Demographic, Housing, and Economic Trends 1990-2020 For Seven Communities Served by the Portland Water District

Prepared for
Camp, Dresser & McKee
on behalf of
The Portland Water District

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Demographics, Housing, and Economic Trends 1990-2020

1.1 Introduction and Summary

The Portland Water District (PWD) is undertaking a master plan for its facilities over the next two decades in the communities of Cape Elizabeth, Scarborough, Standish, Gorham, Windham, Falmouth, and Cumberland. The engineering firm of Camp Dresser & McKee (CDM) serves as the principal consultant to the District in this project, and as a part of the long term plan, CDM and PWD need information on both the extent of growth in population, housing, and employment and the location of that growth relative to the area in each community served by the District's water supply services. This report was prepared by faculty and students of the Graduate Program in Community Planning and Development and the firm of Planning Decisions Inc. to provide the information needed for CDM and PWD to proceed with more detailed engineering studies of potential expansions of water supply in the region.

This report presents an analysis of trends over the past decade and presents forecasts of population growth in each town to 2020. Each town is covered in a separate section. This summary provides a comparative overview of the trends in the region. Descriptions of the methodologies used to analyze residential trends inside and outside of the PWD service area and of the forecasts prepared are contained in Appendix 1. Appendix 2 contains detailed data tables.

1.2 Population Growth

Table 1-1 summarizes growth in each community from 1990-2000 and presents forecasts to 2010 and 2020. Four different forecasting methods are used for the seven "suburban fringe" towns examined in this study and two different methods are used for the "urban core". Table 1-1 presents the low, high, and mean forecasts of the methods used summarized at the town level. A discussion of the forecasting methods is presented in Appendix 1. Tables showing the detailed results for each block group and town, along with maps showing how the different forecast methods affect each town are presented in Appendix 2.

The seven towns examined in this study collectively comprise perhaps the fastest growing area in Maine. With about one third of the population of Cumberland County, the towns collectively accounted for two thirds of the population growth in the county over the decade, collectively growing by more than 14,400 (or 21.4%). This is the equivalent of adding a town the size of Windham or Gorham to the region over that decade. However, the growth was not equally

distributed. Cape Elizabeth grew at just over 2%, while Falmouth and Scarborough both grew about 35%.

Table 1-1
Population Growth in the Portland Water District Communities: History and Forecast

Town	1990 Population	2000 Population	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
Cape Elizabeth	8,870	9,068	9,477	9,583	9,729
Cumberland	5,867	7,159	10,081	10,857	11,985
Falmouth	7,610	10,310	16,619	19,143	22,137
Gorham	11,856	14,141	19,247	20,643	22,551
Scarborough	12,518	16,970	27,373	31,143	35,611
Standish	7,677	9,285	12,905	13,878	15,257
Windham	13,020	14,904	19,023	20,069	21,621
Suburban Fringe	**67,418**	**81,837**	**114,724**	**125,316**	**138,892**
Portland	63106	64249	65,393	65,995	66,597
South Portland	24098	23324	22,549	22,199	21,850
Westbrook	16208	16142	16,076	16,043	16,011
Urban Core	**103412**	**103715**	**104,018**	**104,238**	**104,458**
Total PWD Towns	**170,830**	**185,552**	**218,743**	**229,554**	**243,350**

The long term population growth trends used here reveal some important potential changes in the Portland region over the next twenty years. If the decade of the 1990s is essentially repeated over the next two decades, then the population of the suburban fringe will exceed that of the urban core by 2020 (***see Figure 1-1***). This is the case even under the low forecast. As shown in ***Figure 1-2***, Scarborough will become the second largest community in the Portland metro area by 2010, and, under the high growth scenario, it will become the third largest municipality in Maine by 2020. By 2020, Falmouth and Gorham will, under the high growth scenario, exceed the current (and projected) populations of South Portland. Windham will be about the same size as South Portland by 2020 under the high growth scenario. Standish will grow to a community larger than Falmouth today. Only Cape Elizabeth and Cumberland will see relatively slow growth under all scenarios.

Forecasting small geographic areas where population is measured only every 10 years is inherently difficult. Using multiple approaches to forecasting captures a range of possible futures, and permits planning based on different assumptions.

