roads that lead to public waters from any existing highway. The NH DOT assumes full control and responsibility for these roads.

Class IV: Town and City Streets. These consist of all sections of road that fall within urban compact areas of towns and cities with populations greater than 7,500. The municipality assumes full control and responsibility for construction and maintenance.

Class V: Rural Highways. These consist of all other maintained roads that are not in the state system. They are town-owned and maintained.

Class VI: Unmaintained Highways. These are all other existing public roads that are not maintained by the town and have not been for at least five years. The road may be closed subject to gates and bars, but it continues as a public roadway.

Of these seven state road classifications, Greenfield roads fall into three as follows: NH 31(Sawmill Road), Forest Road and NH 136 are Class II state highways; all other roads in town are Class V and Class VI town roads. These are illustrated on the accompanying map, and the number of miles comprised by each classification is described in Table #1.

**TABLE #1:  
ROAD MILEAGE BY STATE CLASSIFICATION**

Classification	Miles
Class II	13.8
Class V	37.2
Class VI	8.0
Private	8.7
Total	67.7

*Source: NH DOT*

As frontage along Class V roads becomes less available and the centers of town villages reach capacity, there is mounting pressure to develop on Class VI roads. Class VI roads are an important component of the town's transportation infrastructure as they personify the community's rural character and can provide a variety of recreational opportunities. The town should evaluate and make recommendations for future status of Class VI roadways and develop a Class VI road policy.

## **B. FUNCTIONAL CLASSIFICATION**

A functional classification system identifies roads by the type of service provided and by the role of each highway within the state system, based on standards developed by the US DOT. The purpose of utilizing such a system is to correlate the land planning and traffic planning functions of the Master Plan. Understanding the principal function of a road during the design phase of a project can reduce potential conflicts between land use activities and traffic movements. For rural areas such as Greenfield, the following categories are identified by the US DOT:

### **Other Principal Arterial/Controlled Access**

These are Interstates and some primary state routes. They are designed to move large volumes of truck and car traffic through and between population centers without disturbing local traffic and land uses. Controlled Access is a means of minimizing the number of curb cuts, thereby controlling the amount of turning movements along the roadway.

Within Greenfield there are no roads within this category. Within the Southwest Region, NH 9, NH 12 south of Keene, and NH 101 are classified as *Other Principal Arterials*.

### **Arterial System – Major and Minor**

These are the streets and highways that connect communities and regions. They are designed to move large volumes of traffic to and from large traffic generators without disturbing local traffic and land uses. Minor arterials distribute traffic to smaller geographic areas, and place more emphasis on providing land access than the major arterials.

Within Greenfield there are no Major or Minor Arterials. Within the Southwest Region NH 202, NH 10 south of Keene, and NH 12 north of Keene are Minor Arterials.

### **Collector System – Major and Minor**

Major Collectors are designed to move medium traffic volumes at low speeds between or within communities. They differ from the Arterial system in that collector streets go through residential neighborhoods, distributing traffic from the arterials through the area to its ultimate destination. Minor Collectors provide alternate routes to Major Collectors.

Within Greenfield, NH 31 (Sawmill Road), Forest Road, and NH 136 are classified as Major Collectors. There are no Minor Collectors in Greenfield.

### **The Local Street System**

This consists of all streets not classified in one of the other higher systems. Its primary function is to provide direct access to abutting properties and to other roads and highways. It offers the lowest level of mobility.

### **C. SCENIC ROAD CLASSIFICATION**

In addition to the state and federal classifications, RSA 231:157 allows towns, by a vote at Town Meeting, to designate any road other than a Class I or II highway as a Scenic Road. The effect of this designation is that, except in emergency situations, there shall be no tree cutting or alteration of stone walls within the right-of-way without approval of the Planning Board, after a duly-noticed public hearing. The law does not affect the rights of individual property owners; nor does it affect land uses as permitted by local zoning. The statute also authorizes towns to adopt provisions regarding Scenic Roads that are different from, or in addition to, those that are spelled out in the law. When this law was enacted in 1972, Greenfield residents voted to classify all town roads, or sections thereof, that were unpaved at the time as scenic; they are as follows:

1. Swamp Road from NH 136 to Old Bennington Road.
2. Cavender Road from NH 136 to the Old Bennington Road.
3. Colonial Drive from Riverbend Road to the end.
4. Riverbend Road from Cavender Road to the end.
5. Old Bennington Road from Forest Road to the Bennington Town Line.
6. Old County Road from Old Bennington Road to Forest Road.
7. Muzzy Hill Road from Old County Road to the end.
8. Sunset Lake Road from Crotched Mountain Road to the end.
9. Pine Ridge Road from NH 136 to the end.
10. S. Francestown Road from NH 136 to Dodge Road.
11. Dodge Road from S. Francestown Road to East Road.
12. Blanchard Hill Road from New Boston Road to the end.
13. Thomas Road from pavement change to the end.
14. Coach Road from Thomas Road to the end.
15. Old Lyndeborough Road from New Boston Road to the end.
16. Holden Road from Old Lyndeborough Road to Forest Road.

17. Miner Road from New Boston Road to Forest Road.
18. Woodland Hill Road from Miner Road to the end.
19. Etna Drive from Miner Road to Fletcher Farm Road.
20. Fletcher Farm Road from the end to Miner Road.
21. School House Road from Gulf Road to the end.
22. Gulf Road from Russell Station Road to the end of the Class V section.
23. Lake View Circle from Zephyr Lake Road to Zephyr Lake Road.
24. Slip Road from Gulf Road to pavement change.
25. Cornwell Road from Slip Road to Gulf Road.
26. Gulf Road from Peterborough Town Line to Slip Road.
27. Driscoll Road

The total mileage of these sections of road amounts to 19.55 miles, of the approximately 40 miles of town-owned roads.

## **IV. TRAFFIC PATTERNS**

### **A. ROADWAY USAGE AND CONDITIONS**

Roadway usage and conditions have an effect on our everyday enjoyment (or frustrations in some instances) of traveling through town. As the population increases within the state and region, so will the amount of traffic. Careful planning of our roadways, including alternative routes, will give users options to get to their destinations. A heavily travelled road during peak hours or a road with poor maintenance can be avoided, thereby making our travel experience more desirable. The chart below shows the Average Daily Traffic Counts that have been done at various locations over the last 34 years. This is an important factor in planning the location of future land uses as well as access points. The changes in traffic counts can be attributed to a variety of factors including but not limited to new subdivisions, new businesses opening, closing of businesses and road construction.

Information on traffic volume is collected by the NH DOT through the placement of traffic counting devices at various locations around the state. Some of these are permanently installed under the roadway and provide figures based on a full year count, while others are set out on a rotating basis for varying lengths of time – generally during the months of May to October for a seven-day period. Permanent counters are used only on state roads, while the temporary counters will be used on both state and local roads.

Table #2 presents the average annual daily traffic (AADT) counts for eight counters –four of the counters are within Greenfield, and four were placed on the border with neighboring towns (see Town of Greenfield, NH Traffic Counter Locations map). In 2015, two new locations were selected for traffic counters: Crotched Mountain Road north of NH 31 and Slip Road south of Depot Road. The collection of data are not consistent for each counter, so it is not practical to make a comparison of the changes over the same time period.

The location that shows the greatest amount of traffic in 2015 – the most recent year for which counts are available - is #185053, which is on NH 136 in the center of Town, just west of the intersection with NH 31. This counter has consistently registered the highest AADT's since 1989. It is important to bear in mind that these are not permanent counters, therefore any unique event during the week the counter is set out could cause the kind of reading that appears inconsistent.

**TABLE #2:  
AVERAGED ANNUAL DAILY TRAFFIC COUNTS, SELECT YEARS**

	1981	1989	1995	2007	2009	2010	2012	2015
NH 31 @ Bennington TL ( <b>185050</b> )	800	1200	1300	*	1600	*	1500	1500
NH 136 @ Peterborough TL ( <b>185051</b> )	1700	1900	2100	*	2200	*	2200	2000
Forest Rd. west of NH 31 ( <b>185053</b> )	*	2200	3400	*	3300	*	3200	3700
Forest Rd @ Hancock TL (201052)	600	800	850	960	*	1200	*	*
NH 136 @ Frankestown TL (159050)	*	*	1200	*	1400	*	1200	1200
NH 31 at Lyndeborough TL	*	*	*	*	2400	*	2500	2600
Crotched Mt. Rd. north of NH 31	*	*	*	*	*	*	*	1400
Slip Rd. south of Depot Dr.	*	*	*	*	*	*	*	570

Sources: NH DOT; Southwest Region Planning Commission

\*Unrecorded

## **B. TRAFFIC GENERATORS**

Most of Greenfield's traffic is residential, since that is the primary land use in town. There is a significant amount of truck/commercial traffic that services the businesses, as well as travel through Greenfield to and from neighboring towns; NH 31, in fact, carries a significant amount of through truck traffic.

Aside from the residential and local business traffic, Greenfield has several large traffic generators, the single largest being Crotched Mountain Rehabilitation Center in the northern part of town. The Center employs more than 800 people working three shifts, and houses over 90 patients; in addition, there are 24 day students and an out-patient clinic. The access to the Center is off of NH 31, but traffic to and from the facility travels over all three Class II highways (NH 31 & 136, and Forest Road).

Greenfield is also home to Greenfield State Park, with 253 sites, and Brantwood Summer Camp which accommodates 365 campers annually. The locations of these facilities are identified on the Town of Greenfield, NH Community Facilities map found in Chapter Three – Community Facilities. In addition to these seasonal generators, the Barbara C. Harris Camp is another traffic generator in Greenfield that predominantly serves guests during the summer months, although the conference center is available throughout the year and accommodates up to 200 guests.

### C. COMMUTING PATTERNS

The commuting patterns are guided by those employees that are travelling in to Greenfield to reach jobs, and those that live in Greenfield and are travelling to jobs outside of Greenfield. Although the majority of jobs in Greenfield are held by out of town workers, Greenfield holds the greatest percentage of town residency for Greenfield jobs. It is likely that there are additional Greenfield residents that work out of their homes which may not be included in the figures.

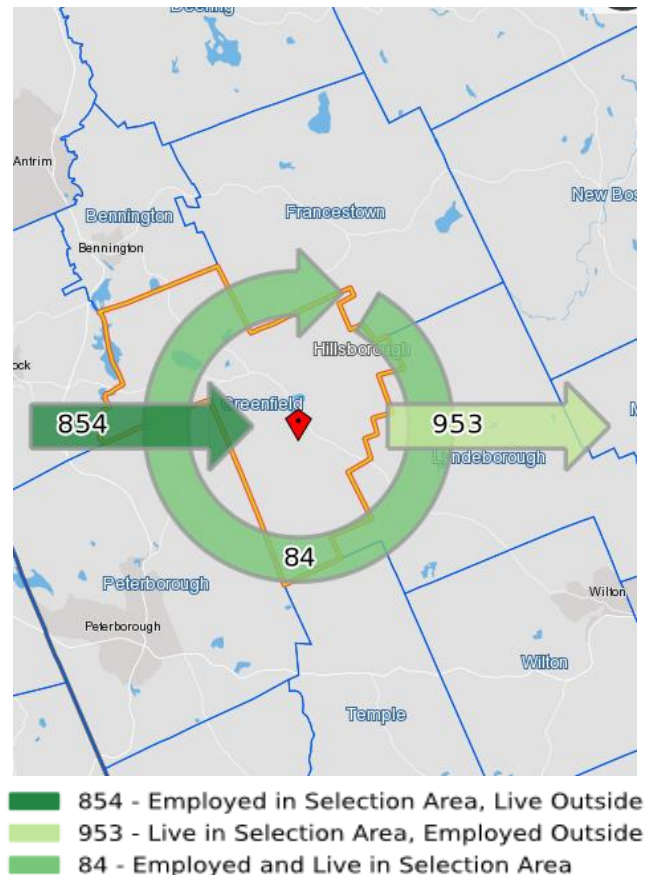
According to data from the *US Census Bureau- Journey to Work and Place of Work 2010*, the majority of commuters use NH 31 to reach the north and south destinations, whereas the commuters travelling east and west predominantly use NH 136. In addition to the destinations, seasonal employment also has an effect on the commuting patterns. In Greenfield, three of the top five largest employers; Barbara C Harris Center, Brantwood Camp, and Greenfield State Park, are seasonal employers. This not only adds more commuters during the summer months, but also brings a considerable amount of daily visitors.

This Inflow/Outflow chart shows the number of Greenfield workers that live in other towns (854 people) and commute to Greenfield; the number of Greenfield residents that are employed in other towns (953 residents) and commute out to other locations; and the amount of Greenfield residents that live and work in Greenfield (84 residents). This information, however, does not include military personnel or those that are self-employed.

**TABLE #3:  
COMMUTING**

Inflow/Outflow Job Counts (Primary Jobs)		
	2013	
	Count	Share
<b>Employed in the Selection Area</b>	938	100.0%
<b>Employed in the Selection Area but Living Outside</b>	854	91.0%
<b>Employed and Living in the Selection Area</b>	84	9.0%
<b>Living in the Selection Area</b>	1,037	100.0%
<b>Living in the Selection Area but Employed Outside</b>	953	91.9%
<b>Living and Employed in the Selection Area</b>	84	8.1%

Source: US Census 2013- Longitudinal Employer Household Dynamics





## V. ROAD NETWORK

### A. SURFACE WIDTHS & CONDITIONS

Roads in Greenfield are of varying widths and surface conditions. The wideness of a road is not necessarily related to the ownership – i.e., the state roads are not always wider than the town roads, although they are more likely to have wider shoulders.

The NH DOT *Suggested Minimum Design Standards for Rural Subdivision Streets* provides the specifications recommended for minimum width and materials. These specifications are based on average daily traffic – in other words, the more traffic a road carries, the wider the traveled way and shoulders, the deeper the base and top coat, etc.

According to these standards, the minimum width for the least-traveled road should be 18 feet, plus a two-foot shoulder; this is for a road carrying no more than 50 vehicle trips per day. Many town roads do not meet this standard and, even with new construction, many small towns will approve an 18-foot width for a Class V town road carrying more than 50 vehicle trips per day.

Road widths in Greenfield vary from 10 feet or less for certain Class V and Class VI roads to 25 feet. All of the state roads are between 16 and 25 feet wide, with Forest Road being the widest. The Class V roads fall into the 11-15 and 16-20-foot widths; only the Class VI (unmaintained) roads are less than 11 feet wide.

### B. BRIDGES

Bridges present an ongoing maintenance and repair concern for all towns, oftentimes accounting for a large portion of local highway budgets. Bridges also present the potential for a number of safety hazards in instances where they are severely deteriorated or are significantly narrower than the road they serve. Bridges are rated by the DOT, using a system based on federal standards for type of construction, widths, surface conditions, ability to handle traffic volumes, etc. Greenfield has only two bridges, the locations of which are identified on the Town of Greenfield, NH Transportation Infrastructure Functional Classification map. The status of these bridges is presented in Table #4.

**TABLE #4:**  
**STATUS OF BRIDGES**

Bridge ID Number	#151/089	#161/102
Location	School House Road over School Brook	Lyndeborough Mt. Rd. over Stony Brook
Last Inspection Date	October 2014	August 2014
Federal Sufficiency Rating <sup>1</sup>	42.9	95
Owner	Town	Town
AADT/Year	230/1987	60/1987
Type of Bridge	Metal Pipe	Metal Pipe
Width	14 feet	17 feet
Functional Class	Rural Local	Rural Local
Year Built (or rebuilt)	1988	1996
Scour Critical Rating	Stable for extreme flood	Stable for extreme flood
<sup>1</sup> The functional sufficiency ratings noted in the table are based on certain criteria regarding traffic capacity, bridge approach, and integrity of the structural components and the bridge surface. A rating of less than 60 points is indicative of a disproportionate share of deficiencies, and a rating of less than 40 points indicates a bridge in very poor or severely deteriorated condition. Source: NH DOT Bridge Design, Bridge Summary 2015		

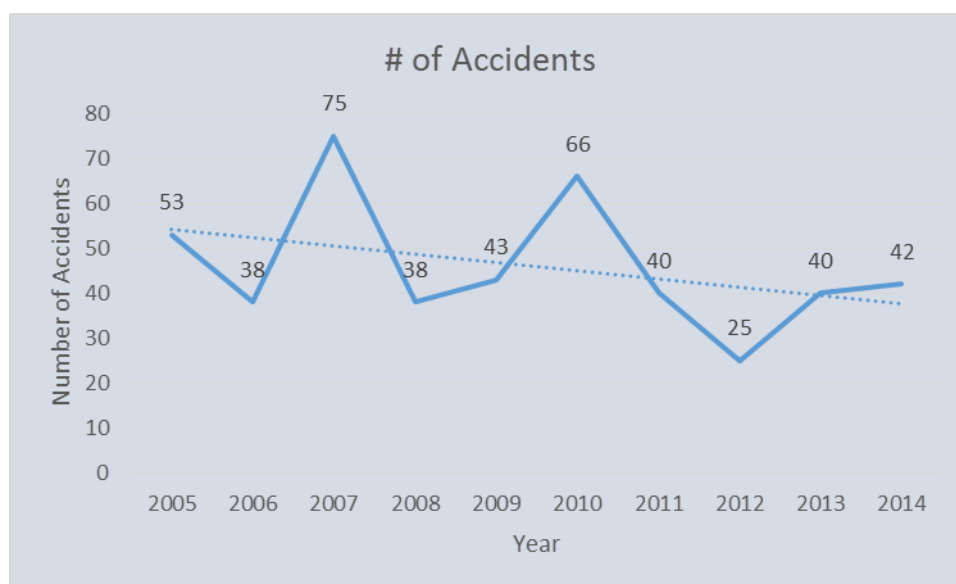
### C. ACCIDENT LOCATIONS AND AREAS OF CONCERN

According to the Greenfield Police Chief, most of the accidents are the result of speed. There does not appear to be any particular pattern to accidents, nor are any roads necessarily more susceptible to accidents than others, with the exception of the railroad crossing on Forest Road, and the sharp curves on Miner Farm Road. The accident rate in Greenfield has actually declined, due to strict local enforcement. The Police Department has a part-time squad whose primary function is traffic patrol.

**TABLE #5:  
NUMBER OF ACCIDENTS 2005-2014**

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Accidents	53	38	75	38	43	66	40	25	40	42

*Sources: Greenfield Town Reports, Police Department*



*Source: Greenfield Town Reports, Police Department*

Vehicle accidents are an occurrence that we all want to avoid. However, without careful planning of roadways and intersections, there may be an increase of accidents at a given location. Accident reports obtained from the Police Department are an effective way to identify areas that are in need of correction. Factors such as sightline visibility at intersections and driveways, poor drainage, excessive speed, sun glare and icing are some of the key reasons for traffic accidents. Many of these can be avoided with good design. It is more efficient and cost effective to identify potential conflicting points prior to roadway construction than to retrofit a problem. It is also easier for drivers so they don't need to adjust to the change.

Projects involving heavy traffic should be required to submit a traffic study by a licensed engineer to the Planning Board. A traffic study will identify the projected level of service (LOS) at intersections and the entrance to the property during peak hours of traffic. The Planning Board may require a peer review, or

third party review, to check the accuracy of the traffic study. The peer review may also result in potential alternatives such as a more suitable driveway location, intersection improvements, pedestrian enhancements, or other safety measures.

Consulting with the local traffic authority and road agent to review sight lines for proposed new accessways can help reduce hazardous situations.

#### Stormwater Management

Some of the roadway concerns are associated with the rising water during heavy rain events. There are several culverts throughout Greenfield that need to be replaced with larger culverts to handle the increased amount of rainfall that has recently been experienced in the region. Several sections of roadway should also be elevated to avoid flooding and prevent the undermining of the roadway. Table 6 provides location of culverts and road elevations that were identified by the Greenfield Hazard Mitigation Committee and added to the Hazard Mitigation Plan as projects to consider.

**TABLE #6:  
STORMWATER MANAGEMENT ROAD PROJECTS**

Location	Project Type
Cornwell Road	Elevate the road.
Russell Station Road	Replace the culvert with a larger one.
Dunklee Hill Road	Replace the culvert with a larger one and elevate the road.
Country Road	Reconstruction for stormwater management.
Cavender Road	Elevate the road.
Swamp Road	Elevate approximately 1550' of the road.
New Boston Road	Replace the culvert with a larger one.
Old Bennington Road	Elevate the road from Country Road to Forest Road.
School House Road	Elevate the road.

*Source: Greenfield Hazard Mitigation Plan*

In addition to these infrastructure projects, the committee identified the following strategies to improve safety on the roads:

- Improve ditching along roads to improve stormwater management
- Open the roads up to allow sunlight to hit the surface to prevent icing
- Trim tree branches near roads and powerlines
- Encourage maintenance of privately owned culverts and stream crossings

The Planning Board should apply these strategies where they feel they are appropriate.

## **VI. PUBLIC/ALTERNATIVE TRANSPORTATION MODES**

The focus of this analysis has been on vehicular, private transportation. Alternative travel is limited in this region, although it has certainly seen resurgence over the last several years. Most roads were designed and built with little or no consideration for anything but vehicles; pedestrians and bicyclists must share the road with cars and trucks. In recent years there has been an increase in both pedestrian and bicycle traffic, and with it a recognition of the potential dangers of mixing these activities with vehicular traffic. These issues can be partly addressed at the local level by designing new roads with attention to alternative traffic. With existing roads the problems are more difficult, since the Road Agent is dealing with a

circumscribed width in most cases; warning signs and speed limits are the traditional techniques for ameliorating the conflicts, although not always effective.

#### **A. PEDESTRIAN**

Planning for pedestrian traffic involves providing areas and amenities that allow pedestrians to get to their destination by walking. Providing sidewalks, crosswalks, and pathways is the way to accomplish this form of transportation. Adding amenities, such as benches and shade trees will help to encourage walking. Another point of consideration for this mode is *connectivity* from one location to another. The proximity and safety between locations will be a deciding factor for some users. Sidewalks that don't connect pose a safety risk for pedestrians, especially those with physical challenges and strollers. It forces them to walk in the roadway or walk across unpaved and uneven terrain. Curb cuts should be provided at the end of each sidewalk and driveway entrances.

Pedestrian mobility in the Village area has been a difficult issue, due to the lack of adequate walking paths and the fact that the Village is at the confluence of two state highways. A plan has been proposed to provide for new sidewalks along NH 31 from the north side of NH 136 which will connect the Village with the elderly housing complex, Greenfield Elementary School, Oak Park, and Greenfield State Park. This suggestion has come about as a result of two Community Design Charrettes done by Plan NH that were held in 1997 and 2014. The planning exercises identified the need to formalize pedestrian and motor vehicle access within the Village and create a walkable distance to these locally-important locations. In addition to the sidewalks, the plans suggest streetscape amenities to encourage usage of the sidewalks and enhance users' enjoyment.

#### **B. BICYCLE**

As people become more health conscious and environmentally aware, this form of transportation is more attractive. The rising cost of fuel also contributes to this decision. Providing bicycle lanes along the roadways is an important and responsible part of transportation planning. This includes clearly established bike lanes, pavement markings, and signage. Planning for the safe passage of bicycle users also includes bike friendly drainage grates and an awareness of other potential hazards. Similar to the needs of pedestrians, connectivity between locations is important for the local bikers that are trying to get to areas within town. Making sure that pathways and bike lanes connect to the local destinations will help to avoid conflicts between bikes and vehicles. Bike racks should be required for sites that tend to attract bicycle users.

NH 31 from the Village south and Forest Road from the Village west is designated as a state bicycle route. Bicycle routes are generally designated as roads with shoulders four feet or wider. All roads in the system are considered to be the best available roads for bicycling to major destinations. All share the road with motorized vehicles. Shoulders vary from wide to none.

#### **C. CARPOOLING**

Ride sharing to work and events is a form of transportation that should be encouraged. While most of us enjoy the freedom of getting to our destinations in our own vehicle, and at our own convenience, there are other options that can be utilized in an effort to be environmentally sensitive and budget wise. A role that the town can play to help facilitate this is to establish a commuter lot. Providing a ride-share board will also provide a way for interested commuters to make connections with other commuters that are travelling to a similar destination.

## **D. PUBLIC TRANSPORTATION**

Public transportation plays a very small role in the overall service network. There are presently no bus routes that serve Greenfield. Community transportation for special needs populations is available from a number of social service organizations on an as-needed basis; some of these services are also open to the general public. For a complete description of the available services, please refer to Southwest Connects, which is the Southwest Region Transportation Plan that was updated in 2015.

## **E. RAIL/TRAILS**

The Hillsboro Branch of the Wilton-Bennington state-owned railroad line traverses Greenfield southeast to northwest. This is an inactive rail freight line, but the tracks are still in place. There are no plans for conversion of this line to a recreational trail.

The railroad bed is clearly indicated with the still-present tracks, making it of course not usable for alternative transportation purposes. There are only a few public trails: one in the area of Russell Station; one that runs from downtown east to the State Park; two that run almost parallel to one another from the Francestown Road north almost to Sunset Lake Road; one that begins near Sunset Lake Road and ends in Francestown. There are also portions of Fletcher Farm, Blanchard Hill, and Dunklee Hill roads that were converted to class A trails.

Common Pathway trail runs for nearly 7 miles from south of downtown Peterborough near Noone Falls on route 202 north to Forest Road in Hancock, one-half mile from the Greenfield town line. The trail is a combination of asphalt and gravel and follows an old railroad right-of-way along the Contoocook River. This unpaved trail continues north from Bennington Depot along the same railroad bed as the Hillsborough Recreational Rail Trail and connects the communities of Bennington, Antrim, Deering, and Hillsborough as it winds along the Contoocook River through rural and wooded landscapes for nearly 8 miles.

# **VII. ROAD IMPROVEMENT PROGRAM**

## **A. STATE PROJECTS**

As of 2015, the only state project in Greenfield is project # 40595 to repair State owned railroad bridges. This project is in the planning phase and is described as the design, construction, and inspection of repairs to the railroad bridges on State owned railroad lines.

## **B. LOCAL PROJECTS**

The Highway Department has a ten-year road plan and is creating a five-year gravel road schedule to put new material down on Class VI roads.

## VIII. TECHNIQUES FOR ADDRESSING TRANSPORTATION ISSUES

### A. PLANNING STRATEGIES

**Focus development in the Village:** Provide for mixed uses and higher densities in the Village rather than in the outlying parts of town.

**Identify appropriate land uses:** Existing land uses can be monitored and the Zoning Ordinance consulted to ensure that development will be compatible with the road system. Applications for development must always be reviewed with the scale of proposal relative to the road network and abutting land uses in mind.

**Plan for pedestrian and bicycle connections:** The Town can make sure that it is always at the table when the NH DOT is considering plans involving the state routes, and make every effort to see that all due consideration is given to the accommodation of non-motorized traffic.

**Develop and adopt a Road Policy:** The Planning Board, in conjunction with the Board of Selectmen, can develop a road policy that would guide development in town based on the status of existing roads and any future plans for roads. This can go far to ameliorate potential questions and problems when applications are submitted for the upgrading of a road, or for a building permit on a Class VI road.

**Capital Improvements Program:** A Capital Improvements Program (CIP) that sets forth the planned capital expenditures over a six year period can also help to guide road development. In conjunction with a Road Policy, the CIP can set the schedule as well as the degree and type of road improvements.

**SWRPC Transportation Advisory Committee:** Participation in this Committee provides an opportunity for the Town to be involved in the development of the Region's 10-Year Highway Plan.

**Complete Streets Policy:** "Complete Streets" is an overall approach to planning, improving and maintaining the street right-of-way for all potential users of the roadway. It takes into consideration all modes of transportation. It is an understanding that people have a variety of needs and are at varying levels of abilities. Complete Streets encompasses a broader way of viewing transportation corridors beyond the travelled portion of the roadway. By understanding these needs and abilities, streets can be planned in a way that is safe and convenient for all users. Providing safe crosswalks, ramps, benches, and shade trees help to encourage walking, which in turn includes benefits such as healthier lifestyles, social interaction, reduction in localized automobile trips, and improved environmental quality. This adds to the social capital of the community and helps to define the distinct character of the community. It provides options for residents and visitors to access shopping, health care, school, and employment. The additional pedestrian traffic can have economic benefits for local businesses as well. Inclusion of landscape improvements may also result in an increase of adjacent property values.

The town should consider adopting a Complete Streets Policy. Along with adopting this policy, other ordinances should be reviewed for barriers that make a walkable/bikeable community difficult to implement. A review should also be done to provide economic opportunities for businesses along these areas such as outdoor patio areas.

Components of Complete Streets Policies include:

- Addition of sidewalks and bicycle lanes;
- Intersection improvements to include crosswalks and signalization for pedestrians and bicyclists;

- Installation of raised or textured crosswalks in locations that have higher pedestrian traffic;
- Streetscape amenities such as benches, street lights, shade trees;
- Sidewalk bumpouts for creating locations for trees and benches, and to add traffic calming principles.

## **B. REGULATORY STRATEGIES**

**Road Standards:** Included in the Subdivision Regulations administered by the Planning Board are standards for road construction. These essentially mirror the DOT standards discussed above, which address such things as width of the traveled way, width of shoulders, type of materials to be used and depth of each level. The Board also has the option, through a waiver procedure, of accepting plans for new roads with modified standards: for example, approving a graveled road rather than a paved road for developments of low traffic impact.

**Driveway Standards:** In accordance with the provisions of RSA 236:13 and 674:35 of the Planning Board adopted the Driveway Regulations on May 23, 2005 and revised them on September 22, 2008. The intent of these regulations is to:

- ensure that emergency services can be reasonably and safely provided to all dwelling units in the Town, including those constructed on or accessed by steep slopes;
- ensure that driveways entering onto roads do not represent a safety hazard;
- minimize the amount of terrain alteration and vegetative removal on hillside areas required for driveway construction;
- ensure that driveways do not disrupt drainage systems or culverts, damage the surface of right-of-ways, or cause erosion or siltation of traveled ways or surface waters; and
- avoid unreasonable public expenditures.

**Access Management Techniques:** These techniques range from various driveway standards and requirements to the use of medians, signalization and signage.

## **C. SUBDIVISION AND SITE PLAN CONSIDERATIONS**

During the subdivision or site plan review process the Planning Board has an opportunity to review all proposals based on the transportation issues identified in this section. Some of the pertinent issues include:

### **VIEWING THE WHOLE PARCEL**

It is always important to step back from an individual plan and look at it in relation to the neighboring properties and land uses. If the lot fronts on more than one road, decisions can be made about which roads would better serve as access, how the parking should be laid out, etc.

### **LOT LAYOUT**

When the opportunity presents itself through a multi-lot subdivision, the subdivision design should consider shared driveways or an interior street, with lots fronting off of the interior rather than the main roads.



## **PARKING LOT LOCATION AND DESIGN**

There are a number of issues with parking lots for commercial uses, such as:

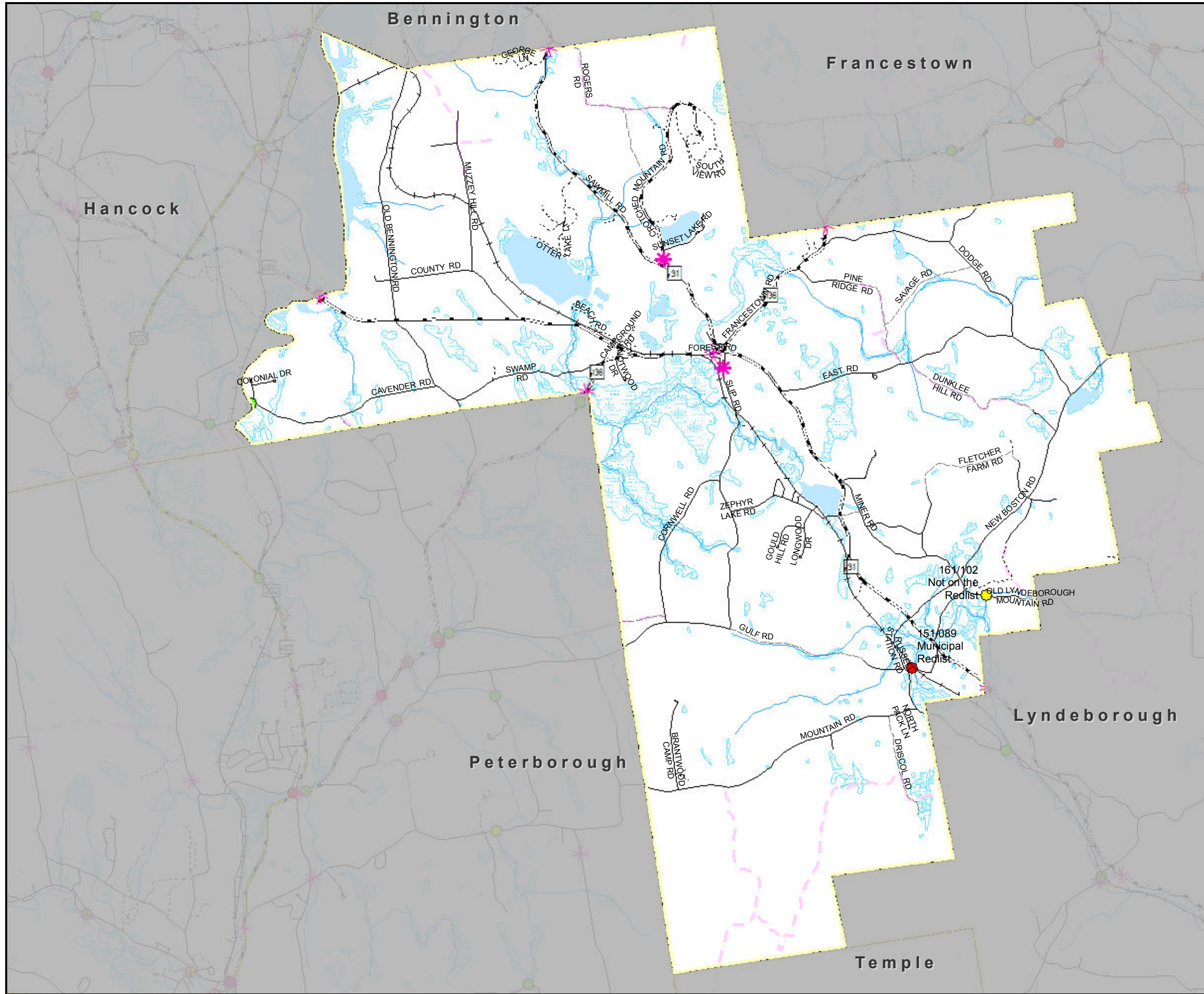
- locating the building(s) close to the road and putting the parking on the side or in the rear of the parcel;
- requiring shared parking, when feasible;
- planning for future shared parking by designating reserved areas on the plan;
- prohibiting parking and loading that requires backing out onto the street; and
- the use of vegetative buffers between parking lots and roads.

## **DRIVEWAY LOCATION AND DESIGN**

- Do not allow more than one entrance and one exit drive on any lot.
- Make sure the driveway is long enough to allow vehicles to pull off the road and stack inside the lot before entering the road.
- Require two-way driveways to intersect the road at an angle of 70-90 degrees.
- Address sight distance from the access point. Adequate sight distance will depend on the road classification and traffic volumes, but ideally, sight distance should be at least 11 times the speed limit.
- Avoid curb cuts on sharp curves.
- Limit driveway grades within 20 feet of the road to no more than 3% uphill and 6% downhill.



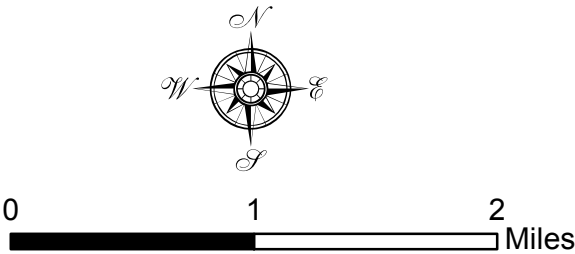




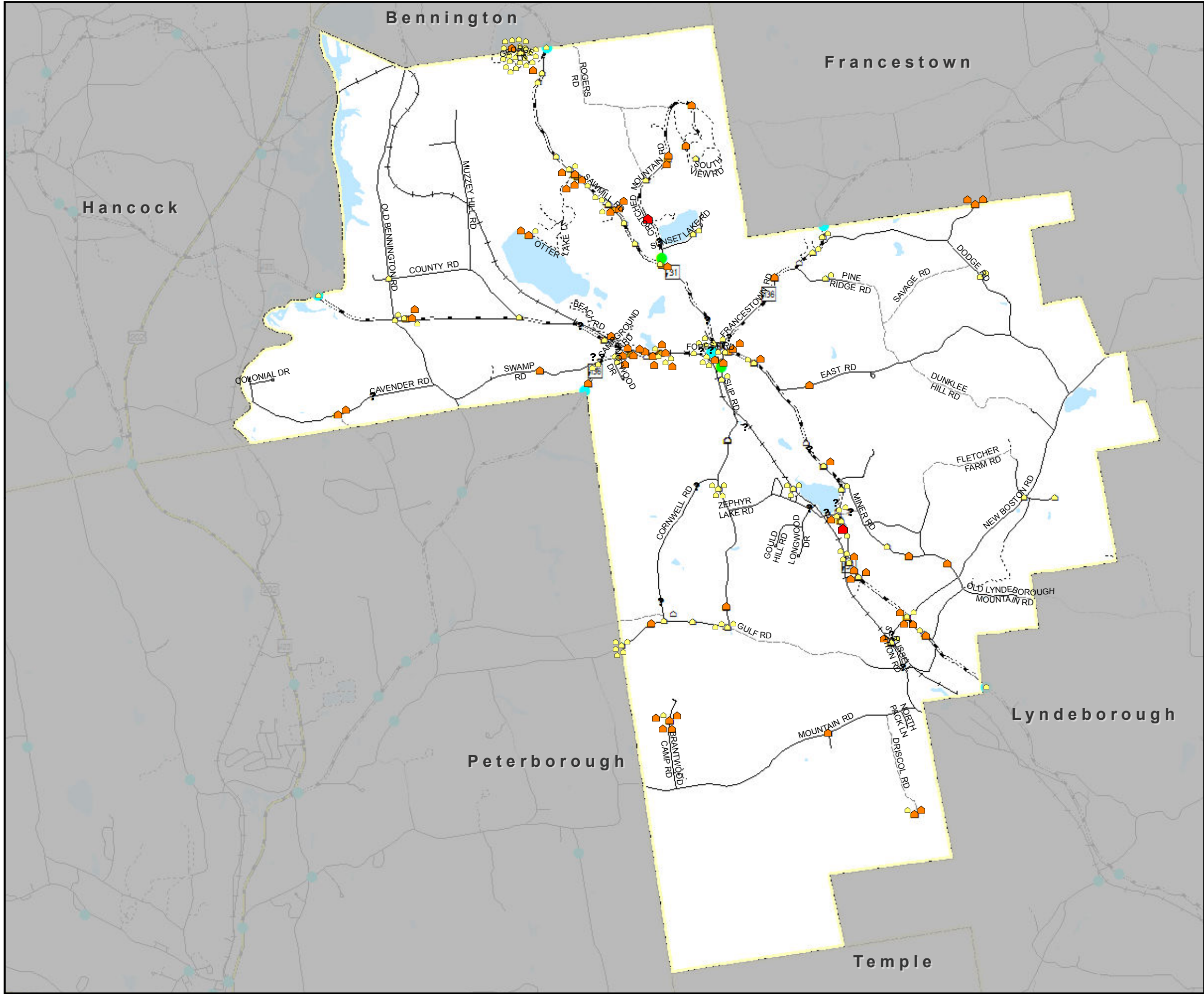
# Town of Greenfield NH

## Transportation Infrastructure Map

- | Highways  | Bridges   | Traffic Counts                       |
|-----------|-----------|--------------------------------------|
| Class I   | Good      | Traffic Count Location (NH DOT)      |
| Class II  | Fair      | Additional Master Plan Traffic Count |
| Class III | Poor      |                                      |
| Class IV  | Not Rated |                                      |
| Class V   |           |                                      |
| Class VI  |           |                                      |
| Private   |           |                                      |
- 
- | Features           | Railroad and Trails |
|--------------------|---------------------|
| Lakes and Ponds    | Railroad            |
| Wetlands           | Trail (NH GRANIT)   |
| Rivers and Streams |                     |
| Parcel Boundary    |                     |







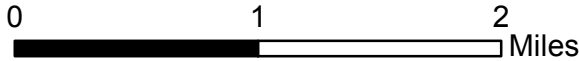
# Town of Greenfield NH

## Traffic/Safety Map

- Highways**
  - Class I
  - Class II
  - Class III
  - Class IV
  - Class V
  - Class VI
  - Private
- Motor Vehicle Crashes 2002 - 2014**  
(Total Locations/Total Injuries)
  - Fatal (2/2)
  - Injury (50/72)
  - Property Damage Only (115/176)
  - Unknown (20/23)

Note: Crash data per NH DOT. Out of 187 provided crash locations, 63 were not located and have not been mapped. However, all provided crash data is reflected in the above crash and injury totals.

- Features**
  - Lakes and Ponds
  - Wetlands
  - Rivers and Streams
  - Parcel Boundary
- Traffic Counts**
  - Traffic Count Location (NH DOT)
  - Additional Master Plan Traffic Count



# CHAPTER II

## CONSTRUCTION MATERIALS ANALYSIS



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### MAPS

Gravel  
Roadfill  
Sand  
Topsoil

# CONSTRUCTION MATERIALS ANALYSIS

## I. INTRODUCTION

### **Enabling Legislation**

In 1989 the New Hampshire Legislature amended the statute that addressed the purpose and description of a Master Plan: RSA 674:2, VIII-a called for a “construction materials section which summarizes known sources of construction materials which are available for future construction needs, including, at a minimum, the location and estimated extent of excavations which have been granted permits under RSA 155-E, as well as reports filed pursuant to RSA 155-E: 2, I (d) with respect to non-permitted excavations.” RSA 155-E is the enabling statute for communities in New Hampshire to adopt regulations as may be reasonably necessary to carry out the excavation of material including operational and reclamation standards. If the community does not have such regulation, an applicant can apply to the Zoning Board of Adjustment for a special exception. Greenfield adopted the *Regulations Governing Earth Excavations* on November 25, 1990 and a revised it on January 26, 2015.

The statute, however, does not define “construction materials” nor does it specify what the “construction needs” might be; however, since the statute addressing earth excavations is referenced (RSA 155-E), it is logical to assume that, at a minimum, sand and gravel are intended. The primary source for identifying sand and gravel resources is the Soil Survey of Hillsborough County, which was completed in 1984<sup>5</sup> by the USDA Soil Conservation Service (SCS). Developed according to the National Cooperative Soil Survey standards by soils scientists, the soil survey identifies distinct properties and characteristics of different soil types, from which certain predictions are made about the suitability of a soil for different uses. The document includes a table entitled “Construction Materials” that lists four types of material by soil category; these are roadfill, sand, gravel, and topsoil.

The purpose of this section of the Master Plan is to identify such materials that may be located in Greenfield. Soils information is an important consideration in land use planning since the various characteristics of soils such as steepness, wetness, flood susceptibility, and flood storage have an impact on development potential. The soil types are listed in tables and the boundaries of the soil units are illustrated on maps.

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<sup>5</sup> Soil Survey of Hillsborough County, New Hampshire, US Department of Agriculture, Soil Conservation Service, 1984. (The SCS is now the Natural Resource Conservation Service.)



## **II. THE SOIL SURVEY: MATERIALS IN GREENFIELD**

The following descriptions of the four types of construction materials are based on the above-referenced Soil Survey of Hillsborough County. Soil categories are identified in the Survey by number and letter; the number represents the composition of the soil, and the letter designates the steepness - "A" being the flattest and "E" the steepest. Note that the maps developed for this report show the soil unit boundaries but not the identifying number and letter, as the scale of the maps would render this information illegible. The designation is described below.

The classifications used to designate the construction materials are based on a number of factors, including observed performance of the soil, soil properties, and site features that affect the removal of the material and its use as a construction material.

### **A. DESCRIPTION OF MATERIALS**

#### **Roadfill**

Roadfill is defined by the Survey as soil material that is excavated in one place and used in road embankments in another place. Only soils suitable for low embankments (under six feet) were rated by the Survey. Roadfill is rated as being either "good", "fair" or "poor". "Good" soils are those that are comprised of significant amounts of sand or gravel or both, and slopes of 15% or less. "Fair" soils have in excess of 35% silt and clay-sized particles, and slopes of 15-25%. "Poor" soils contain many stones, or slopes of more than 25%.

Roadfill materials in Greenfield are primarily of the "poor" classification, with much smaller areas of "good" and "fair" identified. Areas of good roadfill soils range in size from several rather large concentrations to numerous smaller pockets distributed all over town in no particular pattern. The larger areas are primarily located to the south and west of Route 31.

The fair materials are also distributed virtually all over town, with the largest concentration to the east of Hancock and north of Peterborough. The remaining soils in Greenfield are classified as poor roadfill material.

#### **Topsoil**

Topsoil is defined in the Survey as material used to cover an area in order to establish and maintain vegetation. For the purposes of the Survey, only the upper 40 inches of soil were evaluated for its use as topsoil. Topsoil is also rated as being either "good", "fair" or "poor". Soils rated as "good" contain no stones or cobbles, have little or no gravel, and slopes of less than 8%. "Fair" soils are sandy, have considerable amounts of gravel or stone, or slopes of 8-15%. "Poor" soils are comprised of a lot of sand or clay, have a large amount of gravel or stone, and slopes of more than 15%.

All topsoil in Greenfield is rated as "poor", with one exception: a very small (less than 2 acres) pocket of fair topsoil is indicated on the west side of Old Bennington Road about midway between County Road and the Bennington Town Line.

### Sand and Gravel

The properties used to evaluate sand and gravel soils include the thickness of the material, the size of the grain, and the content of rock fragment. In addition, the material must be at least three feet thick and have less than 50%, by weight, large stones.