Figure 1-1
Population in PWD Service Area
Urban and Suburban Communities

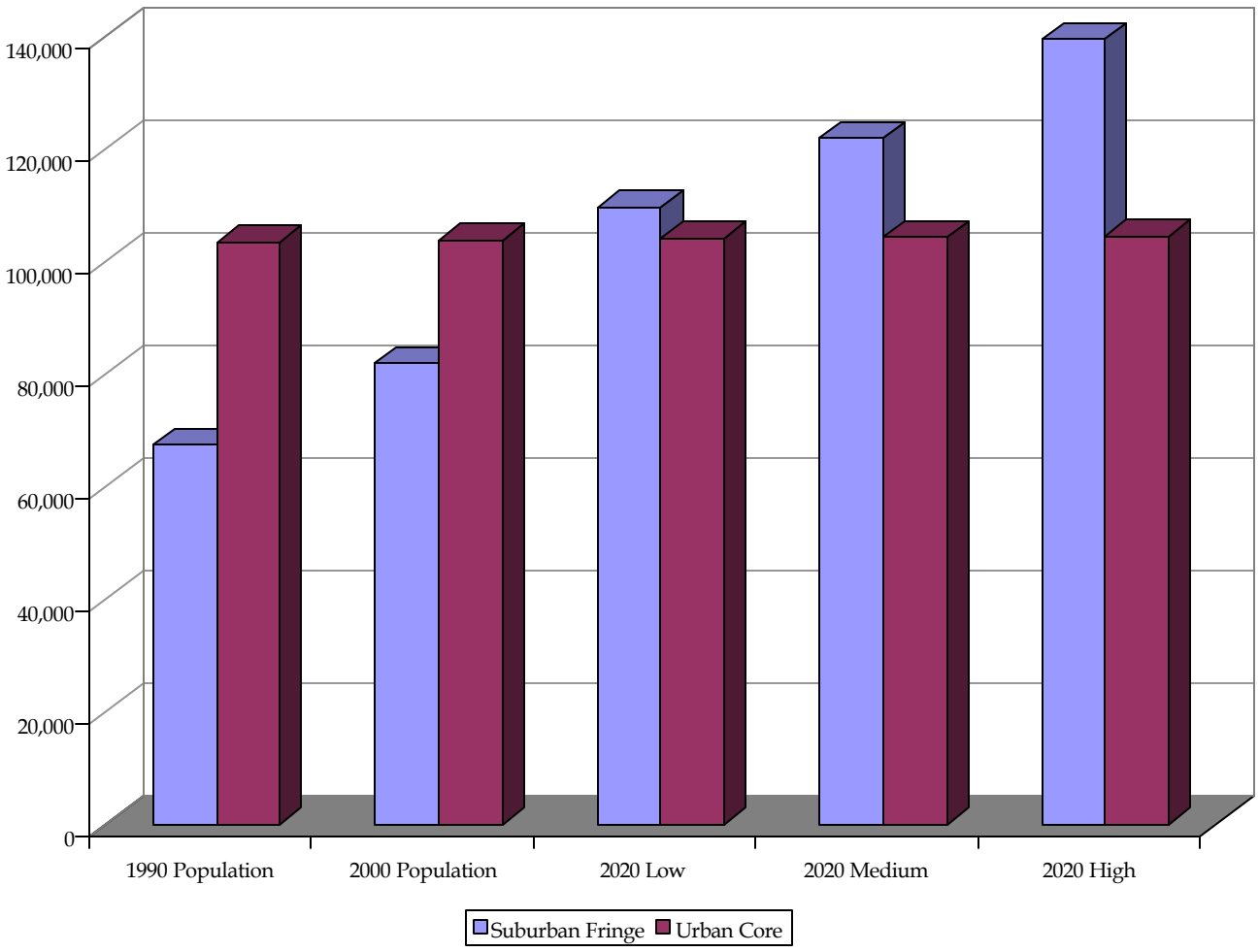
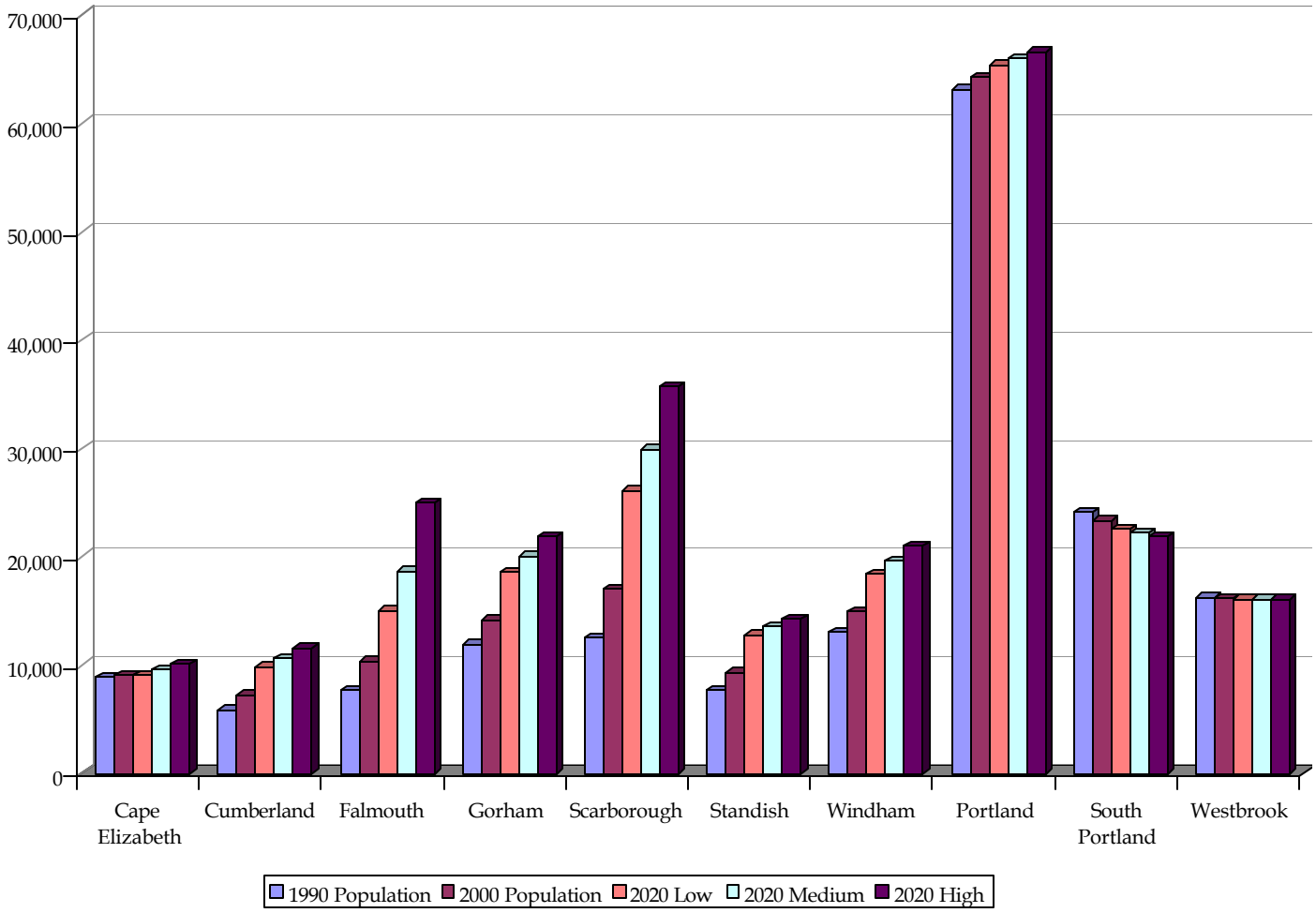


Figure 1-2
Population Forecasts for PWD Communities



However, past trends are at best an imperfect guide to the future. The forecasting methods used do not allow the normal tests of statistical reliability because of the lack of data, and there is always the possibility that significant changes in housing patterns (because of an aging population), transportation routes, or other public policies could alter the past trends. The forecasts at the block group level do not fully account for constraints in each region such as land form, although to the extent these constraints restricted growth in the past, they are also reflected in the future. However, the forecasts should provide a reasonable range of possible futures against which investment needs in the Portland Water District's system can be assessed.

1.3 Population Growths and Future Water Supply

In order to estimate what needs to be done to provide future water supply infrastructure, a key issue is not only the rate of growth, but whether that growth will occur inside or outside of the PWD service area. If growth is concentrated inside the service area, the emphasis will be on upgrading the existing system. If population growth is concentrated outside the service area, there will be pressure to expand the system. CDM will use hydraulic models of the PWD system to test for future investment needs based on estimates of population growth inside and outside the service area. Table 1-2 estimates households within the PWD service area based on 2000 population, the average household size in 2000, and the size of the PWD service area as defined by geographic area using PWD's own mapping of its real extent.

Table 1-2
2000 Population Estimated in PWD Service Area

	2000 Population	% In PWD based on Area	Estimated Population in PWD	Household Size (2000 Census)	Estimated Households in PWD
Cape Elizabeth	9,068	100.0%	9,068	2.57	3,528
Cumberland	7,159	72.2%	5,170	2.80	1,846
Falmouth	10,310	59.1%	6,096	2.56	2,381
Gorham	14,141	19.9%	2,811	2.32	1,212
Scarborough	16,970	48.9%	8,299	2.35	3,532
Standish	6,730	36.9%	2,484	2.72	913
Windham	14,904	8.6%	1,288	2.58	499

Table 1-3 shows two estimates of population growth to 2020 inside and outside the District service area, one emphasizing growth inside and one emphasizing growth outside. Table 1-3 provides data at the town level; these forecasts are presented at greater geographic detail using Census block groups in each community's chapter. (Note that Cape Elizabeth is excluded from

this table since it lies entirely within the PWD service area.) The methods used to derive these estimates are discussed in the Appendix.

Table 1-3
2020 Population Forecast
Inside and Outside of PWD Service Area
Based on "High" Population Forecast

	Growth Concentrated INSIDE Current PWD		Growth Concentrated OUTSIDE Current PWD	
	In PWD	Out of PWD	In PWD	Out of PWD
Cape Elizabeth	Entire Town in PWD Service Area			
Cumberland	6,464	5,055	4,243	7,276
Falmouth	20,461	4,461	17,554	7,362
Gorham	12,270	9,570	8,610	13,246
Scarborough	13,666	2,235	13,333	6,529
Windham	18,703	2,412	8,796	7,770
Standish	1,537	12,680	1,537	12,680

1.4 Housing Growth in the Region

Housing growth in the region has been substantial. Using construction permits filed with each town as a measure of housing growth (and excluding permits for additions, renovations, etc), a total of 6296 permits were issued in the seven towns. As Figure 1-3 shows, Scarborough was the leader in housing permit growth, with more than 1700 permits issued over the period (28% of the town total). The fewest permits were issued in Cape Elizabeth with 340 permits (5.4% of the total).