The soils are rated "good," "fair," or "poor" as potential sources of sand or gravel. A rating of "good" or "fair" means that sand is likely to be in or below the soil. The bottom layer and the thickest layer of the soil are assigned numerical ratings which can range from "good" to "poor".

The distribution of sandy soils is much more defined than roadfill soils; the probable sandy soils are almost all concentrated in the center of Town in a northwest-southeast pattern. Gravel deposits in Greenfield follow almost the same disbursement pattern as the sand, but there are fewer acres deemed probable for the presence of this material.

## III. CONSTRUCTION MATERIALS IN GREENFIELD

The following table presents the calculated acreages for all four construction material types. Based on the Soil Conservation Service information, Greenfield clearly has more sand and gravel than roadfill or topsoil, the quality however, is predominantly rated as poor by the Soil Survey of Hillsborough County. Subsequently, 35 percent of topsoil is rated as fair in quality. An accurate analysis cannot be made for the roadfill category since 61 percent has not been rated.

### CONSTRUCTION MATERIALS BY TYPE AND ACREAGE

CONSTRUCTION MATERIAL	AREA	% OF TOTAL LAND AREA
<b>Roadfill</b>		
Good	219.3	1.3%
Fair	2,317.6	13.4%
Poor	4,181.4	24.2%
Null or Not Rated	10,586.4	61.2%
<b>Topsoil</b>		
Fair	6,064.7	35.0%
Poor	10,781	62.3%
Null or Not Rated	458.9	2.7
<b>Sand</b>		
Fair	562.9	3.3%
Poor	16,282.8	94.1%
Null or Not Rated	458.9	2.7%
<b>Gravel</b>		
Fair	2,887.0	16.7%
Poor	13,958.7	80.7%
Null or Not Rated	458.9	2.7%
<b>Total Land Area – 17,304.6 Acres</b>		

*Sources: Soil Survey of Hillsborough County; US Department of Agriculture*

#### IV. GROUNDWATER IDENTIFICATION

To refine the identification of sand and gravel deposits in the Town of Greenfield, aquifer delineation studies are examined and compared to the SCS soil survey. This information is useful, since the identification of potential groundwater is based in part on the inferred presence of sand and gravel soils; thus, the interpretation that where an aquifer exists, so too, do sand and gravel deposits. Groundwater identification should not, however, be solely relied upon to locate sand and gravel deposits, as these data present only part of the total picture.

The reason for this is that sand and gravel deposits were created by glaciers and rivers, and can be deposited on valley floors, hillsides and hilltops. The aquifer studies identify those soils that were deposited on valley floors - known as stratified drift. The other formations that must also be considered are eskers and deltas, both of which can be prodigious sources of sand and gravel deposits, which are not found in valley floors, but rather on hillsides and hilltops. Therefore, they would not show up on an aquifer map. These formations all have something in common, namely that the materials have all been sorted by water; however, while good aquifers are also good sand and gravel sites, good sand and gravel sites are not always good aquifer sites.

Examination of the region-wide aquifer map titled: *Stratified Drift Aquifers with Watersheds/Basins, Southwest Region*, found in the Natural Resources Analysis Chapter of the Master Plan, shows that Greenfield lies within portions of three major watersheds: the Upper Contoocook to the west; the Piscataquog to the northeast; and the Souhegan to the southeast.

The map of Greenfield's aquifer, at the end of this chapter, has greater detail for the Town and shows a fairly large aquifer deposit exactly in the center of town, underlying areas that are considered probable for sand and gravel.

#### V. EXCAVATION OPERATIONS IN GREENFIELD

Earth excavation has not been an actively sought land use in Greenfield. There are four excavation sites of which only two are considered "*active*". The Town of Greenfield has a sand and gravel pit on Forest Road. The other active excavation site is a commercial operation on Old Bennington Road.

Two sites in the following chart are listed as *inactive*. The excavation site on Sawmill Road was an incidental site during construction of a subdivision. The subdivision has been completed and the removal of earthen material has since ceased. The other inactive site is owned by the New Hampshire Department of Transportation. This site has not been used in many years and it is unknown when the state may again remove material.

**Excavation Sites**

Location		Status	Comments
R7/Lot 28 Forest Rd	Forest Road Town Pit	Active	Town Pit-First Excavated 2013
R2/Lot 17.1 Sawmill Rd	Sawmill Road	Inactive	Revegetated
R1/Lot 3	Muzzy Hill Road	Active	Commercial Pit-Only one in town
R1/Lot 28	The DOT Garage	Inactive	Not excavated for many years.

Source: Town of Greenfield records

**Permitting**

The table below is used in New Hampshire to provide a listing of requirements in RSA 155-E for consideration of earth removal operations:

**NEW HAMPSHIRE EARTH EXCAVATION REGULATIONS**

	No Permit Required	Permit Required	Must Comply w/ Minimum Standards	Must Post Reclamation Bond	Excavation Report
Existing as of 8/24/79	X	For Expansion	X	For Expansion	X
Begun since 8/24/79		X	X	X	
In connection with statutory manufacturing plants	X		x	For Expansion	
Highway Excavations	X		x	For Expansion	
Incidental to building, etc.	X				
Incidental to agriculture, etc.	X				
Granite Excavations	Not regulated by the Planning Board				
Abandoned pre 8/24/79	No Regulation				
Abandoned post 8/24/79				X	
Nonconforming as of 8/4/89		For Expansion	X	For Expansion	

Source: NH Department of Environmental Services

## VI. OPPORTUNITIES FOR EXCAVATION

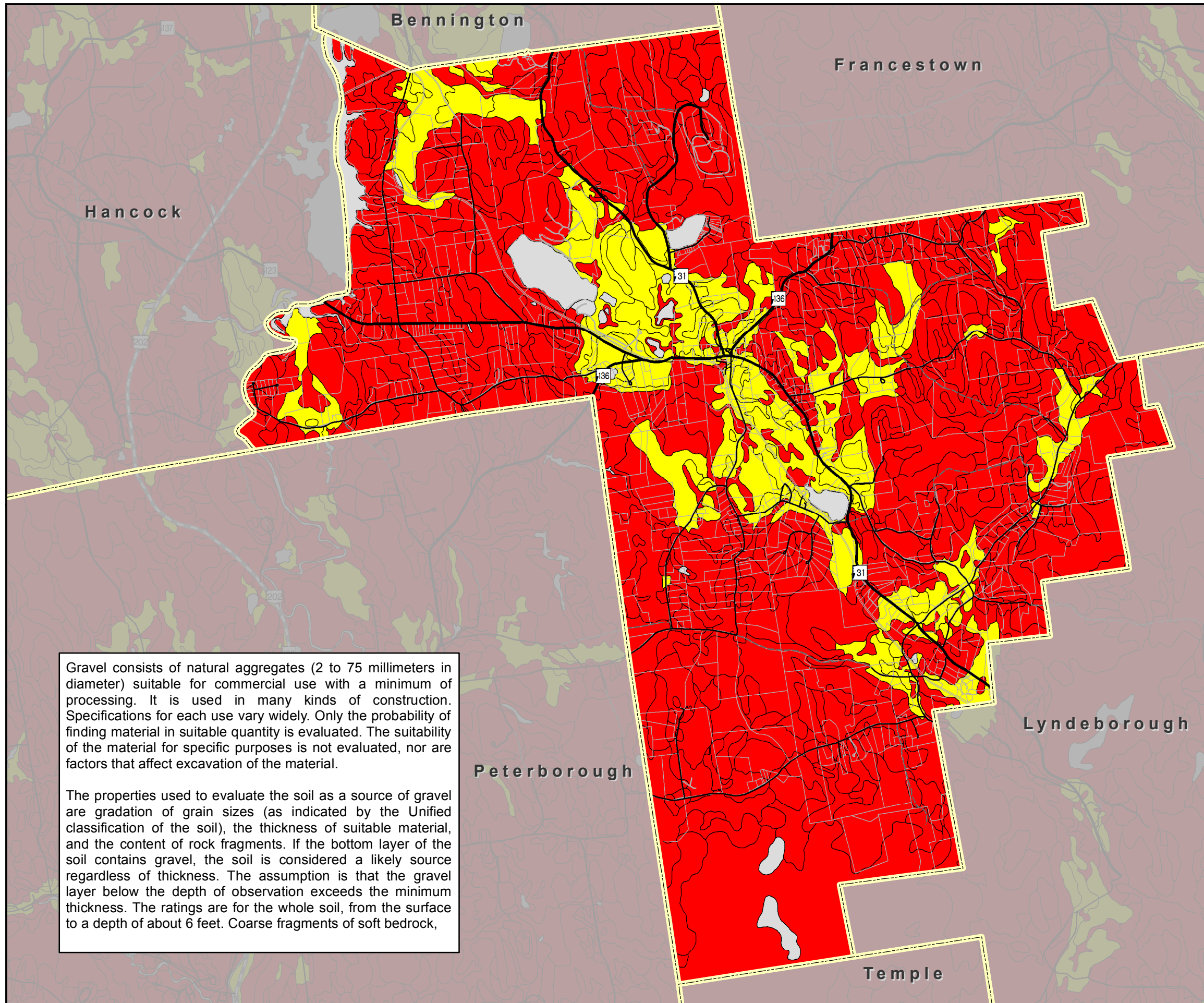
The information on construction materials in this chapter is intended to be used for land use planning. Once locations of sand, gravel, roadfill and topsoil have been identified, the Planning Board can make informed decisions regarding the appropriate locations for the excavation of these materials.

The Town of Greenfield is zoned for six districts, the largest being the Rural/ Agricultural District. The zoning ordinance permits excavation in the Industrial Areas, of which there are two: one on Sawmill Road near the Bennington Town Line, and one in the Russell Station area.

Based on the maps generated for this chapter, the Soil Survey, and the available information on excavation sites in Greenfield, it would appear that the Town has a fair to large supply of sand and gravel, however, most of the sand and gravel appear to be located beneath the Town's aquifer deposits and the quality of this material is predominantly rated as *poor* or *fair*. Today, given the pattern of development, location of the aquifer, and quality of material, opportunities for any large-scale excavations appear to be quite limited.

The following are considerations of the Planning Board with regard to earth excavation:

- The Board will consider whether to permit excavations (by special exception) in the Rural/Agriculture District.
- The Board will recommend that the NH Department of Environmental Services Environmental Fact Sheet on Best Management Practices for Fueling and Maintenance of Excavation and Earthmoving Equipment is followed by all operators.



# Town of Greenfield NH

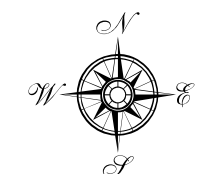
## Construction Materials

### Gravel

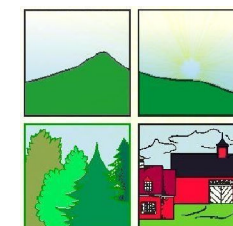
- Poor
- Fair
- Good
- Not rated or not available

Gravel consists of natural aggregates (2 to 75 millimeters in diameter) suitable for commercial use with a minimum of processing. It is used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of gravel are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains gravel, the soil is considered a likely source regardless of thickness. The assumption is that the gravel layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet. Coarse fragments of soft bedrock,

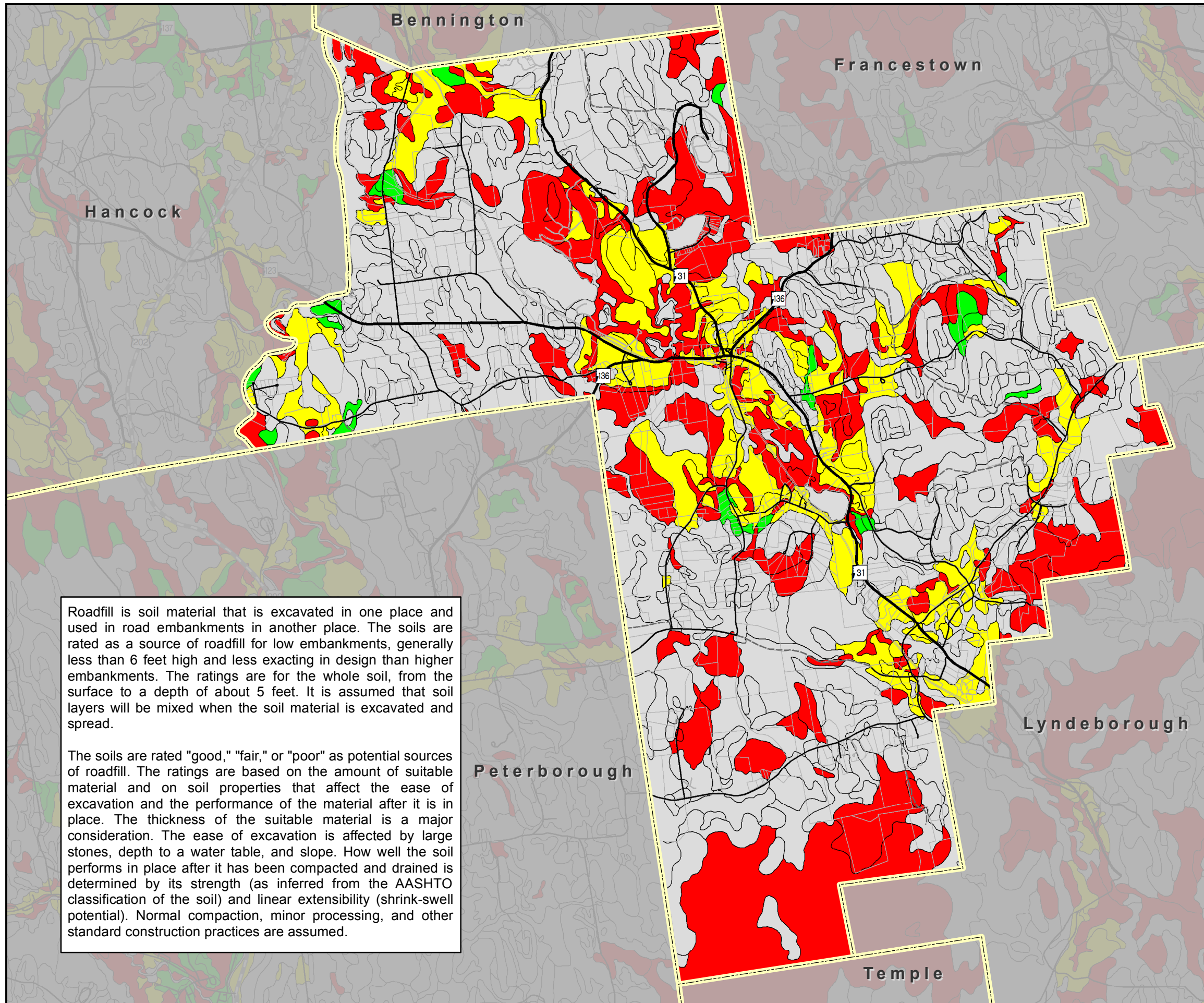


0 1 2 Miles



**Southwest  
Region  
Planning  
Commission**





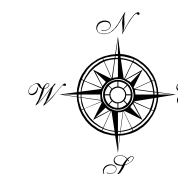
Roadfill is soil material that is excavated in one place and used in road embankments in another place. The soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments. The ratings are for the whole soil, from the surface to a depth of about 5 feet. It is assumed that soil layers will be mixed when the soil material is excavated and spread.

The soils are rated "good," "fair," or "poor" as potential sources of roadfill. The ratings are based on the amount of suitable material and on soil properties that affect the ease of excavation and the performance of the material after it is in place. The thickness of the suitable material is a major consideration. The ease of excavation is affected by large stones, depth to a water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the AASHTO classification of the soil) and linear extensibility (shrink-swell potential). Normal compaction, minor processing, and other standard construction practices are assumed.

# Town of Greenfield NH

## Construction Materials Roadfill

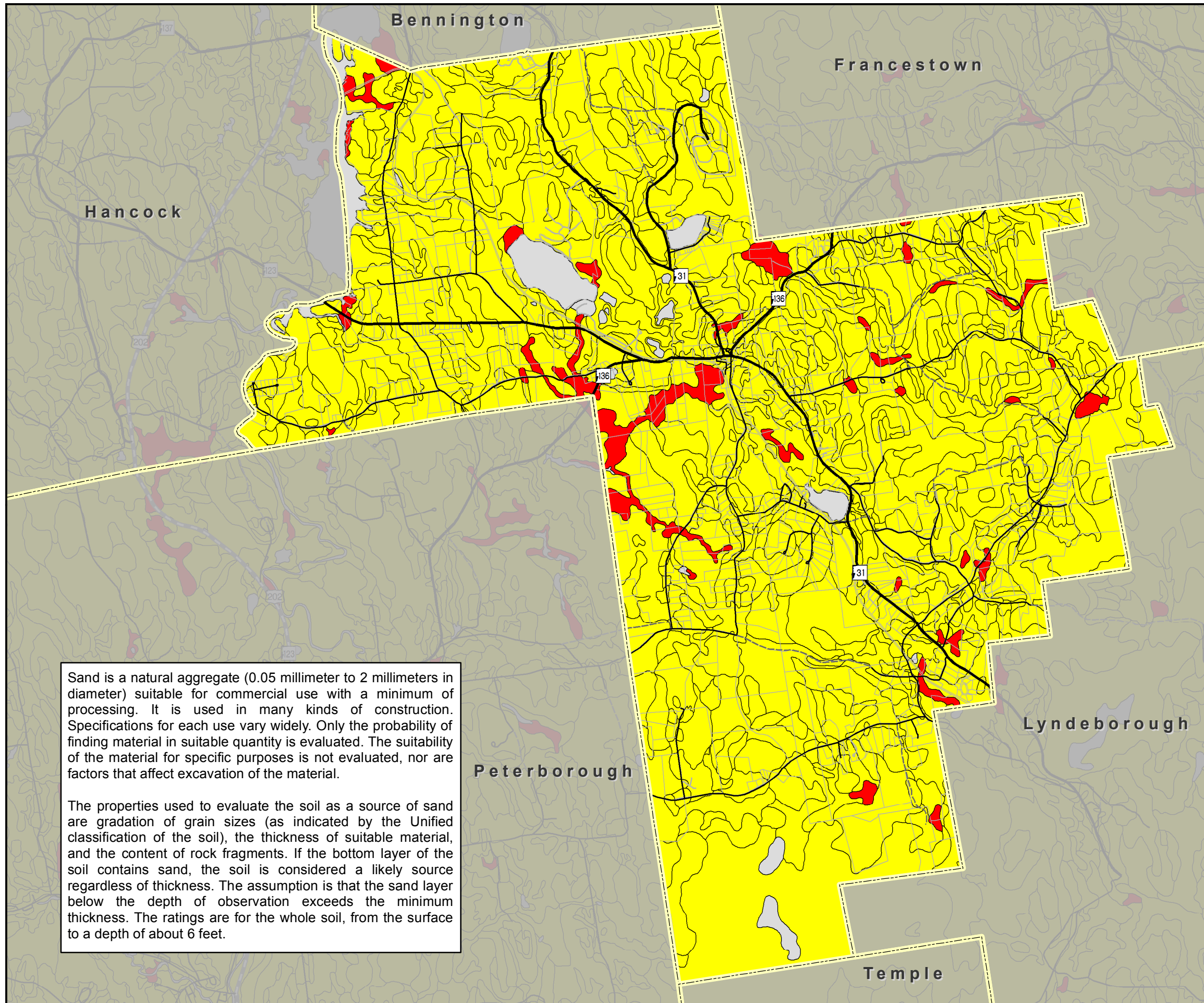
- Poor
- Fair
- Good
- Not rated or not available



0 1 2 Miles







Sand is a natural aggregate (0.05 millimeter to 2 millimeters in diameter) suitable for commercial use with a minimum of processing. It is used in many kinds of construction. Specifications for each use vary widely. Only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

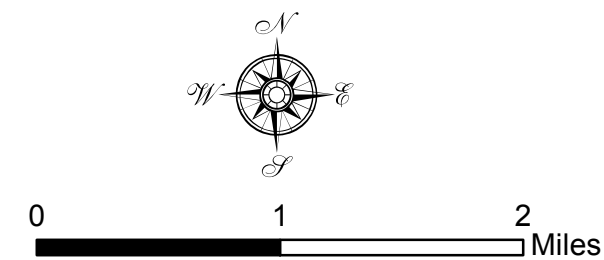
The properties used to evaluate the soil as a source of sand are gradation of grain sizes (as indicated by the Unified classification of the soil), the thickness of suitable material, and the content of rock fragments. If the bottom layer of the soil contains sand, the soil is considered a likely source regardless of thickness. The assumption is that the sand layer below the depth of observation exceeds the minimum thickness. The ratings are for the whole soil, from the surface to a depth of about 6 feet.

# Town of Greenfield NH

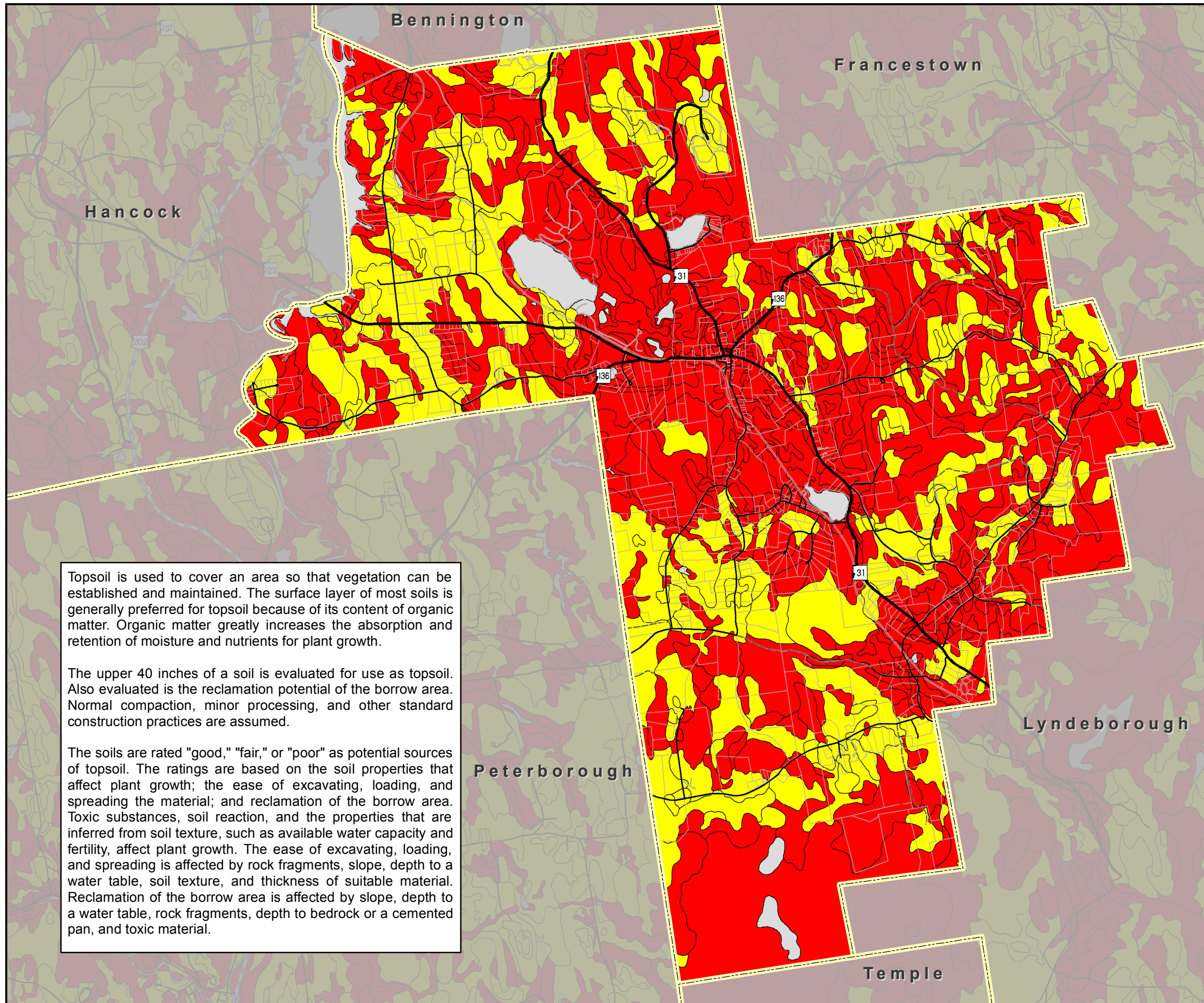
## Construction Materials

### Sand

- Poor
- Fair
- Good
- Not rated or not available







Topsoil is used to cover an area so that vegetation can be established and maintained. The surface layer of most soils is generally preferred for topsoil because of its content of organic matter. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area. Normal compaction, minor processing, and other standard construction practices are assumed.

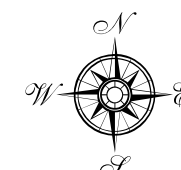
The soils are rated "good," "fair," or "poor" as potential sources of topsoil. The ratings are based on the soil properties that affect plant growth; the ease of excavating, loading, and spreading the material; and reclamation of the borrow area. Toxic substances, soil reaction, and the properties that are inferred from soil texture, such as available water capacity and fertility, affect plant growth. The ease of excavating, loading, and spreading is affected by rock fragments, slope, depth to a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, depth to a water table, rock fragments, depth to bedrock or a cemented pan, and toxic material.

# Town of Greenfield NH

## Construction Materials

### Topsoil

- Poor
- Fair
- Good
- Not rated or not available



# CHAPTER III

# COMMUNITY FACILITIES ANALYSIS



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### **MAPS**

LOCATION OF COMMUNITY FACILITIES

## **COMMUNITY FACILITIES**

### **I. INTRODUCTION**

An important function of town government is to provide residents and property owners with a level of service commensurate with taxes and fees paid that meet the current needs of the populace. This Section of the Master Plan identifies public and semi-public facilities that serve the residents and property owners of Greenfield. In Greenfield's case, these include public safety (police, fire, and ambulance), public works (water, sewer, roads, solid waste disposal, and cemetery maintenance), schools, recreation, cultural facilities, health and welfare services, and the town government operations (selectmen, property maintenance, and assessment).

The degree to which these facilities are developed has a significant impact on the quality of life and general character of a community. This chapter of the Master Plan presents an inventory of such facilities and services, an assessment of the adequacy of the current level of service, and plans or recommendations to expand, improve, or add to an existing facility or service.

### **II. TOWN HALL, TOWN GOVERNMENT**

The administrative services for Greenfield are located in the former elementary school on Sawmill Road in the village. This is a two-story wood frame building constructed in 1885 and listed on the State Historic register. The entire building was renovated in 2001 for use as the Town Office. Recent work has completed renovations begun in 2001, but the question of window replacement remains unresolved.

The lower level of the building houses the Police Department, including office space and a recently created interview room that was badly needed. Storage space has been built to house town records, however, it lacks climate control and fire security. An additional room houses computer networking hardware, electrical services and the phone system that supports the offices of various departments throughout the building. An additional room houses the newly installed boiler.

The first floor has a large meeting room and offices for the Town Administrator, Office Manager, Town Clerk, Tax Collector, Code Enforcement Officer, and Welfare Director. Various elected/appointed Boards meet from time to time as needed or required by statute. These include the Zoning Board of Adjustment, the Trustee of Trust Funds, the Cemetery Trustees, and the Supervisor of Checklists. Other volunteer committees also use the meeting room to promote civic and holiday related observances.

The second floor provides meeting and filing/storage space for the Conservation Commission, Planning Board and Zoning Board of Adjustment. In addition, the old gymnasium/ recreation room is open and currently unused.



The old Town Office building, located on Francestown Road, is currently leased by Crotched Mountain Education and Rehabilitation Center as office space. Following extensive renovation, the facility will be returned to public use when the conditions of a renovation grant are fulfilled.

The position of Town Administrator was created in 2011. The administrator serves as an agent of the Board of Selectmen and interacts daily with various department leaders, Boards and members of the public.

### **III. EMERGENCY SERVICES**

#### **A. POLICE PROTECTION**

Police protection in Greenfield is provided by a full-time Chief, one full-time Sergeant, one full time Patrolman and three part-time officers. Coverage is provided 24 hours a day by shifts in the Department's two cruisers.

The department is located in the lower level of the Town Hall. With the completion of the interview room, barring unforeseen rapid population growth, the facility needs for the Police Department are met for the foreseeable future. When the old Town Office building becomes available, one potential use could be for Police/Public Safety.

#### **B. FIRE AND RESCUE SERVICES**

Fire and Rescue protection is provided by a Volunteer Fire Department with 30 plus members exclusive of department officers, some of which are exclusively trained rescue personnel. All Fire Department members are required to become certified to enter any fire involved structures or provide hands-on emergency medical services to the public.

The Department is located at 816 Forest Road just West of the Village. The Fire House was constructed in 1974, consisting of two bays, two deep, a full kitchen, two small offices and a small meeting room. Funds were appropriated at Town Meeting in 2001 to construct an addition to the Fire House which added another bay, one and ½ deep, a large meeting room that is open to the kitchen and pantry, an Emergency Medical Service (EMS) supply room, two - ¾ bathrooms and an Emergency Communication Room, all of which are handicap accessible. The facility also is equipped with a generator capable of providing full power.

Equipment owned and maintained by the Department consists of two engines, one tanker, one rescue truck, a utility equipment truck, a rescue boat, a military trailer for forestry equipment and a skid-mount forestry pump and on board water supply. Additionally, there is a state-owned forestry truck that is on loan to the Department. The Town is fortunate to have a very extensive amount of water resources within its boundaries.

Greenfield is a member of the "Southwestern NH District Fire Mutual Aid" dispatch center, based in Keene, NH, which dispatches for nearly 100 member towns for emergency calls of fire, EMS and ambulance transport services which are contracted from an outside neighboring agency. The Department is also a member of the Souhegan Valley Mutual Aid Association, since neighboring towns to the east of Greenfield are members of this organization and are listed as mutual aid departments for multiple alarm emergencies that might occur in Greenfield. The Department is also an active member of the Monadnock Area Fire Chiefs Association which consists of all our neighboring towns and beyond who communicate regularly about current technology, training and mutual aid needs. Additionally, the Members of the Department also operate as a non-profit organization known as "The Greenfield Firefighter Association" and is registered with the state of NH and the IRS.



The town has contracted the services of Emergency Communications Network (ECN) for their Code Red emergency notification service. ECN enables any emergency service within Greenfield to notify all residents who subscribe to this service of Emergency Notifications. The Town has also agreed to have access to the NH reverse 911 services which are being developed as of 2014 for local administering.

Greenfield's Forest Fire Warden is planning to adopt and implement an electronic outdoor burn permit process that is presently being tested and expected to be operational in 2015.

The landmark covered bridge on the Contoocook River bordering Hancock has been outfitted by the State of NH with a sprinkler system which is only operable by fire apparatus from the Greenfield line.

#### **IV. DEPARTMENT OF PUBLIC WORKS**

The Department of Public Works (DPW) is located on DPW Drive, off of Sawmill Road, in a building constructed in 1974. The 40' x 80' building contains four equipment bays, an office, and a parts room. Also on the property are a salt shed and a sander hanger. The Department employs a full Superintendent and 3 full time employees.

Equipment owned and maintained by the Department consists of the following:

The DPW's current vehicle roster is such;

- 1998 Trackless Tractor
- 2003 John Deere 672 Grader
- 2005 International 6 Wheel dump truck
- 2007 Ford F-550 Dump truck
- 2007 Caterpillar Loader
- 2009 Caterpillar 430 backhoe
- 2012 Ford F-250 Pick-up truck
- 2014 Mack 10 Wheel dump truck

Since the last Master Plan Update the Highway Department has been tasked with transitioning themselves to become the Department of Public Works. With this change the DPW is now responsible for Maintenance of all town facilities as well as its roads. To perform this task requires them to co-ordinate services, acquire bids for services and materials, and maintain and oversee the construction of roads. The DPW is also working on the reconstruction of roads in co-ordination of the roads commission, and elevating some of gravel roads.

Tasks the DPW has performed of late include creating a police locker room out of the tax collectors former storage area and moving the records to more secure area, creating a storage space with shelves and refurbishing an area of the Police Department to become an interview room.

The Town may need to consider expansion of the DPW building/facilities in the foreseeable future.

#### **V. SOLID WASTE DISPOSAL**

The Town of Greenfield operates a Recycling/Transfer Center at 29 DPW Drive, which is off Sawmill Road. The facility uses the same driveway as the Department of Public Works (DPW) and is located on about 2 1/2 acres of land sitting beyond the DPW. Structures on site consist of a building with an enclosed 60' x 40' area and an attached open bay area of 10' x 40'. There are also several sheds: a storage shed 10' x 10', the Mini Mall shed 11' x 11', the Library shed 11' x 11" and an open three-sided 11' x 11' shed. The equipment

used on site are a town-owned compactor for the trash, as well as a S185 Bobcat that was delivered to the Center in the Spring of 2012. There are two old balers in use with limited capabilities that need attention. One full-time, one part-time and one on-call employee staff the center.

Materials recycled include #1 and #2 plastics, tin/steel cans, aluminum cans, corrugated cardboard, mixed paper, glass, light metals, non-ferrous metals, white goods, textiles, used oils which include automotive and cooking/dressing oils, used antifreeze, household and wet cell batteries, all electronic items, tires, empty propane tanks, and compact fluorescent bulbs and tubes. The Center also collects cell phones, ink cartridges, eyeglasses, old flags, and Box Tops for Education and distributes them to the appropriate entities. We also have a Mini Mall and Library for items for re-use. A brush pile/yard waste area is also provided for the residents.

The town contracts with Monadnock Disposal Services (MDS) to haul the trash and demolition materials at the rate of \$90.00 per ton, including the hauling fee. In 2013, the Center had a total of 194 tons of materials recycled, 238 tons for the trash, and 69 tons for the demolition material (most of which is separated and recycled by MDS).

There are fees associated with certain items that cost the town to properly recycle. These fees, as well as the revenues from the sale of materials, go into the general fund to help offset the Recycling Center's bottom line.

The Recycling/Transfer Center is a main part of the Town's services. Therefore, the Center should have future and continuous consideration in the Master Plan for maintaining, updating, and expanding the capabilities, as well as providing a profitable, clean, respectable, facility for residents to visit.

## **VI. MUNICIPAL WATER/SEWER**

Greenfield has no municipal water system. It should be noted that the Town Office building, Old Town Office building, Stephenson Library and the Meeting House are all served by one well. The recent installation of a generator at the Town Office building assures water at those sites in the event of emergencies.

Responding to recommendations from a PlanNH charrette in 1997, the Town voted to build a municipal septic facility on the site of the East Coast Steel building. The facility is currently operating at about 40% capacity with seventeen hook-ups in operation. The Waste Water site is the subject of ongoing discussion about how to make the best use of that open space.

## **VII. LIBRARY**

The Stephenson Memorial Library is located in the center of the Village in a stone building constructed in 1909 for this purpose, and has been used continuously as a library ever since. The library is governed by an elected three member Board of Trustees and supported by a Friends of the Library volunteer committee. The library is a member of the New England Library Association and the New Hampshire Library Association. In

2012-13, our Children's Librarian served as the President of the Children's Librarians of New Hampshire (CHILIS), a Division of The New Hampshire Librarians Association.

In 2003, ground was broken for a major addition, the Ann Geisel Wing. This addition more than doubled the Library's useable space, permitting installation of handicapped bathrooms, computers, an expanded



Children's Room, staff workspace, and more shelving and stack space. A separate basement room, the Wensburg Room, was also constructed with support donated by the Greenfield Woman's Club, providing meeting space for many community activities. The first full year of operation was 2004.

Staff consists of two part-time employees, a Library Director and a Children's Librarian, who work 29 hours per week each:

Responding to public interest, the Library went from a three day to a four day per week schedule in 2012, open Wednesday through Saturday year round. As Library use has expanded, the Trustees are currently exploring the need for more parking and have been working with the Emergency Management team to potentially participate in some fashion in emergency management preparedness.

The Library is rapidly transitioning to a 21<sup>st</sup> Century institution capable of serving a wider and ever-changing range of community needs. The staff works continuously to provide access to digital materials and technology. Four computer terminals as well as free Wi-Fi serve community residents who currently lack internet access. On-line reminders, a Facebook page, and other forms of out-reach are used to extend the Library's connection to the community. To this end, securing broadband connectivity for the community is an extremely important goal. The Library currently has about 12,000 volumes with a 2013 circulation of 16,868. The Library works closely with both the Parent-Teachers Organization and the Greenfield Elementary School Staff on grants, story times, topical books, special events and exhibits. The library participates in the Community Summer Library Program and hosts a Summer Reading Program.

## **VIII. RECREATION**

Greenfield is fortunate to have many resources providing recreational opportunities to the residents. They include:

- 1) General Events: Below is a list of the types of events that are available to youth and adults at various sites around town. These events are coordinated by the Town Recreation/Town Administrator and/or Oak Park Committee.

- Supervised swimming at Sunset Lake
- Cal Ripkin T-Ball and Little League Baseball at Oak Park
- Monadnock Mountaineers Football at Oak Park
- Miss Laura's School of Dance (tap and ballet) at the Meeting House
- Line Dancing with Linda Gray at the Meeting House
- Music on the Common, Tuesday evenings in the summer at the Meeting House
- Boy and Girl Scouts at Oak Park, the Meeting House or the Stephenson Library
- Tennis at Oak Park
- Ice Skating at Sunset Lake

- 2) Oak Park Committee: Oak Park is a town-owned 20 acre park on Forest Road, west of the Village. General maintenance of the Park is provided by the Town, and the Committee, comprised of volunteers, raise money to provide various recreational structures at the Park, as listed below:

- |                           |                               |
|---------------------------|-------------------------------|
| • Soccer / Football Field | • Pavilion w/kitchen facility |
| • Running Track           | • Gazebo                      |
| • Baseball Field          | • Playground                  |
| • Dugouts                 | • Horseshoe Pits              |
| • Tennis Courts           |                               |

- 3) Greenfield Community Garden: Behind the Town Office building
- 4) In addition to the above, the Crotched Mountain Rehabilitation Center makes certain facilities available to residents of Greenfield, such as use of the swimming pool, including discounts on lessons, use of the gymnasium, the volleyball court, as well as the Media Center, Library, movies and handicap accessible hiking trails.

Table 1 lists the recreation facilities and opportunities in Greenfield. Some highlights of these facilities are as follows:

- Four bodies of water, totaling 133 acres.
- Trails:
  - 1) The Wapack Trail runs 22 miles from Mt. Watatic in Ashburnham, Massachusetts and passes through the Southwest Region in New Ipswich, Temple and Greenfield, ending at North Pack Monadnock. Developed in the 1920s and served as the model for the Appalachian Trail. Rated “Moderate” to “Difficult.”
  - 2) Hiking/Nature Trail on Crotched Mountain – 3 ½ miles, rated “Easy”, leads to a beaver pond.
- Open Space:
  - 1) Municipally-protected - 143 acres.
  - 2) Society for the Protection of New Hampshire Forests – 12.5 acres
- State Bicycle Routes: Route 31 from the Village south; Forest Road from the Village west.



**TABLE 1:  
RECREATIONAL OPPORTUNITIES IN GREENFIELD**

FACILITY/LOCATION	PRIMARY USE	ACTIVITIES	OWNERSHIP	ACREAGE
Playground & Gymnasium/ School	School activities	Variety of school related activities	Conval School	1
½ Gymnasium/Town Office		Underutilized facility	Town	
Town Beach Zephyr Lake	Water Sports	<ul style="list-style-type: none"> <li>• Beach Swimming</li> <li>• Boating</li> <li>• Fishing</li> </ul>	Town	1
Town Beach – Sunset Lake	Water Sports	<ul style="list-style-type: none"> <li>• Picnicking</li> <li>• Beach Swimming</li> <li>• Boating</li> <li>• Fishing</li> </ul>	Town	1
Hog Back Pond	Natural Pond	<ul style="list-style-type: none"> <li>• Fishing</li> <li>• Hiking</li> </ul>	State	
Oak Park	Active Recreation	Public / Private use including: <ul style="list-style-type: none"> <li>• Ball fields</li> <li>• Track</li> <li>• Playground</li> <li>• Courts</li> <li>• Pavilion events</li> </ul>	Town	20
Greenfield State Park (Otter Lake)	Campground	<ul style="list-style-type: none"> <li>• Beach Swimming</li> <li>• Camping</li> <li>• Fishing</li> <li>• Snowmobiling</li> <li>• Cross-Country Skiing</li> <li>• Boating</li> </ul>	State	351
Brantwood Camp	Resident/Youth Camp	Traditional camp activities	Private Nonprofit	300
Crotched Mountain Education & Rehabilitation Center	Natural Area and recreational facilities	<ul style="list-style-type: none"> <li>• Hiking</li> <li>• Handicapped Accessible trails</li> <li>• Active Recreation</li> </ul>	Private Nonprofit	
Wapack Trail, Teds Trail and Carolyn's Trail	Trail	<ul style="list-style-type: none"> <li>• Hiking</li> <li>• Nature Trail</li> </ul>	Public access	
Emma Gipson Lot	Natural Area	<ul style="list-style-type: none"> <li>• Hiking</li> <li>• Nature Trail</li> <li>• Cross Country Skiing</li> <li>• Horseback riding</li> </ul>	Public access	12.5
Barbara Harris Camp and Conference Center	Camp Conference Center	<ul style="list-style-type: none"> <li>• Private waterfront</li> <li>• Athletic facilities</li> </ul>	Private Nonprofit	326
Greenfield Trails Association	Trails	<ul style="list-style-type: none"> <li>• Hiking</li> <li>• Biking trails</li> </ul>	Private Membership	

The responses from Greenfield residents in the Master Plan Survey (2012) indicate that recreation is important to the community by providing opportunities for community interaction, promoting healthy lifestyles, economic opportunities for businesses, and overall enhancing the quality of life for residents. It is a recommendation of this Master Plan that Greenfield consider the restoration of the Recreation Department to maintain or improve existing recreation options and create additional opportunities to meet the demand.

## IX. EDUCATION

Greenfield is a member of the nine-town Contoocook Valley School District (ConVal). The District owns and operates an elementary school in eight of its nine towns, and provides both a middle and a high school in Peterborough and a middle school in Antrim.

The elementary school in Greenfield was constructed in 1999 on Forest Road, just west of the Village. The building is a one-story wood frame structure, with eight classrooms, a Title 1 room, library, guidance room, staff kitchen, principal's office, secretary's office, and cafeteria. The cafeteria is not equipped, however, for cooking; the food is brought in each day by van.

The school teaches Kindergarten through Grade 4; from Grade 5 on, the students attend South Meadow School in Peterborough. The Kindergarten program is a full day program. Personnel at the school consist of a Principal (exclusively serves Greenfield as Principal and works district wide as a math consultant as schedule allows) five teachers, one First Friends Preschool teacher (tuition required), three aides, an Administrative Assistant, and custodian. There is also a music teacher, an art teacher, a physical education teacher, and a guidance counselor who are not permanently located at the school, but travel to all the schools in the district on a regular schedule; in addition, a nurse visits the school on an eight-day rotating basis.

As of June 1, 2014 the Greenfield Elementary School had 85 pupils enrolled, including Kindergarten; this represents 9% of the total ConVal student population. Information on school enrollments and costs per pupil for ConVal and its neighboring school districts is presented below:

**TABLE 2: SCHOOL DISTRICT ENROLLMENTS, OCTOBER 1, 2013**

<b>SCHOOL DISTRICTS</b>				
<b>GRADE LEVEL:</b>	<b>CONVAL</b>	<b>JAFFREY-RINDGE</b>	<b>WILTON-LYNDEB.</b>	<b>MONADNOCK</b>
Pre-Kindergarten	48	37	14	60
Kindergarten	147	148	38	138
Elementary	633	430	223	729
Middle School	676	435	121	261
High School	861	681	204	564
<b>TOTAL</b>	<b>2,365</b>	<b>1,515</b>	<b>600</b>	<b>1,752</b>

*SOURCE: NH Department of Education*

Within its immediate region, ConVal is the largest school district, with more than 2,000 students. On the western side of the region, Monadnock Regional is the second largest with more than 1,700 students. In the ConVal District, the largest group of students is in the high school, followed by the middle school. There is a definite downward trend in student population. ConVal has seen a reduction of approximately 25% in student population since 1999-2000. This has resulted in a district wide conversation about consolidation and potential school closings though voters have indicated, as recently as 2013, that they did not wish to consolidate middle schools. This is a major issue for the School Board and voters of the nine-Town district as student populations decline while school budgets continue to rise.

**TABLE 3:  
COST PER PUPIL, 2012 – 2013**

SCHOOL DISTRICTS					
Grade Level	ConVal	Jaffrey- Rindge	Wilton- Lyndeb.	Monadnock Regional	State
Elementary	\$16,884	\$12,649	\$16,936	\$16,127	\$13,628
Middle Sch	\$16,309	\$12,833	\$15,359	\$16,516	\$12,992
High School	\$16,142	\$13,046	\$14,365	\$16,985	\$13,490
Total	\$16,433	\$12,814	\$15,680	\$16,445	\$13,459
Total Expen.	\$41,709,072	\$21,779,644	\$11,341,332	\$33,851,466	\$ 2,623,625,648

*SOURCES: NH Dep. of Education-Estimated Expenditures by School District 2012-2013;  
Total Expenses from District Reports 2012-2013*

Per pupil costs for education within this selected sub-region range from the high \$12, 992 to nearly \$16,445. ConVal's costs are higher than all other districts except for Monadnock's, and higher than the state average. Money to fund education in New Hampshire comes primarily from local property taxes.

In addition to the Greenfield Elementary School and the middle and high school in Peterborough, residents of Greenfield have access to many childcare/learning opportunities in the area including:

- Private schools in Dublin, Jaffrey, Peterborough, and Wilton
- Post-secondary education offered by two colleges in Keene (Antioch New England and Keene State College) and one in Rindge (Franklin Pierce University).
- The Applied Technology Center (ATC) at ConVal High School offers additional opportunities through its affiliations with New Hampshire Technical Institute, Nashua Community College, Great Bay Community College and Conant High School in Jaffrey. In addition, a Career Internship program at ConVal High School offers students opportunity for job experience and career exploration locally.
- Students in grades 9-12 have access to the Virtual Learning Academy, a state-wide on-line charter school available free of charge to New Hampshire residents. Students and residents in general may also take on-line courses for college credit from a number of institutions.