Over 1990-99, about two thirds of residential growth permits in the seven-town region were within the PWD service are. (***Figure 1-4***) All of Cape Elizabeth's growth and a high percentage of rapidly growing Scarborough's new permits (86%) are in the service area. Falmouth (79%) and Windham (78%) also saw a large percentage of their growth in the PWD service area. A smaller percentage of growth occurred inside the service area in Cumberland and Gorham (58% in each). Standish, with the smallest proportion of its area served by PWD, had only 4.6% occurred within PWD service. ***Figure 1-5*** shows the distribution of permits inside and outside the service area.

Figure 1-3
New Housing Permits 1990-1999

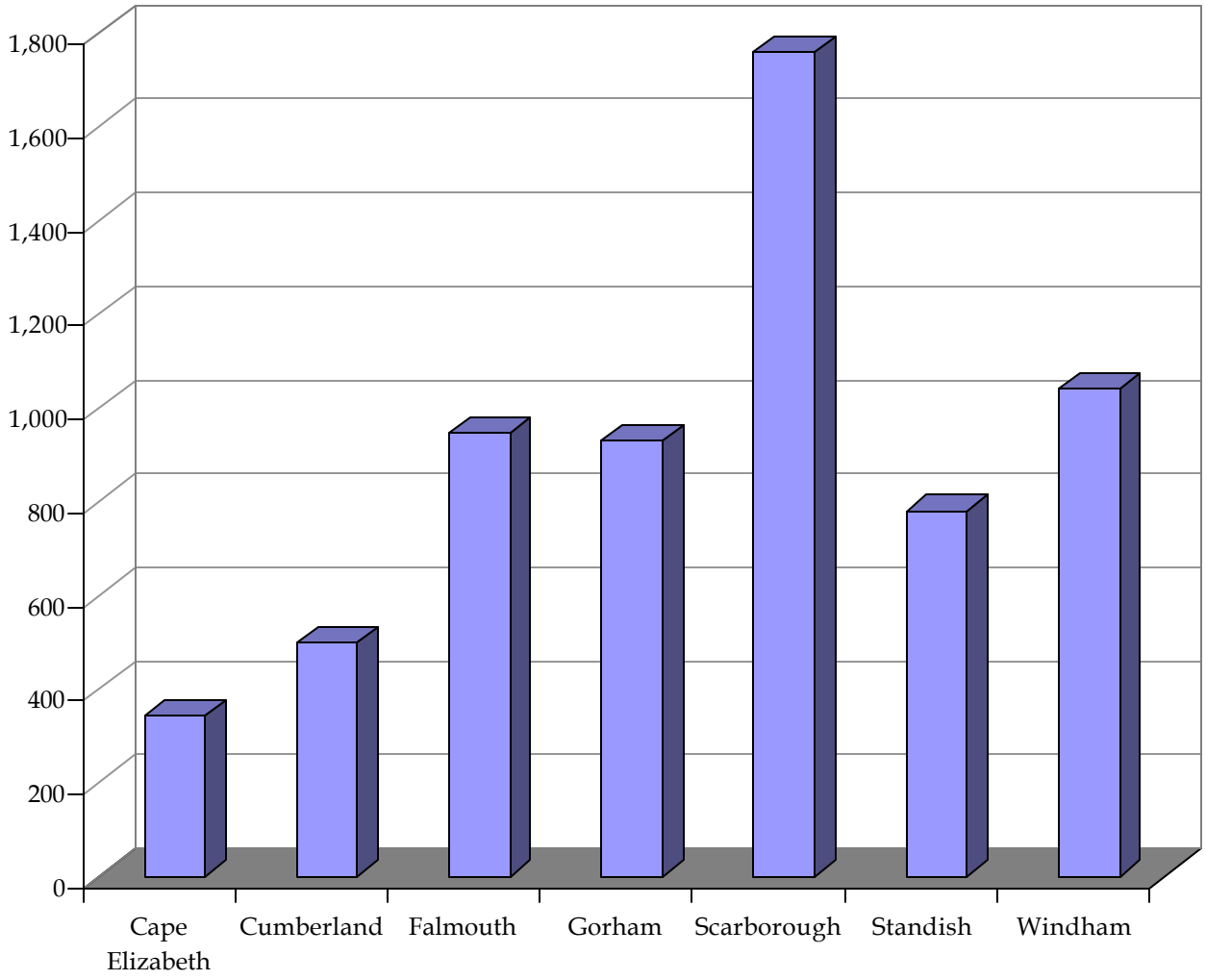


Figure 1-4
Residential Permits Inside and Outside the Portland Water District Service Area
1990-1999