## **X. MEETING HOUSE**

The Greenfield Meeting House is located in the heart of the village, sited on a knoll surrounded by the Town Common. First constructed in 1795, it has been altered, repaired, turned on its foundation once, and

redecorated many times since, including the rebuilding of the steeple in 1985 and 2014, and the installation of a fire alarm system. The clock was repaired in 2014. In 1983, the Meeting House was placed on the National

Historic Register of Historic Places. A plaque has also been placed on the Town Common by the State of New

Hampshire to recognize that it was the oldest original Meeting House in New Hampshire still used for both civic and religious functions. Work done recently on the Meeting House includes the repair of the steeple, identification of structural issues, the addition of a commercial dehumidifier downstairs, cleaning of the ducts and spraying for mold.



## XI. CEMETERIES

Greenfield has one active cemetery and four inactive cemeteries. The cost of maintaining these cemeteries is shared by the Town and income derived from the sale of lots and Trust Funds. Details of these cemeteries are listed below:

### OLD COACH LANE/FLETCHER

The oldest cemetery is situated on the east side of Coach Road and north of Old Lyndeborough Mountain Road. The land was given to the Town about 1755 by Simeon Fletcher, who was buried here with many of his descendants and others of the neighborhood. When Greenvale Cemetery opened some interred were moved from Fletcher to Greenvale. Three stones remain: John Fletcher who died in 1772 and Mr. and Mrs. John Savage who died in 1821 and 1825 respectively.

### WHITTEMORE

On the farm originally owned by the Major Amos Whittemore, near the end of New Boston Road, is a family burying-lot, although names on the headstones show that others have been permitted to be buried there, among whom were Rev. Charles Whiting and wife. Major Amos Whittemore, one of the first three settlers of Greenfield is buried there as is a Revolutionary War veteran. The earliest dated stone is that of Abraham Burnham who died March 14, 1780.

The cemetery is approximately 50' x 50', with fewer than 30 burial sites.

### OLD CEMETERY

The cemetery behind the meetinghouse was laid out *circa* 1794 by the following committee: John Reynolds, Amos Whittemore, Elijah Broadstreet and Joshua Holt, the land being owned by the town. The clearing of the graveyard was let to the lowest bidder - William Darrah, for \$8.83. He was to clear bushes, logs and trees and sow with grass seed and fence it on the east and west with a log fence and on the north with a "gamb" fence. The Old Cemetery is less than 2 acres with 450 grave sites. A town receiving tomb is accessible from the road. The inscription on the earliest marked stone is for "Mrs. Eunice Pollard, wife of Benjamin Pollard, Jr. May 2, 1794 in the 26th year of her age."

#### **GREENVALE**

The Town voted on Sept. 28, 1878 “that eight acres be enclosed within a suitable fence, and laid out in lots in a good, substantial manner, at an expense of not exceeding three hundred dollars, and that hereafter it be called Greenvale Cemetery.” It currently is 15 acres, with 800 burial sites, situated about one mile east of the village on Forest Road (NH 31). It is the only active cemetery in Town. The stone wall was repaired shortly after 2003.

#### **SHEA**

The earliest date of interment is 1886 in this small family burial lot on Slip Road, across from the Post Office. It contains eight graves of members of the Knight and Shea families. This was never a Town cemetery, but a burial plot for relatives that died of a plague.

#### **BUTTERFIELD GRAVES**

In the northwest part of town, in a remote pasture, once owned by Harry Dorr, are the graves of two Butterfield children apparently the victims of a contagious disease.

### **XII. POSTAL SERVICE**

The Post Office is located on Slip Road, in a brick frame building that was constructed for this use in 1967. Employees consist of one full-time Postmaster, one full-time rural carrier and one part-time rural carrier. There are a total of 336 boxes available, with 150 currently rented; the rural route delivers to 513 households.

The current location of the Post Office is not the most desirable for Greenfield residents. Prior to 1967 the Post Office was located in the Village, which made it not only convenient for most people to use, but the Post Office also served as an informal gathering place – not unusual in small towns. Post Offices in village areas play an important role as an anchor in the Village, along with stores, libraries, municipal functions, and residential uses.

### **XIII. HEALTH & HUMAN SERVICES**

The Town of Greenfield supports a number of regional human service organizations in addition to providing a certain amount of direct assistance to families in town. In the year 2013 support was given to 22 families. Expenditures were for such things as: rental assistance, electricity and fuel to help individuals maintain adequate housing, utilities, heat, and hot water; all of which have tended to increase in cost from year to year. The majority of recipients are families with children. Several residents were assisted with maintaining safe and secure housing due to the risk of becoming homeless. The shelter system was contacted whenever the need arose and referrals for support were made. However, due to lack of available space, the shelter system could not be used this year. Whenever a homeowner received assistance, welfare liens were filed with the Hillsborough County Registry of Deeds on the properties, as guidelines permit, to ensure that if the property is sold the Town will receive reimbursement for the amount of assistance provided by the Town Welfare Department.

The regional associations to which the Town contributes are: ConVal Transportation Company, Home Health Care and Community Services, Monadnock Family Services, Project Lift, and St. Joseph Community Services. Additional organizations and individuals have generously continued to give to our residents in need. These include: the GIVers, Greenfield Congregational Covenant Church,



Divine Mercy Parish, Peterborough Rotary Club, Crotched Mounted Rehabilitation and Education Center, the Salvation Army, and other generous patrons.

The Town is also home to Greenfield Commons, a 24-unit Elderly Housing complex owned and managed by Southern NH Services, which gives priority to residents of Greenfield.

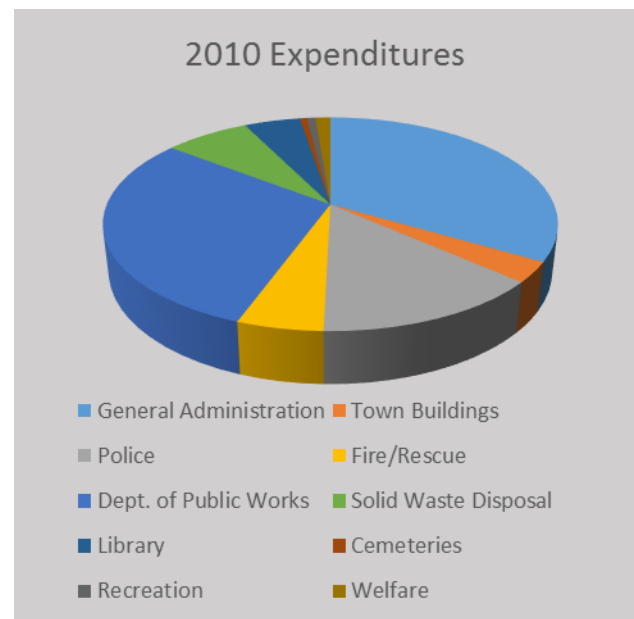
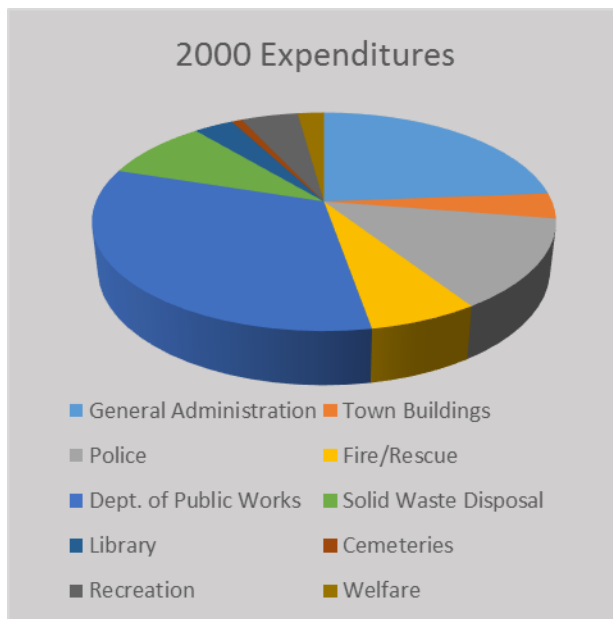
#### XIV. EXPENDITURES

**TABLE 4:  
COMMUNITY FACILITIES & SERVICE  
EXPENDITURES 2000-2010**

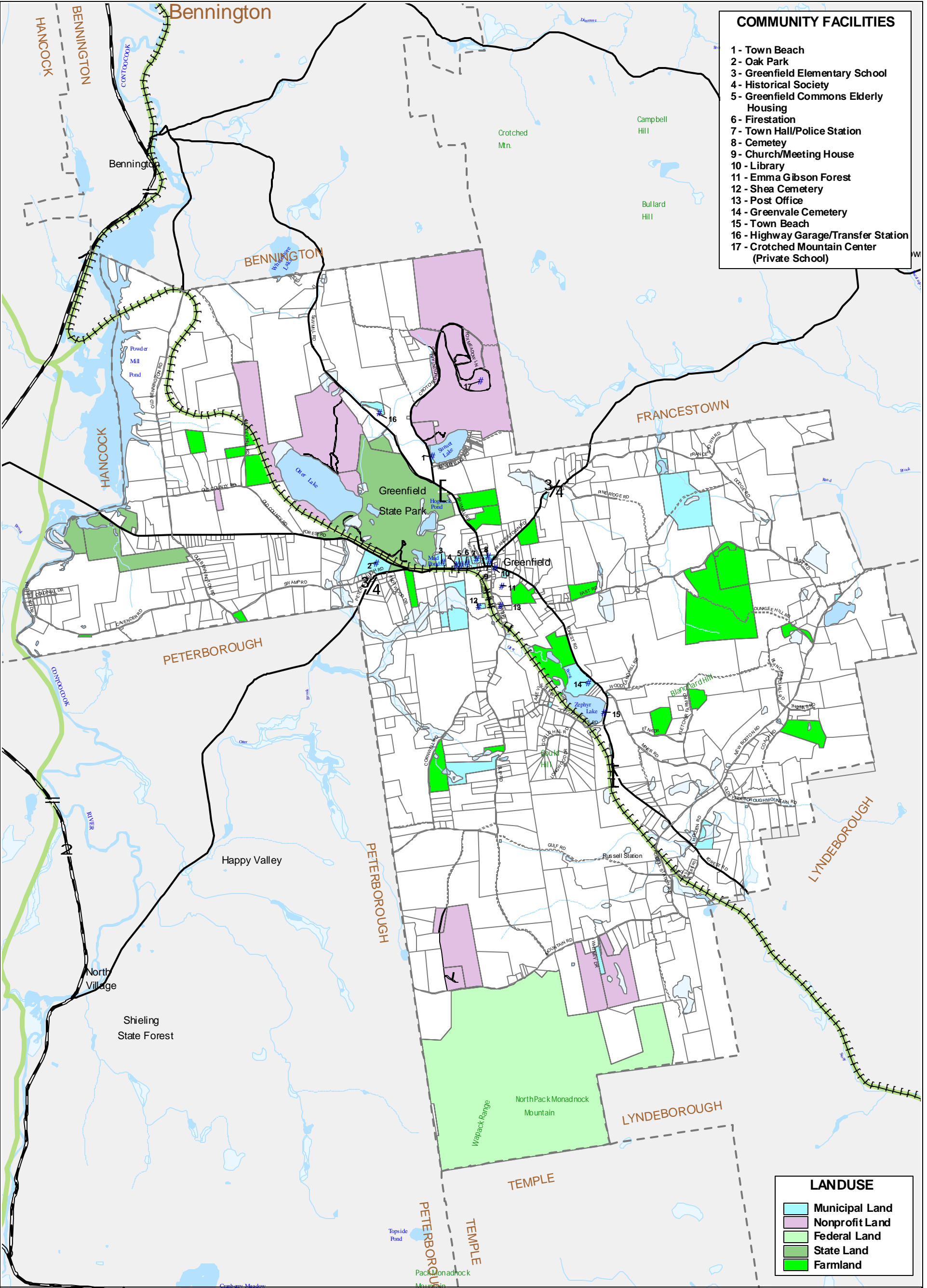
The amount of money spent by Greenfield taxpayers for these various community facilities and services is outlined below in Table 5. Note that this table does not include the cost of education, as this amount is so much larger than any other line item that it skews the other data. As is typical for most New Hampshire towns, the largest part of the town budget is devoted to the Highway Department. Even though this represents the greatest single department expenditure, this has not increased as much over the 10-year period as some other items have – for example, General Administration and the Library, both of whose expenditures increased by over 150%. Expenditures for all community facilities and services have increased by 79% between 2000 and 2010.

Town Government	2000	2010	% Change
General Administration	\$200,817	\$506,559	152.2
Town Buildings	\$31,600	\$46,311	46.6
Police	\$112,384	\$210,197	87
Fire/Rescue	\$54,491	\$78,535	44.1
Dept. of Public Works	\$276,448	\$452,138	63.6
Solid Waste Disposal	\$75,497	\$109,023	44.4
Library	\$27,903	\$72,118	158.5
Cemeteries	\$7,415	\$8,893	19.9
Recreation	\$40,094	\$11,162	-72.2
Welfare	\$18,516	\$19,202	3.7
<b>TOTAL</b>	<b>\$845,165</b>	<b>\$1,514,138</b>	<b>79.2</b>

SOURCE: Greenfield Annual Reports

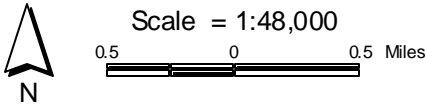






# Town of Greenfield, NH

## Community Facilities



- # Community Facilities
- Waterbodies
- Wetlands
- Watercourses
- Municipal Boundaries
- Property Lines
- Railroad/Railbed
- DOT Road Classes
- Class I
- Class II
- Class V
- Class VI

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Digital base information provided by the  
New Hampshire Geographically Referenced Analysis  
and Information Transfer System (GRANIT)

# CHAPTER IV

## NATURAL FEATURES ANALYSIS



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### MAPS

TAX PARCELS AND CONSERVATION LAND  
SURFACE WATERS AND WETLANDS  
STRATIFIED DRIFT AQUIFERS /PUBLIC WATER SUPPLIES  
WATERSHEDS  
STEEP SLOPES AND ERODIBLE SOILS

# **NATURAL FEATURES**

## **I. INTRODUCTION**

The natural features chapter of the Master Plan uses the environmental criteria of topography, soils, and water resources to evaluate the town's land area and its potential for various types of development. Although natural features can often enhance a particular development site, they just as often pose significant barriers to development; this can be seen by examining locations where existing development has occurred. It is true that transportation routes are another factor in the location of development; however, to a great degree, the location of roads and railroads are also determined by the natural features of the land.

This section enables the Planning Board to address areas of the town that are most suitable for development and high intensity land uses, and evaluate the existing limitations of the land that would have to be accommodated. Environmental limitations may include steep slopes, seasonally wet soils, wetlands, floodplains, shallow bedrock, and underground aquifers.

This section also points out the areas of town that deserve special protection due to the environmental function of the land, for example, a specific wetland area that provides flood water storage during times of heavy rain. In addition, this section notes specific areas the Town may wish to conserve for future community use due to their aesthetic or historic qualities. Not all open spaces need to be steep slopes or wetlands. Some areas may be prime lands set aside for future school sites, parks, intensive farming operations, or other limited low intensity land uses that add value to the overall community.

Greenfield has many natural features that make the Town a very desirable place to live. Outside of the downtown area, the Town is still quite rural with many rolling hills, green fields, streams and waterbodies. Greenfield is also in close proximity to Peterborough and Milford, two regional economic and employment centers. Outside of the downtown area, lots are often five acres or more in size. As the value of land increases, there is greater motivation to subdivide larger parcels and sell smaller lots. This natural features analysis can assist the Town and the Planning Board in establishing appropriate locations for growth to occur, while at the same time preserving the natural environment that the residents currently enjoy.

## **II. TOPOGRAPHY**

The topography of Greenfield is dominated by Crotched Mountain in the north and North Pack Monadnock in the south. Crotched Mountain lies in the three towns of Greenfield, Bennington, and Frankestown. The mountain's highest elevation is actually in Frankestown (2,020 feet above sea level); in Greenfield the highest elevation is 1,500 feet, in the northeasterly corner of the town, going down to 900 feet at Sunset Lake.

North Pack Monadnock has the highest elevation in town, ranging from 1,300 feet at Mountain Road up to over 2,200 feet at the highest point just north of the Temple town line.

Gould Hill in the south-central part of town and Blanchard Hill on the eastern side of town are two other concentrated areas of high elevation, although they do not exceed 1,200 feet. The western and central parts of town have the lowest elevations, ranging from 700 to 900 feet above sea level.

### III. SOILS

As mentioned earlier, soils information is an important consideration in land use planning since the various characteristics of soils can have such an impact on land use – such as steepness, wetness, flood susceptibility, etc. These various aspects are examined briefly below. Soil information for Greenfield was obtained from the following sources:

- 1) Soil descriptions and mapping: Soil Survey of Hillsborough County, New Hampshire, Western Part, published by the US Department of Agriculture Soil Conservation Service, October 1985.
- 2) Soil development capability: Soil Potential Ratings for Development; Hillsborough County, NH, prepared by the Hillsborough County Conservation District in August 1984.

According to the above-referenced soil surveys, the landscape in western Hillsborough County is hilly and characterized by large areas of loamy soils with numerous stones on the surface. The area in which Greenfield is located is drained by the Contoocook River and the Souhegan River, both of which flow into the Merrimack River. The generalized soil map for this area indicates that much of Greenfield's land area – in the south and west – is comprised of excessively drained soils.

#### A. STEEP SLOPE SOILS

Generally speaking, the steeper the land the greater the possibility for erosion and sedimentation, and the more problems can be encountered in siting wells and septic systems.

Steepness is measured in terms of slope, which is defined as the change in elevation (vertical distance) over horizontal distance; the more abrupt the change in elevation, the steeper the slope. Slope is measured and expressed as a percentage that represents the relationship between elevation and horizontal distance.

Typical categories that might be seen on a slope map are 0-8%, 9-15%, 16-24%, and over 25%. Land in the 0-8% slope category is generally preferred for all types of development. Gradual slopes are most favorable for building roads, and public water and sewer facilities can be installed at the least cost to the community. Also, excavations for most structures can be done at a minimal cost and the erosion associated with such work can be reduced easily on-site. The exceptions to this would be wetland areas and floodplains because they occur primarily in the 0-5% slope range. An examination should be made as to the environmental function of such wetland and floodplain areas, as well as the risks that might be inherent in development before such lands are utilized for building sites.

As the slope increases to the 8-15% category, the land is more suited to less intensive forms of development. Carefully placed residential dwellings and some agricultural uses (orchards and field crops) may be suitable for this terrain. As development approaches a 15% gradient, it requires more careful consideration for all types of development. Once a slope exceeds a 15% gradient, all forms of development are considered unsuitable, although it is really at the 25% slope and above that development becomes very problematic. These areas have benefits as conservation areas for low intensity recreational uses and wildlife habitats. Also, their disturbance can create serious erosion problems, washing out topsoil and even roadways downhill. Forestry practices on such slopes must be confined to low-impact operations, with proper erosion controls in place.

Other important controls for forestry uses include minimal basal area cutting (definitely no clear cutting), and skid roads designed for steep slope harvesting. When developing steep terrain, the potential for environmental damage increases as the slope gradient increases. Overly steep slopes consisting of sands and gravels left after the excavation of an area will quickly gully and erode.

Erosion control barriers should be in place at the time of excavation and prompt reseeding and regrading should take place afterwards. Surface water run-off rates and erosion factors increase as the slope steepens.

This will cause sedimentation of the surface waters downslope and will clog stream channels and rivers if no erosion controls are in place.

Greenfield has only six predominant soil types associated with steep slopes, which are primarily found on the sides of hills, along ridgetops, and as rocky outcrops void of soil cover; they are listed below in Table #1:

**TABLE #1: STEEP SLOPE SOIL TYPES**

Symbol	Soil Type	Characteristics	Slope	Suited For	Not Suited For
76D	Marlow Loam	Moderately steep, well drained	15-25%	Tree Farming	Building site development, septic systems, recreation
77D	Marlow Stone Loam	Moderately steep to steep, well drained	15-35%	Tree Farming	Building site development, septic systems, recreation
143D	Monadnock Stony Fine Sandy Loam	Moderately steep to steep, well drained	15-35%	Tree Farming; source of sand for construction	Building site development, septic systems, recreation
161D	Lyman-Tunbridge-Rock Outcrop Complex	Moderately steep to steep, exposed bedrock	15-35%	Tree Farming	Building site development, septic systems, recreation
22E	Colton Loamy Sand	Moderately steep to very steep, excessively drained	15-50%	Tree Farming; source of sand and gravel for construction	Building site development, septic systems, recreation
36E	Adams Loamy Sand	Moderately steep to very steep, excessively drained	15-50%	Tree Farming; source of sand for construction	All types of recreation development

*Source: Soil Survey of Hillsborough County, New Hampshire, Survey Area Data, Version 17, September 15, 2016*

Examination of the accompanying *Steep Slopes* map indicates that the northern, southern and eastern areas in Greenfield are the ones most affected by 15% or greater slopes. The northern area is of course Greenfield's part of Crotched Mountain, which also lies in Bennington and Franconia. The area in the south of town is part of North Pack Monadnock Mountain, with elevations rising from 1,300 feet above sea level at Mountain Road to 2,278 feet at the highest point – which is, in fact, the highest elevation in western Hillsborough County. Blanchard Hill and Gould Hill, on the eastern side of town, do not have the same elevations or steepness, but do have over 25% slopes.

## **B. WETLAND SOILS**

Wetland soils in Greenfield are those that the soil survey categorizes as being poorly drained (Hydric A) and very poorly drained (Hydric B); the location of these soils is illustrated on the accompanying *Wetlands and Hydric Soils* map. The wetland areas in Greenfield are predominantly situated in the west central part of town, between Forest Road and the Peterborough town line. These wetlands are associated with Otter Brook and the surrounding area.

Directly abutting Powder Mill Pond is another fairly large deposit of wetland soils; and there are several, smaller, pockets of wetland soils distributed around town, mostly to the east of the Village area.

The predominant soil types and characteristics that make up the wetland soils are described below in Table #2.

**TABLE #2: WETLAND SOIL TYPES**

Symbol	Soil Type	Characteristics	Suited For	Not Suited For
15	Searsport Muck	Nearly level and very poorly drained	Habitat for wetland wildlife. Probable source of sand for construction	Building site development, septic systems, recreation development, and farming
105	Rumney Loam	Nearly level and poorly drained	Habitat for open land, woodland, and wetland wildlife. Probable source of sand for construction	Building site development, septic systems, some types of recreation development, and farming
197	Borochemists, ponded	Nearly level and very poorly drained	Habitat for wetland wildlife	Most uses
214A	Naumberg Find Sandy Loam	Nearly level and somewhat poorly drained and poorly drained	Habitat for open land, woodland, and wetland wildlife. Probable source of sand for construction	Building site development, septic systems, recreation development, and farming
247B	Lyme Fine Sandy Loam	Nearly level to gently sloping and poorly drained	Habitat for woodland wildlife	Building site development, septic systems, recreation development, and farming
295	Greenwood Mucky Peat	Nearly level and very poorly drained	Habitat for wetland wildlife	Most uses
395	Chocorua Mucky Peat	Nearly level and very poorly drained	Habitat for wetland wildlife. Probable source of sand for construction	Most uses
495	Ossipee Peat	Nearly level and very poorly drained	Habitat for wetland wildlife	Most uses
549	Peacham Stony Muck	Nearly level and very poorly drained	Habitat for wetland wildlife	Building site development, septic systems, recreation development, and forest management
647B	Pillsbury Stony Loam	Nearly level to gently sloping, somewhat poorly drained and poorly drained	Habitat for woodland wildlife	Building site development, septic systems, and recreation development

*Source: Soil Survey of Hillsborough County, New Hampshire, Survey Area Data, Version 17, September 15, 2016*

### **C. AGRICULTURAL SOILS**

Agriculture is a desirable aspect of Greenfield's rural nature and an important feature of Greenfield's land use.

The Hillsborough County Soil Survey also designates prime farmland, which is land of major importance in meeting the nation's needs for food and fiber. Of the nine soil types that are considered



to be prime farmland, only four are found in Greenfield. Furthermore, they represent a very small area of land, and are scattered about the town in such a way as to preclude the possibility of any type of large-scale farming.

Agricultural soils, on the other hand, cover most of the town, but this does not mean that farming is conducted all over town. Some of these soils may be suitable for only specific crops and various services exist to help landowners identify the best use of their land.

## **IV. FLOODPLAINS**

Floodplains are land areas that are susceptible to flooding. These areas actually have two parts: the floodway and floodway fringe. The floodway includes the channel and an additional area that often carries excess flow. The floodway fringe (more commonly known as the 100-year floodplain or the Special Flood Hazard Area) is a broader area over which floodwater may spread, but where the flow velocity is slower. This is an important distinction for land use planning, since some uses can safely occur in the Special Flood Hazard Area, but not in the floodway.

The Federal Emergency Management Agency (FEMA) has mapped the floodplains for all relevant municipalities; the boundaries of the floodplains were computed at cross sections interpolated between cross sections, based on hydraulic information and past experience of flooding. Flood Insurance Rate Maps (FIRM) define the 100-year floodplain (meaning there is a 1 out of 100 chance of flooding in any given year; over long periods of time, base floods will occur on the average once every 100 years), and an area of 500-year floodplain (a 1/5 out of 100 chance of flooding in any given year).

The Flood Insurance Rate Maps for Greenfield became effective May 1, 1980 (most recent published version at time of this Master Plan update is 2009), and the Town then entered into the National Flood Insurance Program, which permits homeowners who live in the floodplain to purchase insurance for their property. However, in order for landowners to be able to purchase this insurance, the Town needed to adopt a Floodplain Management Ordinance, which it did in 1991 (amended 2007 and 2009). This Ordinance requires the Town to keep track of all development in the Special Flood Hazard Areas (SFHA) and ensure that if any new construction or substantial improvements to a home are proposed for the SFHA, the lowest enclosed floor must be at or above the base flood elevation.

The purposes of this requirement are to minimize the potential for flood damage, to avoid damage-prone uses in the floodplains, and to reduce development pressure of flood hazard areas.

Communities that do not maintain and/or enforce their floodplain regulations may be suspended from the insurance program, which could have serious consequences for any affected landowners if their mortgage holders wished to cancel the mortgage. For these reasons, it is very important for the Town to keep the Floodplain Management Ordinance up to date by amending it as necessary, and to monitor all development within these areas.

Greenfield has only a small amount of floodplain, primarily located in four distinct areas in town:

1. Abutting Powder Mill Pond, from Bennington to the Peterborough Town Line;
2. Along Otter Brook, from Otter Lake to Slip Road and down to Cornwell Road;
3. Along Rand Brook in the northeastern part of town; and
4. In the southeastern corner from Russell Station to Lyndeborough Mountain Road.

These floodplain areas are also consistent with much of the wetland soils identified by the County Soil Survey.

## **V. WATER RESOURCES**

Greenfield has a land area of approximately 26.2 square miles, or 16,778 acres. Surface water accounts for only approximately 350 acres. Aquifers, or groundwater, are also included in this analysis, since they provide an important source of water for private and community wells. A description of the town's watersheds, waterbodies, watercourses, and aquifers is presented below.

### **A. WATERSHEDS**

The watershed is the principle focus in describing a surface water system. A watershed is the land area made up of a series of connecting higher ridges that drain surface water to the lowest point, which is where a stream or a river flows out of the watershed.

Greenfield is situated within portions of three major watersheds: the Upper Contoocook River, the Piscataquog River, and the Souhegan River Watersheds, all of which lie within the Merrimack River Basin; the location and extent of these watersheds can be seen on the accompanying *Stratified Drift Aquifers with Watersheds/Basins, Southwest Region* map.

### **B. WATERBODIES**

Greenfield has six waterbodies, listed below:

1. Powder Mill Pond – 435 acres, on the border with Bennington and Hancock.
2. Otter Lake – 61.2 acres, located in the west central part of town, just north of Forest Road.
3. Sunset Lake – 30.9 acres, located to the north of the intersection of Sawmill and Crotched Mountain Roads.
4. Zephyr Lake – 30.9 acres, on the west side of Route 31 south.
5. Hogback Pond – 9.89 acres, situated between Sawmill and Forest Roads, just to the northwest of the Village.
6. Mud Pond.

The first five ponds on the list are classified by the NH Department of Environmental Services as Public Waters, which means that they are subject to the state Comprehensive Shoreland Protection Act (RSA 483-B). This law was enacted in 1991, and establishes standards for the subdivision, use and development of the land around the state's public waters, defined as all land located within 250 feet of the water.

### **C. WATERCOURSES**

Greenfield's most significant watercourse is the Contoocook River, which forms the Town's border with Hancock, and therefore shares the river. In addition, there is Otter Brook that runs south and west from Otter Lake into the Contoocook River in Peterborough. The outflow from Zephyr Lake runs west and joins Otter Brook. Rand Brook runs west to east between Francestown Road and East Road, crossing into Francestown. A small portion of Stony Brook runs southeasterly before entering Lyndeborough.

The state Comprehensive Shoreland Protection Act (RSA 483-B), enacted in 1991, establishes standards for the subdivision, use and development of the land around the state's public waters. Where such water is a watercourse rather than a waterbody, and the watercourse is a third order stream or lower, the definition of protected land is all land located within 50 feet of the water.

#### **D. AQUIFERS**

Aquifers are concentrations of groundwater, found where saturated layers are permeable and the storage and transmission of water can take place. Aquifers are resupplied through precipitation, surface water, wetlands, lakes and streams. The water then moves to a saturated zone (aquifer) where the pore spaces between soil particles are filled by the water. It is very important that the surface of the earth be able to transmit water so that a certain percentage can be stored underground. Excessive compaction or extensive covering of the land surface reduces the volume of groundwater which, as stated earlier, affects the supply of water to wells.

Aquifers of medium to high potential occur in Southwest New Hampshire as unconsolidated deposits of sand and gravel, or in bedrock fractures (known as consolidated deposits). The unconsolidated deposits, also called stratified drift deposits, contain sorted layers of gravel, sand, silt and clay - occurring chiefly in valley bottoms.

These materials have abundant pore space to store water, and pore space may amount to more than 30 percent of the total volume of the deposit. Consequently, these stratified deposits of sand and gravel have become good sources of medium to high volume aquifers.

The consolidated deposits, or bedrock fractures, are a more productive water source when the bedrock is overlaid by a layer of sand gravel, which allows the recharge to occur directly from above. They are usually adequate for domestic wells. In contrast, a till aquifer will typically have a lower-yielding well life. This is due to a mixture of clay, silt, gravel and boulders that tend to compact due to the different soil particle sizes. The transmission and storage of water is greatly decreased in this type of aquifer. The water table (the top of the saturated zone) can fluctuate, depending on the volume recharge to aquifer material.

Groundwater in saturated soils is generally vulnerable to pollution because surface contamination can infiltrate directly into it. It is possible, however, to trace the source of pollution by finding the watershed boundary. Once a pollutant enters an aquifer, it may remain in place for an indeterminate period of time. While pollutants can enter an aquifer easily because sand and gravel are porous and transmit water rapidly, once in the aquifer their movement is then governed by groundwater flow, which moves very slowly through the tiny pore spaces of the glacial till.

Sources of aquifer pollution are frequently located on the ground surface directly above or contiguous to the aquifer: septic tank effluent, landfill refuse, leakage from sewer lines or ruptured fuel tanks, agricultural fertilizers and pesticides are among the many possible sources of pollution for an aquifer. In addition to these potential contaminants are the materials such as fuels, lubricants or other toxic materials associated with earth excavation, an activity that is, of course, directly associated with sand and gravel aquifers.

The US Geological Survey provides aquifer delineation maps for the entire state. The map is essentially a surficial geology map, showing the distribution of unconsolidated (not bedrock) geologic material on the land surface. There do exist bedrock aquifers, but these were not part of this particular study. This study identifies areas of sand and gravel and measures the rate of transmissivity - that is, the speed with which water passes through the materials, in increments of 1,000 feet squared per day.

The *Stratified Drift Aquifers with Watersheds/Basins* map for Greenfield identifies several areas of these groundwater deposits, with one particularly large area that covers the entire central part of Town. This is significant, considering the discussion above about the potential effects of covering over the ground under which aquifers lay.

TOWN OF GREENFIELD

Tax Parcels AND Conservation Land

Tax Parcel

Conservation Land

- Municipal/County
- Federal
- State
- Other Public/Quasi-Public Entity
- Private

Highway

by Legislative Class

- Class I
- Class II
- Class V
- Class VI
- Private
- Summit
- Municipal Boundary
- Rail

Water Body

Lake or Pond

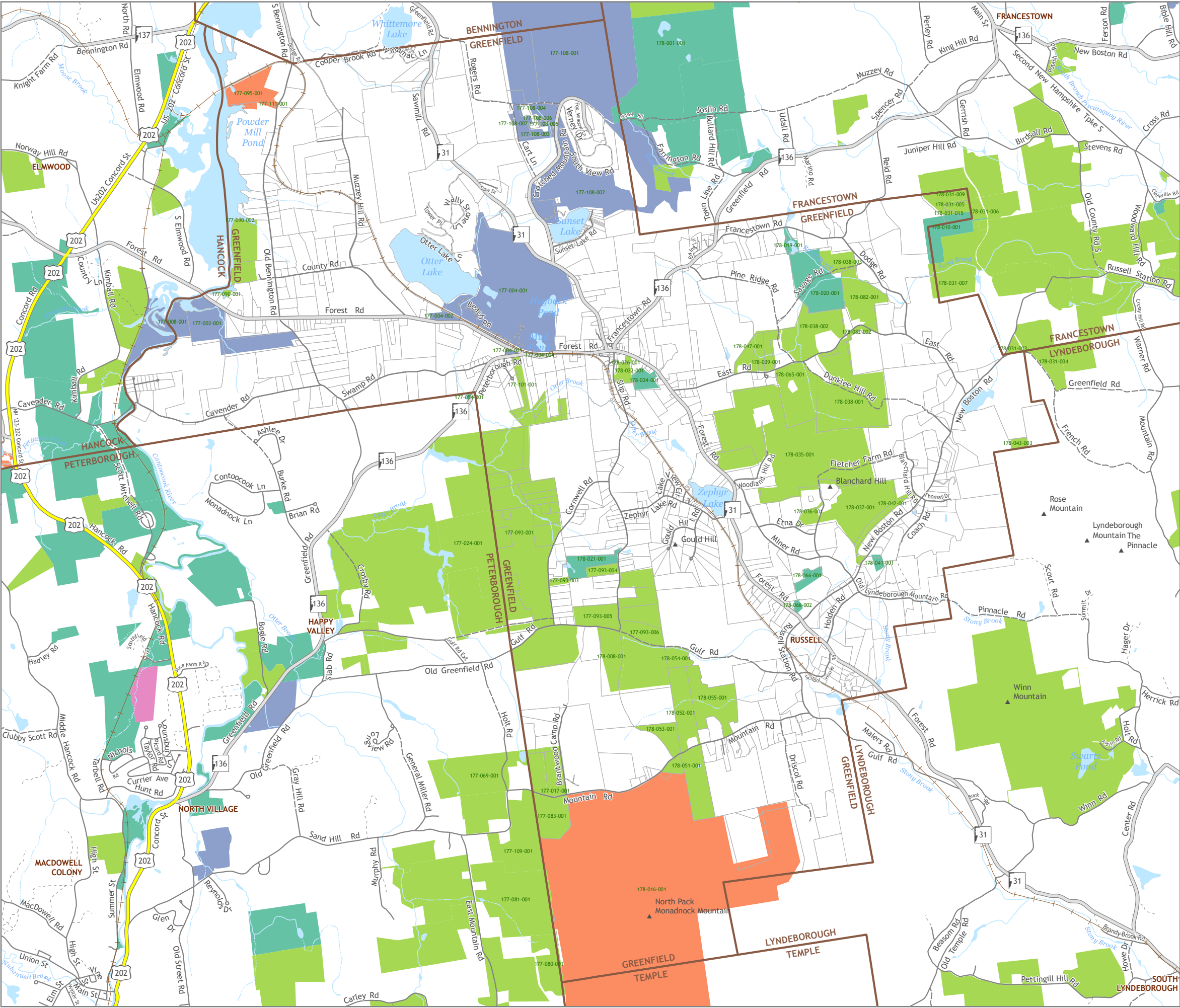
River or Stream

- Intermittent Stream
- Perennial Stream

0 0.5 Miles Absolute Scale 1:48,000



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TOWN OF **GREENFIELD**

Surface Waters  
AND  
Wetlands

National Wetland Inventory



Soil Survey

Drainage Class

- Light green box: Poorly drained
- Dark green box: Very poorly drained

Highway

by Legislative Class

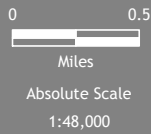
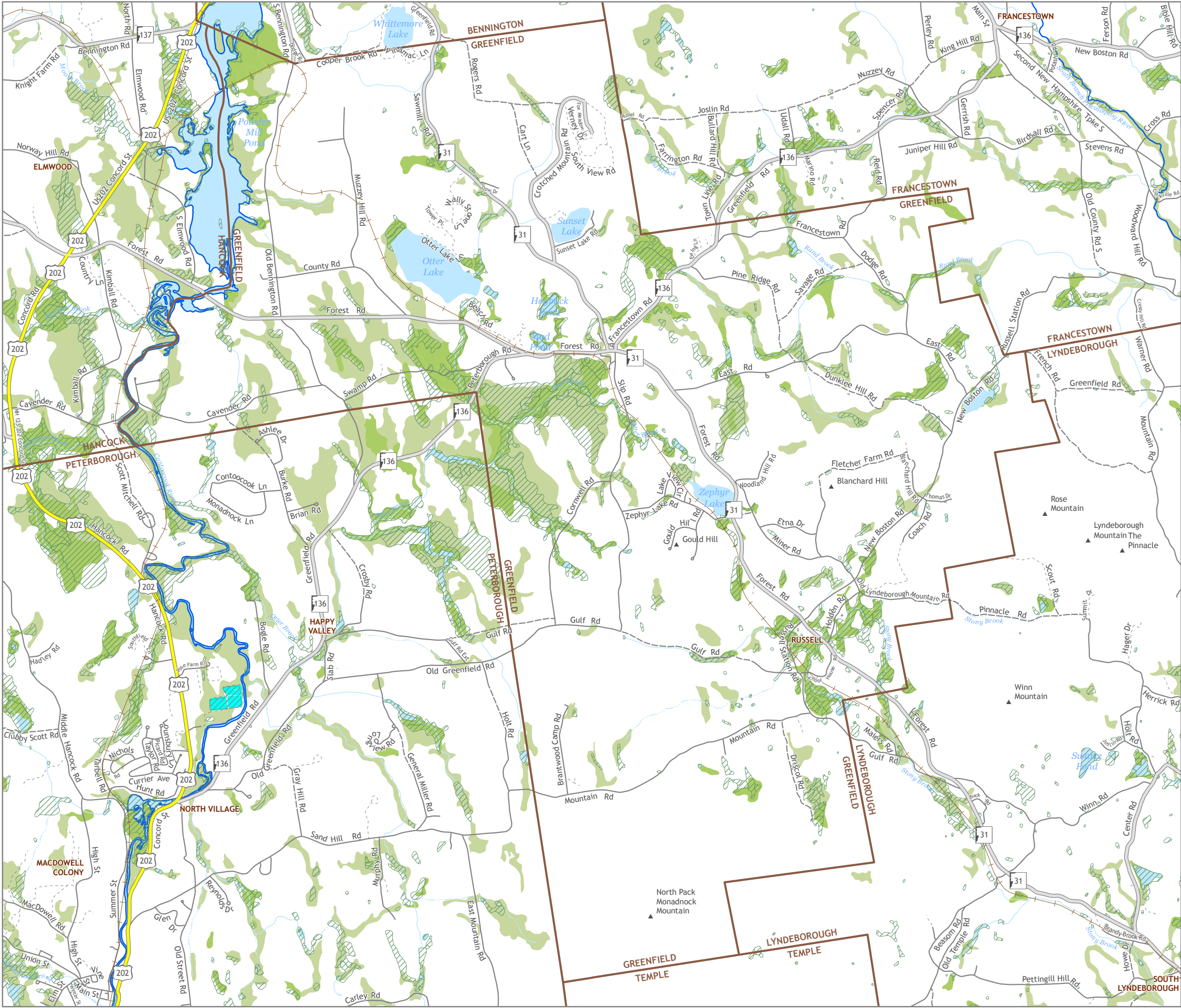
- Yellow line: Class I
- Grey line: Class II
- Thin grey line: Class V
- Dashed grey line: Class VI
- Dotted grey line: Private
- Black triangle: Summit
- Thick brown line: Municipal Boundary
- Thin brown line: Rail

Water Body

- Cyan box: Reservoir
- Light blue box: Lake or Pond

River or Stream

- Light blue line: Intermittent Stream
- Medium blue line: Perennial Stream
- Dark blue line: Designated River

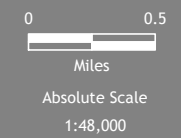
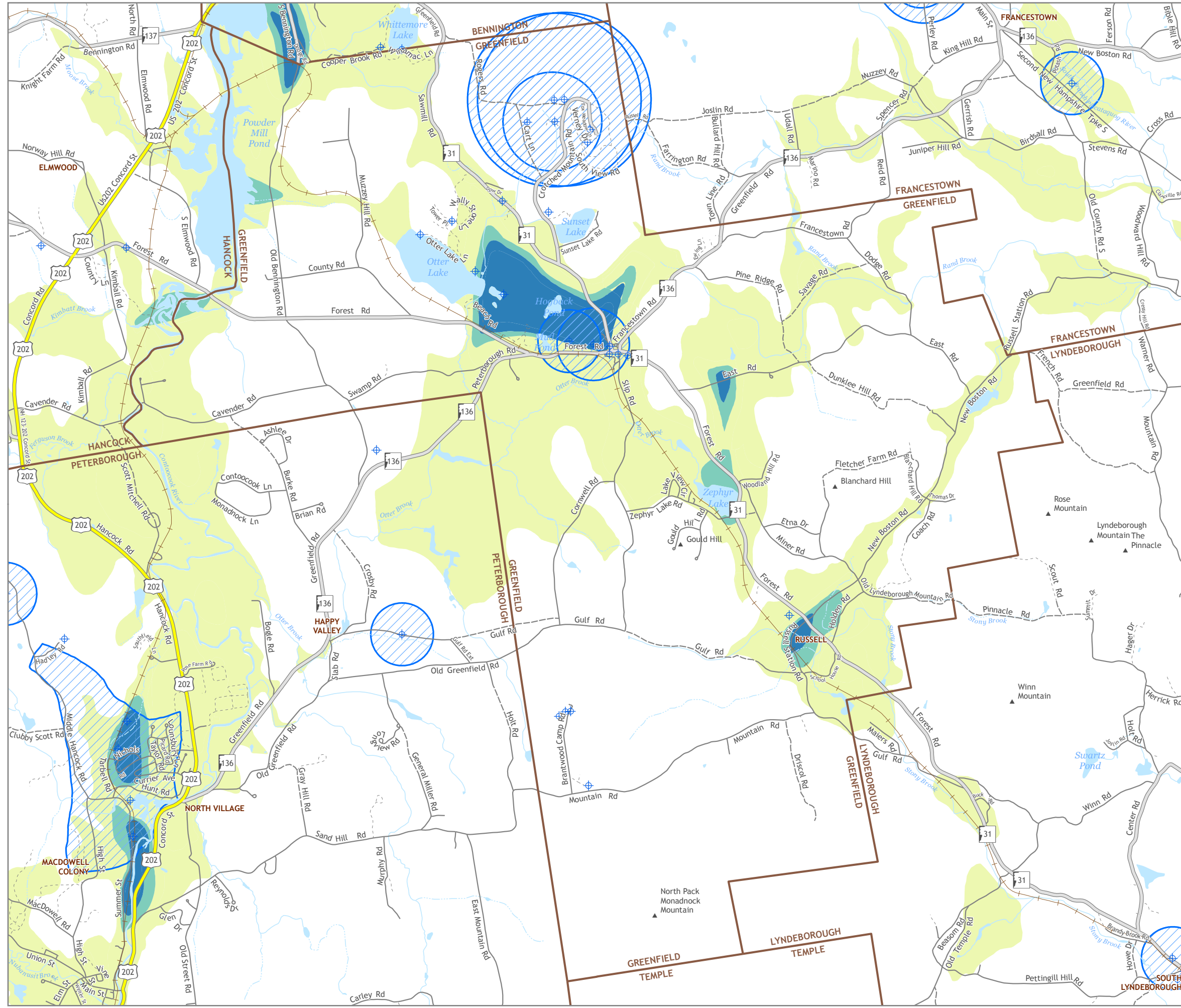


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# TOWN OF GREENFIELD

## Stratified Drift Aquifers Public Water Supplies



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TOWN OF **GREENFIELD**

Watersheds

10-digit Hydrologic Unit Code

- Watershed
- Piscataquog River (0107000606)
  - Souhegan River (0107000609)
  - Upper Contoocook River (0107000301)

Boundary Line

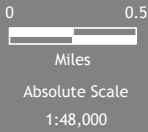
- Hydrologic Unit Code
- 8-digit (Subbasin)
  - 10-digit (Watershed)
  - 12-digit (Subwatershed)

Highway

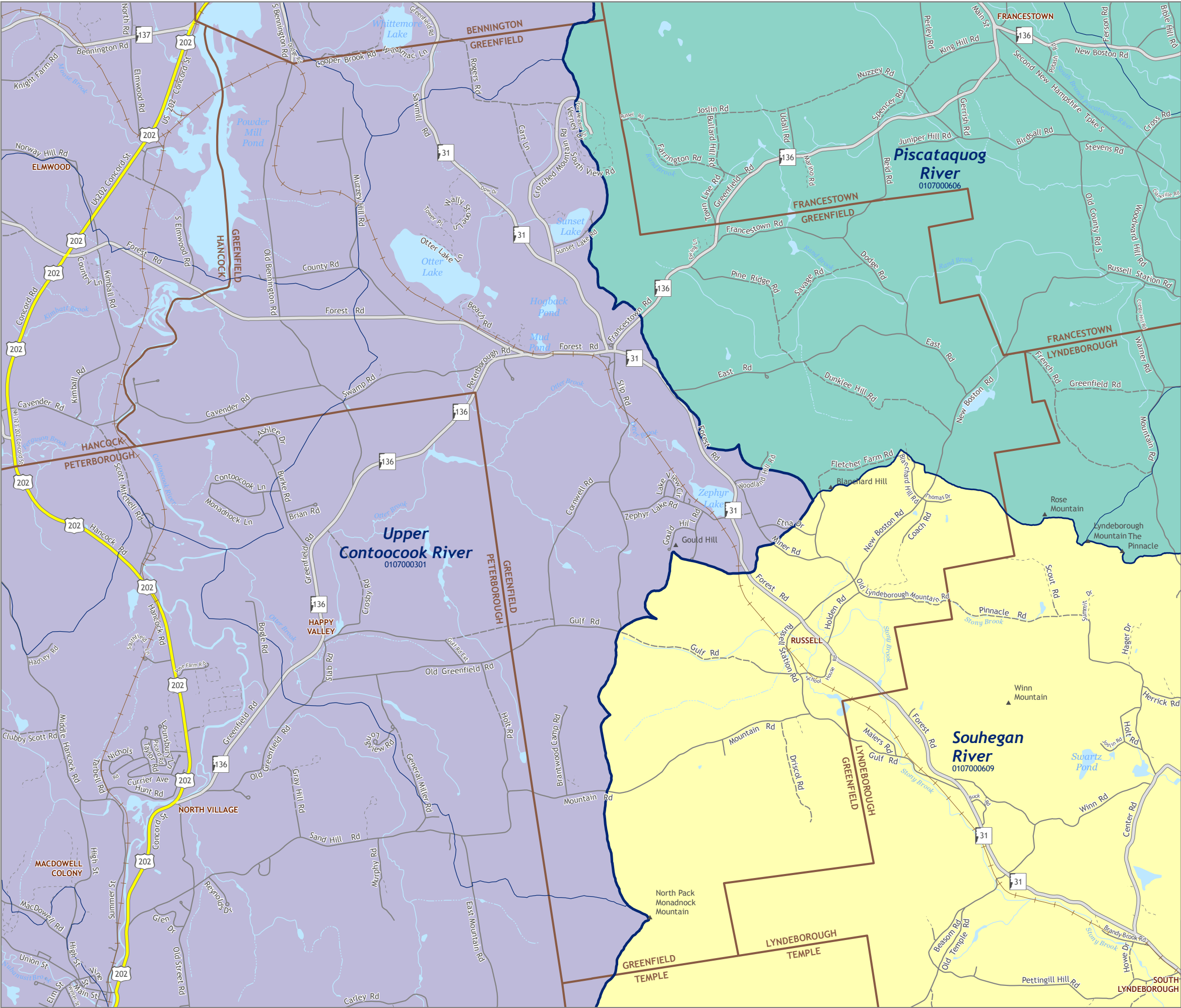
- by Legislative Class
- Class I
  - Class II
  - Class V
  - Class VI
  - Private
  - Summit
  - Municipal Boundary
  - Rail

- Water Body
- Lake or Pond

- River or Stream
- Intermittent Stream
  - Perennial Stream



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TOWN OF GREENFIELD

Steep Slopes AND Erodible Soils

Representative Slope

- 20%
- 25%
- 30%
- 33%

Highway

by Legislative Class

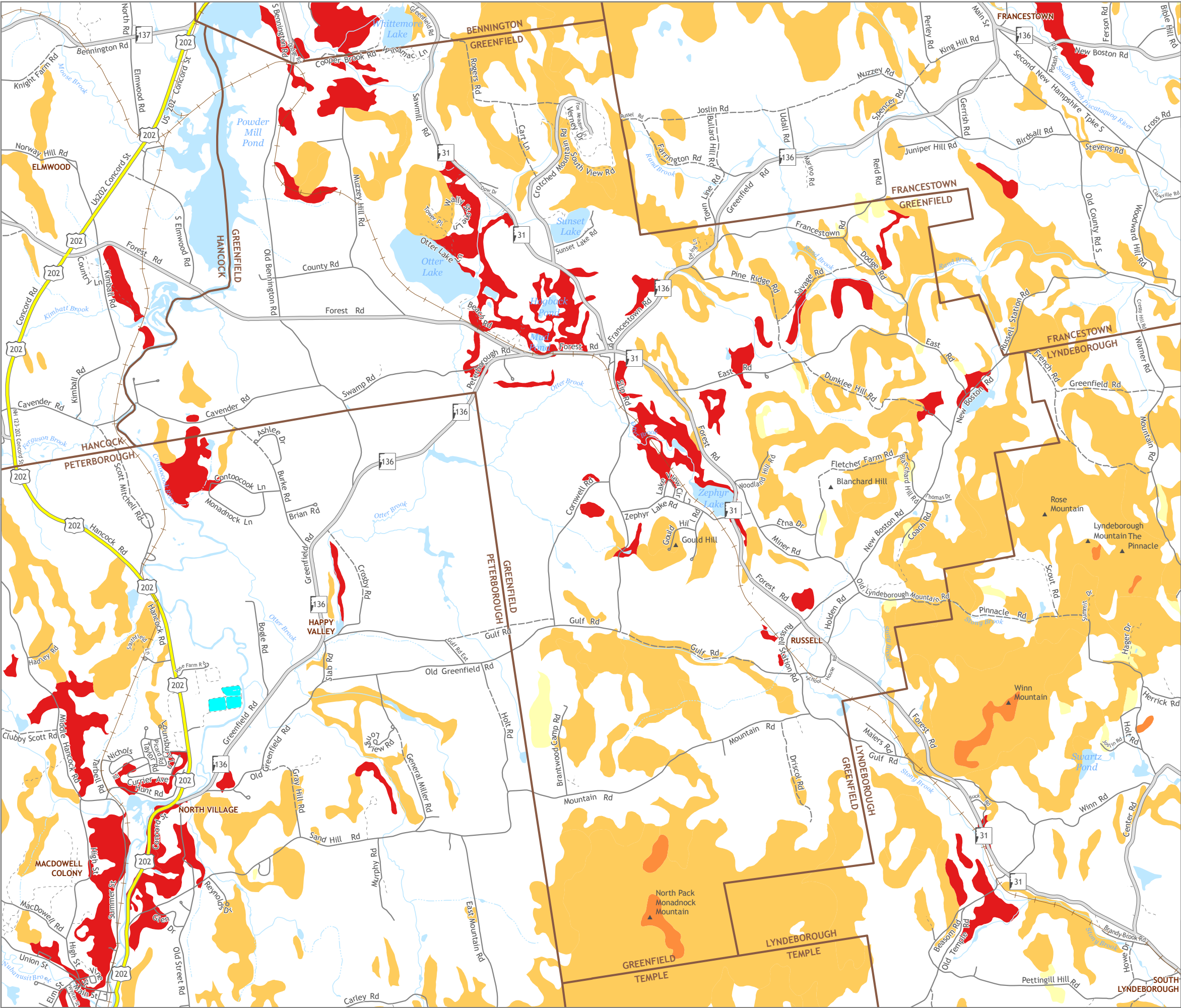
- Class I
- Class II
- Class V
- Class VI
- Private
- Summit
- Municipal Boundary
- Rail

Water Body

- Reservoir
- Lake or Pond

River or Stream

- Intermittent Stream
- Perennial Stream



0 0.5  
Miles  
Absolute Scale  
1:48,000



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# CHAPTER V

## POPULATION AND HOUSING ANALYSIS



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# POPULATION AND HOUSING

## I. INTRODUCTION

The examination of population and housing statistics is a critical element of a Master Plan. The state statute that addresses the purpose and description of a Master Plan (RSA 674:2.III) calls for a “housing section which assesses local housing conditions and projects future housing needs of residents of all levels of income and ages in the municipality and the region as identified in the regional housing needs assessment performed by the regional planning commission pursuant to RSA 36:47,II, and which integrates the availability of human services with other planning undertaken by the community.”

While population studies are not specifically addressed in the enabling legislation, to plan for the impacts of population changes as they relate to housing availability is an integral part of the master planning process. By knowing Greenfield’s past population trends and projecting the future population, it is possible to estimate the level of town services necessary to serve the expected growth and to plan for that growth to occur in an orderly manner. This chapter is intended to provide that information.

An analysis of the population and housing statistics also enables the Planning Board to determine whether amendments to the zoning ordinance might be required in order to address any inequities made apparent through the analysis. Following two important NH Supreme Court cases,<sup>6</sup> the concept of equal opportunity housing is now firmly established in the master plan process. In short, every town must, through its master plan, address the current and future housing need of all its residents - and in doing so must consider the housing situation in its neighboring towns as well.

## II. METHOD OF ANALYSIS

This analysis relies on two primary sources: the US Census Bureau, the American Community Survey, and the New Hampshire Office of Energy and Planning (OEP). Information for both population and housing encompasses the years from 1980 to 2010, and in some tables, 2011 estimates if the ACS was the source of information. Annual estimates developed by OEP, have also been used as applicable. This time period gives a good indication of relevant trends. It must be noted that the way in which Census information is collected and reported results in some sampling errors and inconsistency in the numbers; nevertheless, this is the best and most comprehensive information available for this type of report. The 2010 Census, however, did not include as many questions as previous years and therefore some comparisons and trends cannot be made. In those tables, the ACS 2007-2011 estimates was the source of information. The ACS is administered as a random sample and contains a percentage of error since all households have not participated in the survey.

---

<sup>6</sup> *Soares v. Atkinson*, 128 NH (1986) and *Britton v. Town of Chester*, 134 NH (1991). In both cases, the court held that the local zoning ordinance did not provide reasonable housing opportunity for low and moderate-income residents.

The methodology employed will measure the absolute growth in population and housing; the percentage growth over a particular time period, and the change in percentages. By analyzing the data, the community has an opportunity to prepare for future needs such as schools, housing options, services, roads and other infrastructure.

### III. POPULATION ANALYSIS

According to the 2010 Census, Greenfield has a total population of 1,749 persons. This is an increase of 92 people between 2000 and 2010 or a 5.6% increase. This number represents an 80% increase over the past 30 years.

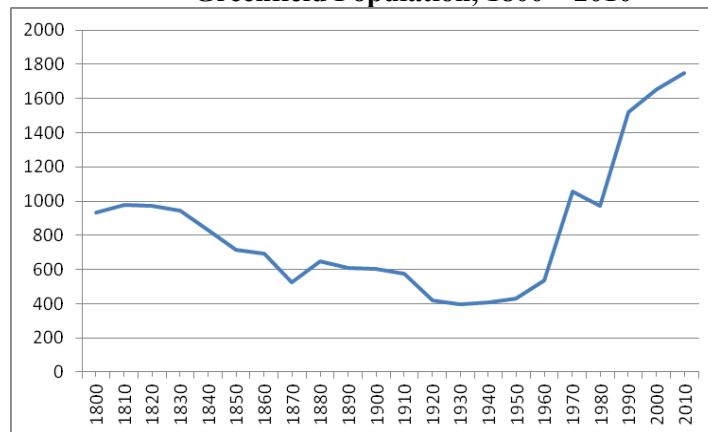
**Table 1:**  
**Population Trends, 1980 - 2010**

YEAR	POPULATION	% CHANGE
1980	972	--
1990	1,519	56.3%
2000	1,657	9.1%
2010	1,749	5.4%

*Source: U.S. Census Bureau*

Graph 1 presents a brief historical perspective of population change over time, illustrating the population from 1800, the first year for which a census was recorded in Greenfield, to the present. As the graph illustrates, Greenfield experienced mostly a steady decline in population until about 1950, when small increases were recorded. Then came the “Baby Boom” which resulted in a sharp increase in population during the 1960’s. Another decline in population occurred between 1970-1980 which may have been the result of the railroad usage in Greenfield. The next noticeable change occurred between 1980 to 1990 with the “Housing Boom”. The changes during the last two decades have been more manageable to be able to plan for the impacts to town needs.

**Graph 1:**  
**Greenfield Population, 1800 – 2010**



*Source: U.S. Census Bureau*



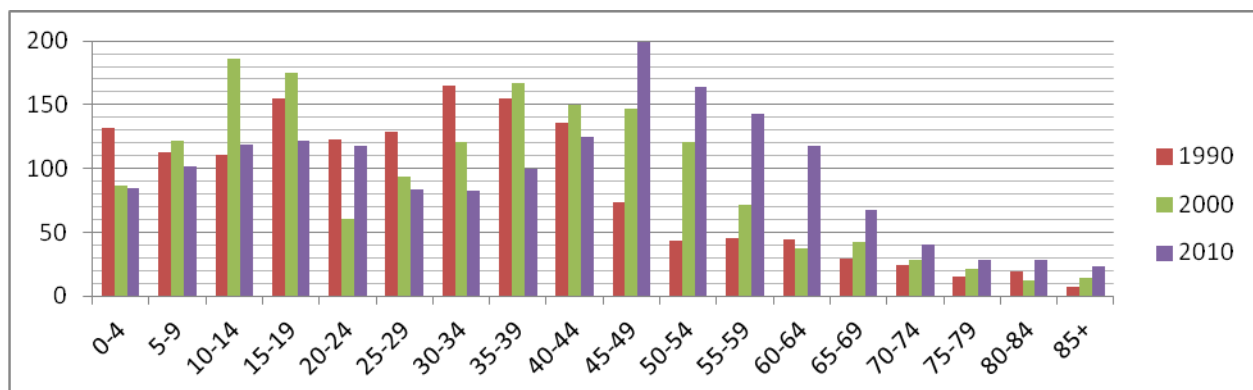
**Table 2:1980-2010 Population by Age**

The Census breaks the population numbers out by age categories, which is also of interest for planning purposes. Table 2 illustrates the population breakdown by age grouping between 1980–2010. The age categories with the most residents in 2010 include the four consecutive age groups between the ages of 40 – 59. This span accounts for 36% of the total population in Greenfield. It will be important to consider the changing needs of this population over the next twenty years. The orange blocks show the progression of this age group through the last three decades. Another trend that is beginning is the four consecutive age groups between the ages of 5-24 and is shown in the yellow blocks. This group accounts for 28% of the total population in Greenfield in 2010.

	1980	1990	2000	2010
<b>0-4</b>	57	132	87	85
<b>5-9</b>	87	113	122	102
<b>10-14</b>	67	111	186	119
<b>15-19</b>	88	155	175	122
<b>20-24</b>	90	123	61	118
<b>25-29</b>	90	129	94	84
<b>30-34</b>	115	165	121	83
<b>35-39</b>	113	155	167	100
<b>40-44</b>		136	150	125
<b>45-49</b>	84	74	147	199
<b>50-54</b>		43	121	164
<b>55-59</b>	41	45	72	143
<b>60-64</b>	36	44	37	118
<b>65-69</b>	66	29	42	68
<b>70-74</b>		24	28	40
<b>75-79</b>	35	15	21	28
<b>80-84</b>		19	12	28
<b>85+</b>	3	7	14	23

Source: 1980: U.S. Census Summary Tape File 3. These data are based on a sample and therefore differ slightly from enumerated 1980 census data (STF-1), NH OEP, Accessed 8/30/2013 1990.

**Graph 2:**  
**1990-2010 Population by Age\***



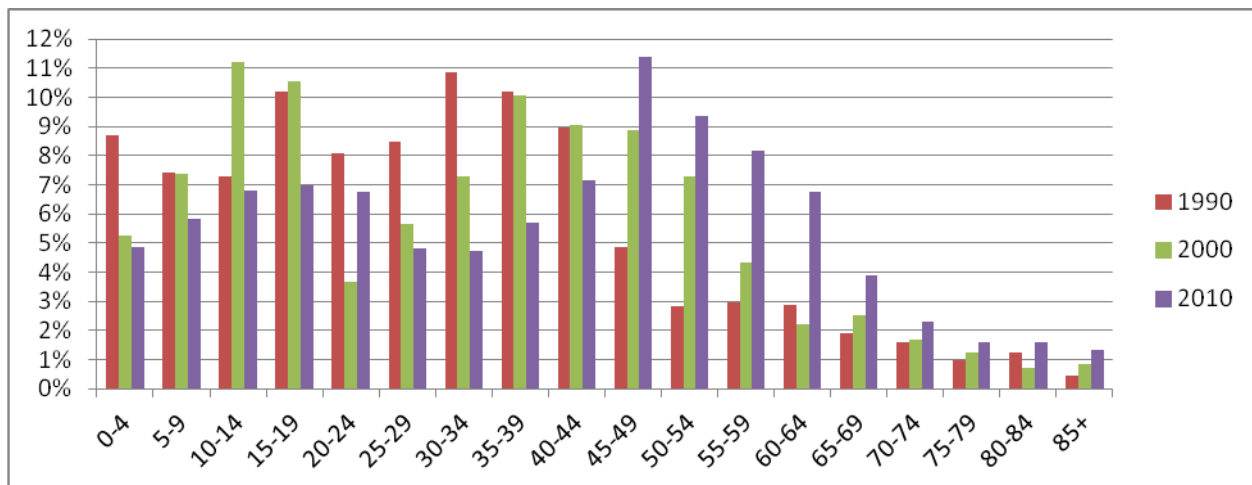
Source: U.S. Census Bureau

\*1980 data is not consistent with cohorts of subsequent years, and is therefore not shown.

Graph 2 provides a visual representation of the age distribution between 1990 - 2010. The graph does not include the age distributions in 1980 because the 1980 Census used slightly different age categories, and would therefore cause the graph to be misrepresentative of some of the categories.

In addition to the age distribution information provided in Table 2, the percentage of the total population for the age groups can provide valuable indicators for planning the needs of a community. Graph 3 shows a distinctive trend in the percentage of Greenfield residents as the population ages. The percentage of residents in the 65 to 69 age category doubled from 1990 to 2010. In addition to this trend, it should be noted that all the age groups between the ages of 0 to 44, with the exception of the 20 to 24 age category, have experienced an overall decline in percentage of population during this same time period.

**Graph : 3**  
**1990-2010 Population by Age\***  
**As a Percentage of the Total Population**



Source: U.S. Census Bureau

\*1980 data is not consistent with cohorts of subsequent years, and is therefore not shown.

Census information also breaks out males and females as shown in Table 3. This table indicates that there are more males in Greenfield's total population. There has been little change in these figures over the past 30 years.

**Table: 3**  
**1990-2010 Male/Female Distribution**

	Males	Females
<b>1990</b>	803	716
<b>2000</b>	845	812
<b>2010</b>	901	848

Source: U.S. Census Bureau

## A. POPULATION CHARACTERISTICS

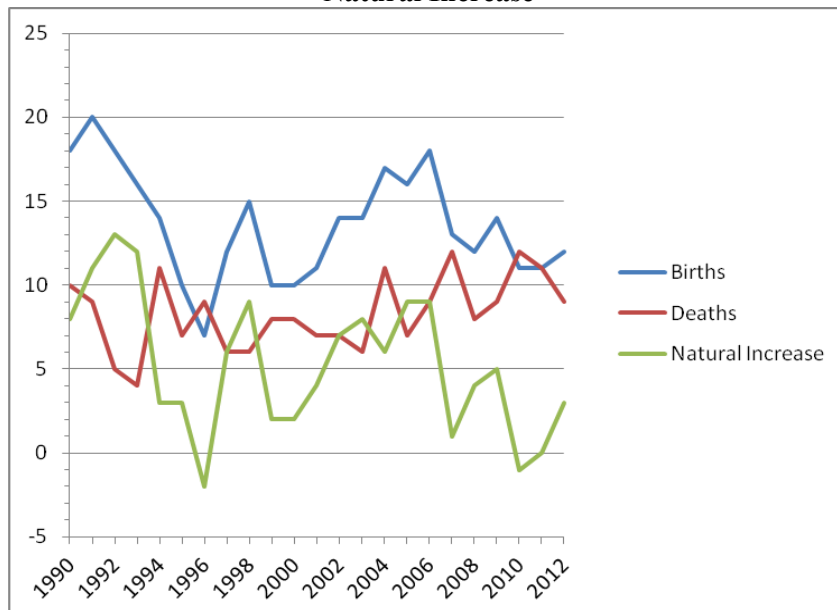
Two factors affect population change: natural increase, or the excess of births over deaths; and migration, the movement of people into or out of the community. Tables 4 below presents the birth and death statistics for Greenfield for the period from 1990 to 2010. These figures show that Greenfield has had a positive increase – meaning more births than deaths, in each of the years examined except 1996 and 2010. The increases overall range from 1 to 13 persons.

**Table 4:**  
**Natural Increase**

Year	Births	Deaths	Natural Increase	Year	Births	Deaths	Natural Increase
1990	18	10	8	2002	14	7	7
1991	20	9	11	2003	14	6	8
1992	18	5	13	2004	17	11	6
1993	16	4	12	2005	16	7	9
1994	14	11	3	2006	18	9	9
1995	10	7	3	2007	13	12	1
1996	7	9	-2	2008	12	8	4
1997	12	6	6	2009	14	9	5
1998	15	6	9	2010	11	12	-1
1999	10	8	2	2011	11	11	0
2000	10	8	2	2012	12	9	3
2001	11	7	4	<b>Total</b>	<b>313</b>	<b>191</b>	<b>122</b>

*Source: Greenfield Annual Reports*

**Graph 4:  
Natural Increase**



Source: Greenfield Annual Reports

Over these past 20 years, Greenfield has had a natural increase of 122 people. If the natural increase figures are applied to the Census information during the same time period, a determination can be made as to the effect of in-migration on the population, for example:

**Table 5:  
In-Migration 1990-2010**

<u>IN-MIGRATION 1990-2000</u>		<u>IN-MIGRATION 2000-2010</u>	
Population, 1990	<b>1,519</b>	Population, 2000	<b>1,657</b>
Natural Increase, 1990-2000	<b>67</b>	Natural Increase, 2000-2010	<b>52</b>
Population in 2000, if no migration	<b>1,586</b>	Population in 2000, if no migration	<b>1,709</b>
Actual 2000 Population	<b>1,657</b>	Actual 2010 Population	<b>1,749</b>
Therefore, increase due to in-migration	<b>71</b>	Therefore, increase due to in-migration	<b>40</b>

Thus, based on the above calculations, in-migration accounted for 51% of the population increase between 1990 and 2000 and 43% of the population increase between 2000 and 2010. This trend shows that fewer people are migrating into Greenfield while the natural increase (births) continues to add to the population. Graph 4 shows a visual representation of this information.

Additional data gathered from the U.S. Census reinforces the role that in-migration might play in population growth. Table 6 below presents information on the year the residents moved into their home or apartment and Table 7 shows the status of residents from a shorter time period. This type of information is used to determine resident mobility and stability.

**Table 6:  
Year Householder Moved Into Unit**

<b>2005 and later</b>	146
<b>2000-2004</b>	134
<b>1990-1999</b>	130
<b>1980-1989</b>	87
<b>1970-1979</b>	38
<b>1960-1969</b>	15

*Source: U.S. Census Bureau American Community Survey  
2007-2011 5-Year Estimates Table DP04*

**Table 7:  
Residence One Year Ago**

<b>Population 1 year and over</b>	1,461	100.0%
<b>Same house</b>	<b>1,333</b>	<b>91.2%</b>
<b>Different house in the U.S.</b>	<b>117</b>	<b>8.0%</b>
<b>Same county</b>	<b>89</b>	<b>6.1%</b>
<b>Different county</b>	<b>28</b>	<b>1.9%</b>
<b>Same state</b>	<b>0</b>	<b>0.0%</b>
<b>Different state</b>	<b>28</b>	<b>1.9%</b>
<b>Abroad</b>	<b>11</b>	<b>0.8%</b>

*Source: U.S. Census Bureau American Community Survey (ACS)  
2007-2011 5-Year Estimates Table DP02*

The two tables following represent information collected by the Census on income and poverty levels. Table 8 contains median household and family incomes for Greenfield residents in 1990, 2000, and 2011, and compares those to the incomes for Hillsborough County<sup>7</sup> and the State of New Hampshire; and Table 9 represents the census information on poverty levels.

**Table 8:  
1990- 2011 Income Information**

	Median Household Income			% Change
	1990	2000	2011*	2000-2011
New Hampshire	\$36,329	\$49,467	\$64,664	30.72%
Hillsborough County	\$40,404	\$53,384	\$70,591	32.23%
Greenfield	\$40,057	\$48,833	\$71,667	46.76%
	Median Family Income			% Change
	1990	2000	2011*	2000-2011
New Hampshire	\$41,628	\$57,575	\$78,310	36.01%
Hillsborough County	\$46,249	\$62,363	\$83,636	34.11%
Greenfield	\$43,333	\$56,250	\$80,893	43.81%
	Per Capita Income			% Change
	1990	2000	2011*	2000-2011
New Hampshire	\$15,959	\$23,844	\$32,357	35.70%
Hillsborough County	\$17,404	\$25,198	\$33,653	33.55%
Greenfield	\$15,107	\$19,895	\$32,293	62.34%

Source: U.S. Census Bureau 2000 Summary File 3 (SF 3) Table DP-3

\*U.S. Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table DP03

Greenfield residents compared favorably over the state and county incomes during the last decade as shown in Table 8 above. The Median Household income increased 46.76% in Greenfield, while the increases were 30.72% and 32.23 % in the state and county respectively. There was a similar increase in the Median Family Income, and a more substantial increase in the Per Capita Income. The Per Capita increase for Greenfield between 2000-2011 was 62.34% compared to a 35.7% increase in state income and 33.5 % in county incomes.

Information on poverty levels gives a slightly different picture (Table 9). The percentage of the population below the poverty level in Greenfield dropped by 1.8% between 1990 and 2000, however it increased by 4.4% between 2000 and 2010. This was a greater change than that of the County poverty figure.

<sup>7</sup> The Census defines a family as a householder and one or more persons in the same household who are related by birth, marriage or adoption. A household, on the other hand, includes all nonrelated persons who occupy a housing unit, and may consist of just one person.

**Table 9:  
Poverty Levels  
1990- 2011\***

	<b>Greenfield 1990</b>	<b>County 1990</b>	<b>Greenfield 2000</b>	<b>County 2000</b>	<b>Greenfield 2011*</b>	<b>County 2011*</b>
<b>Above Poverty Level</b>	1,203	309,735	1,431	349,544	1,256	346,690
<b>Below Poverty Level</b>	94	19,261	81	23,358	137	27,958
<b>% Below Poverty</b>	7.2%	5.9%	5.4%	6.3%	9.8%	7.5%

<b>Under Age 18 Above Poverty Level</b>	384	78,240	380	90,501	309	93,606
<b>Under Age 18 Below Poverty Level</b>	47	6,308	37	7,769	28	7,891
<b>% Under Age 18 Below Poverty Level</b>	10.9%	7.5%	8.9%	7.9%	9.1%	10.2%

<b>Age 65 + Above Poverty Level</b>	85	28,929	107	34,840	166	44,422
<b>Age 65 + Below Poverty Level</b>	9	3,238	10	3,125	14	2,691
<b>% Age 65 + Below Poverty Level</b>	9.6%	10.1%	8.5%	8.2%	8.4%	6.1%

Source: U.S. Census Bureau U.S. Census Bureau 1990 Summary Tape File 3A Table P117, Census 2000 Summary File 3 (SF 3) - Sample Data Table DP-3, \*2007-2011 American Community Survey 5-Year Estimates Table S1701.

Disclaimer: Persons for whom the Census Bureau can determine poverty status (either "in poverty" or "not in poverty"). For some persons, such as unrelated individuals under age 15, poverty status is not defined. Since Census Bureau surveys typically ask income questions to persons age 15 or older, if a child under age 15 is not related by birth, marriage, or adoption to a reference person within the household, we do not know the child's income and therefore cannot determine his or her poverty status. For the decennial censuses and the American Community Survey, poverty status is also undefined for people living in college dormitories and in institutional group quarters. People whose poverty status is undefined are excluded from Census Bureau poverty tabulations. Thus, the total population in poverty tables--the poverty universe--is slightly smaller than the overall population.

## **B. SUBREGIONAL POPULATION COMPARISONS**

An analysis of population is not complete without a comparison of Greenfield's population with that of its immediate neighbors – Bennington, Fracestown, Lyndeborough, Temple, Peterborough, and Hancock. Statistics on percent of growth can be misleading if the towns involved in the comparison vary too greatly in population. For the purpose of this discussion, however, such a comparison can be useful, since the towns are all somewhat similar in size, with the exception of Peterborough. Table 10 below presents this information for the last three decades, 1980 – 2010.

**Table 10:  
Subregional Population Comparisons  
1980-2010**

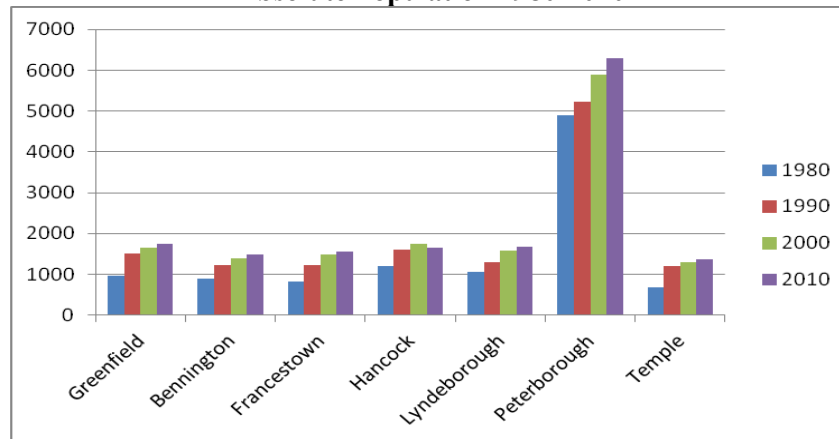
<b>ABSOLUTE POPULATION</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>
Greenfield	972	1,519	1,657	1,749
Bennington	890	1,236	1,401	1,476
Francestown	830	1,217	1,480	1,562
Hancock	1,193	1,604	1,739	1,654
Lyndeborough	1,070	1,294	1,585	1,683
Peterborough	4,895	5,239	5,883	6,284
Temple	692	1,194	1,297	1,366
Total	10,542	13,303	15,042	15,774
<b>PERCENTAGE CHANGE</b>	<b>1980-1990</b>	<b>1990-2000</b>	<b>2000-2010</b>	<b>1980-2010</b>
Greenfield	56.3%	9.1%	5.6%	79.9%
Bennington	38.9%	13.3%	5.4%	65.8%
Francestown	46.6%	21.6%	5.5%	88.2%
Hancock	34.5%	8.4%	-4.9%	38.6%
Lyndeborough	20.9%	22.5%	6.2%	57.3%
Peterborough	7.0%	12.3%	6.8%	28.4%
Temple	72.5%	8.6%	5.3%	97.4%
<b>PERCENTAGE OF SUBREGIONAL POPULATION</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>
Greenfield	9.2%	11.4%	11.0%	11.1%
Bennington	8.4%	9.3%	9.3%	9.4%
Francestown	7.9%	9.1%	9.8%	9.9%
Hancock	11.3%	12.1%	11.6%	10.5%
Lyndeborough	10.1%	9.7%	10.5%	10.7%
Peterborough	46.4%	39.4%	39.1%	39.8%
Temple	6.6%	9.0%	8.6%	8.6%

Source: U.S. Census Bureau

Graphs 5–7 visually present the information contained in Table 10. Graph 5 shows the absolute population of the towns in each year examined; Graph 6 illustrates the percentage of population increase between 1980-2010; and Graph 7 compares the share of each town's population relative to the total subregional population.

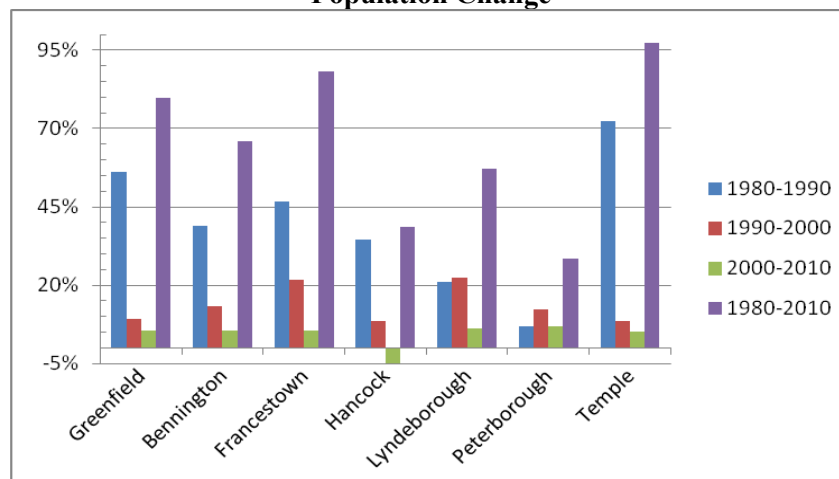


**Graph 5:  
Absolute Population 1980-2010**



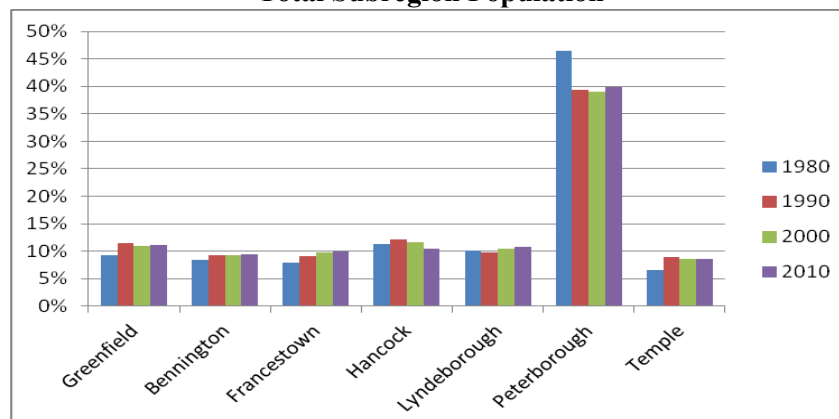
Source: U.S. Census Bureau

**Graph 6:  
Population Change**



Source: U.S. Census Bureau

**Graph 7:  
Population as a Percentage of  
Total Subregion Population**



Source: U.S. Census Bureau

The figures in Table 10 illustrate widely variable rates of growth for Greenfield, as well as the six surrounding towns. Five of the seven towns had more growth in the 1980s than they did in the 1990s – Lyndeborough and Peterborough were the exceptions. Greenfield was the second largest town in this subregion excluding Peterborough (due to the large difference in its population compared to the other five towns), in 1980 – 2000. However, in 2010, Greenfield had a 5.6% increase in growth while Hancock had a 4.9% reduction, which changed Greenfield's subregional population status to the first largest (Peterborough excluded).

During this time period, each town has increased in population (except Hancock 2000-2010), however, the percentage of change in population has been steadily decreasing in all of the towns with the exception of Peterborough and Lyndeborough between 1990- 2000. Greenfield had a relatively high percentage increase (79.9%) in population between 1980 -2010 while the other towns ranged from 28.4% – 97.4% growth.

In terms of each town's *share* of this subregional population, Peterborough ranks the highest for each of the years examined, although the percentage has decreased since 1980. Greenfield has remained the most constant, at around 11% of the subregional total. With the exception of Peterborough, Greenfield has had the second highest percentage of the subregional population for 1980, 1990 and 2000. A shift occurred in 2010, as mentioned above, due to the decrease in population in Hancock, which put Greenfield in the next highest percentage of the subregional population behind Peterborough.

## IV. HOUSING ANALYSIS

### A. DESCRIPTION OF THE HOUSING STOCK

In this section, statistics on housing supply and type, age of housing, and various housing conditions are examined in order to describe the status of the housing supply in Greenfield. Beginning with the basic number of total housing units, Table 11 below presents these numbers for the years 1980-2010 along with the tenure and vacancy information.

**Table 11:**  
**Housing Supply & Tenure, 1980 -2010**

		# of Units	% Change	# of Units	% Change	# of Units	% Change	% Change
	1980	1990	1980-90	2000	1990-00	2010	2000-10	1980-10
All Housing Units	416	517	24.3%	640	23.8%	699	9.2%	68.0%
Occupied Units	371	436	17.5%	563	29.1%	618	9.8%	66.6%
owners	261	368	41.0%	458	24.5%	496	8.3%	90.0%
renters	65	68	4.6%	105	54.4%	122	16.2%	87.7%
Vacant Units	45	81	80.0%	77	-4.9%	81	5.2%	80.0%
seasonal	24	50	108.3%	62	24.0%	45	-27.4%	87.5%
other vacant	21	31	47.6%	15	-51.6%	21	40.0%	0.0%
% vacant	12%	19%		12%		12%		
% owner-occupied	70%	84%		81%		80%		

Source: US Bureau of the Census

The increases in the total housing units are consistent with the population changes witnessed over the same time period: that the greatest growth was in the 1980s, with a slowdown from 1990 to 2000 and a sharper decline between 2000 and 2010. During this last decade, changes across the country with stricter lending thresholds and the economic downturn, the trend of homeownership saw the smallest increase in decades. In Greenfield, most housing units are owner-occupied, although the percentage shifted significantly from 1990 to 2000. This is an indicator that more Greenfield residents are either choosing to rent homes or are unable to purchase homes, probably due to economic factors.

Also of interest when examining housing issues is the type of housing units that are available in town. Housing stock is defined by the following types: single family, multi-family, and manufactured housing. Definitions used in this analysis come from NH Office of Energy and Planning (OEP), which uses definitions developed by the US Census, but sometimes combines categories, as follows:

- **Single Family** (or 1-Unit Detached): A 1-unit structure detached from any other structure. This also includes mobile homes or trailers to which one or more permanent rooms have been added.
- **Two Family.** One structure containing two separate, independent housing units.
- **Multi-Family:** Residential buildings containing units built one on top of another and those built side-by-side which do not have a ground-to-roof wall and/or have common facilities (i.e., attic, basement, heating plant, plumbing, etc.)
- **Manufactured Housing:** Both occupied and vacant mobile homes to which no permanent rooms have been added. (Note that once any addition is put onto a manufactured unit, the Census counts it as a single-family dwelling.)
- **Other:** Any living quarters occupied as a housing unit that does not fit the previous categories, such as houseboats, railroad cars, campers and vans.

**Table 12:**  
**Number of Units In Structure, 1990 – 2011\***

	1990		2000		2011*	
	Number	% of Total	Number	% of Total	Number	% of Total
Total	517		640		694	
1-unit, detached	448	86.7%	544	85.0%	584	84.1%
1-unit, attached	4	0.8%	15	2.3%	5	0.7%
2 units	16	3.1%	30	4.7%	25	3.6%
3 or 4 units	32	6.2%	25	3.9%	10	1.4%
5 to 9 units	2	0.4%	3	0.5%	5	0.7%
10 to 19 units	0	0.0%	0	0.0%	4	0.6%
20 or more units	0	0.0%	3	0.5%	36	5.2%
Manufactured	13	2.5%	20	3.1%	25	3.6%
Other	2	0.4%	0	0.0%	0	0.0%

Source: U.S. Census Bureau U.S. Census Bureau 1990 Summary Tape File 3A Table H020, Census 2000 Summary File 3 (SF 3) - Sample Data Table DP-4, \*2007-2011 American Community Survey 5-Year Estimates Table DP04.

Greenfield, like most towns in the region, has more single family housing than any other type. The percentages accounted for by each type of housing has not changed appreciably over the years, either: single family units accounts for between 84.8 and 87.3 percent; two- family between 3.1 and 4.7 percent; and multi-family between 4.9 and 7.9 percent. Manufactured housing, overall, has experienced the smallest change.

The age of the housing stock is useful information in gauging whether or not to expect aesthetic or structural problems (see Table 13). There is a presumption that homes built prior to 1940 are more likely to be dilapidated or have outdated heating, water and septic systems. Even though this might be true overall, many older homes have been renovated and restored to good condition. Housing quality is also a function of age and income of the occupants, and these are examined later.

**Table 13:  
Year Structure Built**

	Estimate	Percent
Total:	694	
Built 2005 or later	21	3.0%
Built 2000 to 2004	96	13.8%
Built 1990 to 1999	61	8.8%
Built 1980 to 1989	106	15.3%
Built 1970 to 1979	89	12.8%
Built 1960 to 1969	52	7.5%
Built 1950 to 1959	37	5.3%
Built 1940 to 1949	8	1.2%
Built 1939 or earlier	224	32.3%

*Source: U.S. Census Bureau, 2007-2011 American Community Survey Table B25034*

Table 13 shows that 32.3% of the housing stock was constructed prior to 1940. After that, there was a limited amount of new construction until 1960. During the next 50 years, 61.2% of the current housing stock was constructed. The largest increase in new housing construction was during the housing boom between 1980-1989 with 106 homes. This is also the period in which Greenfield experienced the largest population growth with a 56.3 % increase as previously indicated in Table 10.

Housing standards and building codes became stricter during the 1970's as information about health risks associated with the use of certain building materials such as asbestos and lead paint became available. After these discoveries, 41% of Greenfield homes have been constructed since the risks of asbestos were released, and 53.7% of homes were constructed since the risks of lead paint were released.

Table 14 illustrates housing units by number of rooms. The larger units of five or six rooms experienced the greatest increase (379% from 1980 to 2011), while the one or two room units experienced the least change of 41%. It is possible that many of these new units are accounted

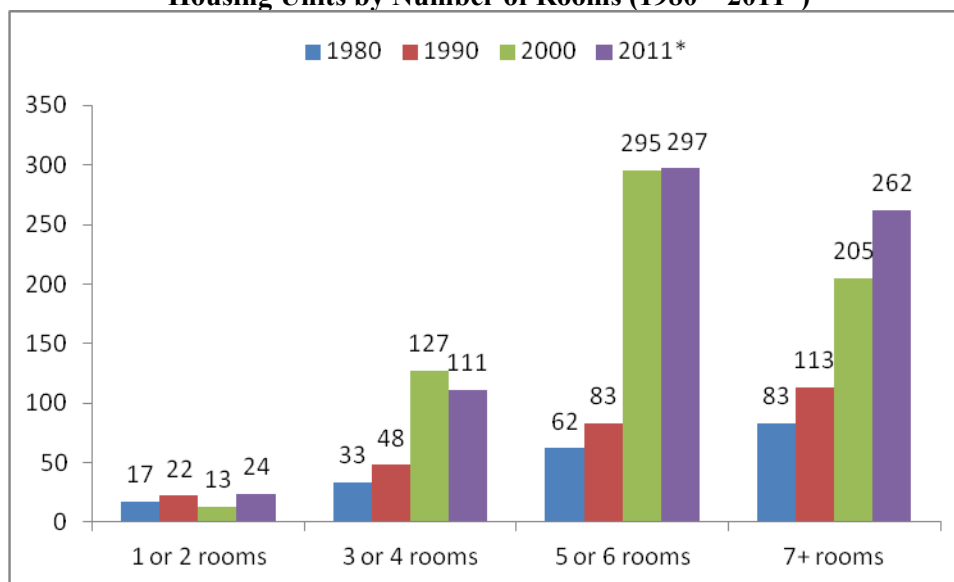
for by additions to existing housing stock. It is not uncommon that early post-war homes, typically smaller than is seen today, are converted over time, adding living and sleeping space. The overall average for homes in Greenfield is between five and six rooms per dwelling unit, a number that has been slightly increasing since 1980. Graph 8 provides a visual representation.

**Table 14:**  
**Housing Units by Number of Rooms**

	1980		1990		2000		2011*		% Change 1980 - 2011*
	Number	% of Total	Number	% of Total	Number	% of Total	Number	% of Total	
1 or 2 rooms	17	9%	22	8%	13	2%	24	3%	41.2%
3 or 4 rooms	33	17%	48	18%	127	20%	111	16%	236%
5 or 6 rooms	62	32%	83	31%	295	46%	297	43%	379%
7+ rooms	83	43%	113	42%	205	32%	262	38%	216%
Total	195		266		640		694		256%
Rooms per Unit	5.7		5.7		5.8		5.9		

Source: United States Census Bureau; \*United States Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table B25018

**Graph 8:**  
**Housing Units by Number of Rooms (1980 – 2011\*)**



Source: U.S. Census Bureau

\*United States Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates: Table B25018

## B. MEASURE OF HOUSING PROBLEMS

Census data relative to overcrowding and affordability are examined here, as these are two other variables that help gauge the extent of housing problems. Two measures the Census relies on to determine whether or not dwelling units are overcrowded are *persons per unit occupancy* and *persons per room*.

### Overcrowding

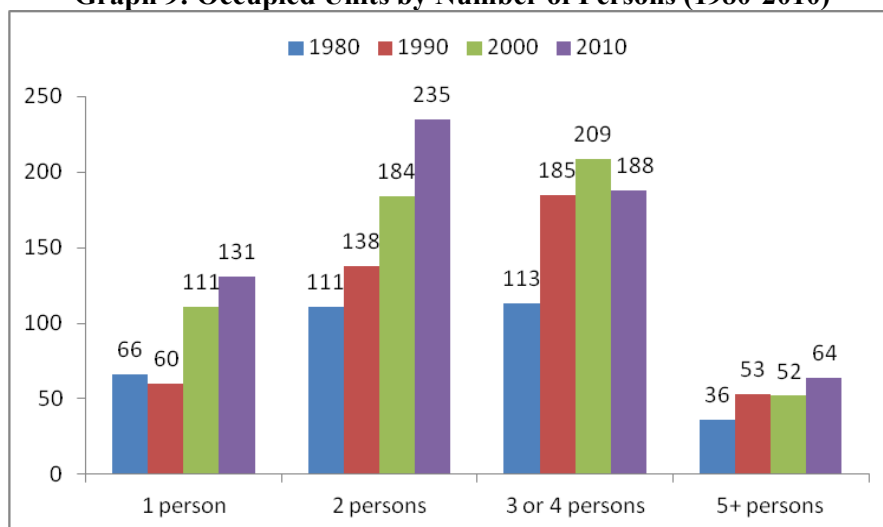
Table 15 presents four categories for examining household size. The census selects these categories on the basis of their social significance and their frequency of occurrence. The table shows that more units in Greenfield were occupied by 3-4 persons between the period of 1980-2000. However, this changed in the 2010 census data in which the largest category shifted to 2 persons per unit.