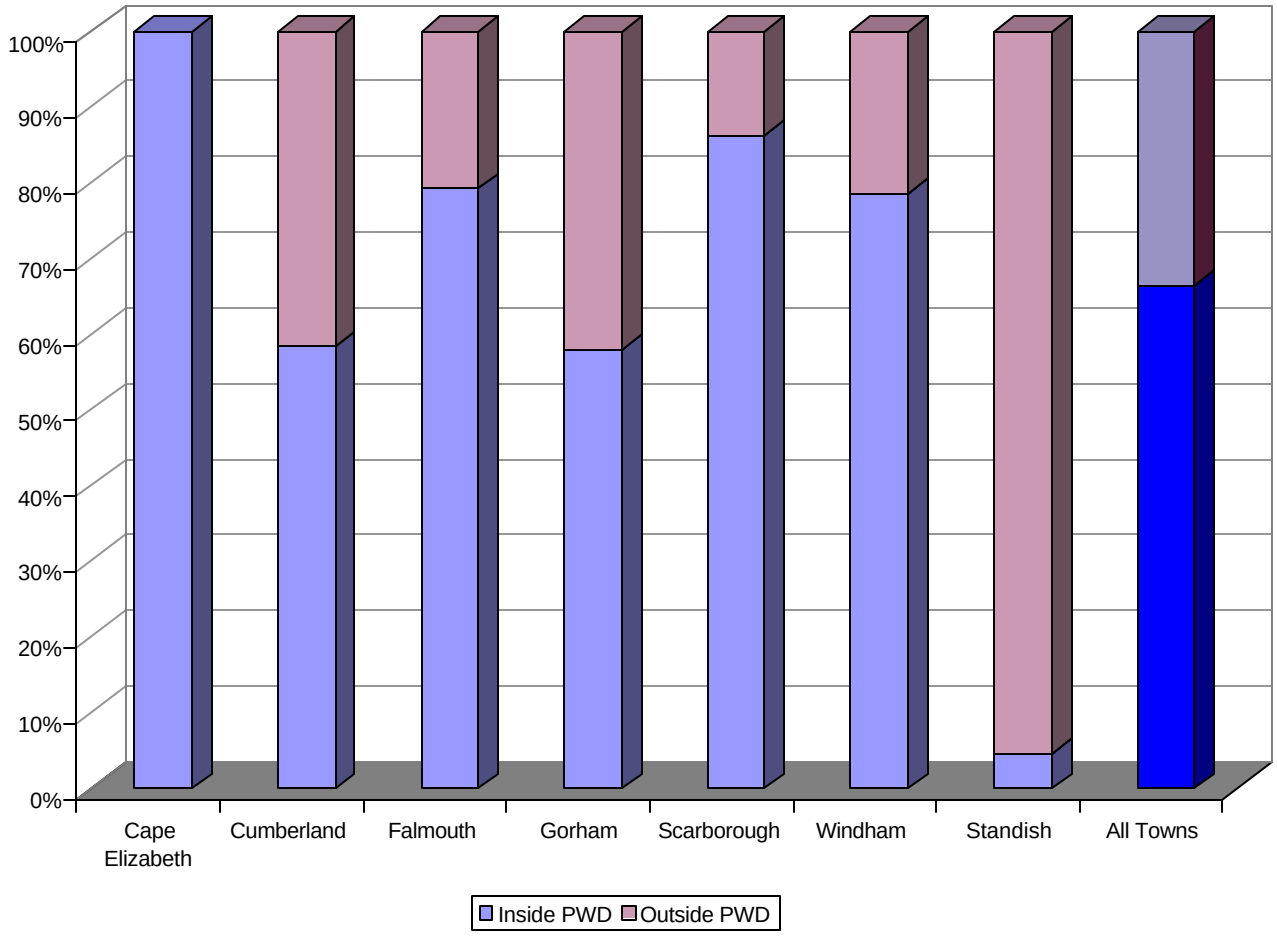
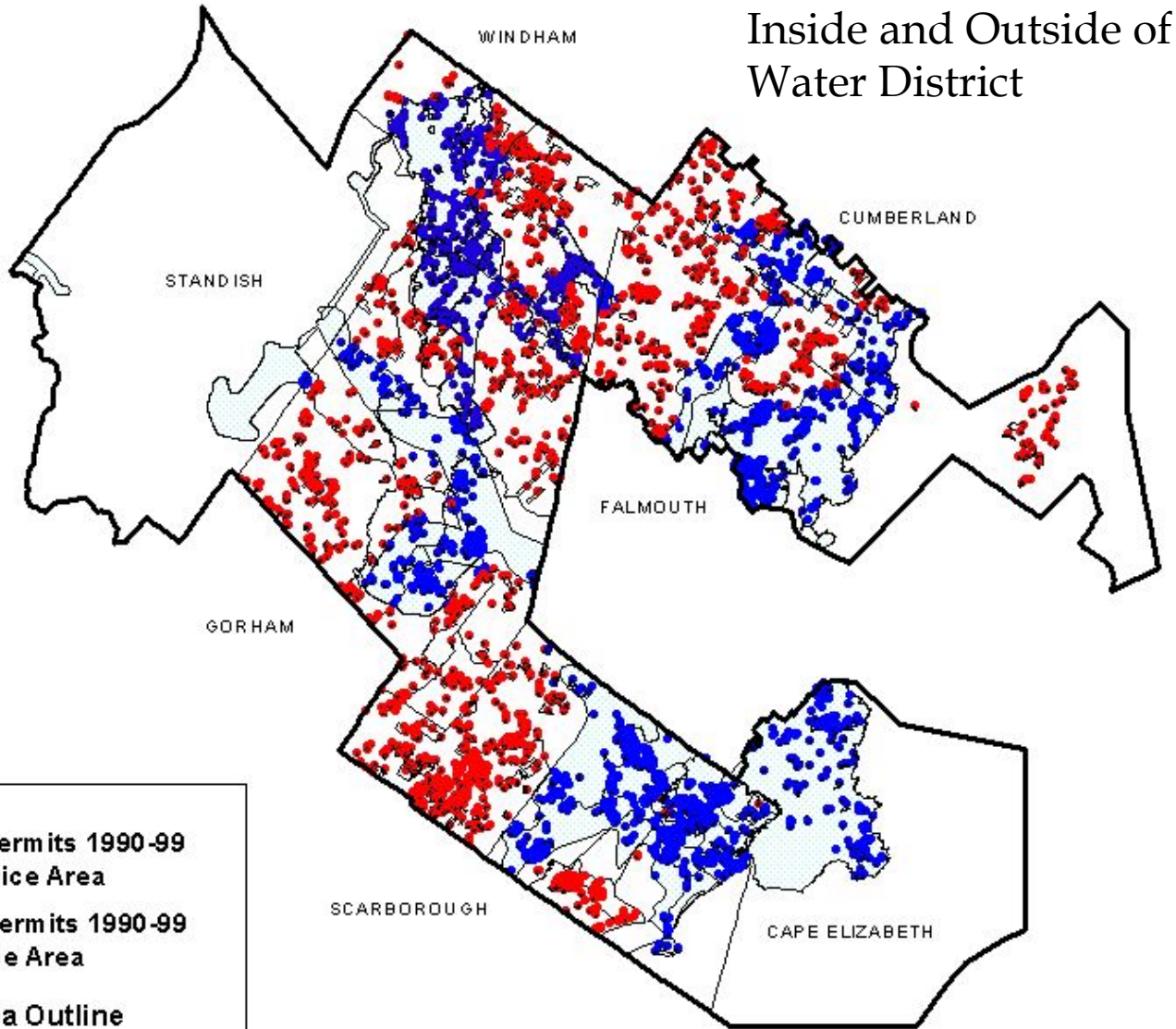


Figure 1-5
Distribution of 1990-1999
Residential Permits
Inside and Outside of Portland
Water District



Block Group-level trends over 1990-99 modify this picture,. With the exception of Cape Elizabeth, with nominally 100% service for current growth, every town has areas where significant growth concentrations have occurred outside water service. In the fastest growing towns of Scarborough and Falmouth, there is a high proportions of growth in the service are, but in each town there are also significant areas of development in their western districts which are outside of water service.

Cumberland and Gorham have experienced significant percentages of their 1990-99 growth (42% each) outside of the water service area, and also particularly in their western districts. The Town of Windham presents a slightly different pattern. Although a high percentage of Windham growth has been estimated to be within water service (78%+), an extensive pattern of development covers the areas directly east and south of the PWD service area that represents the north-south spine of the town.

The town-level and block group-level forecasts of how population growth and development location trends may interact is intended to simulate how much of a difference town sub-area trends may make in terms of future residential water demand patterns. The results in Table 1-4 show some potential volatility in the maximum forecasts. Of the 20,647 new persons expected under the Town-level MAX forecast, 79% are estimated to be within the existing water service area. However, of the 24,681 new persons forecast under the Block Group-level, unconstrained forecast, only 57% are estimated within the service area.

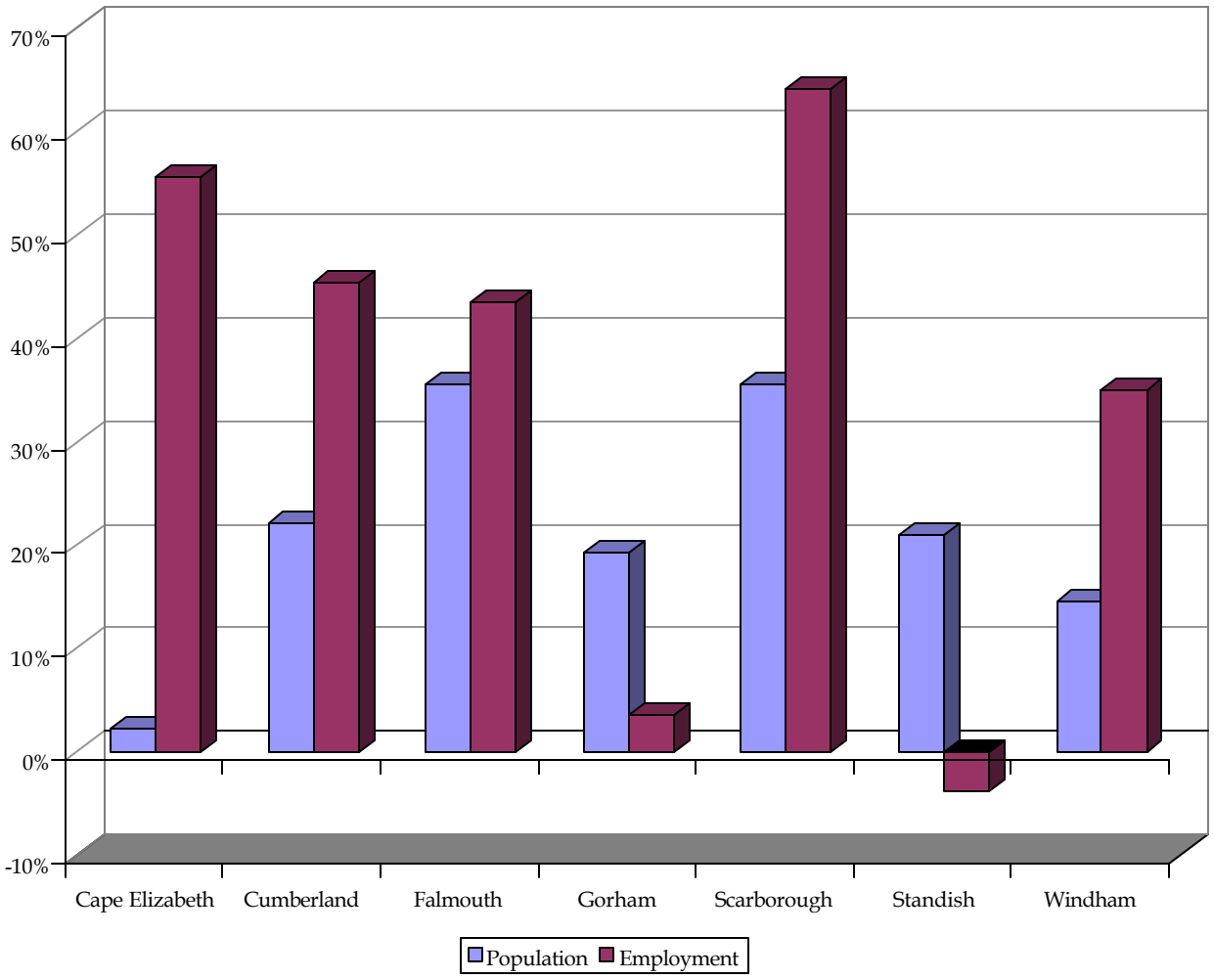
These results are somewhat modified when Standish is excluded. The highest percentage of growth within the service territory is estimated for the Town-level MAX forecast without Standish (87% of 18,452 new people or 16,161 people). The Block-Group-level MAX forecast without Standish produces a slightly attenuated estimate that 63% of 22,395 new people (14,092) will be within the service area.

1.5 Employment Growth in the Region

One of the most important features of the suburban communities around Portland is that employment has been growing in these communities faster than population during 1990-2000. While population was increasing by 21%, employment was growing by 40.4%. This rate of employment growth is remarkable, since it was measured at approximately the peak of employment in the business cycles of the 1980's and 1990's. As ***Figure 1-6*** shows, five of the seven towns saw employment growth exceed population growth. Only in Gorham and Standish did population growth exceed employment growth.

Table 1-4 shows the distribution of growth in establishments and employment in each town. Establishments are locations of employment required to report to the Maine Department of Labor. The employment data reported is "covered" employment, that is employment covered by the unemployment insurance laws.

Figure 1-6
Employment and Population Growth Rates
1990-2000
Sources: Census and Maine Department of Labor



It excludes farm and fisheries employment, along with most self-employment, so actual employment may be somewhat higher than that reported here, but the difference is not likely to be large enough to affect the Water District in any significant way.

Scarborough is the largest employment center in the region, with Windham, Falmouth, and Gorham following. Cumberland has the smallest employment in the seven town region. Scarborough has the distinction of having more total employment than population in 2000. It also had the largest employment growth and the fastest growth rate over 1990-2000. Scarborough also accounted for nearly two thirds (64%) of the region's employment growth. Standish saw an increase in the number of employers but a slight decrease in employment.

Table 1-4
Growth in Establishments and Employment 1990-2000

	Number of Establishments			
	1990	**2000**	**Change**	**% Change**
Cape Elizabeth	160	219	59	36.9%
Cumberland	137	210	73	53.3%
Falmouth	293	444	151	51.5%
Gorham	273	371	98	35.9%
Scarborough	512	735	223	43.6%
Standish	119	155	36	30.3%
Windham	416	492	76	18.3%
TOTAL	**1910**	**2626**	**716**	**37.5%**
	Employment			
	1990	**2000**	**Change**	**% Change**
Cape Elizabeth	1,237	1,924	687	55.5%
Cumberland	1,103	1,602	499	45.3%
Falmouth	3,632	5,208	1,575	43.4%
Gorham	4,543	4,704	161	3.6%
Scarborough	12,382	20,312	7,930	64.0%
Standish	2,967	2,856	(111)	-3.7%
Windham	4,563	6,159	1,596	35.0%
TOTAL	**30,427**	**42,765**	**12,338**	**40.5%**

Source: Maine Department of Labor

Because of the structure in the employer records maintained by the Department of Labor, it is not possible to precisely locate each establishment in the same way that the permit data can be located on specific land parcels or population data can be displayed in terms of Census geography. The data can only be geo-located by street address, and even this is often imperfect. Employment has been aggregated by street, and this data is discussed in the individual town discussions below.

1.6 Investing in Water Supply

There are three broad groups of investments that PWD is considering as part of its long term capital plan:

- Repair and rehabilitation of existing system
- Expansions of capacity to serve existing customers
- Expansions of capacity to serve new customers.

The first two types of investments are paid for by PWD as part of its normal costs of supplying water. Existing customers fund these investments through their regular rate payments. Under current state law and PWD policies, investments in the third category must be paid for by the new customers who need service. Investment to expand the PWD service area thus follow new residential developments.

Given the growth trends in the seven communities and the widespread concern about "sprawl", it is natural to ask about the relationship between investments in expanding water service for new customers, as these can influence the shape of growth patterns in each community. It is important to understand that water supply investment is only one of several variables in this relationship. PWD's role is defined primarily by the legal and economic frameworks within which the Portland Water District functions and is influenced by municipal land use policy and the marketability of various "styles" of real estate including urban, suburban and rural.

The PWD is chartered as a quasi-municipal organization, with its own separately elected Board of Trustees. Although a public entity, it operates under the supervision of the Maine Public Utilities Commission (PUC) as a regulated utility. The PUC regulates the PWD and all other water districts in the state under authority of 35-A MRSA Part 6. As a regulated utility, its investment policies are governed by the Maine Legislature, the PUC and the policies of the Board of Trustees. By Board policy, the PWD has chosen to be a "non-investing" utility. Pursuant to 35-A M.R.S.A § 6106, PWD requires that the individuals or developers who want the extension must pay for all water main extensions. Cost estimates for main extensions are prepared by PWD, and the customer or developer must pay those costs prior to the beginning

of construction. (Any differences between estimated and actual costs are settled following completion of the project.)

This policy is the basis of the requirement that new customers pay the full cost of additions to the water distribution system . The result minimizes the cost of new water mains on existing customers. Current customers need not pay the costs of speculative investments by the District, which may not be recovered if a development is not fully occupied. Water rates do not need to support the cost of expanding the water system. The policy, however, may result in an under-investment in water main extension when viewed from the perspective of long term public interest.