**Table 15:**  
**Occupied Units by Number of Persons**

	1980		1990		2000		2010		% Change 1980 - 2010
	Number of Units	% of Total	Number of Units	% of Total	Number of Units	% of Total	Number of Units	% of Total	
1 Person	66	20%	60	14%	111	20%	131	21%	98%
2 Persons	111	34%	138	32%	184	33%	235	38%	112%
3 or 4 Persons	113	35%	185	42%	209	38%	188	30%	66%
5+ Persons	36	11%	53	12%	52	9%	64	10%	78%
Total	326		436		556		618		
Persons/Unit	2.37		2.93		2.69		2.61		

Source: U.S Bureau of the Census 2010 Census Summary File 1

**Graph 9: Occupied Units by Number of Persons (1980-2010)**



Source: U.S. Census Bureau

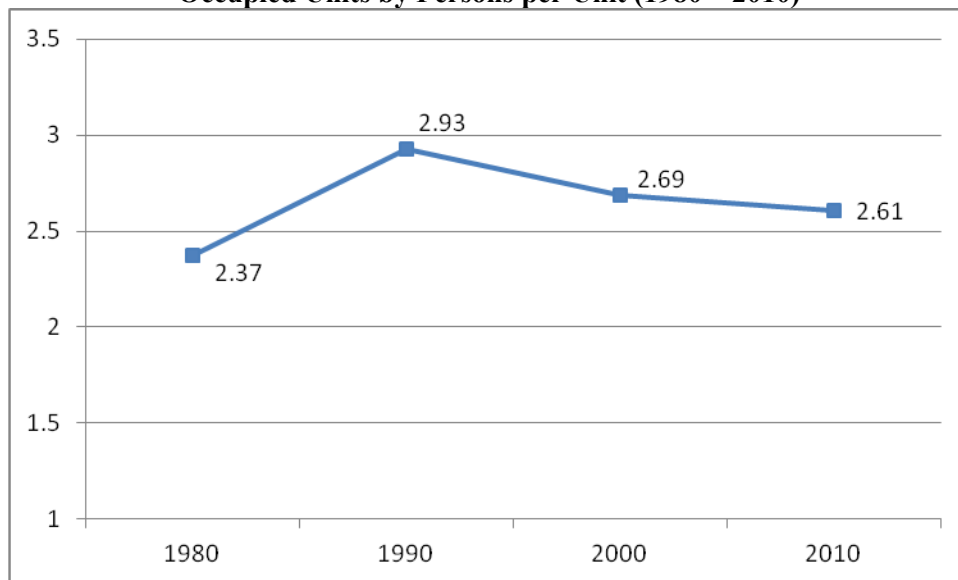
The Census defines an overcrowded unit as one that is occupied by more than one person per room. The data for Greenfield, illustrated in Table 16, indicate that overcrowding is not an issue. In all four time periods examined here, nearly 100% of the housing stock had a measure of 1.00 person per room, or less. Graph 10 provides a visual representation of occupied units by person per unit.

**Table 16:**  
**Occupied Units by Persons per Room, 1980 – 2011**

	1980	% of Total	1990	% of Total	2000	% of Total	2011*	% of Total
1.00 or less	317	97%	431	99%	554	98%	550	100%
1.01 – 1.50	7	2%	4	0.90%	8	1%	0	0%
1.51 or more	2	0.30%	1	0.20%	1	0.20%	0	0%

Source: U.S. Census Bureau \*United States Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table B25014

**Graph 10:**  
**Occupied Units by Persons per Unit (1980 – 2010)**



Source: U.S. Census Bureau



### Affordability

The information in this section is intended to determine how affordable and available housing is for people in Greenfield. Table 17 presents the relative cost of housing in Greenfield, based on the 2007-2011 American Community Survey data.

**Table 17:**  
**Cost of Housing, Greenfield and Region, 1980 – 2011**

Median Housing Cost	1980	1990	2000	2011*	% Change 2000-2011
Greenfield House Value	\$49,900	\$120,200	\$124,300	\$244,700	96.9%
Greenfield Rent	\$208	\$514	\$687	\$725	5.5%
Regional Value	\$47,650	\$124,050	\$113,431	\$227,926	100.9%
Regional Rent	\$206	\$552	\$653	\$931	42.6%

Source: U.S. Census Bureau Summary Files; \* 2011 ACS

Housing costs for both owners and renters have increased over the years, of course, as they have in the region and state as well; however, Greenfield's cost relative to the regional median housing costs have been fairly constant, being either just above or just below the median house values. The noticeable difference, however, is the sharp contrast between Greenfield rentals and regional rentals. The regional median rent value increased by 42.6% between 2000 and 2011, whereas, the Greenfield median rent values increased by only 5.5% during the same period.

Table 18 refines the data in the previous table by illustrating not just what people pay for housing, but what percentage those costs are of their income. It has been recognized that people in lower income brackets pay more proportionally for housing than do people in higher income brackets.

**Table 18:**  
**Selected Monthly Owner Costs as a % of Household Income 1989, 1999, 2011\***

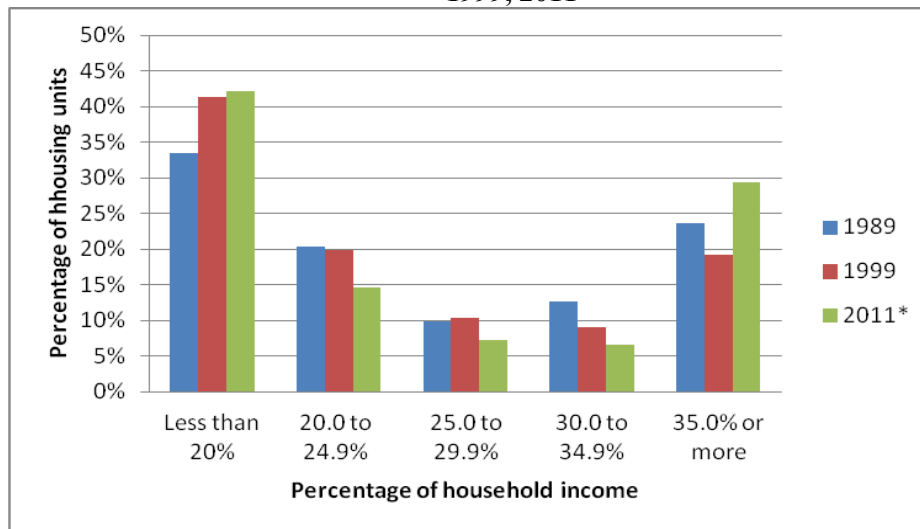
	Owner-occupied units						Renter-occupied units					
	1989		1999		2011*		1989		1999		2011*	
Less than 20%	82	33.5%	127	41.4%	193	42.2%	13	27.7%	40	48.8%	23	33.8%
20.0 to 24.9%	50	20.4%	61	19.9%	67	14.7%	14	29.8%	14	17.1%	6	8.8%
25.0 to 29.9%	24	9.8%	32	10.4%	33	7.2%	3	6.4%	16	19.5%	10	14.7%
30.0 to 34.9%	31	12.7%	28	9.1%	30	6.6%	6	12.8%	0	0.0%	8	11.8%
35.0% or more	58	23.7%	59	19.2%	134	29.3%	11	23.4%	12	14.6%	21	30.9%
<b>Total</b>	<b>245</b>		<b>307</b>		<b>457</b>		<b>47</b>		<b>82</b>		<b>68</b>	
Not Computed	1		3		9		4		10		16	

U. S. Census Bureau 2000 Summary File 3 Table QT-H15, 1990 Summary Tape File 3A Tables H050 & H058 \*Source: U. S. Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table C25095

Changes in the economy, housing market and in the lending policies have had a dramatic affect on the statistics of homeownership, and will make it difficult to make projections based on past figures and

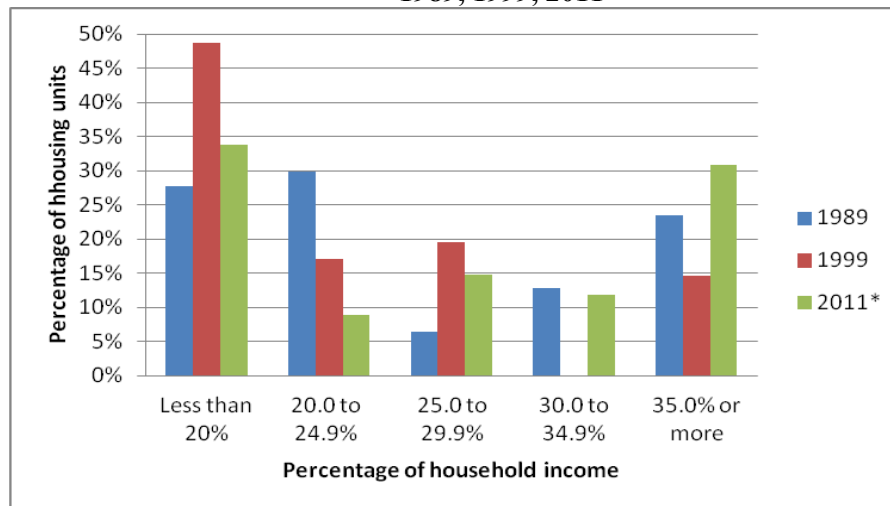
trends. In addition, the difference in the data source and methodology may result in inaccuracies. According to the figures found in Table 18 and seen in Graph 11, approximately 36% of owner occupied households paid 30% or more of their monthly incomes on housing in 2011 which reflects an increase from the 1999 figure of 28%. The changes in the rental figures are more significant as can be seen in Graph 12. Approximately 43% of renters in Greenfield paid 30% or more of their monthly incomes in 2011 in contrast to 15% in 1999. Changes such as this may indicate that there is not enough rental property in Greenfield to meet the demand, which may result in higher rental rates.

**Graph 11:**  
**Selected Monthly Owner Costs as a Percentage of Household Income (SMOCAPI) 1989, 1999, 2011\***



Source: U. S. Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table C25095

**Graph 12:**  
**Gross Rent as a Percentage of Household Income (GRAPI) 1989, 1999, 2011\***



Source: U. S. Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table C25095

Based on the principle that no more than 30% of a household's income should be spent on housing to be considered affordable, the possibilities for home ownership in Greenfield are examined in the table below.

**Table 19:  
Home Ownership Affordability in Greenfield, 2011**

2011* Median Household Income	\$71,667	80% of Median Household Income	\$57,334	50% of Median Household Income	\$35,834
30% of monthly income	\$1,792	30% of monthly income	\$1,433	30% of monthly income	\$896
Mortgage affordable at 4.5% for 30 years**	\$232,313	Mortgage affordable at 4.5% for 30 years	\$185,282	Mortgage affordable at 4.5% for 30 years	\$114,800
Down payment (10%)	\$23,231	Down payment (10%)	\$18,528	Down payment (10%)	\$11,480
Total	\$255,544	Total	\$203,810	Total	\$126,280

Source: New Hampshire Housing Finance Authority Mortgage Qualifier Calculator

\* U. S. Census Bureau 2007-2011 American Community Survey (ACS) 5-Year Estimates Table DP03

\*\*includes 2011 property tax rate of 2.092%

**Table 20:  
Home Value in Greenfield in 2011\***

Owner-occupied units	466	
Less than \$50,000	9	1.9%
\$50,000 to \$99,999	4	0.9%
\$100,000 to \$149,999	17	3.6%
\$150,000 to \$199,999	59	12.7%
\$200,000 to \$299,999	264	56.7%
\$300,000 to \$499,999	78	16.7%
\$500,000 to \$999,999	31	6.7%
\$1,000,000 or more	4	0.9%

\*Source: U. S. Census Bureau 2007-2011 American Community Survey 5-Year Estimates Table DP03

Under the three scenarios examined in the table, median income households could afford a home valued at \$255,544. Those, however, earning 80% or 50% of the median household income could afford a home valued at \$203,810 and \$126,280 respectively. Tabel 20 shows that the affordability of homes for the median family income and the 80% of the median family income category is being met since 56.7% of Greenfield homes range between \$200,000 to \$299,999. This may be somewhat misleading since it is not known how many of those homes are in the lower end of that range to meet the needs of those families falling in the 80% median family income category.

### C. SUBREGIONAL HOUSING COMPARISONS

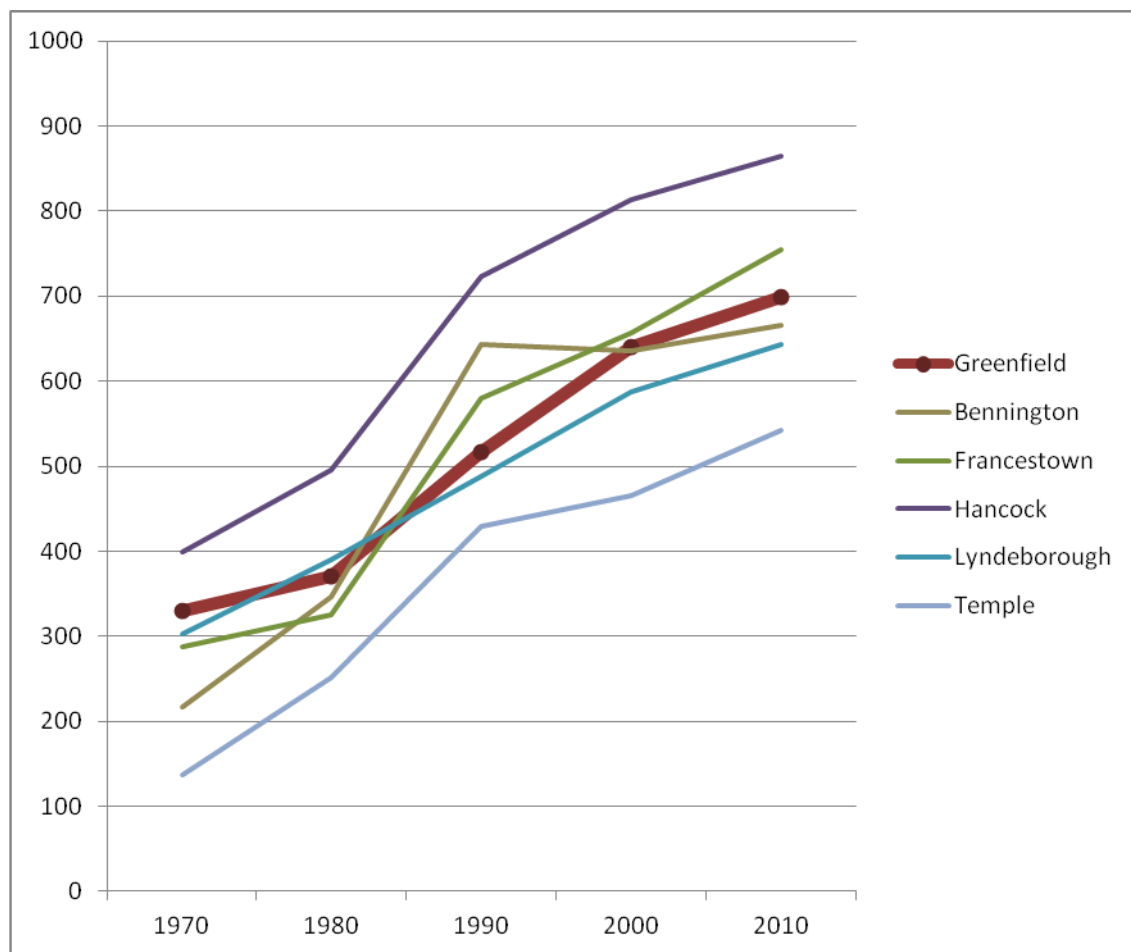
Housing data for the subregion is gathered to compare the towns using various housing characteristics. The following table presents the comparison of the total housing supply for Greenfield and its subregion from 1980 to 2010, and the percentage change from each decade.

**Table 21:**  
**Subregional Housing Trends, 1980 – 2010**

<b>NUMBER OF UNITS</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>
<b>GREENFIELD</b>	330	370	517	640	699
Bennington	217	347	643	635	666
Francestown	287	325	580	656	755
Hancock	399	495	723	814	864
Lyndeborough	303	390	488	587	643
Peterborough	374	1,952	2,242	2,509	2,956
Temple	137	252	429	465	542
<b>TOTAL HOUSING UNITS</b>	<b>2,047</b>	<b>4,111</b>	<b>5,622</b>	<b>6,306</b>	<b>7,125</b>
<b>PERCENTAGE CHANGE</b>	<b>1970-1980</b>	<b>1980-1990</b>	<b>1990-2000</b>	<b>2000-2010</b>	<b>1970-2010</b>
<b>GREENFIELD</b>	12%	40%	24%	9%	112%
Bennington	60%	85%	-1%	5%	207%
Francestown	13%	78%	13%	15%	163%
Hancock	24%	46%	13%	6%	117%
Lyndeborough	29%	25%	20%	10%	112%
Peterborough	422%	15%	12%	18%	690%
Temple	84%	70%	8%	17%	296%
<b>PERCENTAGE OF TOTAL UNITS</b>	<b>1970</b>	<b>1980</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>
<b>GREENFIELD</b>	16%	9%	9%	10%	10%
Bennington	11%	8%	11%	10%	9%
Francestown	14%	8%	10%	10%	11%
Hancock	19%	12%	13%	13%	12%
Lyndeborough	15%	9%	9%	9%	9%
Peterborough	18%	47%	40%	40%	41%
Temple	7%	6%	8%	7%	8%

Source: U.S. Census Bureau

**Graph 13:  
Subregional Housing Trends, 1970 – 2010**



Source: U.S. Census Bureau

The information presented in Table 21 is fairly consistent with the population statistics presented earlier in this chapter; namely, most of the growth seen in this region - in terms of both population and housing, occurred in the 1980s. Greenfield had the greatest percentage of increase in housing units among the subregional towns during the 1990- 2000 period with a 24% change; however it had one of the lowest percentage of change in housing units during the period between 2000- 2010 with only 9% growth. Overall, Greenfield tied with Lyndeborough for the lowest increase during the period of 1970-2010, showing a 112% change while Peterborough experienced a 690% change and Temple experienced a 296% change.

#### **D. HOUSING NEEDS ASSESSMENT**

The enabling statute that addresses the development of Master Plans (RSA 674:2) requires that the housing section address current and future housing needs of all residents, at all income levels, of the town and the region in which it is located. In order to do that, opportunities for housing

development in Greenfield are examined, as well as population projections that give some indication as to what the town can expect in terms of housing needs for new population.

### **Housing Opportunity**

In this section, the zoning provisions for Greenfield are reviewed, as they relate to opportunities for various housing types in the town, specifically which types are permitted and what the minimum lot requirements for those dwelling units are. Greenfield has four zoning districts that accommodate residential development. Examination of the Greenfield Zoning Ordinance reveals the following provisions that deal with the availability of housing:

**TABLE 22:  
Housing Opportunities in Greenfield**

<b>ZONING DISTRICT</b>	<b>PERMITTED HOUSING TYPES</b>	<b>LOT AND YARD STANDARDS</b>
Business District	<ol style="list-style-type: none"> <li>1. Single Family Dwellings – Permitted by right.</li> <li>2. Accessory Dwelling Units (attached)– Permitted by Special Exception.</li> <li>3. Detached Accessory Dwelling Unit –Permitted by Special Exception.</li> <li>4. Elderly Housing – Permitted by Special Exception</li> <li>5. Multi-Family (up to 25 units, only for HUD-eligible elderly). – Permitted by Right</li> </ol>	<ul style="list-style-type: none"> <li>♦ 1.5 acres with 150 feet of frontage</li> <li>♦ 50-foot front setback</li> <li>♦ 25-foot side &amp; rear setback</li> </ul>
Village District	<ol style="list-style-type: none"> <li>1. Single Family Dwellings – Permitted by right.</li> <li>2. Accessory Dwelling Unit (attached) –Permitted by Special Exception.</li> <li>3. Detached Accessory Dwelling Unit –Permitted by Special Exception.</li> <li>4. Elderly Housing – Permitted by Special Exception</li> </ol>	<ul style="list-style-type: none"> <li>♦ 2 acres with 250 feet of frontage</li> <li>♦ 100-foot front setback</li> <li>♦ 50-foot side &amp; rear setback</li> </ul>
General Residence	<ol style="list-style-type: none"> <li>1. Single Family Dwellings – Permitted by Right.</li> <li>2. Detached Accessory Dwelling Units –Permitted by Special Exception</li> <li>3. Elderly Housing – Permitted by Special Exception</li> <li>4. Multi-Family, up to 4 units – Permitted by Right.</li> <li>5. Manufactured Housing – Permitted by Right</li> </ol>	<ul style="list-style-type: none"> <li>♦ 2 acres with 250 feet of frontage</li> <li>♦ 100-foot front setback</li> <li>♦ 50-foot side &amp; rear setback</li> </ul>
Rural/Agricultural	<ol style="list-style-type: none"> <li>1. Single Family Dwellings – Permitted by Right</li> <li>2. Accessory Dwelling Units(attached) –Permitted by Special Exception</li> <li>3. Detached Accessory Dwelling Units –Permitted by Special Exception</li> <li>4. Elderly Housing – Permitted by Special Exception</li> </ol>	<ul style="list-style-type: none"> <li>♦ 4 acres with 350 feet of frontage</li> <li>♦ 100-foot front setback</li> <li>♦ 50-foot side &amp; rear setback</li> </ul>

*Source: Town of Greenfield Zoning Ordinance*

### **Future Housing Need**

In order to estimate what the potential need for housing will be in the future, the available data on housing characteristics and population growth must be reviewed along with estimates for growth in population, and therefore housing need. Between 2000 and 2011, the increases in both housing stock and population were very close 9% and 5.6% respectively, indicating that population growth did not outstrip housing need over this time period. Further, the census data show that, in general, Greenfield's housing stock is in good condition and the incidence of overcrowding of dwelling units is very low.

The NH Office of Energy and Planning (NH OEP) population projections can be used to estimate future housing need, based on a person per unit estimate. The projections for Greenfield and surrounding towns are presented below in five-year intervals up to the year 2030, beginning with the Census count from the year 2010.

**Table 23:  
Subregional Population Projections**

						# Increase	% Change
	2010	2015	2020	2025	2030	2010-30	2010-30
<b>GREENFIELD</b>	1,749	1,930	2,010	2,080	2,150	401	22.9%
<b>Bennington</b>	1,476	1,640	1,700	1,760	1,820	344	23.3%
<b>Franeestown</b>	1,562	1,750	1,830	1,920	2,000	438	28.0%
<b>Hancock</b>	1,654	1,920	1,990	2,050	2,120	466	28.2%
<b>Lyndeborough</b>	1,683	1,880	1,960	2,040	2,110	427	25.4%
<b>Peterborough</b>	6,284	6,670	6,890	7,120	7,350	1066	17%
<b>Temple</b>	1,366	1,640	1,700	1,750	1,810	444	32.5%

*Source: NH Office of Energy and Planning –Projections June 2007*

Greenfield's future housing need is estimated based on this projected population by dividing population by housing units to reach a person per unit figure. A person per unit figure can be calculated for the past decades: 2.37 in 1980, 2.93 in 1990, 2.69 in 2000, and 2.61 in 2010. In order to calculate future housing need, a reasonable person per unit figure for the future must be assumed; in this case, since the figure fluctuated up and then down, a simple average will be used here, which is 2.65 out to the year 2030. The following calculations will use two possible scenarios: one using the OEP projected population increase over the next twenty years; the other using the known past population increase between 1990 and 2010.



**Table 24:**  
**Housing Needs Assessment**

Methodology Used	Population Increase	Projected Populations	Persons Per Unit	Total Housing Needed
Past Trend Method	15%	2,014	2.65	760
Projection Based Method	18%	2,150	2.65	811

Source: NH OEP Population Projections and U.S. Census Bureau

Thus, if Greenfield were to experience the same level of population growth between now and the year 2030 (using the Past Trend Method) as it did between 1990 and 2010, the need for housing units would increase from the current 699 to 760 units. This would amount to an additional 61 units by the year 2030, which means approximately 3 units per year (from 2010-2030) need to be built to keep up with the population demand. If, on the other hand, the Projection-Based Method was correct, the Town would expect an increase in demand of 112 housing units, or 5.6 units per year between 2010-2030.- Given either scenario, it seems reasonable to expect the town to be able to accommodate these projected housing increases.

It is critical for a town to have a housing stock that meets the needs of all residents to maintain a healthy diversity. Having the necessary regulations that enable a range of housing options will help to ensure that there are no regulatory barriers for residential development.

Nevertheless, there are other housing issues to be considered that are not addressed by the current zoning provisions; in particular, the availability of housing for the elderly. Based on updated national census information, the country can expect to see a continued increase in the number of elderly residents (those aged 65 and over). In Greenfield, the age categories with the most residents in 2010 are the four consecutive groups between the ages of 40 – 59 accounting for 36% of the total population (see Table 2). In 20 years, this group will be between the ages of 60-79 years old.

At this time, the elderly population in Greenfield amounts to 9.3% of the total population of the town; granted, this is not a significant proportion of townspeople, but as Table 2 illustrates, it represents nearly a 60% increase since 2000. However, as important as the existing elderly population, is the potential for the smaller group of middle-age residents of Greenfield needing to provide care for aging parents - in the form of on-site housing accommodations. Therefore, the Planning Board recognizes the need to examine these issues at this time and prepare for future situations.

## **V. PLANNING STRATEGIES**

The availability and affordability of housing should be monitored carefully, and the estimated need adjusted as new information is obtained. As a result of the information and analysis presented in this section, the Planning Board offers the following as strategies to be considered by the town in addressing the housing issue on an on-going basis:

1. Investigate the possibilities of obtaining Community Development Block Grants for the rehabilitation and repair of existing substandard units in the housing stock.
2. Consider to include innovative approaches to providing housing options to all income levels, people with disabilities, and household size as new planning tools become available.

# CHAPTER VI

## ECONOMIC DEVELOPMENT ANALYSIS



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## ECONOMIC DEVELOPMENT ANALYSIS

### I. INTRODUCTION

#### A. STATEMENT OF PURPOSE

Greenfield's economic development plan can help the community better understand its present economic circumstances, its short and long term economic goals, and strategies to attain these goals. Efforts to shape Greenfield's economic future will require cooperation among many groups. It is important to strive for consensus about the community's economic future prior to designing and committing to economic development strategies. Cooperation of residents, taxpayers, business owners and managers, and local government on an economic development team can guarantee the realization of Greenfield's economic development goals. Likewise, these goals cannot be realized in isolation from other community issues such as the natural environment, historic preservation, infrastructure needs, and other quality of life concerns.



Photo by Ray Cilley

#### B. OVERVIEW OF ECONOMIC DEVELOPMENT PLAN

This Economic Development Plan begins with a summary of Greenfield's history and the Town's place in a broader economic landscape. This background section provides an overview of Greenfield's economic history and a profile of recent business, socio-economic, and demographic trends. Following this background section is an overview of existing utilities (water, sewer, electric, and telecommunications) and any identified capacity limitations that may impact future economic development in Greenfield. An analysis of municipal policies addresses the current Master Plan and Zoning Ordinance as they relate to economic development. The final section outlines the recommended goals and objectives developed through this Plan.

### II. BACKGROUND - Greenfield in the Economic Landscape

#### A. BRIEF HISTORY OF GREENFIELD<sup>8</sup>

The economic history of Greenfield parallels many of its neighbors in the region. Originally founded by three frontiersmen/farmers, the best detailed description can be found in Greenfield New Hampshire: The Story of a Town written and compiled by Doris Hopkins and the Greenfield Historical Society, 1977.

<sup>8</sup> Taken from "A Brief History of Greenfield, NH", Greenfield Master Plan, 1991

The earliest economic activities included agricultural crops of rye and hops, pine shingles and boat oars. In addition to farm products, small local mills included grist mills, sawmills and “fulling” mills (wool processing). By 1860, a business directory printed in the Greenfield Budget included “...cabinet makers, harness makers, house joiners, blacksmiths, dry goods dealers, Teamsters, carriage makers and trimmers, boot and shoemakers, tailoress...” Over time, a substantial dairy industry began to flourish. After the Civil War, the railroad boom spread throughout the country and Greenfield was among the beneficiaries when the rail came to town in 1874.

“According to Deacon Dunlop, the railroad added \$1 to the value of every acre in town... From a population of 35 families in 1870, by 1880 there were 65 families... As a direct result of the railroad, three new stores, two post offices and six hotels were created. By 1883, ten trains a day rolled through Greenfield carrying passengers and freight.” (The Golden Rail, 2008).

Rail access created prosperity in Greenfield. A box mill, a steam powered saw mill, and a soapstone mill provided employment locally and promoted economic development in the village. One of the largest industries using the rails was the ice industry, centered on Zephyr Lake. Greenfield also became a tourist destination, as Otter Lake, the Oak Park Fairgrounds, Pack Monadnock and Crotched Mountain became local vacation spots. In 1891, the Snow Train from Boston could be had for a \$3 round trip fare for a day’s excursion.

Two events, one technological (the truck) and one economic (the Great Depression) changed the prosperity of the community. By the early 1930’s, Greenfield had become a quiet little village again. The last passenger train ended in 1935. The last commercial operation serviced by rail was the Hopkins Grain Mill, which burned in 1975. Commercial freight operations were officially ended in 1984.

As the railroad diminished in Greenfield, the population of the community declined as economic opportunity disappeared. Many properties were bought up in the 1950’s and 1960’s for reduced prices as summer properties. The Crotched Mountain Education and Rehabilitation Center opened in 1953. As an internationally renowned center for the treatment and rehabilitation of physical and neurological injuries and disabilities, it is currently the largest employer in Town. In June, 1964, the State opened the 400 acre Greenfield State Park which currently has 179 camp sites available to the public. Renewed economic activity in the 1970’s and early 1980’s centered on steel fabrication conducted in the village by East Coast Steel Corp. and American Steel Erectors. The Mitchell warehouses on Forest Road provide storage space and business opportunities for small local operations. New England Forest Products, founded in 1993 at the former N. E. Smith Sawmill site, provides sustainable custom lumber and other forest products.

Today, Greenfield is in transition. Thanks to the automobile and road improvements, it has become a generally acknowledged “bedroom community” from which many commute to work destinations, both easterly and westerly. The Town’s population virtually doubled from 1980 to 2000. Economic activity, in addition to those businesses already mentioned, centers around Delay’s Harvester Market, the Riverhouse Café, the Greenfield Inn and many local home-based businesses and tradesmen.

Despite recent redevelopments, economic growth is slow. Of great concern, and an issue that is currently being addressed by the Greenfield Economic Development Advisory Committee, is the lack of broadband connectivity. This problem also has consequences for the local real estate market and the ability of residents to telecommute. Other factors affecting economic development include the lack of a municipal water/wastewater system, limited land available for commercial uses, and the aging population with the continuing out migration of young residents. It is imperative that Town boards and committees work together to address these issues.

## B. CURRENT BUSINESS PROFILE

This section will examine economic trends for Greenfield and surrounding areas to provide background on Greenfield's recent economic history and how Greenfield fits in this regional context.

Situated in the western portion of Hillsborough County, Greenfield has a central location to five New Hampshire labor market areas including Keene, Concord, Manchester, Nashua, and Peterborough.

### Business Profile - Demographics

#### Population

According to the previous hundred years of United States Census Bureau decennial figures, Greenfield experienced its strongest population growth between 1960 and 1970, when the population nearly doubled from 538 to 1,058 residents. Between 1970 and 1980, there was a decline in population to 972. This was followed by a second surge in population to 1,506 in 1990, an increase of 55% over the ten year period. Since then, population growth has subsided. In terms of population density, Greenfield grew from a density of 37 persons per square mile of land area in 1980 to 67 persons per square mile in 2010. In comparison, the population density of Cheshire County was approximately 109 persons per square mile based on 2010 population figures.

**Table 1:  
Comparison of Past Population Growth Rates 1980 – 2010**

	1980	1990	2000	2010	% Change 1980- 2010	% Change 1990- 2010	% Change 2000- 2010
United States	226,542,199	248,709,873	281,421,906	308,745,538	36%	13%	10%
New Hampshire	920,610	1,109,252	1,235,786	1,316,470	43%	11%	7%
Hillsborough County	276,608	335,838	380,841	400,721	45%	13%	5%
Bennington	890	1,236	1,401	1,476	66%	13%	5%
Francestown	830	1,217	1,480	1,562	88%	22%	6%
Greenfield	<b>972</b>	<b>1,519</b>	<b>1,657</b>	<b>1,749</b>	<b>80%</b>	<b>9%</b>	<b>6%</b>
Hancock	1,193	1,604	1,739	1,654	39%	8%	-5%
Lyndeborough	1,070	1,280	1,591	1,683	57%	24%	6%
Peterborough	4,895	5,239	5,883	6,284	28%	12%	7%
Temple	692	1,194	1,297	1,366	97%	9%	5%

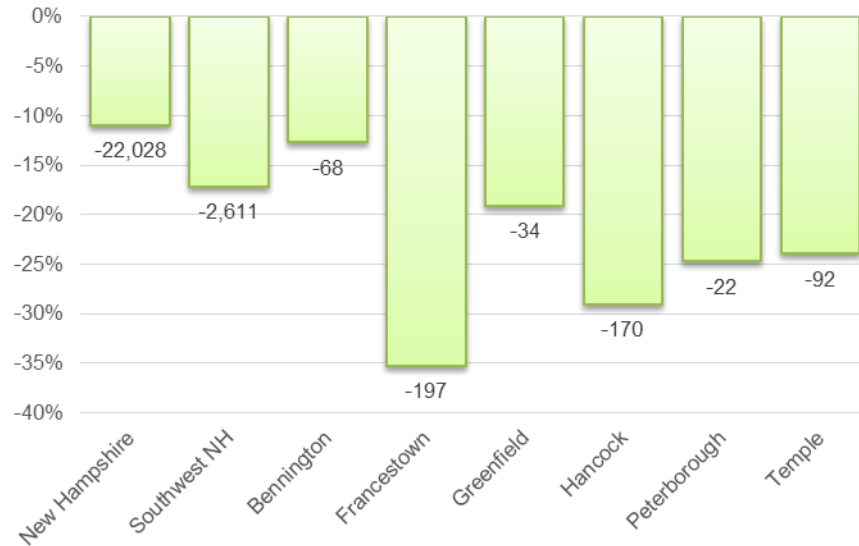
*Source: United States Census Bureau Decennial Census*

#### School Enrollment

Despite an increase in population between 2000 and 2010, school enrollment has displayed a steady decrease from the 2005-2006 school year to the 2013-2014 school year from 277 students to 224 students. The 19% decrease is in line with the Southwest Region (17%) and significantly stronger than the State (11%).



**Graph 1:  
Public School Enrollment Trends (K-12)  
2005/2006 – 2013/2014**



Source: New Hampshire Department of Education

### Employment- Industry Trends

According to figures from the Census Bureau, the total employed population of Greenfield has shrunk from 884 individuals to 777 individuals since 2000. The largest industry of employment continues to be educational services, health care, and social assistance, accounting for about 23% of all employment by Greenfield's residents. Additional industry sector figures are shown in Table 2.

Table 2: Table 2: Greenfield Employed Civilian Population by Industry Type (2000-2012)a (20

Industry Type	2000	2012	Change
Civilian employed population 16 years and over	884	777	-12%
Agriculture, forestry, fishing and hunting, and mining	15	17	13%
Construction	60	72	20%
Manufacturing	197	133	-32%
Wholesale trade	32	9	-72%
Retail trade	96	89	-7%
Transportation, warehousing, and utilities	16	16	0%
Information Technologies	36	23	-36%
Finance and insurance, and real estate and rental and leasing	26	41	58%
Professional, scientific, management, administrative and waste management services	83	106	28%
Educational services, health care and social assistance	208	175	-16%
Arts, entertainment, recreation, accommodation and food services	51	37	-27%
Other services, except public administration	41	26	-37%
Public administration	23	33	43%

Source: \*US Census Bureau American Community Survey (ACS) 5-Year Estimates 2008-2012, Civilian employed population 16 years and over

As of 2014, the current largest employers in Greenfield are Crotched Mountain Rehabilitation Center, Barbara C. Harris Center, and Brantwood Camp. Table 3 highlights the top employers by the number of employees. These major employers offer a range of employment opportunities such as manufacturing, retail sales, governmental, educational, and healthcare services.



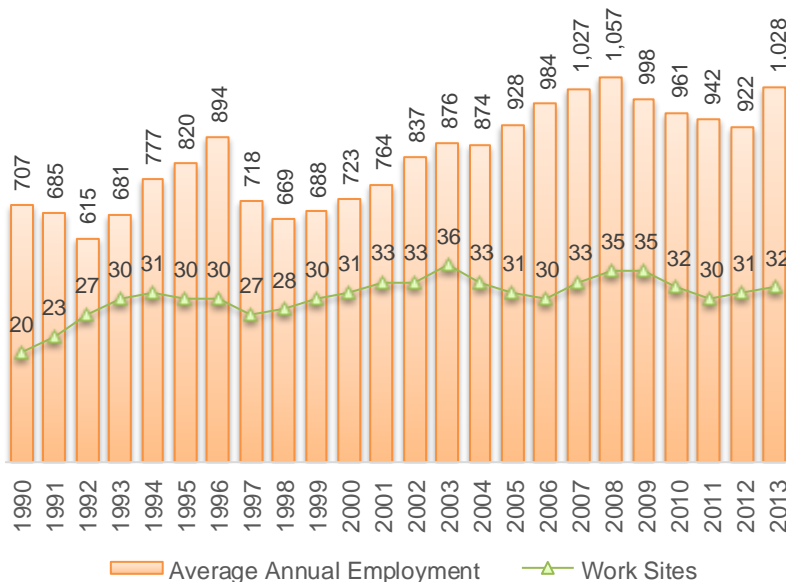
*Crotched Mountain Rehabilitation Center- Photo by Ray Cilley*

**Table 3: Largest Employers by Number of Workers**

Employer	Partial Address	Employer Size
Crotched Mountain Rehab Center	Verney Drive	500 - 999
Barbara C. Harris Center (seasonal)	Wally Stone Road	50 - 99
Brantwood Camp (seasonal)	Mountain Road	50 - 99
Greenfield State Park (seasonal)	Forest Road	20 - 49
American Steel Erectors Inc.	Sawmill Road	20 - 49
GWY Inc.	Forest Road	10 - 19
Plow Share Farms	Whitney Drive	10 - 19
New England Forest Products	Sawmill Road	10 - 19
Delay's Harvester Market	Forest Road	10 - 19
Greenfield Elementary School	Forest Road	5 - 9
Crotched Mountain Waterfront	Verney Drive	5 - 9
Paper Thermometer Co.	East Road	5 - 9
The River House Cafe	Slip Road	5 - 9
Sullivan Brothers Paving	Slip Road	5 - 9
Greenfield Highway Dept.	Bennington Road	5 - 9

*Source: New Hampshire Employment Security and info USA*

**Graph 2:**  
**Employment and Work Sites in Greenfield (1990-2013)**

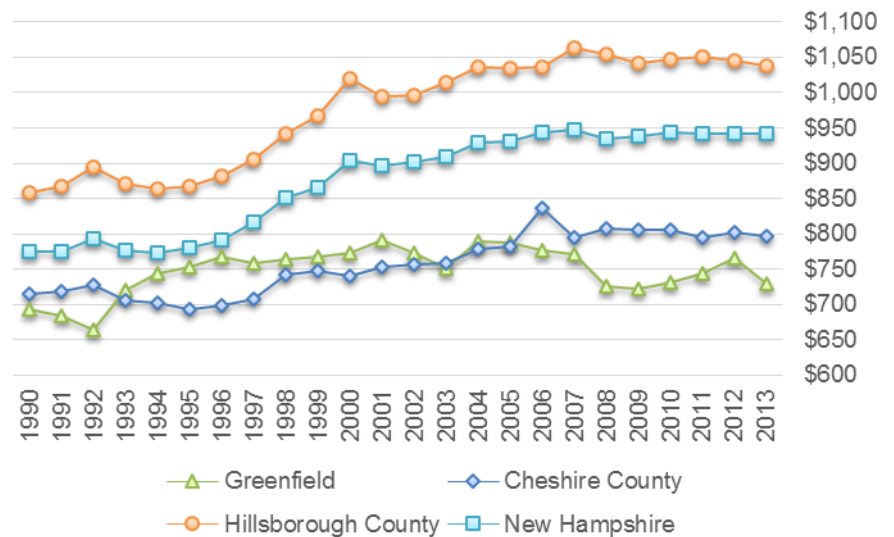


According to the Bureau of Labor Statistics Quarterly Census of Employment and Wages, total employment at work sites in Greenfield has experienced marked growth since the late 1990s, and the 2013 employment figures indicated the first annual increase since The Great Recession, a nationwide period of economic contraction which began in December 2007 and ended in June 2009. As shown in Graph 2, there were 32 total work sites employing 1,028 in 2013, nearing the highest recorded figure since 1990 of 1,057 (reached in 2008). The employment figures reflect private sector plus government employment (federal, state, and local).

Source: New Hampshire Employment Security, Private plus Government, All Sectors

**Graph 3: Average Weekly Wage (1990-2013)**

Between 1990 and 2013, average weekly wages paid at work sites in Greenfield increased from an inflation-adjusted figure of \$693 to \$730, roughly following a level trend similar to the wages of Cheshire County. In comparison, Hillsborough County and statewide wages continue to outpace the local wages (Graph 3). This is due in part to their industry composition, which includes generally higher-paying sub-sectors like precision manufacturing. The availability of higher wages in Hillsborough County also helps explain the most popular commutes by Greenfield residents, to Manchester and Nashua.



Source: NH Department of Employment Security Quarterly Census of Employment and Wages. Figures were adjusted for inflation to their 2013 equivalents using the Bureau of Labor Statistics Consumer Price Index

### Annual Income

Although wages paid by Greenfield employers have not kept pace with State trends, income by its residents has continued to increase. The latest estimates from the American Community Survey indicate that Greenfield's median household income exceeds the figures for Hillsborough County and the State (Table 4).

**Table 4:**  
**Median Household Income**

	Greenfield	Cheshire County	Hillsborough County	New Hampshire
1979	\$16,757	\$26,873	\$31,317	\$17,013
1989	\$40,057	\$31,648	\$40,404	\$36,329
1999	\$48,833	\$42,382	\$53,384	\$49,467
2012	\$72,321 <sup>5</sup>	\$54,921 <sup>3</sup>	\$69,395 <sup>3</sup>	\$63,280 <sup>1</sup>

Source: United States Census Bureau Decennial Census

<sup>5</sup> American Community Survey (ACS) 5-Year Estimates 2008-2012

<sup>3</sup> American Community Survey (ACS) 3-Year Estimates 2010-2012

<sup>1</sup> American Community Survey (ACS) 1-Year Estimates 2012

Figures were not adjusted for inflation

### Educational Attainment

A well-educated workforce is an important resource for both existing and new businesses. As the comparison in Table 5 shows, the educational attainment of Greenfield residents aged 25 and over is similar in composition to the State as a whole. Over 34% of residents have earned a Bachelor's degree or higher, according to figures from the U.S. Census Bureau.

**Table 5:**  
**Highest Level of Educational Attainment (2012)**

	Less than 9th grade	9th to 12th grade, no diploma	High school graduate	Some college, no degree	Associate's degree	Bachelor's degree	Graduate or professional degree	High school graduate or higher	Bachelor's degree or higher
United States	6.0%	8.2%	28.2%	21.3%	7.7%	17.9%	10.6%	85.7%	28.5%
New Hampshire	2.8%	5.8%	29.3%	19.1%	9.6%	21.2%	12.3%	91.4%	33.4%
Hillsborough County	3.6%	5.8%	27.2%	18.6%	9.5%	22.7%	12.6%	90.6%	35.3%
Southwest Region	2.4%	6.3%	32.5%	19.3%	7.6%	19.7%	12.3%	91.3%	32.0%
Bennington	1.8%	3.3%	31.0%	29.6%	6.6%	17.7%	10.0%	94.9%	27.7%
Francestown	0.7%	4.1%	18.4%	21.4%	9.7%	26.4%	19.2%	95.1%	45.6%
Greenfield	<b>2.3%</b>	<b>5.4%</b>	<b>27.1%</b>	<b>19.2%</b>	<b>11.4%</b>	<b>25.4%</b>	<b>9.2%</b>	<b>92.3%</b>	<b>34.6%</b>
Hancock	1.2%	1.8%	20.7%	13.5%	7.2%	31.9%	23.6%	96.9%	55.5%
Lyndeborough	2.6%	5.1%	32.3%	16.5%	12.3%	23.1%	8.1%	92.3%	31.2%
Peterborough	0.8%	2.3%	19.8%	13.3%	6.5%	30.7%	26.6%	96.9%	57.4%
Temple	1.8%	7.4%	35.2%	22.8%	7.2%	12.6%	12.9%	90.8%	25.5%

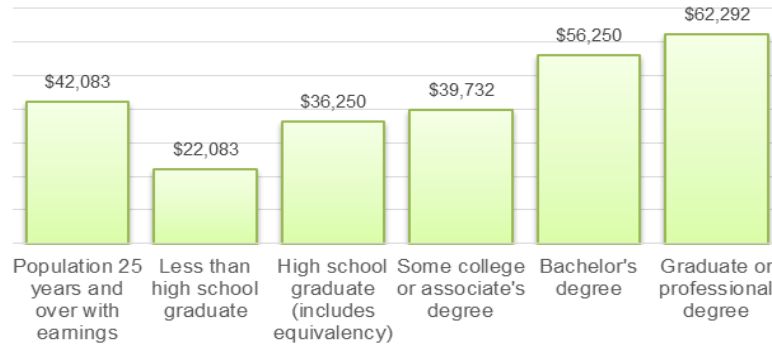
Source: United States Census Bureau American Community Survey 5-Year Estimates 2008-2012

### Earnings

Earning a higher income and increasing your employment opportunities have historically been a driving force for attending college after high school. Graph 4 shows the varying levels of income based on the

educational attainment of workers in Greenfield in 2012 according to the ACS 5-year estimates. The median income for workers with a bachelor's degree was 55.2% higher than those workers with a high school diploma and no college, and 42.6% higher earnings over those workers with an associate's degree or some college experience. The median income for workers with a graduate degree is 10.7% higher than those with a bachelor's degree.

**Graph 4:**  
**Median Earnings by Highest Level of Educational Attainment (2012)**

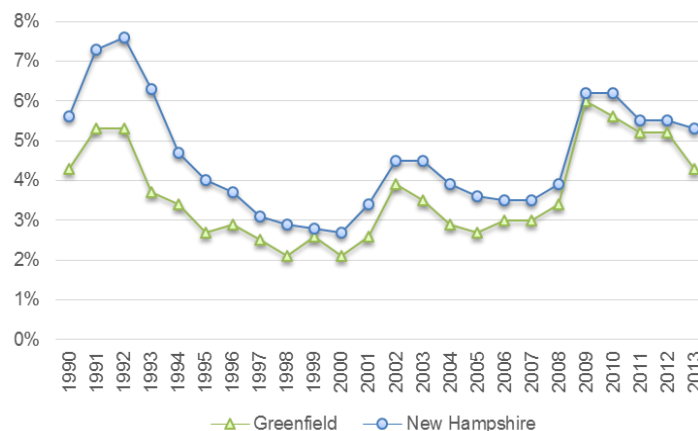


Source: United States Census Bureau American Community Survey 5-Year Estimates 2008-2012

### Unemployment Rates

The following graph shows the average annual unemployment rate between 1990 and 2013 for Greenfield and the State of New Hampshire. The unemployment rate in Greenfield over the last twenty years has followed the state (and regional) trend with a peak in the early 1990s, following a national recession, and a declining rate until 2001 (Graph 5). An eight month national recession beginning in March 2001, according to the National Bureau of Economic Research, resulted in increasing unemployment rates in all nearby labor market areas. This brief recovery was followed by a 2007 recession, which lasted 18 months.

**Graph 5:**  
**Average Annual Unemployment Rate**



Source: NH Employment Security and US Bureau of Labor Statistics, Local Area Employment Statistics (LAUS)  
Figures are estimates

## C. LAND VALUATION AND TAXATION

### Land Valuation

Municipal property taxes are levied as a percentage of the assessed value of buildings and land in the community. In 2013, the total valuation in Greenfield was nearly \$160 million.

Looking at a breakdown of valuation by use, the majority of Greenfield's valuation comes from residential land and buildings, about 1.3% from commercial and industrial properties, nearly 2% from utilities, and less than 1% from properties in current use (Table 6). In comparison, Table 7 shows a breakdown of land valuation for the surrounding communities and Hillsborough County. The Town of Peterborough has a relatively similar percentage of commercial/industrial land valuation as Hillsborough County.

**Table 6:  
Greenfield Valuation by Land Use (2013)**

	Amount	% of Gross
<b>Land</b>		
Current Use	\$1,012,411	0.6%
Conservation Restriction	\$10,110	< 0.1%
Residential Land	\$56,230,500	35.2%
Commercial/Industrial Land	\$2,088,300	1.3%
<b>Buildings</b>		
Residential Buildings	\$89,755,200	56.1%
Manufactured Housing	\$1,938,000	1.2%
Commercial/Industrial Buildings	\$5,732,600	3.6%
<b>Utilities</b>		
Electric Utilities	\$3,083,400	1.9%
<b>Gross Valuation</b>	<b>\$159,850,521</b>	

*Source: New Hampshire Department of Revenue Administration  
Percentages have been rounded. Taxable valuations only.*

**Table 7:  
Regional Property Valuation Statistics (2013)**

	Gross Valuation	Residential (% of Gross)	Commercial & Industrial (% of Gross)	All Utilities (% of Gross)	Current Use (% of Gross)	Gross Valuation per Land Acre
Greenfield	\$159,850,521	92.5%	4.9%	1.9%	0.6%	\$9,430
Bennington	\$119,091,762	85.5%	8.6%	5.6%	0.3%	\$16,389
Francestown	\$213,242,869	93.5%	4.3%	1.6%	0.6%	\$11,163
Hancock	\$245,345,957	94.6%	2.2%	2.8%	0.4%	\$12,788
Peterborough	\$596,127,616	75.5%	22.6%	1.6%	0.2%	\$24,501
Temple	\$151,921,489	92.6%	4.9%	1.9%	0.5%	\$10,668
Lyndeborough	\$168,300,450	94.5%	3.7%	1.1%	0.6%	\$8,721
Hillsborough County	\$38,849,344,981	74.7%	22.3%	2.8%	0.1%	\$69,207

*Source: New Hampshire Department of Revenue Administration. Percentages have been rounded. Taxable valuations only.*



### Exempt Properties

Properties that are categorized as *exempt* are the second largest land use category, which means that the town does not collect taxes on these parcels. These include parcels owned by the town, state, and federal government such as parks, schools, institutional uses, and other facilities necessary to conduct public business. It also includes parcels owned by non-profits such as churches. The exempt land uses 3,304 acres or 19.7% of all land in Greenfield, and comprises 38.8% of the town's property valuation. Table 8 shows the largest exempt properties.

**Table 8:**  
**Greenfield Valuation of Tax Exempt Properties (2013)**

Owner	Land and Buildings
CROTCHED MOUNTAIN FOUNDATION	\$56,403,500
HARRIS, BARBARA C. CAMP &	\$14,279,500
GREENFIELD STATE PARK	\$12,047,300
GREENFIELD, TOWN OF	\$5,881,600
PLOWSHARE FARM, INC.	\$2,862,500
BRANTWOOD CAMP, TRUSTEE OF	\$2,499,800
CON-VAL SCHOOL DISTRICT	\$2,368,900
SNHS GREENFIELD ELDERLY	\$2,034,500
U. S. DEPT OF THE INTERIOR	\$1,229,000
N.H., STATE OF	\$692,800
N.H. DEPT OF PUBLIC WORKS	\$335,300
GREENFIELD CONGREGATIONAL	\$328,600
N.H., STATE OF FISH & GAME	\$290,600
GREENFIELD HISTORICAL SOCIETY	\$261,900
GREENFIELD, TOWN OF ET AL	\$14,600
UNITED STATES OF AMERICA	\$3,200
	<b>\$101,533,600</b>

Source: Town of Greenfield Assessing Records 5/12/13

### Taxes

In order to levy a fair and proportional statewide property tax and county tax, the imbalance created by varying municipal assessments must be resolved. This process, called "equalization", involves the adjustment of a town's local assessed value, either upward or downward, in order to approximate the full value of the town's property.<sup>9</sup> The equalized tax rates can then be compared from town to town (Table 9).

<sup>9</sup> "Explanation of State Education Property Tax Rate Shown on Your Tax Bill", NH Department of Revenue Administration, 2001



**Table 9:  
2013 Tax Rate Comparison**

	Greenfield	Bennington	Francestown	Hancock	Lyndeborough	Peterborough	Temple	Hillsborough County
Municipal	\$6.67	\$9.93	\$7.29	\$5.25	\$7.06	\$8.93	\$5.84	\$7.83
Local Education	\$14.07	\$12.21	\$12.11	\$13.37	\$13.40	\$16.92	\$15.08	\$12.10
State Education	\$2.39	\$2.17	\$2.30	\$2.43	\$2.41	\$2.66	\$2.47	\$2.41
County	\$1.16	\$1.09	\$1.08	\$1.22	\$1.13	\$1.29	\$1.11	\$1.20
Total	\$24.29	\$25.40	\$22.77	\$22.27	\$24.00	\$29.80	\$24.50	\$23.55
Equalization Ratio	121.2%	112.4%	112.3%	98.1%	109.0%	94.8%	111.9%	100.2%
Equalized	\$27.82	\$28.58	\$25.68	\$21.88	\$26.10	\$27.44	\$27.52	\$23.26
State Ranking	188	195	164	94	166	182	184	N/A

Source: New Hampshire Department of Revenue Administration (1 = Low, 227 = High)

#### D. COMMUTING PATTERNS

The majority of Greenfield residents leave town to reach their place of employment. Journey to Work data, published by the Census Bureau (2006-2010 estimates) and based on a survey sample, showed that 169 residents (or 23% of the employed population) worked in Greenfield (Graph 6). The data also suggest that the increase in total employment opportunities in Greenfield businesses was being satisfied by non-residents, the result of a mismatch between the skills of the resident population and the available occupations.

**Graph 6:  
Journey to Work (1990, 2000, 2006-2010)**



Source: U.S. Census Bureau Journey to Work (2006-2010)

Two main drivers of this trend include Greenfield's reliance on a small number of large employers, such as Crotched Mountain Rehabilitation Center, and the normal process whereby residents seek out convenient and well-paying work beyond their community or sub-region.

**Table 10:  
Top 10 Work Destinations for  
Greenfield Residents (2006-2010)**

	Count	Share
Greenfield	169	22.9%
Peterborough	119	16.1%
Milford	104	14.1%
Merrimack	29	3.9%
Nashua	27	3.7%
Amherst	26	3.5%
Hollis	24	3.3%
Hudson	20	2.7%
Hancock	19	2.6%
Wilton	16	2.2%
All Other Locations	170	25.1%
Total	738	100%

Table 10 shows the most common work destinations for all Greenfield residents that are employed. Many resident commuters travel well beyond the adjacent communities to find work, while only 23% of all employment in Greenfield is filled by its residents. Common destinations include an area on NH 101 from Peterborough to Nashua, and from Nashua, northward along the I-293 and I-93 corridors.

*Source: U.S. Census Bureau Journey to Work (2006-2010)*

Table 11 differs from the previous table by showing where the people who work in Greenfield, are commuting from to get to their jobs. This can help to determine where the commuting patterns are, and what the potential infrastructure needs of the businesses may be as they grow. In this table, the largest percentage of people employed by Greenfield businesses live in Greenfield also (16.7%) with Peterborough close behind (13.3%).

**Table 11:  
Top 10 Places of Residence for People who  
Work in Greenfield Businesses (2006-2010)**

	Count	Share
Greenfield	169	16.7%
Peterborough	135	13.3%
Hillsborough	88	8.7%
Milford	82	8.1%
New Ipswich	65	6.4%
New Boston	42	4.1%
Antrim	40	3.9%
Goffstown	39	3.8%
Manchester	32	3.2%
Rindge	32	3.2%
All Other Locations	290	28.6%
Total	1,014	100%

*Source: U.S. Census Bureau Journey to Work (2006-2010)*

### III. UTILITIES AND MUNICIPAL SERVICES

#### A. WATER AND SEWER

Greenfield currently has a small sewer system, but has no municipal water. The sewage disposal system was added as a result of a PlanNH Charrette in 1997, and primarily supports development in the Business District.

#### B. ELECTRIC

In terms of industrial and manufacturing development, the availability of three-phase power is desirable. Three-phase power is made up of three single phases of electricity synchronized and offset by 120 degrees. The benefit of three phase power is that, at any given instant, one of the three phases is nearing a peak to provide even power output for high power motors and industrial applications. See map titled *Three Phase Power* showing the availability of three-phase power. One circuit, coming from Peterborough up NH 136, extends northward via NH 31 to Crotched Mountain Road and southward on Slip Road approximately 0.5 miles. A second circuit enters Greenfield from Bennington via NH 31 and continues to within a third of a mile of the intersection with Crotched Mountain Road. A short segment of 3-phase distribution enter Greenfield via Frankestown on Frankestown Road for one to two-tenths of a mile. The area of NH 31 south of the village center is not served by three-phase power. The Town is encouraged to work with Eversource Energy, previously Public Service of New Hampshire (PSNH), for additional information and to coordinate potential for new or expanded areas of development and technologies.

#### C. TELECOMMUNICATIONS

To stay competitive in today's digital economy, Greenfield needs access to broadband. Broadband in 2014 is comparable to what electricity was to New Hampshire in the 1930s - a necessity. In a relatively short time period, access to high capacity and reliable broadband has become integral to economic growth and improved quality of life. Many of today's businesses require or prefer high-speed/capacity internet access to conduct their daily business. This includes a portion of the population that have home-based businesses or work partially from home, also known as telecommuters, who may rely on high-speed/capacity connections to conduct their business.

The total economic impact of broadband in New Hampshire was estimated at \$634 million in 2010, and in 2011, 11,000 net new jobs were created as a result of expanded broadband.<sup>10</sup> Broadband and economic development are connected in that, as we progress into the future, both are needed for each to be successful.

The use of broadband for economic development improves the ability to retain and recruit businesses, increases business profitability, attracts highly skilled workers, improves the efficiency of municipal services, enhances access to healthcare, and contributes to stronger educational attainment. All are key ingredients to a successful economic development strategy.

As a rural area with low population density and mountainous, forested terrain, the development of high-performing, affordable broadband has been slow in coming to Greenfield. As of 2014, Fairpoint Communications is the only wireline service provider. Fairpoint Communications offers digital subscriber line (DSL) service to a portion of addresses in the town. Customers can also receive service

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<sup>10</sup> R. Crandall and H. Singer. "The Economic Impact of Broadband Investment." *National Cable and Telecommunications Association*, 2010.

from fixed wireless (i.e. Radius North or WiValley), mobile wireless, and satellite providers. Currently, there is a mobile wireless tower located in Greenfield.

Since the late 1990s, there have been a number of initiatives within the Southwest Region of New Hampshire focused on improving the availability of broadband regionwide. These include Monadnock Connect, which attempted to aggregate business demand for high-speed/capacity internet access and other telecommunication service in the region, and most recently, the NH Broadband Mapping and Planning Project (NHBMP). The NHBMP is a multi-year project, which is aimed at better understanding where broadband exists and how it can be more widely available in the future. In the spring of 2014, the Southwest Region Planning Commission (SWRPC) developed the Southwest New Hampshire Broadband Plan as part of its involvement with the NHBMP. This Plan identifies regional strategies for improving access to and utilization of high-quality broadband.

#### **D. TRANSPORTATION INFRASTRUCTURE**

Greenfield is part of the regional highway network of the NH 202 North corridor. This corridor, as defined by Southwest Region Planning Commission's (SWRPC) Long Range Transportation Plan, includes the communities of Antrim, Bennington, Francestown, Greenfield, Hancock and Peterborough. Regional corridors, such as this, provide the backbone of the transportation network that connects communities to employment, goods and services, entertainment, and travel destinations within and beyond the region and thereby bring economic opportunities.

### **IV. MUNICIPAL POLICY ANALYSIS**

An important element of economic development planning is ensuring that current municipal policies and regulations can support the policies, goals and actions recommended in this plan. Accordingly, the Zoning Ordinance and other chapters of the Master Plan were examined relative to the recommendations in this chapter. In addition to ensuring compliance with the existing policy framework, the analysis also examines the policies and regulations in the surrounding towns to ensure that Greenfield is prepared to compete regionally for new businesses.

**Table 12:**  
**Minimum Lot Requirements for Greenfield and Surrounding Towns**

District	Minimum Lot Size	Minimum Lot Frontage	Minimum Front Setback	Minimum Side /Rear Setbacks
<b>Greenfield</b>				
Business District	1.5 acres	150'	50'	25'
Village District	2 acres	250'	100'	50'
General Residential District	2 acre single family or 1.5 acre per unit for duplex or multifamily	250'	100'	50'
Rural/Agriculture District	4 acres	350'	100'	50'
<b>Bennington</b>				
Industrial District	5 acres	500'	100'	100'
Village District	½ acre	100'	30'	15'
Commerce/Recreational District	2 acres	200'	50'	30'
<b>Franeestown</b>				
Village District	3 acres	300'	100' - 400'	50'
<b>Hancock</b>				
Village Commercial District	20,000 sq.ft.	---	25'	10'
<b>Lyndeborough</b>				
Village District	2 acres	150'	35'	35'
Light Industrial District	2 acres	250'	50'	50'
<b>Peterborough</b>				
Downtown Commercial Districts	none	none	5'	15'
Commercial District	none	50'	15' or 30'	15'
Business/Industrial District	none	50'	25' or 50'	25'
Commercial Park District	20,000 sq.ft.	100'	25'	20'
Office District	1 acre	100'	50'	30'
Temple	Temple does not have a business district			

*Source: Ordinances from each Town*

By displaying the minimum lot requirements of Greenfield with the requirements of the surrounding towns, a comparison can be made to determine if changes are needed to keep Greenfield in a competitive labor field. Table 12 indicates that Greenfield's dimensional requirements, or building requirements, give a competitive advantage in several categories. The minimum lot size of 1.5 acres in a Business District helps to show that Greenfield is a "business friendly" community. Minimum lot frontage and setbacks also give Greenfield the competitive edge over other communities with a business or industrial district. Peterborough is the only subregional community with smaller requirements, which is more in line with communities of similar size to Peterborough.

## A. GREENFIELD ZONING ORDINANCE

### Permitted Uses that Support Business Activity

Greenfield has five districts that support a range of economic opportunities and can serve as places of employment for residents and commuters as development occurs.

Business District: This district shall be principally a district for the transactions of business. The following uses are permitted: stores and shops for the conduct of any retail business or personal service; offices; banks; filling stations; car washes; motor vehicle repair garages; and food service facilities.

General Residence District: The General Residence District is principally a district of residences, however, the following businesses are permitted: buying, selling and exposing for sale home produce and products; maintaining and operating hotels and bed & breakfast inns; day care centers; and professional uses and customary home occupations (as defined under Section IV.B of the Zoning Ordinance).

Rural/Agricultural District: This district is primarily a district in which facilities to the benefit of agriculture and/or rural living are to be retained. The following businesses are permitted in this district: buying, selling and exposing for sale home produce and products; maintaining and operating hotels and bed & breakfast inns; day care centers; and professional uses and customary home occupations (as defined under Section IV.B of the Zoning Ordinance).

#### Special Purpose District-Industrial Districts:

Industry and excavations may be permitted in those areas of the General Residence District in designated areas after a public hearing, providing the industry and/or excavation is not injurious to agricultural enterprises or nearby private residents and does not exist on lots created for the purpose of residential subdivision. The specific areas applicable to this purpose are: **Russell Station Road area** in the vicinity of the railroad tracks; and **Sawmill Road area** in the vicinity of Greenfield's Department of Public Works' garage and Recycling Center.

#### Special Purpose District-Crotched Mountain Rehabilitation and Education Center District:

The purpose of the Crotched Mountain Rehabilitation and Education Center ("CMREC") District is to provide for the medical, educational and residential care of persons with disabilities and others in need of these services. The following uses are permitted within the CMREC District: hospital; clinics and outpatient services; education and vocational training; professional and administrative office; research; housing; group day care; nursing home; recreational; agricultural; sustainable forestry and timber production; and manufacturing and repair of medical and rehabilitation devices.

In addition to the uses above, the following uses are permitted if they are accessory to a permitted use within the district and are intended for residents, staff and guests of the facilities and not for the general public: conference and meeting facility; food service; lodging; retail; theater/function hall; artisan/studio; utilities for the production and distribution of electricity, heat, water and waste water treatment; vertical take-off and landing area; and communication towers for cell phones, emergency response and mutual aid systems. The Town encourages professional uses and home occupations in all districts.

**Table 13:**  
**Uses Permitted in Greenfield's Business, General Residence, and Industrial Districts**

Business District	General Residence District	Rural Agricultural District	Industrial/Special Purpose District	Crotched Mountain Rehabilitation and Education Center / Special Purpose District
Retail Stores & Shops	Sale of Home Produce/Products	Sale of Home Produce/Products	Industrial uses	Hospital, clinic, outpatient services
Personal Service	Hotels	Hotels	Excavation	Educational/ vocational training
Offices	Bed & Breakfast	Bed & Breakfast		Professional and administrative office
Banks	Day Care Centers	Day Care Centers		Research
Home-based Profession or Customary Home Occupation	Home-based Profession or Customary Home Occupation	Home-based Profession or Customary Home Occupation		Housing
Car Wash				Group day care; nursing home; Recreation
Motor Vehicle Repair				
Food Service Facilities				Agriculture
Sale of Home Produce/Products				Forestry/timber production
Filling Stations				Manufacturing/repair of medical devices

*Source: Greenfield Zoning Ordinance*

## **B. MUNICIPAL POLICY ANALYSIS FINDINGS**

The Greenfield Zoning Ordinance and Dimensional Requirements indicate that Greenfield is a community that supports the potential for new business start-ups and the expansion of existing ones. Tables 12 and 13 provides the basis for supporting this analysis. In addition to the dimensional requirements, a review of the zoning ordinances of the subregional communities was made to compare the permitted uses that support business activities. While the list of permitted uses varied from town to town, Greenfield remains competitive with similar uses. While no significant deficiencies were found in this analysis, some opportunities exist for amendments to the zoning ordinance to strengthen the potential for economic development. These opportunities include:

- Consider expanding the definition of industry to include warehousing;
- Examine the feasibility of reducing the dimensional requirements for the Village District and its potential impact on economic development.



## **V. PLANNING STRATEGIES**

### **Expand Business/Employment Opportunities**

- Expand the property tax base by fostering start-up companies, retaining existing employers, and recruiting new employers. Promote and expand programs and facilities that support small and emerging businesses (e.g. incubators, maker spaces, shared commercial kitchens, etc.). Increase income and employment opportunities by diversifying industry representation.

### **Utilities and Infrastructure Needs**

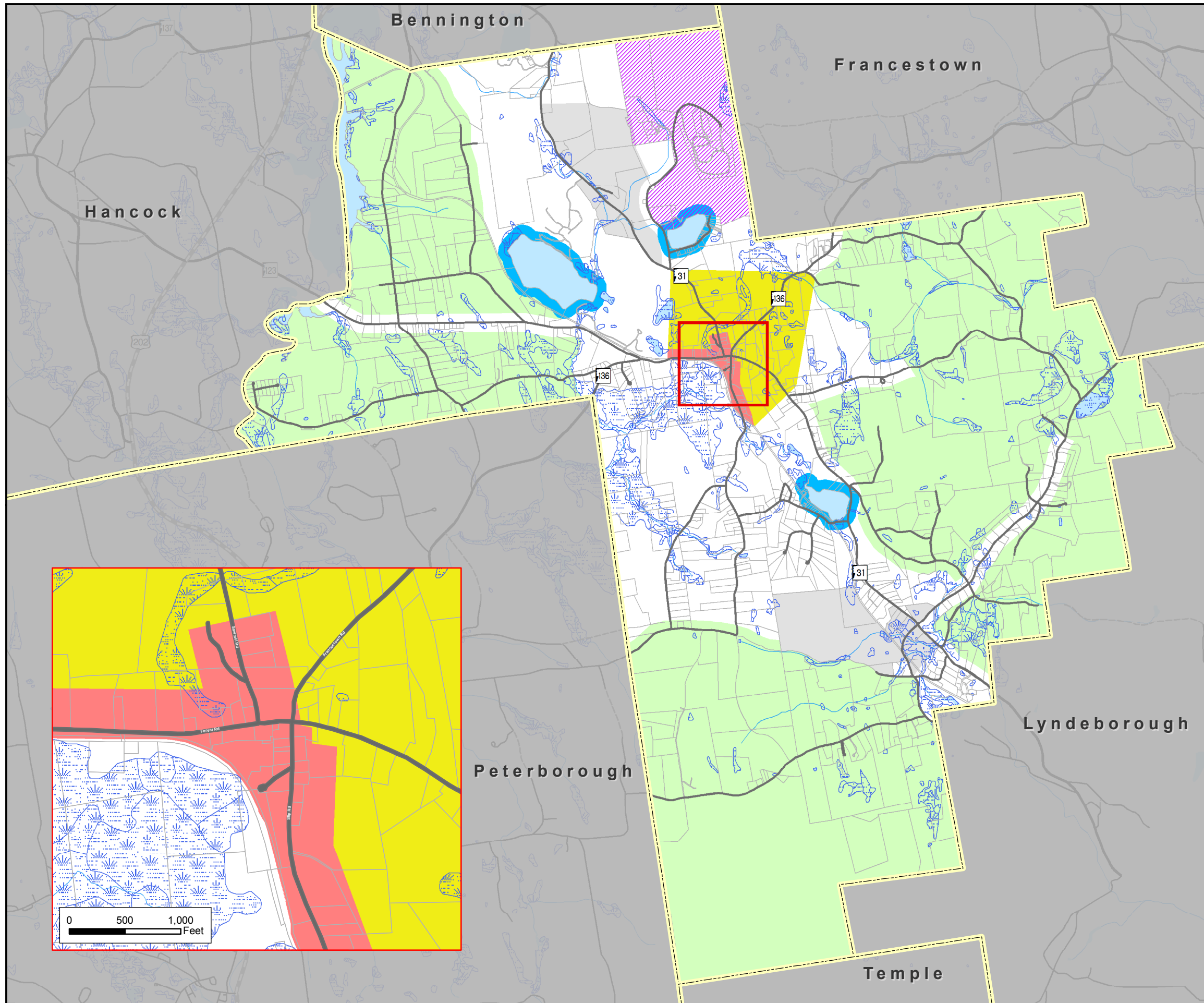
- Support efforts to expand the availability and quality of broadband infrastructure through local broadband planning and support funding needed for implementation. Encourage policies that promote the installation of broadband conduit when construction occurs in roadway rights of way. Investigate colocation of broadband technology & equipment such as wireless antennas and existing structures.
- Consider the feasibility of public sewer and/or water infrastructure to support industrial and residential development. This may include a multi-town coordination and collaboration on shared infrastructure needs such as sewer, water, sidewalks, schools, transfer stations, etc. Consider programs to strategically maintain and upgrade municipal infrastructure and facilities such as tax increment financing, asset management, capital improvement plans, etc. Support opportunities for diversifying energy supplies including renewable resources such as biomass, solar, wind, etc.

### **Trained Workforce**

- Collaborate with businesses, educational institutions, and other partners to help meet workforce training needs. Support programs that connect youth and other ages and abilities with apprenticeship and internship opportunities.

### **Local Policies/Support**

- Continue efforts of the Economic Development Advisory Committee to pursue the economic development objectives of the master plan update and to advise local government and residents.
- Review permitting procedure for new applications to prevent delays or obstacles for potential businesses.
- Expand industrial definition to include warehousing.
- Examine the dimensional requirements and permitted uses for the Village District and make appropriate changes where needed that will encourage economic growth while maintaining the rural character.

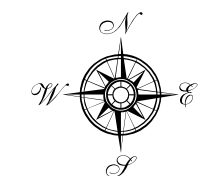


# Town of Greenfield NH

## Zoning Map

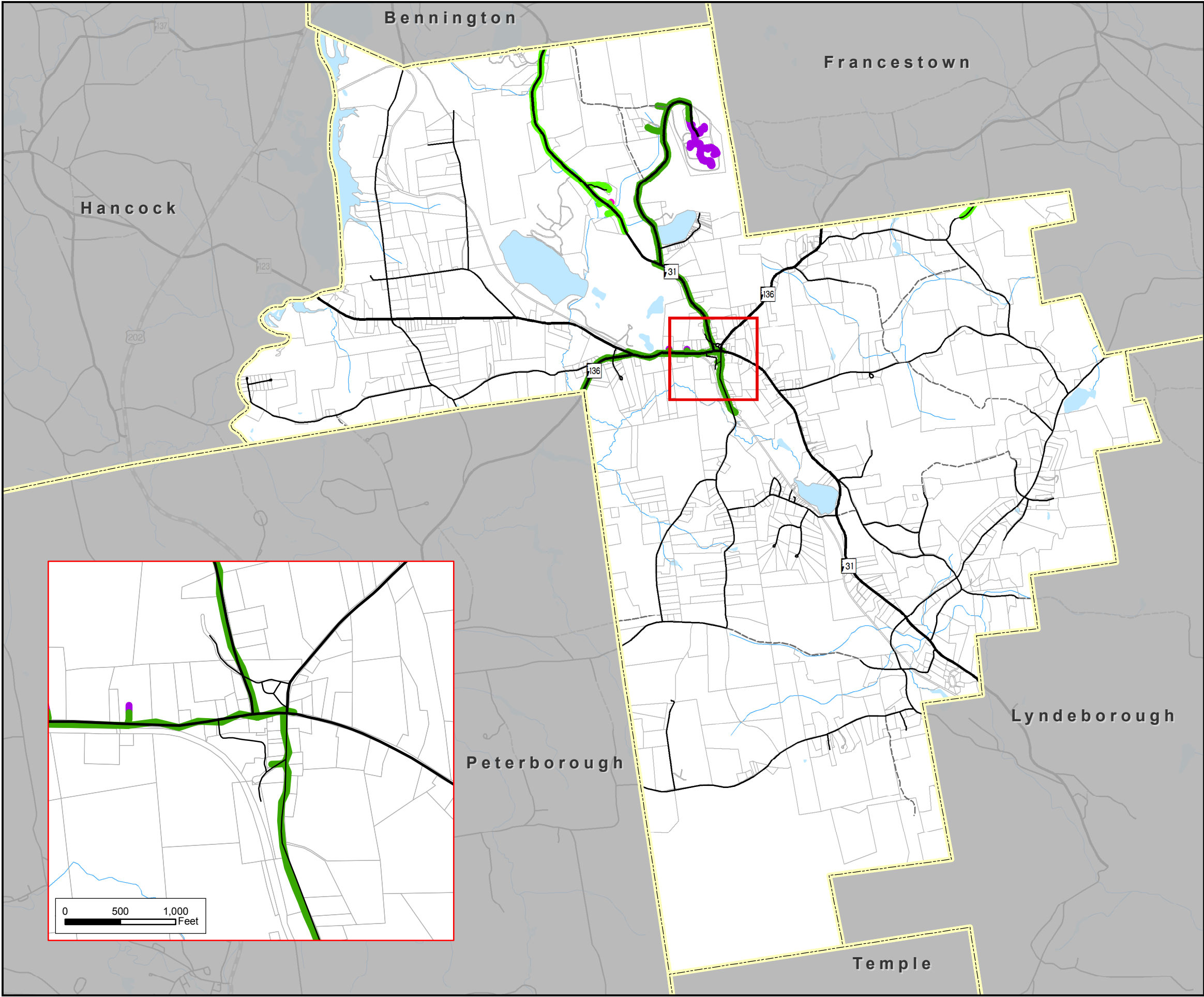
- Zoning**
- BUSINESS DISTRICT
  - GENERAL RESIDENCE
  - INDUSTRIAL DISTRICT
  - RURAL AGRICULTURE
  - LAKESIDE VILLAGE DISTRICT
  - CENTER VILLAGE DISTRICT
  - CMREC DISTRICT

- Features**
- Transportation
  - Lakes and Ponds
  - Wetlands
  - Rivers and Streams
  - Parcel Boundary



0 1 2 Miles





# Town of Greenfield NH

## 3-Phase Power

### Infrastructure

#### Overhead



Circuit 24X1\_36



Circuit 313X1\_36

#### Underground



Circuit 24X1\_36



Circuit 313X1\_36

### Features



Transportation



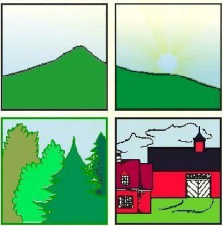
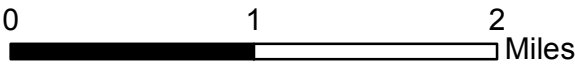
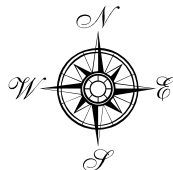
Lakes and Ponds



Rivers and Streams

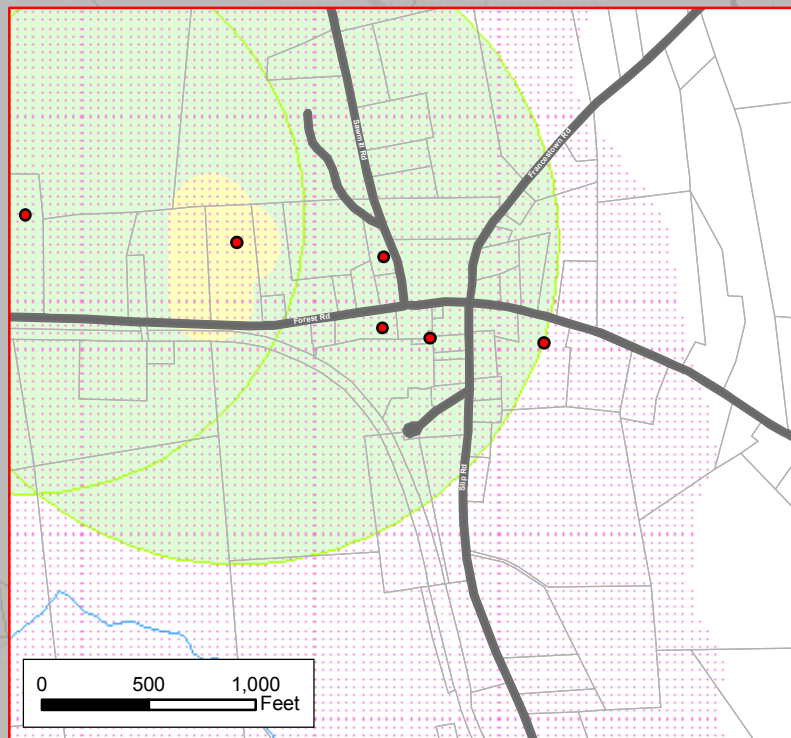
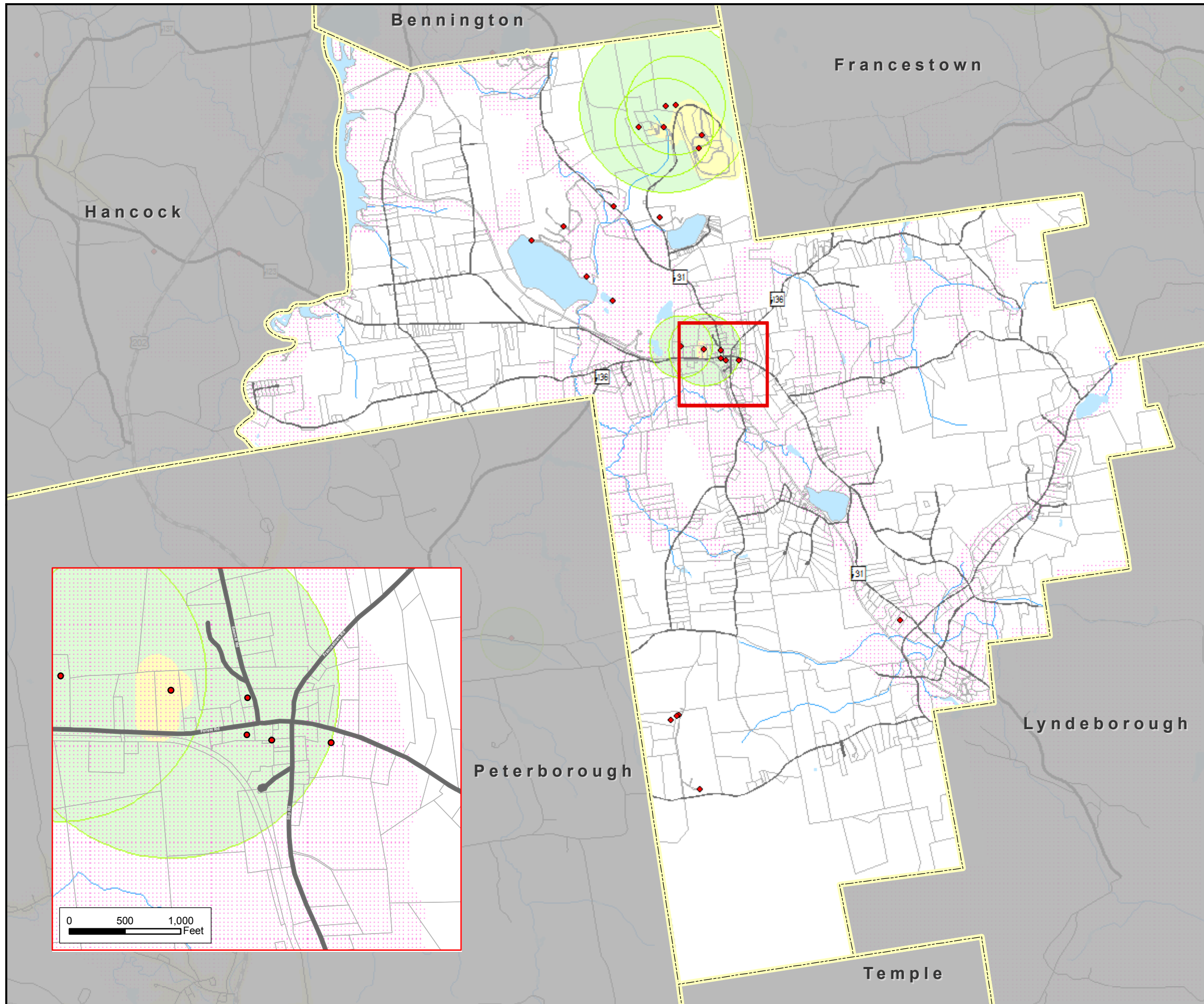


Parcel Boundary



**Southwest  
Region  
Planning  
Commission**













# Town of Greenfield NH

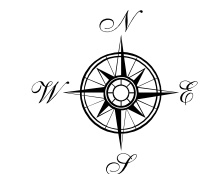
## Water & Sewer Map

### Infrastructure

-  Public Water Supply Well
-  Water Service Area
-  Wellhead Protection Area
-  Stratified Drift Aquifer

### Features

-  Transportation
-  Lakes and Ponds
-  Rivers and Streams
-  Parcel Boundary



0 1 2 Miles



# CHAPTER VII

# ENERGY CHAPTER



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# ENERGY CHAPTER

## I. Purpose

The purpose of this chapter is to explore current energy usage and projected energy needs to help sustain our community in an economical and environmentally friendly way. By taking a closer look at our consumption patterns and production options, we can develop strategies to meet our energy needs in an efficient and cost-effective manner that balances cost, economic and environmental impact, and local control. We will also identify opportunities for alternative energy sources to meet the current demand and conserve for future needs.

## II. Energy in Planning

There is an integral connection between energy and planning. Energy availability and cost influences our options for transportation, housing, employment, finances, economic development, as well as other applications. Access to affordable and reliable energy is essential to our economic stability and growth, both globally and at the community level. In New Hampshire, there is a heavy reliance on fossil fuels which are primarily transported into the state. This lack of home-grown energy production drives up the cost for the energy needed in our daily activities and has a negative impact for attracting new businesses.

By reducing energy consumption and increasing energy production, we can lower the amount of money spent on this vital need. Integrating smart growth tools into planning decisions will help to shift the current energy profile and make the change to reduce reliance on our current energy sources.

The US Environmental Protection Agency (EPA) encourages communities to consider using the following smart growth principles in local planning decisions:

- Provide opportunities for mixed land uses through ordinances, regulations and incentives.
- Establish regulations that support and encourage compact building design.
- Create a range of housing opportunities and choices.
- Create walkable neighborhoods.
- Foster distinctive, attractive communities with a strong sense of place.
- Preserve open space, farmland, natural beauty, and critical environmental areas.
- Strengthen and direct development towards existing communities.
- Provide a variety of transportation choices.

### RSA 672:1

- III. Proper regulations enhance the public health, safety and general welfare and encourage the appropriate and wise use of land.”
- III- a. Proper regulations encourage energy efficient patterns of development, the use of solar energy, including adequate access to direct sunlight for solar energy uses, and the use of other renewable forms of energy and energy conservation. Therefore, zoning ordinances should not unreasonably limit installation of solar, wind, or other renewable energy systems or the building of structures that facilitate the collection of renewable energy, except where necessary to protect the public health, safety, and welfare.”

- Make development decisions predictable, fair, and cost-effective.
- Encourage community and stakeholder collaboration in development decisions.

These principles are flexible and can be applied to decisions made in Greenfield. While some of them, such as *provide a variety of transportation choices*, may not seem to fit within our rural setting, it is important to remain open as changes and opportunities emerge. Specific strategies using these principles can be found in the Implementation Chapter of this Master Plan.

### **III. Energy Diversity**

To maintain resiliency, it is important to provide diversity in energy choices. Similar to other markets, having a range of options available to use when one source is not productive will help maintain a constant supply of energy without great fluctuations in the cost.

The Southwest Region of New Hampshire, similar to the rest of the state and nation, has developed a strong reliance on foreign, non-renewable fossil fuels to meet its energy needs. Traditionally, fossil fuels have been relatively easy to obtain. However, resource depletion combined with political and market volatility could lead to dramatic price increases and reduced availability of these energy sources in the future. To stabilize the price and supply of energy, and to reduce the environmental impacts of fossil fuels, it is important to encourage the development and expansion of local, renewable energy resources such as solar, wind, hydropower, geothermal, biomass, and methane generation.

According to the U.S. Energy Information Administration, in 2015 seventeen percent of New Hampshire's net electricity generation came from renewable resources, with hydroelectric facilities providing slightly more than half, and biomass facilities supplying most of the rest. In fact, New Hampshire is third in the nation, after Maine and Vermont, in the proportion of its net electric generation that comes from biomass. Renewable energy can produce viable energy at a small scale (individual commercial building or house) or at a large scale (producing energy for multiple buildings or to sell to other energy consumers). Within the Region, there are currently few large scale renewable energy facilities in operation. However, recent projects and proposed developments are likely to increase the Region's renewable energy production.

#### **Solar Energy**

The most abundant source of renewable energy in the world is solar energy. Energy from the sun's light and heat is converted to make use of its energy in other forms, typically electric. It is a clean source and does not emit any greenhouse gases in the energy generation process.

There are two ways to use this form of energy; photovoltaics and solar thermal. Photovoltaics is a method that converts the sunlight into electricity by using semiconductors. Solar thermal is a method that uses the sun's heat energy for heating or for electricity.

Solar energy has been gaining popularity in the region with the installation of solar arrays at municipal buildings, schools, colleges, and businesses. In 2013, Keene State College became the third largest producer of solar power under Eversource in the state. More recently, the Town of Peterborough installed the largest solar array in the state (944 kW DC) to provide enough energy to power the wastewater treatment plant and help offset costs to other municipal buildings. Other nearby towns, such as Harrisville, have installed solar arrays to produce power for the Town Office and Fire Station.

Geographic location of the solar units plays an important role in the successful energy production of solar energy. Sites which have shorter sunlight exposure would likely be less productive than sunny, south-facing locations. Another deterrent to this form of energy conversion is the initial cost of the systems, especially for individual residential usage.

An opportunity for encouraging increased renewable energy in the state is the passage of legislation (NH RSA 362-A:9, XIV) in 2013 that enables group net metering. Net metering is the mechanism through which customer generators receive credit for excess electricity supplied to the grid. Reimbursement is given by the servicing utility in the form of kilowatt-hour (kWh) credits during a billing period. Whenever the customer's system is producing more energy than the customer is consuming, the excess energy flows to the grid and the customer's meter "runs backwards." At other times the customer may use more energy than is generated by a renewable energy system. The customer is billed for energy used and credited for energy produced so the result is the combined "net" of the two values. Most utilities have a size limit for net metering and credit rates may change with corresponding regulations.

*Group* net metering allows the excess electricity generated by a single renewable energy system to offset electricity use for multiple retail service accounts within a single utility's service territory. It provides a greater opportunity for community members of all backgrounds—including renters, those with shaded roofs, and those who choose not to install a residential system on their home for financial or other reasons—to invest in and support local, renewable energy.

### **Wind Energy**

Wind energy is another source of green energy. In 2015, New Hampshire obtained 2% of its net electricity generation from wind. The state has an estimated 2.1 gigawatts of wind power potential along its mountain ridges and another 3.6 gigawatts along its Atlantic coastline. It is rapidly growing in popularity as an alternative to fossil fuels since it is a clean source of



*Wind farm on Crotched Mountain in Greenfield, NH.*

energy and will never be depleted. It is however, a somewhat unpredictable source of energy production for inland generators where wind is not a constant.

Wind turbines can be space efficient if the land around them is used for other purposes, such as farming. While the turbines themselves have space requirements due to the long fins, the amount of ground space needed for each unit is minimal.

The world's first wind farm began in Greenfield at Crotched Mountain in 1980, however it is now decommissioned.

State and regional challenges associated with wind energy are largely related to the impact of wind development on scenic views and wildlife resources. The hill-tops and mountain ridges that are most suitable for generating larger scale wind power are also valued for their scenic beauty, recreational value, and natural resources. Some of the proposed sites for wind energy in the

region are also areas that support important wildlife habitat and critical flyways for migratory birds. Potential impacts such as these should be considered in determining the appropriateness of sites for wind farms.

### **Hydro-power**

Hydroelectric power is produced from moving water. The volume of water flow and the change in elevation (drop) from one point to another determines the amount of available energy in moving water. Water descending rapidly from a high point has a substantial amount of energy in its flow. Periods of low precipitation, such as droughts, have a big impact on the hydroelectrical industry.

Hydropower is one of the oldest sources of energy production for mechanical and electrical energy. It is the largest source of renewable energy in the United States. In 2015, hydropower accounted for approximately 6% of total electrical generation and 46% of renewable electrical generation. It is also the cheapest way of producing electricity. Once the dam is built and the equipment is installed, the energy source is free.



In New Hampshire, 35 of the 60 power plants are small hydropower plants. Hydropower accounts for approximately 7.1% of total electricity generation in the state. Eversource owns and operates nine of them. The closest one to Greenfield is in Hillsborough on the North Branch of the Contoocook River and it generates 3.6 MW of energy. A smaller, nearby, hydropower producer is in Bennington at the Monadnock Paper Mills, also using water power from the Contoocook River, which generates up to 49% of the mills power.