By shifting all of the risks and costs to the new customer, the cost of public water rises relative to the costs of private wells. The result is to reduce the demand for public water relative to private wells. The question arises whether this relatively higher cost for public water supply is efficient. The current policy is consistent with approaches to the economic regulation of natural monopolies such as a water utility. In a natural monopoly, the costs of providing a service are such that it is inefficient to have more than one supplier. Water utilities are a typical example of a natural monopoly; it would clearly be more costly to supply water through duplicate systems. In such situations, the economic incentives cause under-investment in the public water supply to the ultimate detriment of customers who continue to pay higher rates to offset the fixed cost of existing capacity. Public regulation of such monopolies counters these incentives, but it is possible that regulation may result in too much investment. The "non-investing" status of PWD assures that investments are made only when there is someone willing to pay for the additional costs for the water service needed. From this perspective the policy is indeed efficient.

However, if the question is addressed differently, the policy may not be efficient. As suggested, the effect of the policy is to raise the price of public water compared with private wells. Particularly for subdivision developers, the lower cost of private wells means that lot sizes must be larger than those that can be serviced from public water, particularly if a decision is made to use on-site septage disposal. The larger lot sizes also exacerbate the cost of future public water supply installation and may raise the cost of other municipal infrastructure. Larger lot sizes counter many of the efforts to limit "sprawling" development by discouraging increased residential densities. The result may, in part, be the kinds of rapid growth outside of village or designated-growth areas (where sufficient land for large lots is available) that is characteristic of these towns to one degree or another.

This raises the question of whether the policy of requiring all costs of serving new customers be born entirely by those customers, or the effects of that policy, might be modified. This is a discussion that the District and its communities will have to undertake. The discussion should include the exploration of the consequences and desirability of changing the current approach as well as various options for doing so. The discussion should be informed by a detailed analysis of the costs and benefits of changing approaches to financing new water supply, and should evaluate such options as:

- Identifying certain projects that could benefit both existing and new customers and dividing the costs of such projects between the District and the Community based on mutually agreeable proportions.
- The potential role that municipal bonds might play in financing certain projects.
- A change in rate making policies at the Public Utilities Commission to reflect the external benefits of using water supply investments to encourage more compact development.

2
Common Community Concerns

2.1.1. Common Community Issues

During the data collection process, municipal officials in each community were interviewed about the PWD water system and issues related to the provision of public water in their community. A number of common themes or issues emerged form these discussions.

2.1.2 Water Main Extension Policies

A number of municipalities raised issues relating to Town policy dealing with water main extensions in conjunction with development proposals especially residential subdivisions. This includes topics such as when extensions should be required, what should be considered in the decision, the relative costs and benefits of public water versus on-site wells, etc. There was some sense that assistance from the Portland Water District in developing local policies based upon objective analysis and in reviewing the water supply options for proposed developments would be helpful.

2.1.3 Paying for Water Main Extensions

The issue of how to pay for desired water main extensions is a key concern of a number of municipalities. Municipal staff is not always aware of District policies with respect to rebates available to developers who pay for main extensions. Some communities may be looking to the District to come up with an approach for funding the extension of water mains where that is desired by the community while the District may be looking for the communities to take the lead. This appears to be an area where further discussions may be beneficial.

2.1.4 Groundwater Issues

Concerns about groundwater quality and/or contamination and the potential need to extend public water to overcome problems with groundwater supplies were identified in a number of communities. In some communities, this is viewed as a key factor in driving possible water main extensions. However, communities expressed concern that there is no coordinated policy among the Towns, Portland Water District, State agencies such as DEP, and federal agencies dealing with how these situations will be handled and how the provision of public water will be paid for.

3
Population Projection and Water Use Trends for Cape Elizabeth

3.1 Existing Water Service Area

Essentially all of the developable area of Cape Elizabeth is within the Portland Water District's Service Area (***see Figure CE-1***)

3.2 Residential Development and Population Growth

3.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Cape Elizabeth experienced modest residential development, primarily single-family homes. A review of building permit records identified 342 new housing units constructed between 1990 and 1999. Residential development occurred throughout the Town (***see Figure CE-2***), with the area immediately west of Route 77 seeing the largest amount of development.

Of the new residential units built during the 90's, all were located within the PWD service area. ***Table CE-1*** shows the distribution of the units by Census block group.

3.2.2 Population Trends

During the 1990's, the year-round population of the Town of Cape Elizabeth grew from 8,870 in 1990 to 9,068 in 2000 or an increase of approximately 200 residents or 2.2%. This population growth occurred unevenly across the Town with the area between Route 77 and Shore Road experiencing the largest population growth while some census block groups actually lost population. ***Table CE-2*** shows the distribution of the population change by Census block groups.

Portland Water District

Town of Cape Elizabeth, Maine

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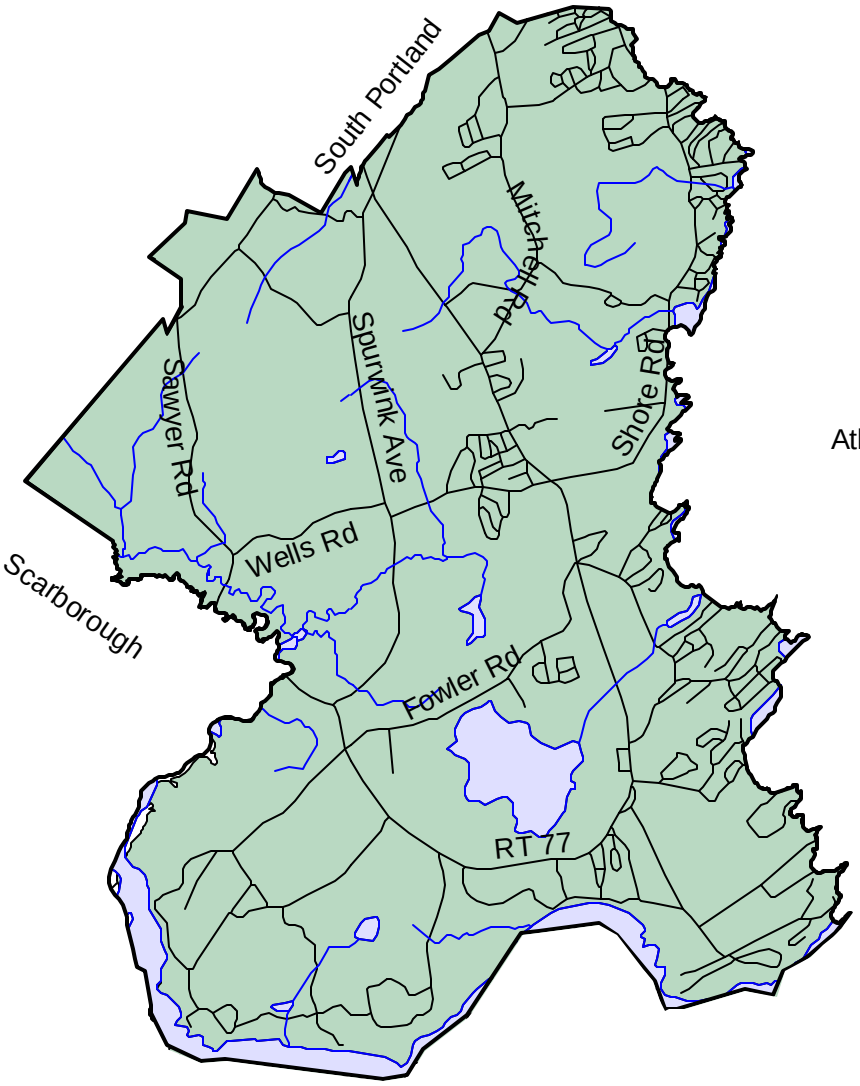