Unfortunately, hydropower does have some negative impacts on the environment. The damming of rivers disrupts the movement of fish and natural habitats that some wildlife species depend on. It can also cause low

dissolved oxygen levels in rivers which is harmful to river habitats and water quality.

### **Geothermal**

Geothermal energy is thermal energy generated and stored in the Earth. Resources range from the shallow ground to hot water and hot rock found miles below the Earth's surface. The amount of heat within 33,000 feet of the Earth's surface contains 50,000 times more energy than all of the oil and natural gas resources in the world.

The United States is a world leader in geothermal electricity production. The largest producers of geothermal energy in this country are found in the western states, Alaska, and Hawaii. Nearly 80% of this capacity is in California where more than 40 geothermal plants provide nearly 7% of California's electricity. The eastern half of the U.S. has very limited sources of geothermal energy (also known as hot spots), since the areas with the highest underground temperatures are in regions with active or young volcanos. In regions with temperature extremes, such as the north in the winter and the south in the summer, ground source heat pumps are the most energy efficient and environmentally clean heating and cooling systems available.



The US Department of Energy found that heat pumps can save a typical homeowner hundreds of dollars annually, with a return on the installation investment of 8 to 12 years. Tax credits and incentives can result in a system payback in 5 years or less. However, the high upfront costs and the installation process is a deterrent. Geothermal heat pumps must be dug close to the heating/cooling system which make it difficult for existing homes and businesses.

Although carbon dioxide is a natural byproduct of geothermal steam, one of the biggest advantages of geothermal energy production is the minimal impact that it has on the natural environment.

### **Biomass Energy**

Biomass is a form of renewable energy that is produced from plant and animal material which is converted into another form of energy. Plants store energy from the sun which is later released into another form of energy through various methods. This energy source is somewhat controversial because it is not always a clean source and can create air pollution when burned. Improper burning practices can pose environmental challenges. Older woodstoves are a significant source of wood smoke and emissions of harmful fine particle pollution. Other negative aspects include deforestation, cost to transport, the conversion method process of some waste products, and more. It does, however, help reduce waste that would normally end up in the landfills.

With its strong biomass resources, particularly in the forestry sector, the Region has the opportunity to increase its role in the production of bioenergy. Although wood has historically been the largest biomass energy resource, other sources can be used including food crops, grasses, residues from agriculture, and algae. Biomass can be used for fuels, power production, and products that would otherwise be made from fossil fuels.



The primary biomass feedstocks for power are paper mill residue, lumber mill scrap and municipal waste. Biomass energy plants often burn wood chips made from tree tops and other low value wood scraps from timber harvesting projects. Currently, there are 7 existing and 2 proposed biomass energy plants in the state, none of which is located in the region. On average, NH's existing biomass facilities are about 25 years old and produce more than 39% of the state's renewable power. Although the region does not have a biomass energy plant, it is the location of one of the Northeast's largest wood pellet manufacturer, New England Wood Pellet, which is headquartered in Jaffrey.

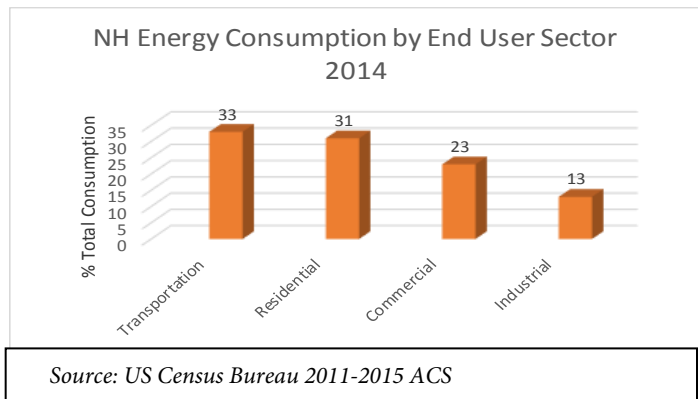


Methane generation is another form of biomass energy. It is produced when organic wastes, such as manure from farms, are converted into methane gas through decomposition. Capturing the gas and converting it into energy not only produces a useful energy source, it also uses up methane which is a powerful greenhouse gas. Small scale

generators can be used for individual use, or larger methane generators can be utilized on a community-wide scale.

#### IV. Energy Consumption

Although we rely on many different types of energy sources, petroleum products dominate our energy consumption. New Hampshire households are among the most dependent on petroleum in the nation, with nearly half of the homes using fuel oil as their primary source for home heating. This is especially true in our region, where 66% of residents rely on petroleum products to heat their homes. However, due to the rural nature of our state and the lack of mass transit, it is the transportation sector that consumes more petroleum-based products than any other sector in the state. In 2014, this sector accounted for 33% of the state's total energy consumption. While a reliable source of this information is not available on a local scale, it is reasonable to assume that Greenfield's transportation figures would be similar or slightly higher based on the rural location and the dependence on the automobile to get to jobs, schools, shopping, appointments, and entertainment.

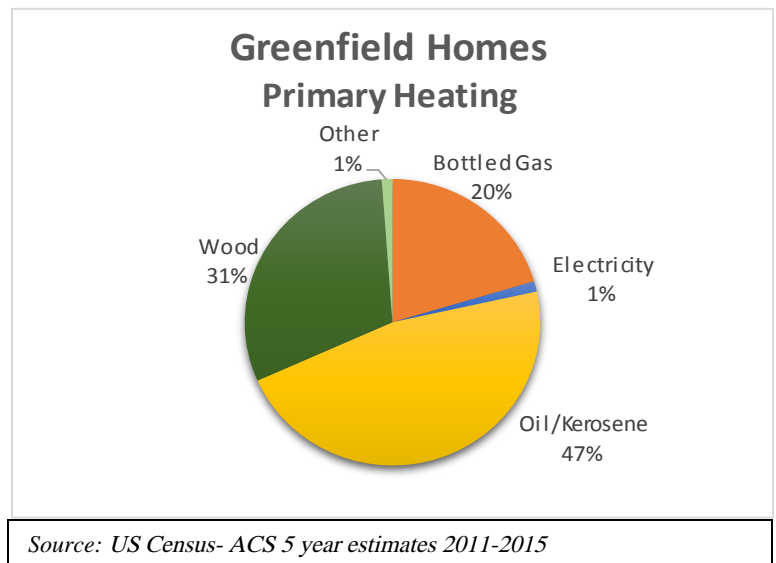


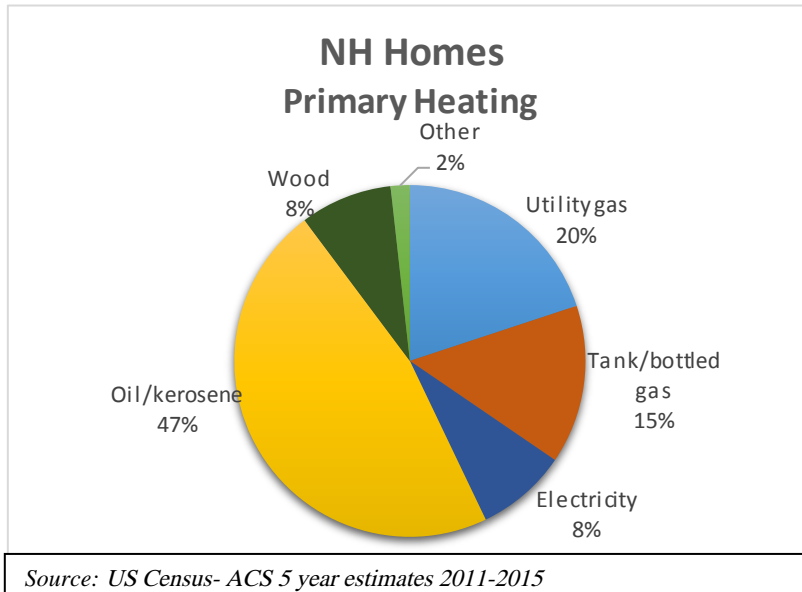
Greenfield Master  
Plan Update  
Update

#### Home Heating

##### Heating Oil

In Greenfield, the highest source of energy used for home heating is oil and kerosene (47%). Wood and wood products, such as pellets, are the second most utilized source of heat with 31% of users. These figures are obtained using the US Census Bureau American Community Survey 2011-2015 figures. They do not show, however, the secondary heat sources. While most homes are heated with oil, it is not uncommon for a secondary source, such as wood or pellet stoves to be used to reduce oil consumption and heating costs.





In comparison to the Greenfield chart above, the New Hampshire chart also indicates that approximately 47% of homes are fueled by oil/kerosene. Utility gas, however, is the second largest heating source, followed by tank/bottled gas. There is also a significant difference between the Town and State in the percentage of residents that use wood and wood products as their primary heating source.

### **Natural Gas**

New Hampshire is among the lowest states in per capita natural gas consumption, in part because large areas of the state do not have natural gas distribution infrastructure. New Hampshire receives natural gas by interstate pipelines from Maine and Canada, yet more than 50% of the natural gas in these pipelines travels through the state to reach consumers in Massachusetts. As a predominantly rural area, there is less use of utility supplied gas for home heating use in the Southwest Region than in New Hampshire as a whole (3% compared to 20% statewide).

### **Wood/Biomass**

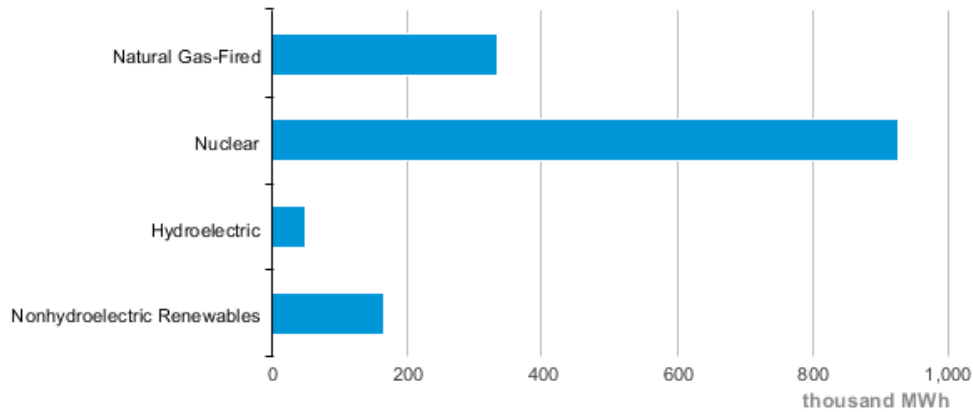
The region and state have a much higher rate of using biomass as a primary heating source with nearly 1 in 12 homes depending on firewood and wood pellets. This is mostly due to the availability of wood products in a densely forested state. Use of biomass for home heating is higher in the Southwest Region (31%) and Greenfield (31%), than in the state (8%) or nation (2%). Wood is still the largest biomass energy resource today, but other sources of biomass can also be used such as landfill gas, crops, garbage, and alcohol fuels.

## **V. Energy Production**

According to the US Energy Information Administration (EIA), New Hampshire ranked 42<sup>nd</sup> in the country for total energy production in 2014. This makes the state vulnerable to shortages and increased costs, especially during the winter months when the energy consumption is at its highest. The predominant sources of electricity generation are nuclear (42%) and natural gas (33%). Other sources of renewable energy used to produce electricity in the state include hydroelectric power, biomass, wind power, and solar power. New Hampshire is third in the nation, after Maine and Vermont, in the proportion of its net electric generation that comes from biomass.



### New Hampshire Net Electricity Generation by Source, Oct. 2016



eia Source: Energy Information Administration, Electric Power Monthly

## VI. Efficiency

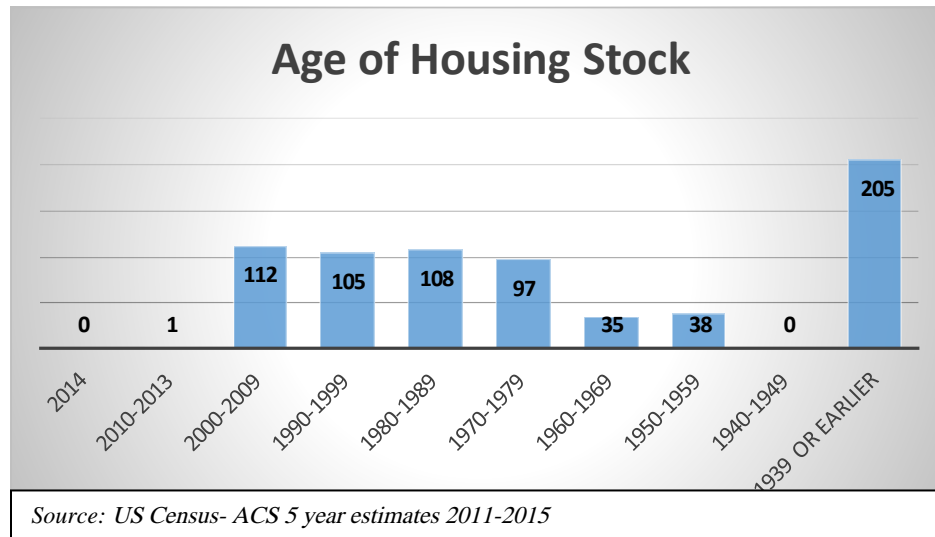
One of the best ways to reduce energy consumption is through the use of energy efficiency methods. Energy efficiency not only reduces the strain on fossil fuels, it will reduce greenhouse gasses and save money. There are many ways to increase energy efficiency. Weatherization of existing buildings can be done through retrofitting older heating units and replacing older and less efficient doors and windows. Adding insulation in walls, floors and attics, as well as around pipes will help during the cooler temperatures. Replacing fluorescent bulbs with LED bulbs and replacing older appliances with *Energy Star rated* appliances will greatly reduce the energy needed to provide the same amount of light. Amendments to land use regulations and building codes is another approach. Making changes to public buildings sets the pace to initiate change for commercial, industrial, and residential structures.

### Age of Structures

The age and size of structures can be a factor in the amount of changes necessary to achieve maximum efficiency. Construction methods, building materials, and building codes have changed considerably since 1970, making the units more energy efficient. In Greenfield, the age of the housing stock is shown in the chart below. This shows that nearly 40% of homes were constructed prior to 1970. While many of these older structures are important to the Town's heritage and character, they consume a great deal of energy.

In addition to the age of a home, the size also plays a factor in energy consumption. It stands to reason that a larger home requires more energy to maintain the same indoor temperature that a homeowner desires. A recent study by the US Department of Energy, however, has indicated that the average home

today is 28% larger than it was in 1970 thereby offsetting the efficiency ratings that would otherwise be seen with today's construction methods and materials.



## VII. Resiliency

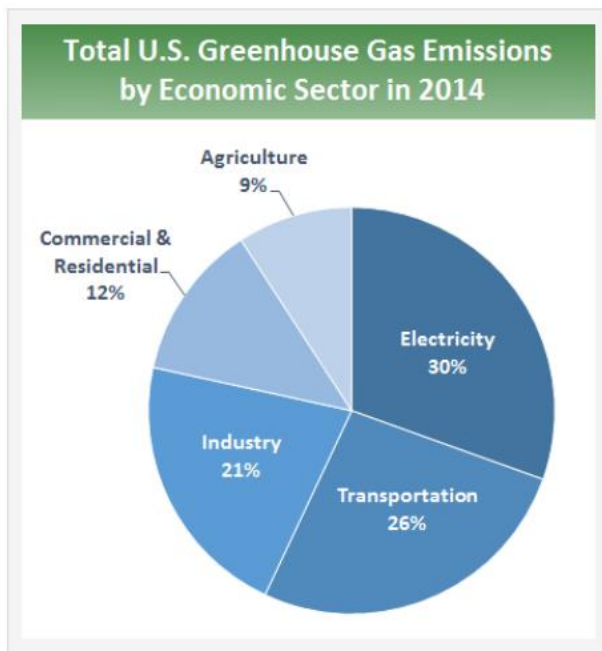
Greenfield has much to gain by taking charge of the energy future and making investments in the existing and future energy infrastructure. This includes both energy efficiency methods and local energy production. Through these investments, benefits for both the public and private sectors can include: lower energy costs, fewer environmental impacts, and increased energy security.

The adoption of building codes that promote energy efficiency and conservation can begin to initiate movement toward a more resilient community. The inclusion of landscape standards, low-impact development, mixed uses, and other pedestrian related ordinances and regulations should also be considered.

## VIII. Greenhouse Gas Effect

The accumulation of greenhouse gas has been attributed to climate change through the heat that is emitted, similar to the effects of a greenhouse. The source of greenhouse gasses are concentrations of water vapor, carbon dioxide, methane, nitrous oxide, and ozone. Reducing our “carbon footprint” will help to reduce the amount of greenhouse gas that is produced.

The chart below provides a look at the major contributors to the greenhouse gas emissions in the country in 2014. It shows that 30% of all greenhouse gas emissions were the result of electricity production. Approximately 67% of electricity in the US comes from fossil fuels such as oil, coal and natural gas. The next highest source of greenhouse gas is transportation (26%) mostly from burning fossil fuels in nearly every mode of transportation. The third largest contributor is industrial use (21%) which is mainly from the burning of fuels for energy as well as chemical reactions needed to produce goods from raw materials. The remaining categories, commercial/residential and agriculture only contribute 21% combined.

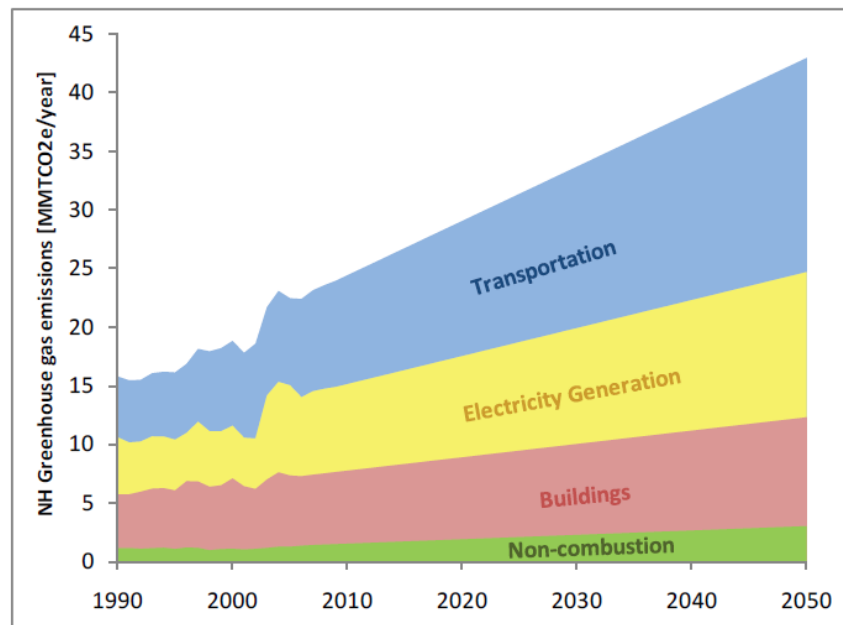


Source: US EPA Greenhouse Gas Inventory Report 2014

New Hampshire, with the rural nature and lack of mass transportation, has the transportation sector as the largest source of greenhouse gas emissions. It is likely that the same is true for Greenfield although no figures are available.

The state is part of the Regional Greenhouse Gas Initiative (RGGI) and has pursued energy efficiency programs to lower electricity consumption. RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce carbon dioxide emissions from the power sector. It is the first mandatory market-based program in the United States to reduce greenhouse gas emissions.

The next graph shows the New Hampshire greenhouse gas emissions projected out to 2050 according to a study prepared by Carbon Solutions New England and cited in the New Hampshire Climate Action Plan. Transportation is currently the highest source of emissions in the state and electrical generation is second highest. This is in contrast to the country which has buildings (combined categories) as the highest source, followed by electricity generation and transportation. The State's scenario is expected to continue, and nearly double by 2050, due to population increase and sprawl development if land use continues in the same manner as historical trends have shown.



Source: The New Hampshire Climate Action Plan

**IX. Regional Recommendations**

The Monadnock Region Future (MRF), a regional plan developed by the Southwest Region Planning Commission, includes the following recommendations for communities in Southwestern New Hampshire to consider on a local level:

- Adopt and Enforce Improved Building Energy Codes
- Increase Efficiency of Existing Buildings
- Implement Energy Financing Programs
- Community Energy Planning & Action
- Renewable Energy Rebate Program
- Renewable Energy Tax Exemption
- Group Net Metering
- Community Solar

# CHAPTER VIII

## LAND USE ANALYSIS



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### MAPS

Existing Land Use  
Development Constraints



# LAND USE CHAPTER

## I. INTRODUCTION

A land use analysis is an important element of community planning. This section is intended to guide the Town's thinking about future uses in long-term concepts. Once raw land is converted to a particular use, it is usually committed to that use for a very long time, if not indefinitely. It is extremely difficult to change a pattern of development once it takes hold. Therefore, decisions about future land use should be made carefully, with a studied eye to the potential ramifications of those uses. A well-conceived land use plan allows for new growth and development while it protects and preserves the integrity of neighborhoods, businesses, transportation routes, and the environment.

This chapter describes the pattern of existing land uses in Greenfield and analyzes changes that have taken place in the land use pattern since 1985. Comparisons in development patterns over the past 30 years are illustrated in tables to show trends that have occurred. These trends are analyzed and used to provide assistance in determining the future land use map. It is also helpful to consider *how* particular land uses evolved. Maps are used to identify the areas of town that have been developed, the kind of development that has occurred, and the relationship of one land use to another. These maps include the Existing Land Use Map and the Development Constraints Map. Together, this information provides the baseline necessary to evaluate the appropriateness of future development and the availability of suitable land for such development.

The Land Use Plan is that section of the Master Plan required by RSA 674:2 that "takes into account natural conditions and which shows the existing conditions and the proposed location, extent and intensity of future land usage." The natural conditions to be taken into account include such features as wetlands, steep slopes, aquifers, surface water bodies, and any other natural features considered to be particularly significant. Existing conditions refer to the actual land uses found in town at the time, e.g., residential development, commercial uses, etc. Both the man-made conditions and the natural features impact the future development in the town.

The development of a land use plan forms the basis of land use regulations, which are effected through zoning ordinances, subdivision and site plan review regulations. The land use plan describes the goals and objectives envisioned by the town; the regulations are the means to put these goals and objectives into place. For instance, if in the process of describing present land use patterns in Greenfield, recommendations are made to encourage more commercial activity in a particular area, the zoning ordinance should be amended to permit that kind of activity in that location - if it does not already do so. Or, by the same token, the land use plan might recommend that the zoning ordinance be made more restrictive in particular areas, for the purpose of protecting and preserving certain natural features in town.

## II. LAND USE CATEGORIES

The first step in the land use analysis is to classify the various land uses that exist in Greenfield. A classification system describes these activities. The second step is an analysis of tax assessing data from Greenfield using Geographic Information System (GIS) technology. Existing land uses and activities are recorded on a map to illustrate an interpretation of the land use pattern.

In general, land is classified according to its physical characteristics and/or the present activity that occurs on it. The two major divisions in a land use classification system are "Developed" and "Undeveloped" uses. Each of these divisions can be further subdivided into specific land uses. The following is a listing and description of the standard land use categories used to prepare a Land Use Plan:

- ◆ ***Residential:*** All land and/or structures used to provide housing for one or more households. These include site-built single family homes, manufactured homes (previously known as mobile homes), factory-built modular homes, duplexes, apartment buildings, condominiums, and seasonal residences.
- ◆ ***Government/Institutional:*** Establishments and facilities supported by and/or used exclusively by the public or non-profit organizations, such as fraternal, religious, charitable, educational and governmental facilities.
- ◆ ***Agricultural:*** Lands that are utilized for the cultivation of crops, the raising of livestock and poultry, and nurseries for horticultural purposes.
- ◆ ***Commercial:*** All lands and structures that supply goods and/or services to the general public. This includes such facilities as restaurants, motels, hotels, service stations, grocery stores, furniture and appliance sales, as well as establishments which are primarily oriented to providing a professional and/or personal service to the public, such as medical offices, banks and financial institutions, personal care establishments, etc.
- ◆ ***Industrial:*** Land and/or facilities used for mining, construction, manufacturing, treatment, packaging, incidental storage, distribution, transportation, communication, electric, gas and sanitary services, and wholesale trade.
- ◆ ***Home-Based Business:*** A residential property that houses a home occupation or home-based business. The residence continues to be the principle use of the land, and the occupation is by definition secondary and incidental.
- ◆ ***Road network:*** All public and private rights-of-way that are designated for

carrying vehicular traffic. This includes Class VI roads that are no longer maintained by the town and do not carry public traffic.

- ◆ ***Protected & Conservation Lands:*** Included in this category are all federally-owned lands, all State parks and forests, land protected under the State Land Conservation Investment Program (LCIP), land protected and/or owned by the town, sensitive land and wildlife habitats protected by the NH Audubon Society, land held by the Society for the Protection of NH Forests and the Monadnock Conservancy.
- ◆ ***Undeveloped:*** All lands that are not developed for any of the above uses, regardless of the reason - whether it be because the land is not usable due to environmental constraints, or there has been no demand to develop.

### **III. FACTORS THAT INFLUENCE LAND USE**

Various factors influence growth and development in a town. The major physical and topographic features are the primary factors that influence the initial as well as the subsequent development of land. Secondary factors usually consist of public and private investments such as roads, railroads, utilities and major commercial, industrial or recreational facilities that attract and/or stimulate new or expanded development.

The following factors have played an important role in the development of Greenfield:

#### **Waterfront Development**

Greenfield is home to several major waterbodies; Hogback Pond, Otter Lake, Powder Mill Pond, Sunset Lake, Mud Pond and Zephyr Lake. These waterbodies are classified by the NH Department of Environmental Services as Public Waters, which means that they are subject to the State's Water Quality Protection Act (SWQPA). This law was enacted in 2011 and is a variation of the previous Comprehensive Shoreland Protection Act. It establishes standards for the subdivision, use and development of the land around the state's public waters, defined as all land located within 250 feet of the water.

Although Greenfield is home to these waterbodies, only a limited amount of residential development has occurred around them, with the exception of Sunset and Zephyr Lakes. High density residential development has occurred along portions of these two lakes. The limited amount of development along the other waterbodies is due to the efforts of the Town to protect the quality of these waters. The Town owns a small parcel on the western shore of Sunset Lake as well as a parcel on the east shore of Zephyr Lake, and Hogback Pond. Mud Pond and a portion of Otter Lake are located within Greenfield State Park. Nonprofit institutions such as the Barbara C Harris Camp and conference center and Crotched Mountain own large parcels on Otter Lake and Sunset Lake respectively. There is a boat launch area on the north side of Forest Road owned by the State.

### **Topography & Soils**

To some extent, topography and soils also play a role in any town's development. Historically, people built houses and roads on land that was most easily accessed; and soil type and characteristics influence what kind of development will occur - farming, for example, and where that development will take place.

The topography of Greenfield is dominated by Crotched Mountain in the north and North Pack Monadnock in the south. Crotched Mountain lies in the three towns of Greenfield, Bennington, and Franconia. The mountain's highest elevation is actually in Franconia (2,020 feet above sea level); in Greenfield the highest elevation is 1500 feet, in the northeasterly corner of the town, going down to 900 feet at Sunset Lake.

North Pack Monadnock has the highest elevation in town, ranging from 1,300 feet at Mountain Road up to more than 2,200 feet at the highest point just north of the Temple town line.

Gould Hill in the south-central part of town and Blanchard Hill on the eastern side of town are two other concentrated areas of high elevation, although they do not exceed 1,200 feet. The western and central parts of town have the lowest elevations, ranging from 700 to 900 feet above sea level.

### **Public and Private Investments**

Public investments can be as influential as private development in shaping land use patterns and determining the growth of a town. Therefore, the overall impact of development that occurs in any town is directly related to the joint efforts of the public and private sectors, as well as to the changing economic and social conditions of the area. Investments in the public infrastructure, such as state highway improvements, power generating stations, etc., respond to development, and at the same time have an effect on where future development will occur.

### **Transportation Systems**

Settlement in Greenfield has been influenced by three major roads; NH Route 136, Forest Road, and NH Route 31. These are classified as Major Collectors are designed to move medium traffic volumes at medium speeds between or within communities.

The chart below shows the total miles of roads in town, and the mileage of each type of roadway:

Table 1: Road/Class Miles

<b>Legislative Type</b>	<b>Miles</b>	<b>% of Total</b>
<b>State</b>	13.8	20.5%
<b>Local (Class V)</b>	36.3	53.8%
<b>Not Maintained (Class VI)</b>	8.9	13.2%
<b>Private</b>	8.5	12.5%
<b>Total</b>	67.5	100.0%

Source: NH DOT

The other transportation system that influenced the settlement pattern of Greenfield is the railroad, which runs across town from the southeast to the northwest. Until the summer of 1986, Greenfield was served by the Hillsborough Branch of the Boston & Maine Railroad, which provided freight service to and from local industries. The railroad initially served a much greater role in moving people and goods around and through Greenfield than did the road network. Thus, the demise of rail travel and the establishment of major transportation routes outside of Greenfield's boundaries set in place certain parameters that have dictated the rate and type of development experienced in Greenfield over the last several decades.

### **Utilities and Public Services**

Presence and availability of adequate utilities is vital to the welfare of the community, in particular for meeting the health, safety, and security needs of the citizens, and in general for meeting their desires for comfort, entertainment, and quality of life. Further, the availability of certain utilities can support the community's goals for economic development.

To meet these needs, utilities presently being provided in the Town of Greenfield include electricity and 3-phase power, telecommunications (broadband, telephone/wireless communications, internet service), water and sewer. Because of their diverse nature, each of these is considered separately in the following sections. Due to the rural nature of the Town, not all utilities are available in all areas of the community, such as high-speed internet technologies and 3-phase power. However, electricity and certain telecommunications services being somewhat easier to distribute, are available virtually everywhere in the Town. Electrical and telecommunications infrastructure are provided by private business entities. There are not presently any municipal or private systems for general distribution of gas, either natural or propane, within the Town of Greenfield.

- **Water and Sewer**

The community currently provides limited public sewer and water service. Residents and businesses are predominantly served by private water and sewer systems.

Public water service is defined as any water system which serves more than 25 people. There are several locations meeting this definition, including but not limited to: Greenfield Elementary School, Crotched Mountain, Greenfield Commons, and Barbara C. Harris Center.

The only area in Greenfield that has public sewer service is the downtown area. There are no current plans to extend this service.

- **Electricity**

Public Service of New Hampshire (PSNH) is the main electricity supplier for the Town of Greenfield and serves approximately 830 customers. Distribution and transmission lines, which are placed along roadways, carry power throughout the town to the individual customers, including homes, businesses, and streetlights. The voltage from these lines is stepped down to the voltage that is used by the specific customer by way of transformers.

- **3-Phase Power**

Public Service of New Hampshire has indicated that three-phase service, required for manufacturing operations, is available in selected areas of the Town. These areas include: Route 136 from Peterborough to the center of Greenfield and continues North on Route 31 to the Greenfield / Bennington town line. Three Phase ends in downtown Greenfield at the intersection of Route 136 / 31 and Slip Road. It continues on Slip Road for three pole sections before it ends and continues with single phase power.

While there are no plans to expand this service at the present time, it is possible that service could be expanded, within reason, if new customers requested the service. The cost for such projects would be reviewed on a case-by-case basis. PSNH indicates that the projected revenue from a new customer requiring three-phase service would be reviewed and may be used to reduce customer contribution for the upgrade.

- **Telephone and Wireless Communications**

Landline phone service is provided for new and existing residences and businesses in Greenfield by Fairpoint Communications. Long distance calling service through landline phones is available through a number of service providers.

In 2012, the Town amended the Telecommunications/ Personal Wireless Service Facilities Ordinance.<sup>11</sup> Currently, telecommunications facilities are permitted in all districts. Special exception by the Zoning Board of Adjustment is required for all zoning districts except the Rural/ Agricultural District.

Federal law regulates the placement of cellular towers in a given community; however, emphasis has been placed on balancing the need for telecommunications infrastructure with a community's desire to maintain community character. The Telecommunications Act of 1996 preserved state and local regulatory authority for the placement, construction or modification of wireless facilities.

- **Internet Systems**

While 56k dialup connections over telephone lines are universally available, Digital Subscriber Line (DSL) high-speed computer internet service is the most widely available high-speed telephone connection type in the region. DSL phone service may be available to individual residential and business customers in Greenfield through local phone service providers. Availability will depend on the residential or business location in proximity to a central office or substation of the service provider (DSL broadband has a limited service area of 18,000 feet from the central office or substation providing service).

High speed or Broadband Internet connectivity, when locally available, is provided through either a Local Exchange Carrier (LEC), typically a phone carrier, or an Internet Service Provider (ISP). LECs typically provide bandwidth and contract with ISPs to market and sell connectivity. ISPs also typically offer value added products including web-hosting space, web design assistance, email and access to news groups and other services.

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<sup>11</sup> Source: Greenfield Zoning Ordinance, 2012.

## **Broadband Technology**

### **Understanding Broadband (a.k.a. High-Speed Internet) Technology**

#### What is Broadband?

Broadband is the common term for a high bandwidth internet connection that can send or download information many times faster than with a standard telephone and modem. You can do everything you want to do online more quickly and more easily with broadband including logging-on, working from home through network connections, downloading files and music, and more.

#### Who Provides Broadband?

There are different ways of delivering broadband services: over telephone lines, cable connections, via one or two-way satellite systems and even by radio. High speed or Broadband Internet connectivity, when locally available, is provided through either a Local Exchange Carrier (LEC), typically a phone carrier, or an Internet Service Provider (ISP).

- **Gas**

Natural gas is a private, for-profit utility that does not currently service the Town of Greenfield. An up-to-date list of providers is maintained by the NH Public Utilities Commission at <http://www.puc.state.nh.us/Gas-Steam/gas-steam.htm>.

Propane gas is also a private, for-profit utility used for cook stoves and hot water, and to a limited extent, home heating. Several private companies provide home delivery service to residents of Greenfield and other communities in the region.

- **Solid Waste**

Solid waste in Greenfield is collected at the Recycling Center located at 29 DPW Drive. There is no public curbside collection program in Greenfield. Residents either take their waste to the recycling center or hire a private, commercial hauler that collects residential waste.

Hazardous household waste is processed through a contract with the Keene Recycling Center through funding from the NH Department of Environmental Services Household Hazardous Waste grant program. Twelve household waste collection days are held annually. The contract with the City of Keene allows Greenfield residents to deliver, at no cost to the residents, up to 10 gallons per collection day to the Keene Recycling Center.

## **IV. EXISTING LAND USE**

An analysis of the present land use pattern in a town is one of the first steps in the formulation of a Land Use Plan. Since the type and intensity of existing land uses have a strong influence on future development patterns, it is important to understand how land and other resources are used within a given area before recommendations can be developed relative to future land uses.



### **A Brief History**

The Development of the Town of Greenfield's land has gone through several changes as economic emphasis has shifted from one period to another. Greenfield was first settled around 250 years ago, and for the next one hundred and fifty years the Town, like so many of its neighbors, was primarily an agricultural community. By the mid-1800's, more than 80% of Greenfield's land was cleared and used for grain and hay fields, pastures, orchards, and vegetable gardens. Dozens of dairy and poultry farms shipped large quantities of milk and eggs as far as Nashua and Boston. Other products shipped included apples, potatoes, cordwood, and lumber.

By the early 1900's, America had developed an extensive and efficient system of railroads. This, coupled with advances in refrigeration, enabled perishable agricultural products to be shipped long distances. There were five industrial trains daily, including two milk runs daily to send milk and dairy products to Boston. Greenfield's dairy farms, working the rocky and hilly New Hampshire soils, found themselves competing with the agriculturally rich Midwest. It was a competition they couldn't meet and gradually the farms were abandoned. Regular use of the rail for industrial shipping ended after 1976 when the grain mill burned down. The train continued for a short time afterwards as a tourist train running between Greenfield and Wilton on the weekends.

Because of the lack of swift rivers and brooks necessary for the water-powered mills of the 1800's, Greenfield never developed a large industrial base. There were, from time to time, many small mills, but their primary purpose was to support the needs of the local community. The railroad came to Greenfield in 1874, but almost all of its freight traffic was agriculturally related.

The automobile oriented economy of today has changed many of the traditional development patterns of the past. Old mansions have become tourist homes; businesses have infiltrated residential areas; some residents work from home with internet access; businesses oriented to the highway traveler follow the approach roads to the community, crowding on right-of-way originally laid out for "horse and buggy" use, and, now oftentimes inadequate, for the increasing volumes of automobile traffic.

While the commercial and industrial centers of the neighboring towns of Peterborough and Jaffrey, as well as cities to the east, grew and prospered, Greenfield began to change from a New England farming and mill town to a suburban "bedroom" community and recreationally oriented area. Factors that influenced this trend were the ending of rail transportation and the conservation of large parcels of land. This is the character of Greenfield as it is today.

### **Greenfield's Land Use**

Analysis of the *Existing Land Use* map (page 84) verifies the pattern of development described above. Note that the residential uses occurring in Greenfield's town center, with later residential development and most of the subdivisions locating on the roads leading out of Town, suggests that the more recent growth has been related to residents commuting to nearby towns. The center of Town is where many of the public buildings and much of the older housing is located. This concentration was undoubtedly the nucleus of an agrarian society developed around local farms and functioning as the hub of the community until

later changes including institutional, recreational, and second home uses moved much of the land uses out of the center.

Greenfield has a land area of approximately 26.2 square miles, or 16,807.9 acres. Surface water accounts for approximately 351 acres.

A review of the *Existing Land Use* map and the analysis shown in Table #1, in terms of specific uses, indicates the following:

**Residential** – The greatest use of land in Greenfield is residentially used land, which is approximately 7,761.7 acres or 46.6% of the total land area. Residential development in Town is mostly single family detached homes and manufactured housing, with an infrequent occurrence of two family and multi-family housing. There is a senior housing complex and a few in-law apartments throughout town. Also of significance in terms of concentrated residential development are the areas around Sunset and Zephyr Lakes where residential density is higher than in other parts of Town.

The Town adopted an Open Space Development Ordinance in 2004 and amended it in 2010. To date, only one project has been approved, which is a 9-10 home subdivision.

**Commercial/Industrial** – Commercial and industrial land includes all land that has uses that are considered “business” in general. These parcels have a higher tax rate, and often require less of the services that are provided by the town, such as schools. The major concentration of commercial and industrial uses is located north of Town on Route 31. There is a limited amount of commercial development found along NH Route 31 in the southern portion of Town. The table shows us that there is only 321.9 acres, or 1.9% of the total land area, designated as commercial/ industrial uses in town.

**Exempt** – The second largest category is land that is exempt, which means that the town does not collect taxes on these parcels. These include parcels owned by the town, state, and federal government such as parks, schools, institutional uses, and other facilities necessary to conduct public business. It also includes parcels owned by non-profits such as churches. The Town owns many large parcels throughout town, the State of New Hampshire owns the land in Greenfield State Park as well as some parcels in the northeast portion of town, and the federal government owns a very large parcel that borders the Town of Temple, which is part of Wapack National Wildlife Refuge. Exempt land is often referred to as government or institutional uses. Many of these parcels are concentrated in the village center and include the Town Office Building, Fire Station, Stephenson Memorial Library, the Meeting House, the old Fire Station, and the Post Office. The schools, cemeteries, and the large tracts used by the Crotched Mountain Rehabilitation Center, Brantwood Camp, Plowshare Farm, and by Barbara C. Harris Camp and Conference Center are also included in this land use category. Some of these are considered mixed uses such as the Barbara C. Harris Center, which operates both as an “educational” facility and a “recreational” area. The exempt land uses 3,304.2 acres or 19.7% of all land in Greenfield.

**Agricultural** – Although primarily a suburban town, Greenfield has some 608 acres, or 3.6% of total land area, devoted to farming. These are scattered throughout town in several concentrations and areas just outside the center of Town. The largest farm in Greenfield is 187.4 acres on East Road. A common occurrence in farming is a change in the type and intensity of farming as farms get handed down through generations, or sold to new farmers. The change is often to a less intense commercial business or a total change to a more

recreational use. This shift can further have an affect on the future use of the land, since it is no longer an income generating use, making it ripe for development. The loss of farmland is a concern across the country as it is easy and desirable to convert this land into subdivisions due to the rural locations, good soils and ease of site work for the developer. In Greenfield, as in most of the towns in the region, there are individual garden plots servicing the needs of local homeowners. These uses have not been considered of major agricultural significance in documenting the land use in this chapter of the Master Plan.

**Forestland** – Another large category in the table below is forestland, which includes managed forests and unmanaged forests. The total of the forest categories comprises 26.3% of total land, or 4,420.2 acres. This land is still developable; however, it has been put into current use taxation status.

**Water and Wetlands** – Water and wetlands consumes 2.3% of total land area, or 391.5 acres. This land is undevelopable and should be protected to the fullest extent possible. The land area around lakes, rivers and ponds is often considered “prime” real estate, and therefore attracts higher valued homes. Maintaining the water quality will provide recreational opportunities, serve as a resource for wildlife habitats, and maintain the property values that border these areas.

**Recreational** – Greenfield’s 2012 tax assessing data does not include recreational uses as a separate land use category. Recreational uses are incorporated in the Exempt categories (municipal, state, and federal). Recreational land in Greenfield includes Oak Park, the fairgrounds, the elementary school playground, a part of North Pack Monadnock Mountain, the Greenfield State Park, the beaches of Sunset and Zephyr Lakes, and several private camps.

**Table # 1 Change in Land Use 2003-2012**

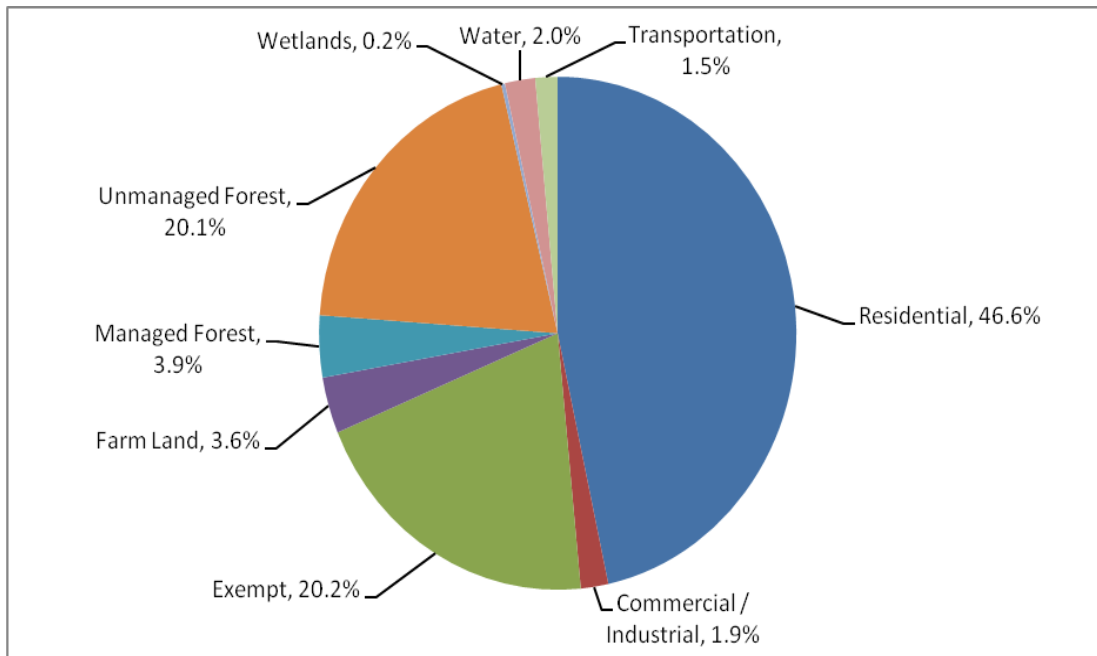
Land Use Category	2003*		2012**		2003-2012% Change***
	Acres	% of Total Land Area	Acres	% of Total Land Area	
Residential	8,198.7	48.7%	7,978.3	46.6%	-2.7%
Commercial/Industrial	353.0	2.1%	318.6	1.9%	-9.7%
Exempt	3,169.4	18.8%	3,469.2	20.2%	9.5%
Farm Land	585.1	3.5%	608.2	3.6%	3.9%
Managed Forest	532.1	3.2%	669.0	3.9%	25.7%
Unmanaged Forest	3,602.5	21.4%	3,436.5	20.1%	-4.6%
Wetland	41.5	0.2%	42.2	0.2%	1.7%
Water	350.0	2.1%	350.6	2.0%	0.2%
Transportation	-	-	256.1	1.5%	-
<b>Total:</b>	16,832.2		17,128.7		

\*Source: Town of Greenfield Assessor Database, 2003

\*\*Source: Town of Greenfield Assessor Database, 2012

\*\*\*Percent change is based on the difference between 2003 and 2013 acreage totals

**Chart #1 Land Use Distribution**



*Source: Town of Greenfield Assessor Database, 2012*

The Town should carefully weigh the implications of an overabundance of residential development as regards its impact on the Town's financial structure. It should be noted that much of the land in Greenfield is either exempt from taxes or under "current use" status. Although there is little doubt that the Town will continue to be a residentially-oriented community, and greatly influenced by existing recreational and institutional uses, consideration should be given to means by which the demands for town services generated by additional residential development can be offset.

The Current Use Taxation program was enacted in 1973 to promote the preservation of open land in the state by allowing qualifying land to be taxed at a reduced rate based on its current use value as opposed to a more extensive use. The minimum land area currently needed to qualify is ten acres. The price of this favorable treatment is a 10 percent penalty tax (10% of the sale price) when the property is later changed to a non-qualifying use.

In comparing conservation easements to current use taxation, easements are permanent, while current use may be reversed by change to a non-qualifying use and payment of the Use Change Tax. Thus, current use may satisfy the goals of a landowner who cannot afford to permanently abandon future development value, but desires current property tax relief. If it becomes financially necessary to subdivide, the use change tax becomes an element of the development costs.