Legend

- Streams/Rivers
- PWD Service Areas
- Lakes/Ponds

Fig. CE-1 Existing PWD Service Areas

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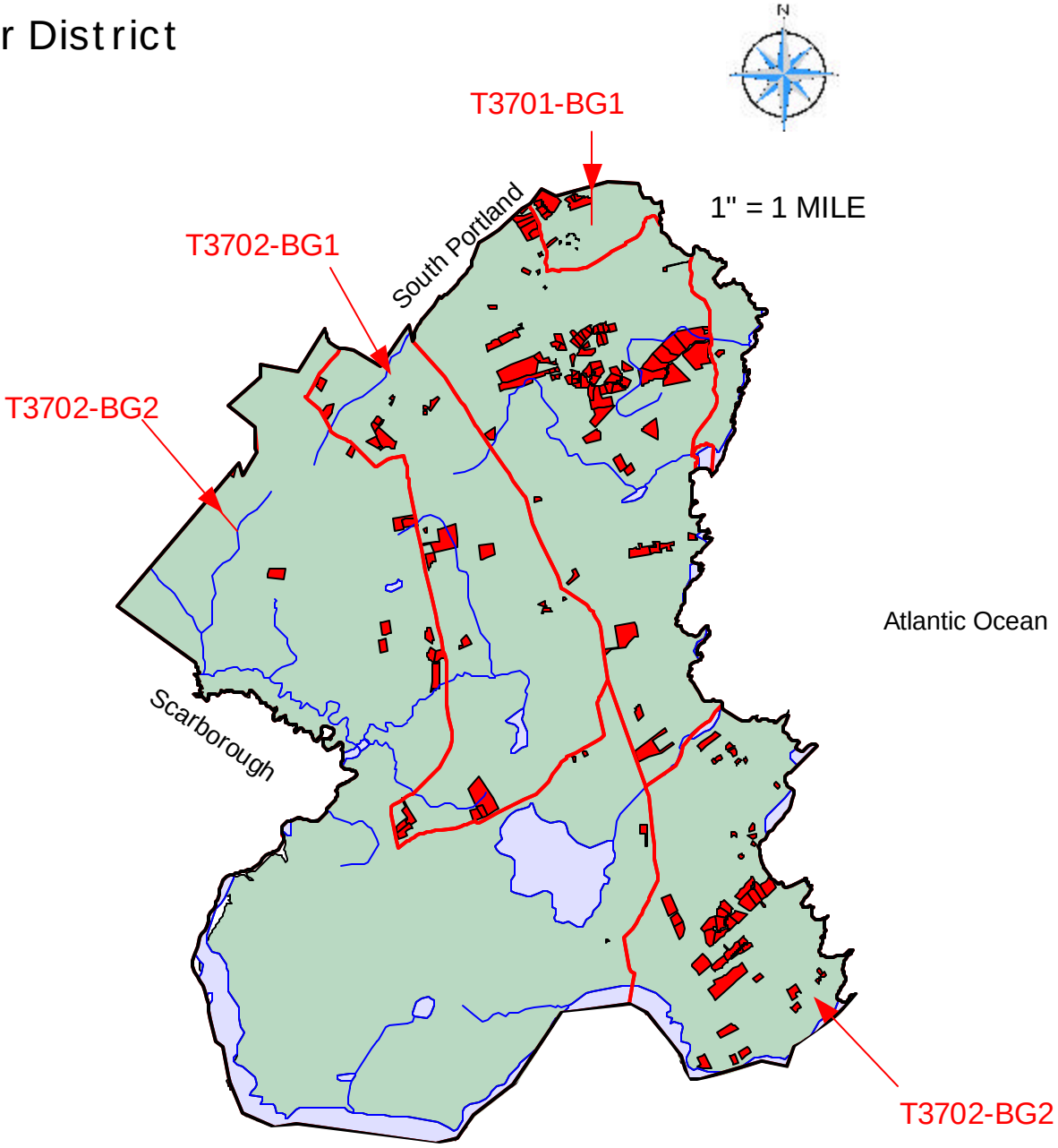
Portland Water District

Town of Cape Elizabeth, Maine



Legend

- Permits Inside PWD Service Area
- Census 2000 Tract and Block Groups
- PWD Service Area

Fig. CE-2 New Housing Units 1990-99

CDM

MUSKIE SCHOOL

PLANNING DECISIONS

Table CE-1
Distribution of New Dwelling Units
Town of Cape Elizabeth 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
T3701 BG1	Cape Cottage / Shore Road	32	9.4	100
T3701 BG2	Route 77 – Shore Road	85	24.9	100
T3702 BG1	Route 77 – Spurwick Road	144	42.1	100
T3702 BG2	Broad Cove – Two Lights	48	14.0	100
T3702 BG3	Sawyer Road – Sprague Est.	33	9.7	100
Total Town		**342**	**100.0%**	**100%**

Source: Town of Cape Elizabeth Building Permit Records and PWD Service Area Maps

Table CE-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T3701 BG1	1,476	1,470	(6)	-0.4
T3701 BG2	2,405	2,660	255	10.6
T3702 BG1	2,202	2,077	(125)	-5.7
T3702 BG2	1,785	1,824	39	2.2
T3702 BG3	1,002	1,037	35	3.5
Total Town	**8,870**	**9,068**	**198**	**2.2%**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Cape Elizabeth will grow to approximately 9, 550 residents by 2020 with a range of 9,027 to 10,096. The Town's 1990 Comprehensive Plan projected that the Town's population would increase to approximately 10,000 by 2000 or significantly higher than the growth reported by the Census. Local population projections beyond 2000 were not included in the plan.

As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Cape Elizabeth. The PACTS projections forecast that Cape Elizabeth's year-round population will grow to 11,771 by 2025. This implies a 2020 estimate of 11,300, significantly higher than the projections used in this report. Given the population growth experience by Cape Elizabeth during the 1990's and

the limited development potential of the community, the Muskie projections are reasonable. A comparison of the forecasts is shown in ***Figure CE-3***.

Figure CE-4 shows the population of each Census block group in Cape Elizabeth from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in the Appendix.

Table CE-3 shows the estimated population in each Cape Elizabeth block group for 2020. Since virtually all of the community is serviced by the PWD system, all growth is projected to occur within the PWD service area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Details of how these forecasts were prepared are contained in the Appendix.

Table CE-3
Forecast 2000-2020 Population by Block Group

	In PWD	Out of PWD
T3701 BG1	1,553	0
T3701 BG2	3,302	0
T3702 BG1	2,194	0
T3702 BG2	1,927	0
T3702 BG3	1,120	0
Town TOTAL	**10,096**	**0**