In Greenfield, up to \$5,000 per year of the monies collected from the Use Change Tax (10% of the sales price of a piece of land taken out of current use and sold for development) goes to the Conservation Commission for the acquisition of land and/or conservation easements.

The current use designation, authorized by RSA 70-A, provides the town other benefits as well: it encourages landowners to maintain traditional land-based occupations such as farming and forestry; promotes open space, preserving natural plant and animal communities, healthy surface and groundwater; and may provide opportunities for skiers, hikers, sightseers, and hunters. The concept of the Current Use designation is seen by some as placing a heavy burden on those parcels that are not eligible for current use. However, current use land requires little, if any, municipal services.

## V. LIMITATIONS TO DEVELOPMENT

Not all of the available land is suitable for development. Limiting factors to development include steep slopes, certain soil types, wetlands, aquifers, floodplain areas, and other sensitive lands or features. In addition to these physical constraints, development is limited by the public's desire to protect the quality of life and property values of existing residents. This public will is ideally expressed in the Town's land use regulations, and is the central purpose of this planning document.

### Physical Limitations to Development

Four maps have been created using Geographic Information System technology showing limitations to development in Greenfield: *Stratified Drift Aquifers*, *Steep Slopes*, *Wetlands & Hydric Soils*, and *Development Constraints*. The *Development Constraints* map can be found on the accompanying page. These maps identify seven limitations to development that are related to the ability of the soil to accommodate septic systems, road or building construction (see Table #2 below).

**Table # 2 Development Constraints**

Constraint	Total Acres	% of Total Acres
Slopes greater than 15%	5171.1	30.19%
Poorly/very poorly drained soil (Hydric soils)	2588.1	15.11%
Wetlands	1776.0	10.37%
Floodplain	1236.0	7.22%
Aquifer	5476.7	31.97%
Shallow to bedrock soils (Less than 40 inches)	2501.4	14.60%
Shallow to water table (Less than 1.5 feet)	2969.7	17.34%

Source: SWRPC Geographic Information System database (GIS)

Reference to the maps illustrates that one or more of these development constraints exists virtually all over town. There are in fact, only a few areas on the map that appear to have no limitations at all. It is interesting to note that the built up area of the village center is one of the areas in town with few limitations to development which was probably a primary reason the area was in fact built out. The northern and southern sections of Town have many steep

slopes due to the location of Crotched Mountain in the north and North Pack Monadnock Mountain in the south.

In comparing limitations to development to the *Existing Land Use Map*, it can be seen that, while the development does follow almost every road in town, the areas shown as having the greatest constraints have not been developed. How much of this pattern is due to the natural constraints of the land or to other factors such as road access is not known.

Through thoughtful and intelligent planning and zoning, the Town can direct new growth into areas best suited to each class of land use. Through such advanced knowledge of development potential, Greenfield can plan for roads, utilities, and community services and facilities.

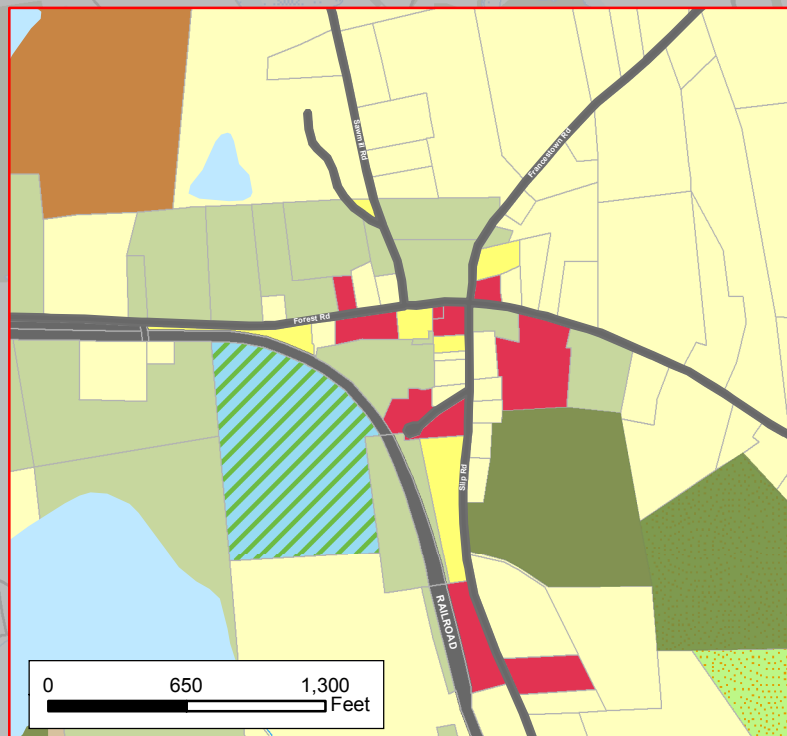
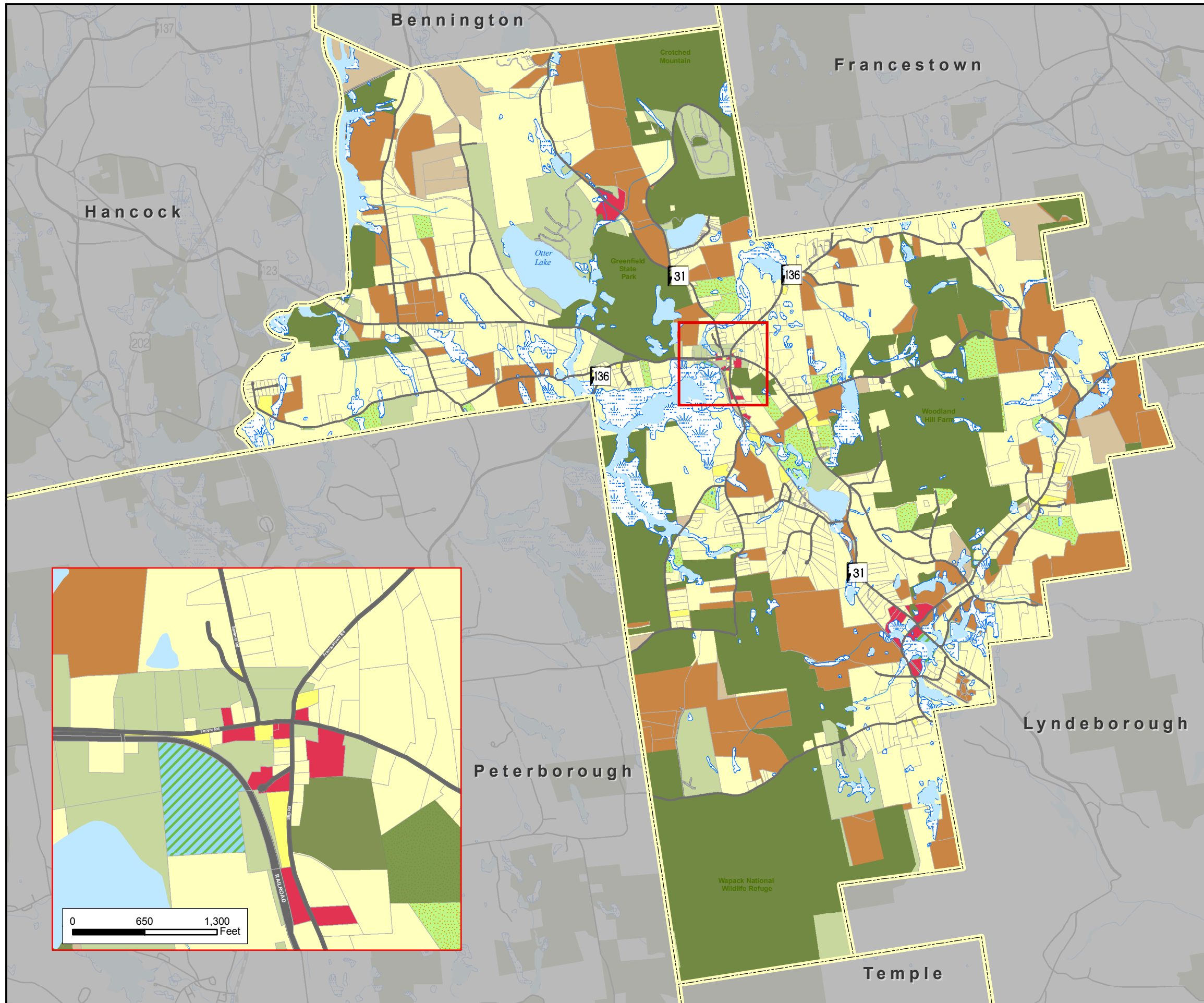
### **Regulatory Limitations to Development**

The State of New Hampshire enables the towns to establish regulations to protect the character of the town and limit the uses of the land under RSA 674:18 (Zoning Ordinance), RSA 674:36 (Subdivision Regulations), and RSA 674:44 (Site Plan Review Regulations). The Town of Greenfield has adopted all of these land use documents.

The Greenfield Zoning Ordinance was first adopted in 1936 and has had many amendments since its original adoption. The most recent amendments have included regulations that provide protection to the environment such as Groundwater Protection and Floodplain Development, as well as ordinances that have addressed technological changes including telecommunications and alternative energy sources.

The Subdivision and Site Plan Regulations were adopted in 1970 and 1988 respectively with amendments as needed. While the Zoning Ordinance establishes the uses that are permitted, these provide guidelines on the procedures and standards that are acceptable to the town.

The town has also adopted Driveway Regulations in 2005 with a revision in 2008 pursuant to RSA 674:35 and Earth Excavation Regulations in 1990 pursuant to RSA 155-E of the New Hampshire Revised Statutes Annotated.



# Town of Greenfield NH

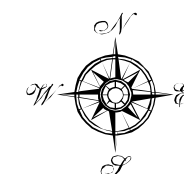
## Land Use Map

### Land Uses

- Single Family Residential
- Multi-Family Residential
- Commercial/Industrial
- Exempt
- Farmland
- Managed Forest
- Unmanaged Forest
- Wetlands

### Features

- Transportation
- Lakes and Ponds
- Wetlands
- Rivers and Streams
- Conservation Land
- Parcel Boundary

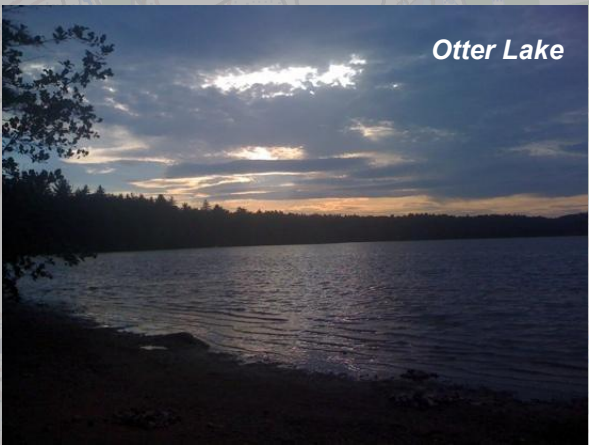
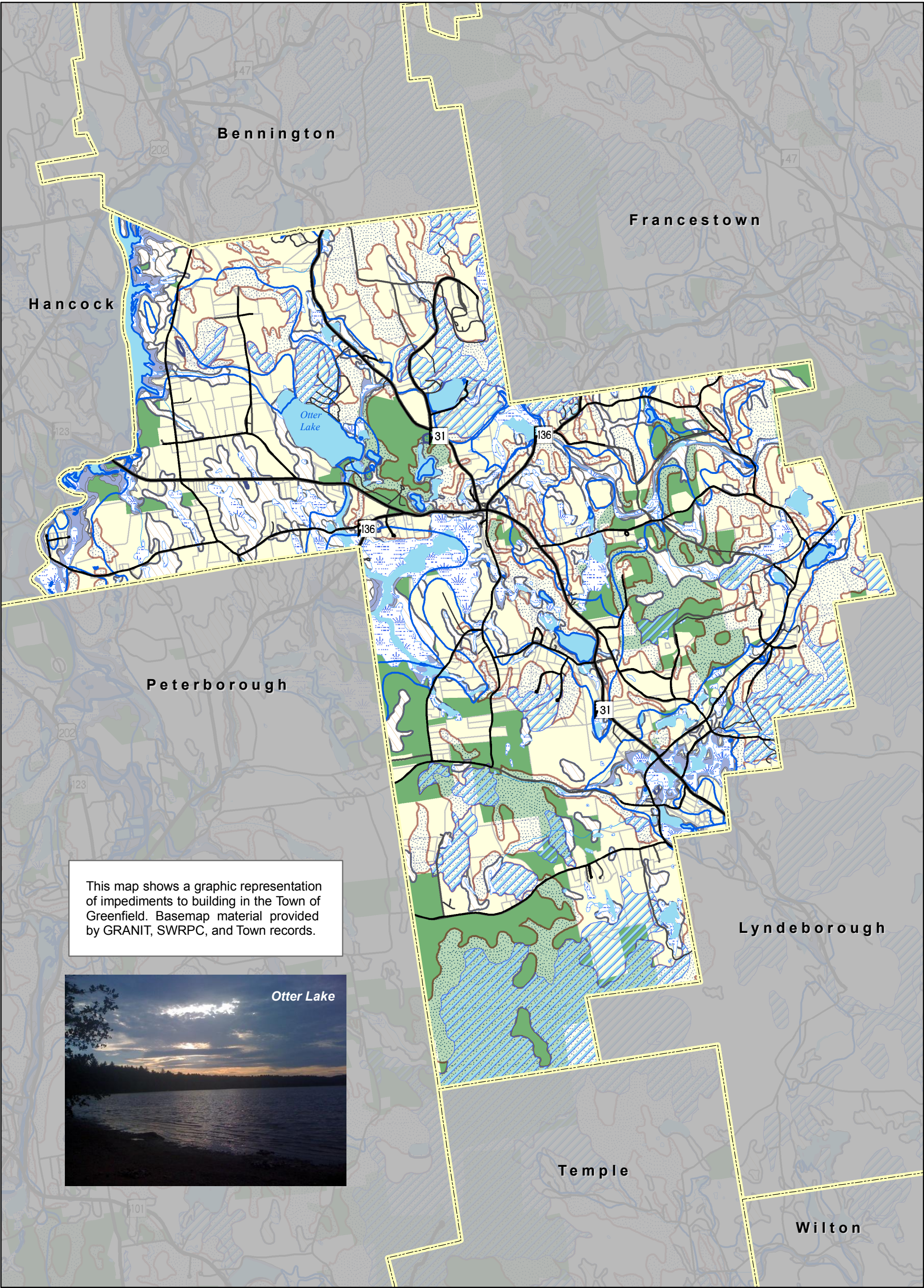



0 1 2 Miles




\* Single family consists of single family homes, vacant homes, outbuildings, and mobile homes on a single lot.









Town Boundary



Parcel Boundary




Conservation Land




Slopes > 15%

Town of Greenfield, New Hampshire


Development Constraints




Poorly and Very Poorly Drained Soils




Shallow to Water Table (Less Than 1.5')




Depth to Bedrock 40' or Less




100 Year Floods



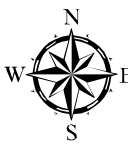
Lakes and Ponds



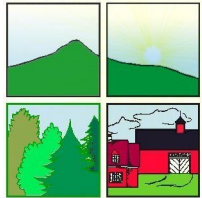
Rivers and Streams



Wetlands



0 0.5 1 Mile



**Southwest  
Region  
Planning  
Commission**

Map Not to be Used For Conveyance.  
Y:\MAPS\Greenfield\Grf\_DevelopmentConstraints\_020813.mxd February 2013



# CHAPTER IX

## FUTURE LAND USE PLAN



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# **FUTURE LAND USE PLAN**

## **I. INTRODUCTION**

Land is Greenfield's most basic resource. As such, its use determines the character and quality of community life. The rate of growth, type and location all directly affect the physical appearance of the Town, the need for certain public services and facilities, and the cost of providing these services. Change is inevitable so Greenfield must be prepared to face future development.

Thus, in creating a Master Plan to guide Greenfield's growth, it is the Future Land Use Plan that is the core of a comprehensive planning program. It is this document that reflects the best thinking and wishes of Greenfield residents regarding all future development in Town.

Certain assumptions are made in anticipating future development in Greenfield. Based on the data collected and analyzed in the preceding sections:

- Based on both historical trending and current OEP projections, Greenfield should experience only minor population growth in the coming ten years.
- The road network in and through Greenfield will remain unchanged over the next ten years, aside from regular maintenance and improvements. The roads carrying traffic through Greenfield, i.e. Route 31, Route 136, and Forest Road, will continue to serve as subregional major collectors.
- A high proportion of Greenfield residents participate in the labor force and regional economy. In the coming ten years, there will be increased instances of telecommuting and self-employment. We will also see an increase in individuals transitioning into retirement.
- Agriculture will not be a notable land use, nor will it be a significant contributor to the local economy.

## **II. GOALS, OBJECTIVES, AND STRATEGIES**

In any planning process, it is inevitable that some goals will conflict with others. Residential and commercial development, for example, invariably conflicts with agricultural use and open space preservation. One of the purposes of this Plan is to set objectives and establish clear strategies, where appropriate, that will guide future growth in a manner that best accommodates both protection and development.

In small towns such as Greenfield, it is sometimes more appropriate to base future land use decisions on development objectives, rather than specific strategies. In such towns, where future growth is not anticipated in large numbers, the form in which most growth takes place is the development of individual properties. The Plan, then, expresses a general concept of development and is considered to be a realistic means of managing future growth.

### **Land Use**

Overall, land use patterns in Greenfield are dominated by residential development of mostly single family detached homes, with an infrequent occurrence of manufactured, two family, and multi-family housing units. Also of significance in terms of concentrated residential development are the designated village districts, where residential density is higher than in other parts of Town. This general pattern is not expected to change, although the Planning Board is very concerned about development occurring in a sprawling pattern along the roads throughout town. Additionally, the

Planning Board recognizes the need for a greater variety of housing options available to meet the needs of Greenfield's changing demographics.

Agriculture, while significant in the heritage and historical development of the town, does not play a significant role in the local economy. It is unlikely that this will change in the foreseeable future, due as much to national trends in farming as to anything else. Therefore, how far land use regulations can or should go to protect farmland that is not being farmed must be carefully considered. It is, however, the intent of the Planning Board to preserve our natural resources, open space, and farmland while balancing the needs of the community.

### **Community Facilities**

Based upon the information collected in the Basic Studies section, Greenfield currently meets the community facilities needs of its residents, and expects to do so into the near future. The most significant changes, since the 2003 Master Plan, are the addition of a community gravel pit; the installation of sidewalks, street lights, and a community septic system serving the Business District; significant improvements to the Recycling Center including truck ramps as well as a number of building improvements; and a substantial addition to the Library that doubled useable space and vastly expanded community offerings.

Specific town facilities are in need of significant repair and a need to develop a maintenance schedule. The Greenfield Meeting House as well as the Town Offices/Police building are targeted for maintenance/improvement, with the specific enhancements needed being determined and alternate funding sources sought in order to fund the improvements.

There is the potential to leverage the old Town Offices building on Francestown Road as the Crotched Mountain lease expires (mid-2020s). There is a need for greater handicapped accessibility across Greenfield town facilities, and that building is believed to be handicapped accessible.

The Town could, however, expect to have a large proportion of its population in need of services for seniors. Reference to the *Population and Housing Analysis* illustrates that the largest age category as of 2010 was the 45-59 year-olds. This represents a marked aging of the Greenfield population as seen against the 2000 analysis. This trend is expected to continue (factors such as out-migration notwithstanding), and in ten years the age structure in Greenfield is expected to again have shifted in favor of older demographics.

Money to fund education in New Hampshire comes primarily from local property taxes. Costs for education continue to be at the center of major state-wide and district debates, in the Court as well as in the Legislature. With declining school age population, school tax revenues continue to be viewed as excessive across the majority of the Conval towns. This has led to challenges that may lead Greenfield to consider alternate schooling options.

### **Economic Development**

The existing land use analysis demonstrates that Greenfield has a limited amount of commercial or industrial development. Greenfield is predominantly a rural residential community. The community values recreational, agricultural, and silvicultural land use.

The vast majority of Greenfield working residents commute out of town. A small proportion of residents work within Greenfield, including at local businesses or via telecommuting options from their employers. This plan continues to recognize the importance of flexible working options and the emerging importance of high-speed internet access to sustain and encourage professional opportunities. It further supports the continuation of relevant provisions for such uses in the Greenfield Zoning Ordinance. In addition, all reasonable efforts to support existing businesses and attract new businesses are encouraged, as recommended in the 2014 Planning Charrette (e.g. in-fill development to encourage economic development).

In recognition of the desire to encourage new business creation, modifications have been proposed to our town ordinances to remove restrictions based on type of business and move to utilizing impact criteria as the primary consideration. Further, efforts such as streamlining the submission and approval criteria have been made to simplify the process from a regulatory standpoint. This is a continuing process and we are committed to diligent review for options to expand business potential within the Town of Greenfield.

A key aspect of attracting new business in the age of information and beyond is exhibiting the technical infrastructure to stimulate and sustain growth. This includes continuously improving the functionality of the town website with easily accessible information on the town, business development opportunities and regulations, and contact information.

Modern businesses require cost-effective and scalable access to high-speed network infrastructure in addition to their traditional physical requirements (transportation, water, waste disposal, etc.).

### **Traffic and Transportation**

Greenfield's road network is long established; virtually every road in use in town today has been in existence for the better part of a century or longer. New plans have been put in place for maintenance of the existing gravel and paved roads in town. This plan for paved roads includes repaving roads more frequently, with budgetary support for annual road maintenance. Maintenance of culverts throughout town is a recognized issue, and a plan is being developed to address same. We have no expectation of new road construction being necessitated within the foreseeable future.

Tools are available to aid local municipalities in evaluating road conditions and prioritizing projects (e.g. the SADES Road Surface Management System (SRSMS) leveraging the Statewide Asset Data Exchange System (SADES) created by the Technology Transfer Center of the University of New Hampshire with the involvement of the NH DOT). Such tools may be of aid to our Selectmen and the DPW Supervisor in planning future road improvement projects.

Paved road reconstruction is currently funded through annual warrant articles. To streamline planning and smooth tax impacts on residents, the community should evaluate alternative funding mechanisms such as capital reserve accounts.

As mentioned in the Traffic and Transportation chapter of this plan, three Greenfield roads are classified as Major Collectors. These roads are designed to move medium traffic volumes at low speeds between or within communities, including moderate trucking traffic. No significant changes to the traffic type, traffic amount, or the communities connected are expected that would impact the road network. Likewise, based upon the population statistics, the Town is not expected to experience any significant population increase that would unduly impact the road network.

Nevertheless, development in remote or inaccessible areas of town will continue to be closely regulated. For example, allowing development on Class VI roads can be problematic as Class VI roads are generally not able to accommodate any significant volume of traffic. The Planning Board should closely scrutinize all development proposals to determine their possible impact on the roads in the area and the ability of the Town to adequately maintain them. A Private Road policy is in place to guide the Selectmen and the Planning Board during an application review process.

### **Energy**

It is the intent of Greenfield to become more energy efficient and reduce the need for energy that relies solely on fossil fuels. Individual homeowners have pursued solar as a key mechanism for reducing fossil fuel reliance and their respective costs.

A key opportunity exists at the town level to develop ways in which town facilities can reduce energy use and our resulting carbon footprint. This includes ensuring that our facilities are as energy efficient as possible and researching alternative energy solutions for municipal buildings.



Such research should also include investigating potential opportunities such as group net metering and large scale alternative energy projects.

### **Housing**

The most recent Housing Analysis conducted by the Southwest Region Planning Commission (as required by the New Hampshire Legislature in RSA 36:47) was conducted in 2006. A key continuing question for the Housing Analysis is the opportunity afforded by a town's zoning ordinance to develop a variety of housing types.

Examination of the Greenfield Zoning Ordinance reveals the following provisions relative to housing opportunity:

- Single family homes are permitted by right in all Districts.
- Duplex dwellings are permitted in the General Residence District.
- Multi-family units (up to 4 units) are permitted in the General Residence District, Business District and Center Village District. Multi-family units (up to 25 units, only for HUD-eligible elderly) are permitted in the Business District.
- Up to 3 Attached Accessory Dwelling Units are permitted by Special Exception in the General Residence District, Business District, and Center Village District.
- Manufactured housing is permitted in the General Residence District, Business District, Center Village District, and Rural/Agricultural District.
- Backlot development is permitted in the General Residence District, Center Village District, Lake Village District, and Rural/Agricultural District subject to certain conditions.
- Elderly housing is permitted in all Districts subject to Special Exception approval by the Board of Adjustment.
- Open Space development is permitted in the General Residence District and Rural/Agriculture District, subject to certain conditions.

Based on this review of the zoning ordinance, it appears that there are provisions for the development of a variety of housing types to meet a range of income levels and needs, including special needs of the elderly. The provisions for Attached Accessory Dwelling Units provides additional means for the elderly to stay in their homes - either by renting the apartment for income or services in kind or by moving into the apartment and renting the larger house. These provisions also enable options for young families and professionals to stay within or move to our Town.

In addition to residential development zoning regulations, Greenfield adopted the State Building Code, per RSA 155-A, enforced by our Code Enforcement Officer, to guide reasonable and permitted development. Additionally, maps such as the *Development Constraints Map* indicate where one might expect problems and development is regulated accordingly. This allows each site to be developed based upon its particular characteristics, as determined by on-site examination.

### **Natural Features**

Repeated Master Plan survey responses and Vision Statement Community Conversations, as well as the 2014 Planning Charrette, showed that conservation and open spaces are very important to the residents of Greenfield. Preserving critical open space areas is vital to maintaining not only the environmental health of Greenfield, but also the natural identity and recreational opportunities that are so closely connected to the Town. Quite a bit of land is already protected in some fashion, either through public or private conservation efforts or deed restrictions. This plan recommends continued

support of the efforts of the Conservation Commission to preserve and protect significant and sensitive lands and water bodies in Greenfield.

Preservation of the rural characteristic of the Town is also deemed to be valuable to the Economic Development of the Town, both in terms of recreational business development opportunities and the appeal of an attractive landscape and locale for non-recreational businesses and their employees.

### **Construction Materials**

The earthscape of Greenfield is primarily sand and gravel, with quality topsoil at a premium. It is the intent of the town to protect the integrity of the landscape to the greatest extent possible, while permitting reasonable earth excavation within local and state regulations. This includes such requirements as ensuring that disturbed areas are appropriately landscaped after any approved excavations, which may necessitate performance bonds to cover reclamation costs.

## **III. ADMINISTRATION AND IMPLEMENTATION**

The Future Land Use Plan set forth in this document and its accompanying maps envisions a comprehensive program for the Town of Greenfield to direct the development of the Town in an orderly and thoughtful manner. Unless the proposed goals, objectives, and strategies are adopted and implemented, the Plan will probably not accomplish its purpose.

The term "administration" refers here to those activities that direct and manage the Town's municipal affairs. Greenfield is administered by a three-member Board of Selectmen, assisted by a Town Administrator. The Town Meeting is the legislative body of the Town, and the Selectmen represent the executive, or administrative, arm of that body. In addition to the Selectmen, other local boards participate in municipal government, i.e., the Planning Board, Board of Adjustment, Conservation Commission, and other appointed entities. This form of government relies heavily on part-time officials serving in a wide range of capacities. Some of these functions relate directly to the goals, objectives, and strategies of this Master Plan, others less so.

The Future Land Use Plan contains three levels of planning components:

1. Broad, general goals to be followed for the Town's future development.
2. Objectives related to the Basic Studies in:
  - Land Use
  - Economic Development
  - Housing
  - Energy
  - Community Facilities
  - Traffic and Transportation
  - Natural Features
  - Construction Materials

3. Specific strategies for action that will help the Town achieve the goals and objectives.

Implementation of the goals, objectives and strategies can be accomplished in a number of ways; some items would require no more than official endorsement by the Selectmen. Others, however, include the Planning Board, Economic Development Advisory Committee, and the Conservation Commission.

**Purpose**

The purpose of this Plan is to make and document recommendations for the desirable development of the community, including:

- Streets and transportation facilities.
- Location of public buildings, properties, and utilities.
- A zoning plan for control of the uses and siting of private, commercial, and public structures, and of population density.
- Steps necessary to preserve valued features, clean water, and a safe environment.

The Plan provides guidance for the accomplishment of coordinated and harmonious development in order to promote:

- Health, safety, convenience, prosperity, and general welfare.
- Efficiency and economy in the process of development.
- Good civic design.
- Wise and efficient expenditure of public funds.

Today, southern New Hampshire is experiencing slow growth. Predictions are that Greenfield's population will increase by approximately ten percent over the next twenty years. The collection of studies, maps, and reports accompanying this plan represents a data-base from which to visualize long-range growth in Greenfield. By understanding past trends and future potentials, solutions to the problems of growth become clearer.

This Plan is intended not as an edict, but rather to serve as a guide for the community as a whole to use in shaping its future over a period of years to come. It is therefore sufficiently general to permit wide interpretation without damage to its basic intent, sufficiently flexible to allow modification as conditions change, and reasonable enough to encourage good, enforceable legislation with due respect to the rights of all.

The Master Plan is not a town regulation, and has no power in law. However, if well-framed and practicable, it should suggest laws, regulations, or ordinances which may serve to carry out its prime purposes. It does not embody solutions to all municipal problems; rather it is a guide to aid town officials in attacking these problems. Unless it is understood and used, unless it is consulted often and amended when necessary, it will be of little value to the Town's future generations.

**General Objectives**

1. Protect the health, safety, security, and welfare of all inhabitants of Greenfield.
2. Accommodate growth and development in such a manner as to preserve and enhance the rural character, charm, and visual appeal of Greenfield, as expressed in the Master Plan Vision Statement.
3. Assure that development occurs in an orderly, progressive manner, considered in relation to its impact on the services and economy of the Town.

4. Assure that the Town's government is conducted in an efficient and economical manner, and in the best interest of its citizens.
5. Encourage the greatest possible public awareness and citizen participation in Town affairs.
6. Encourage cooperation and coordinate planning efforts with surrounding communities.

## Implementation Plan

A Master Plan is not fully complete without a mechanism that sets the wheels in motion for actions to be taken to implement it. The matrix below is a compilation of strategies that can be explored to help meet the goals and objectives in each chapter of this Master Plan. The strategies include the leadership of different members of the Town staff and Town Boards, Commissions, Committees, and organizations. To maximize the success of this plan, there should be an annual meeting between all of the parties identified in the leadership column of this matrix. This will keep the plan fresh and can be a catalyst for conversation and action.

<b>Community Facilities Chapter</b>			
<b>Goal:</b> Maintain community facilities and services that meet the current and future needs of Greenfield residents in an efficient manner.			
<b>Objective 1:</b> Provide town services to better meet the needs of residents and improve the quality of life in Greenfield.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Determine where improvements can be made in town services; add services based on these findings.	Board of Selectmen & Planning Board	2018	Survey residents or hold public informational meetings; Town budget.
2. Investigate upgrading the Town website to process on-line forms and applications.	Town Administrator	2018-2019	Update and upgrade the website; Town budget.
3. Investigate enabling on-line motor vehicle registration.	Town Clerk	2017-2018	Install needed software; Town budget.
4. Assess recreation services and facility needs.	Board of Selectmen/Buildings & Grounds staff/Town Administrator	2018-2019	Buildings & Grounds input; Town budget.
<b>Objective 2:</b> Make strategic improvements to town facilities to reduce operating costs and to extend the structural integrity.			
Strategy/Action			
1. Have an energy audit done for the municipal facilities to determine ways to reduce energy costs to the Town. Prioritize projects and develop a schedule to implement the findings.	Board of Selectmen (Buildings & Grounds staff & Town Administrator)	2017-2019	Hire a consultant; Town budget and grants.
2. Perform routine and scheduled maintenance on facility operating systems.	Buildings & Grounds staff (Board of Selectmen & Town Administrator)	Annually	Continue proper maintenance and inspections; Town budget.

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Strategy/Action	Leadership	When	How/ Funding & other resources
3. Plan for and maintain a Capital Reserve Fund for improvements.	Planning Board (Board of Selectmen)	Bi-annual (plan)/ annual (maintain)	Warrant article; Town budget.
4. Assess the work that is needed at the Meetinghouse to restore the structure for use as a multi-purpose public meeting facility, including improvements to public safety, accessibility, sound amplification system, energy efficiency, and historic preservation.	Board of Selectmen/Town Administrator	2018	Coordinate with the Greenfield Improvements Association; Town budget and grants (Moose plate, LCHIP).
<b>Objective 3:</b> Provide adequate and appropriate facilities for meetings, storage, and general Town operations.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Assess the options for additional storage space for town records, including fire security and climate control.	Town Administrator	2018-2019	Coordinate with Police Chief, Town Clerk, and Tax Collector; Town budget.
2. Determine the facility needs for the Highway Department by projecting the future operational and storage needs for equipment and materials needed to adequately maintain Greenfield roads.	Department of Public Works	2018-2019	Communicate to Planning Board and Board of Selectmen (CIP); Town budget.
3. Consider the reconfiguration of the recycling facility to improve efficiency and revenue.	Recycling	2018-2019	Communicate with Recycling Center Supervisor (include in CIP); Town budget.
4. Assess the Old Office Building to reintegrate its use for municipal purposes, including additional office space. Improvements to consider include energy efficiency, accessibility, historic preservation, etc.	Board of Selectmen	2018-2019	Coordinate with Planning Board, Building & Grounds, department heads & Town Office. Collaborate with CMRC to inspect the building; Town budget.
<b>Objective 4:</b> Upgrade public facilities to meet emerging needs.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Consider a training facility for local and regional fire and rescue operations.	Fire Chief	2018-2019	Determine the need and feasibility; Town budget, grants, fund raising, regional resources.

Strategy/Action	Leadership	When	How/ Funding & other resources
2. Add up-to-date audio/visual equipment in meeting rooms (i.e. projector, smart board/screen, etc.).	Planning Board & Town Administrator	2018	Determine updates needed; Town budget.
3. Investigate digitizing town records.	Town Administrator	2018-2019	Scanning of records; Town budget.
<b>Population &amp; Housing Chapter</b> <b>Goal:</b> To have a range of housing options to meet the current and future housing needs of Greenfield residents.			
<b>Objective 1:</b> Consider innovative approaches to providing housing options to all ages, income levels, people with disabilities, and household size.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Attend planning sessions and webinars on housing issues to maintain the latest planning techniques.	Planning Board	Ongoing	Attend conferences; Town budget.
2. Update ordinances and regulations to incorporate latest planning techniques to provide for optimal housing alternatives; consider innovative land use approaches.	Planning Board	Ongoing	Annual review; Town budget.
<b>Economic Development Chapter</b> <b>Goal:</b> To have a mix of innovative and traditional businesses, including home-based businesses, which maintain the character of the neighborhood and quality of the natural environment.			
<b>Objective 1.</b> Expand Business and Employment Opportunities in different employment sectors.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Develop a promotional campaign to highlight and market the economic development opportunities that Greenfield has to offer.	Economic Development Advisory Committee (EDAC)	2017	Through the Economic Development Plan; Town budget.
2. Update the Town website to show that Greenfield is a “business friendly community”. Make information available on-line to encourage business development.	Economic Development Advisory Committee (Board of Selectmen)	2017	Website update by the IT contractor; Town budget.
3. Expand the property tax base by encouraging home-based businesses, promoting in-fill and mixed-use development, retaining existing employers and recruiting new employers.	Economic Development Advisory Committee	Ongoing	Coordinate with the Planning Board for zoning amendments; Town budget.



<b>Objective 2.</b> Provide for utility and infrastructure that allows for the desired and appropriate economic growth for Greenfield.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Support efforts to expand the availability and quality of broadband infrastructure through local broadband planning and support funding needed for implementation.	Economic Development Advisory Committee	2018-2020	Explore funding options; Town budget.
2. Explore options for 3-phase power to industrial land on Forest Road.	Economic Development Advisory Committee	2017	Communicate with Eversource and local businesses; Town budget.
<b>Objective 3.</b> Continue to build local support for economic development.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Coordinate efforts with the Economic Development Advisory Committee to pursue the economic development objectives of the master plan update and to advise and inform local government and residents.	Economic Development Advisory Committee (Board of Selectmen)	Ongoing	Standard policies and practices; Town budget.
2. Review permitting procedure for new applications to prevent delays or obstacles for potential businesses.	Planning Board	Annual review procedure	Coordinated effort between EDAC and Zoning Enforcement Agent; Town budget.
<b>Land Use Chapter</b> <b>Goal:</b> Maintain the existing rural atmosphere of the Town while allowing for appropriate growth.			
<b>Objective 1:</b> Develop policies to meet emerging needs of the community while maintaining the rural character.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Review and consider revising land use regulations to address potential barriers to home based businesses.	Planning Board	Annual review	Review Zoning Ordinances and Site Plan Review Regulations for barriers; Town budget.
2. Consider adopting innovative land use approaches (such as found in RSA 674:21) such as conservation subdivisions. Provide options to the development of land that considers the conservation of land as an integral part of the overall project.	Planning Board	2017-2018	Hire a land use consultant; Town budget.

Strategy/Action	Leadership	When	How/ Funding & other resources
3. Support activities that promote agricultural practices to younger generations such as farm-to-school initiatives and school gardening and composting programs.	Planning Board	2018	Send a letter to Greenfield School Principal; Town budget and grants.
4. Consider occasional Community Marketplace event(s) on town property.	Economic Development Advisory Committee (Board of Selectmen)	2019	Discuss the feasibility and logistics of such an event; Town budget and grants.
<b>Objective 2:</b> Maintain Greenfield's Heritage and Historical Significance. The historical buildings, cemeteries, stone walls, and gathering places should be maintained to provide protection for these significant town treasures.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Consider the creation of a Heritage Commission.	Planning Board	2018	Meet with the Historical Society; Town budget
<b>Traffic and Transportation Chapter</b>			
<b>Goal:</b> To provide for the safe transportation of people and goods for all modes of transportation available in Greenfield. Seek to expand transportation options.			
<b>Objective 1.</b> Improve roads, ditches, culverts, and bridges to handle stormwater during heavy weather events.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Maintain an inventory of road, culvert and bridge conditions with sufficient detail to include in the Capital Reserve Funds to cover anticipated costs.	Department of Public Works	2018	Review SADES-RSMS program to assess its viability for the town. Work with the Town Administrator and Board of Selectmen; Town budget and grants.
2. Identify funding sources to improve and expand stormwater management efforts. Explore grant opportunities through State and Federal sources such as NH DOT, FEMA, and NHSEM for culvert upgrades, erosion control, bridge repair/replacement, etc.	Town Administrator (Department of Public Works)	Ongoing	Coordination between the Town Administrator and the Department of Public Works; Town budget.
3. Maintain a dialog with NH DOT on concerns for improvements needed to State highways. Identify and advocate for transportation projects to be included in the New Hampshire Ten Year Transportation Plan. Work with SWRPC through the Transportation Advisory Committee on potential projects.	Planning Board (Greenfield SWRPC Commissioner)	Annual	Dialog between the Town Administrator, Board of Selectmen, Planning Board, and Department of Public Works; Town budget.

<b>Objective 2.</b> Ensure that safe passage is available for pedestrians and bicyclists.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Investigate the benefits and appropriate application of Complete Streets options.	Planning Board	2018-2020	Work with NHDOT and SWRPC; Town budget and grants.
<b>Objective 3.</b> Support rural driver networks to provide rides for residents to regional facilities for medical appointments, employment, shopping and entertainment.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Provide outreach assistance to driver networks by helping to recruit local volunteer drivers (using town website, newsletter, etc.).	Town Administrator	2017	Contact SWRPC for link to directory for volunteer driver network; Town budget.
2. Support volunteer driver programs.	Board of Selectmen	Ongoing	Continue to make donations to programs; Town budget.
<b>Energy Chapter</b> <b>Goal:</b> To become more energy efficient and reduce the need for energy that relies solely on fossil fuels.			
<b>Objective 1.</b> Develop ways in which the town facilities can reduce energy consumption through conservation.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Review the town's current weekly operations of facilities. Consider ways in which the hours of usage may be reduced.	Town Administrator	2018	Contact NHOEP and Eversource for assistance; Town budget and grants.
2. Consider motion sensors for indoor and outdoor lighting in Town facilities where appropriate.	Town Administrator	2018	Contact NHOEP and Eversource for assistance; Town budget and grants.
<b>Objective 2.</b> Develop ways in which town facilities can reduce energy consumption through improving on efficiency.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Seek opportunities to provide funding for an energy audit of all town facilities. Set a schedule to conduct the audits.	Town Administrator	2018	Research energy conservation grants; Contact NHOEP, SWRPC, and Eversource for assistance; Town budget.

Strategy/Action	Leadership	When	How/ Funding & other resources
2. Replace outdated appliances and equipment with energy star rated appliances/equipment.	Town Administrator (Buildings & Grounds staff)	Ongoing	Coordination between Town Administrator and Buildings and Grounds staff; Town budget and grants.
3. Replace fluorescent bulbs with LED bulbs.	Town Administrator (Buildings & Grounds staff)	Ongoing	Maintenance activity; Town budget and grants.
4. Utilize standard weatherization practices such as caulking windows and doors, install window blinds and curtains, improve insulation, etc.	Town Administrator (Buildings & Grounds staff)	Ongoing	Coordination between Town Administrator and Buildings and Grounds staff; Town budget and grants.
Objective 3. Reduce Greenfield's overall carbon footprint.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Consider the use of alternative fuels in Town vehicles.	Board of Selectmen	2022	Research cost effective options; Town budget and grants.
2. Determine the feasibility of installing solar panels or other alternative energy sources in public facilities. Develop a cost/benefit analysis for the buildings that are capable of supporting the alternative energy source.	Board of Selectmen	2018-2020	Form an Energy Committee; Town budget and grants.
3. Develop an outreach campaign to enhance the public awareness on ways in which they can reduce energy consumption through greater conservation and improved energy efficiency. Host an event with a presenter from NHOEP, UNH Cooperative Extension, Eversource, or other.	Energy Committee and Library	2018-2020	Develop material to add to the website and newsletter. Organize town event with presenters; Town budget and grants.
4. Develop a solar ordinance and resource materials for individuals to use as a guide for obtaining individual and group net metering benefits while maintaining the rural character of Greenfield.	Planning Board (Economic Development Advisory Committee)	2017-2019	Review resource material, review ordinances from other towns, and attend energy forums; Town budget and grants.
5. Review the Wind Ordinance and update as appropriate.	Planning Board	2019	Determine if any updates or revisions are needed to the Wind Ordinance; Town budget.

<b>Construction Materials Chapter</b>			
<b>Goal:</b> Protect the integrity of the landscape to the greatest extent possible while permitting the earth excavations within local and state regulations.			
<b>Objective 1:</b> Process applications for earth excavations submitted in accordance with the Greenfield Regulations Governing Earth Excavations and NH RSA 155-E.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Require additional information when necessary to provide the Planning Board with sufficient information to make a decision on the application. Solicit assistance from a third party when needed for professional input.	Planning Board	Ongoing	Consult with Code Enforcement staff when necessary; Application fees.
2. Require specific information on the Reclamation Plan to ensure that the disturbed area will be appropriately landscaped when the operation has ceased. Ensure that the performance bond is sufficient to cover the total costs of reclamation.	Planning Board	Ongoing	Seek advice of a third party when necessary; Application fees.
<b>Natural Features Chapter</b>			
<b>Goal:</b> Protect and preserve our natural resources, significant and sensitive lands, and water bodies for the enjoyment and value they provide to current residents and future generations as well as the many visitors that are attracted to Greenfield.			
<b>Objective 1.</b> Maintain and improve water quality where needed in the rivers, lakes, ponds, and other waterbodies in Greenfield.			
1. Review the NHDES List of Impaired Waters annually to determine waterbodies that are in need of improvements. Monitor changes in water quality reports.	Conservation Commission	Annual	Get the annual list of impaired waters from NHDES and communicate with VRAP and VLAP groups; Town budget.
2. Develop Watershed-based Management Plans for the lakes, ponds, and rivers.	Conservation Commission	2018	Work with SWRPC or other non-profit organization to seek a 604b grant from EPA (NHDES); Town budget or grant.
3. Begin and/or continue participation in programs such as VLAP, VRAP, Lake Host, and Weed Watchers.	Conservation Commission	Ongoing	Seek additional volunteers; Town budget and grants.
4. Develop an outreach and education campaign for topics such as invasive species, stormwater management, septic maintenance, etc. Utilize programs such as <i>Soak up the Rain</i> to implement demonstration projects.	Library	2018	Coordinate with the Conservation Commission and the Code Enforcement staff; Town budget and grants.

<b>Objective 2.</b> Continue to protect forested areas, shorelines, scenic vistas, and farmland through conservation easements and purchases.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Develop a conservation plan to create unfragmented corridors for wildlife and recreation. Determine priority areas for future purchases and conservation easements.	Conservation Commission	2017-2019	Work with a consultant to develop a plan; Town budget and grants.
2. Manage conservation land by monitoring the uses and implementing good stewardship practices.	Conservation Commission	Ongoing	Work with the Town Forester, Monadnock Conservancy, Piscataquog Conservation Commission and others; Town budget and grants.
3. Coordinate with neighboring communities to identify and prioritize tracts of land to consider for conservation that will provide contiguous unfragmented areas for wildlife corridors across borders.	Conservation Commission	2019-2020	Hold a meeting with the Conservation Commissions from neighboring towns; Town budget
<b>Objective 3.</b> Update land use regulations, town policies, and general town practices with innovative approaches to protect and conserve our natural resources.			
Strategy/Action	Leadership	When	How/ Funding & other resources
1. Consider incorporating rain gardens and other stormwater management methods at municipal facilities and encourage them in site plan designs.	Planning Board and Board of Selectmen	2018	Invite a presenter from NHDES to a town sponsored event; Town budget.
2. Consider encouraging voluntary water conservation strategies during times of drought. Provide outreach materials and guidance to residents for methods of conserving water.	Conservation Commission	2017	Develop outreach materials and links to resources to add to the Town website. Invite a presenter from NHDES to a town sponsored event; Town budget.