Figure CE- 3
Cape Elizabeth Population Forecasts

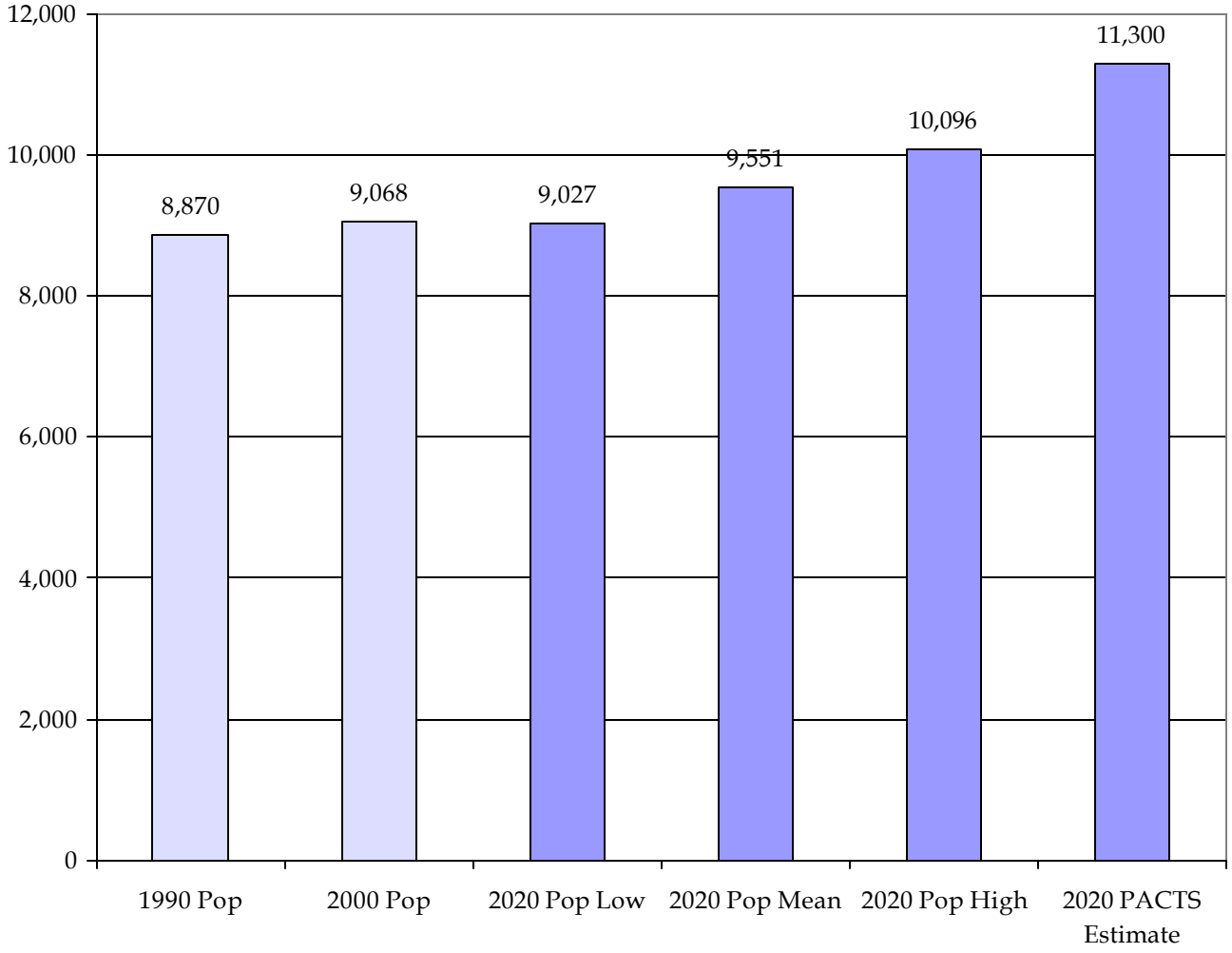
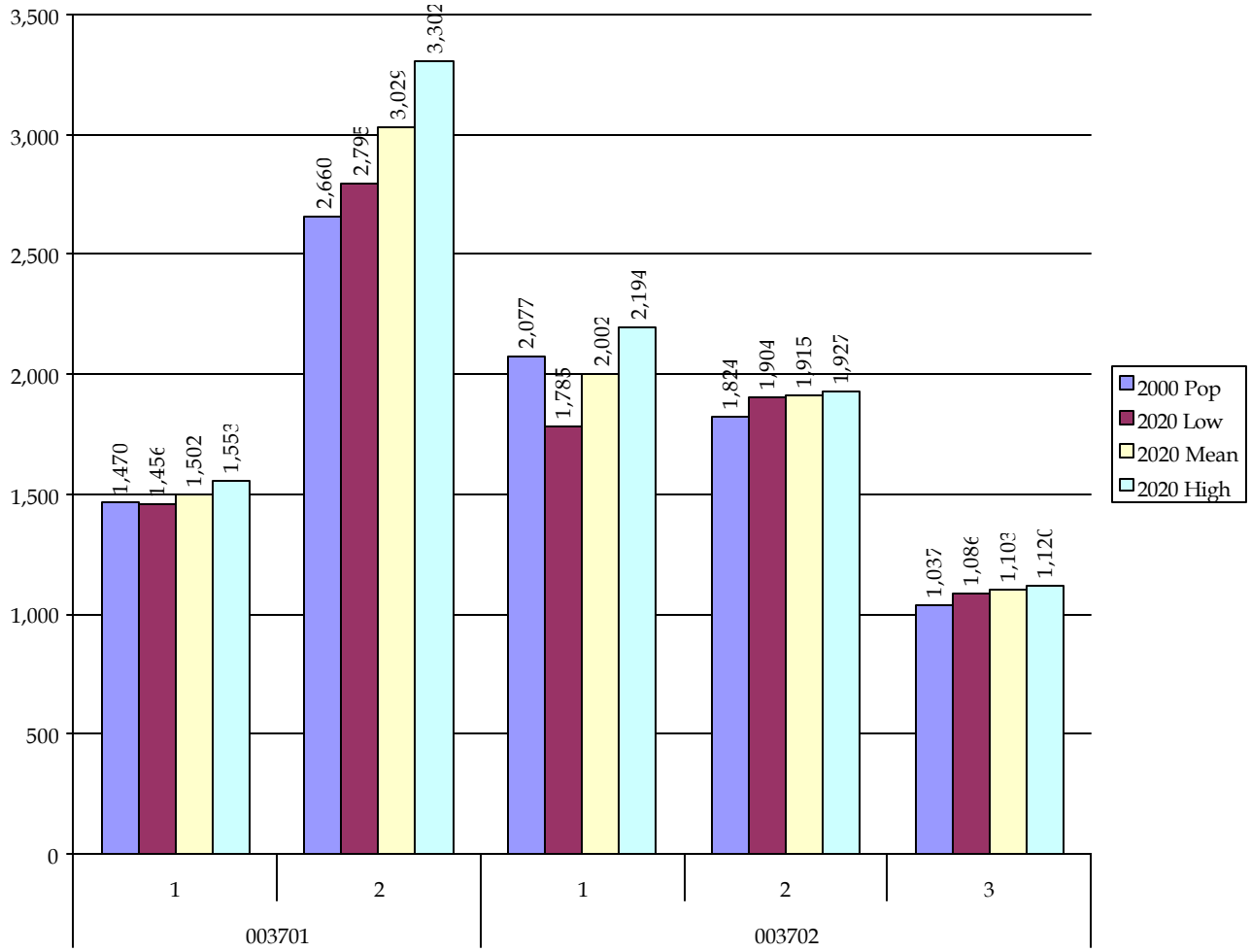


Figure CE- 4
Cape Elizabeth Population Forecast by Block Group



3.2.3 Planned Residential Growth Patterns

The Town's adopted Comprehensive Plan (1990) and zoning ordinances provide good indicators of the Town's desired pattern of residential growth. The Plan envisioned that approximately 15% of new residential development would occur as in-fill within existing residential neighborhoods, that about 10% would occur in the Residence C zone on vacant land, with the balance occurring in the Residence A zone that includes much of the Town.

To guide the anticipated residential development, the Town's comprehensive plan identified two types of residential growth areas, areas of residential growth and areas of infill growth (***see Figure CE-5***). The designated infill growth area is located in the northern portion of the community adjacent to South Portland in the Mitchell Road and Shore Road areas. Much of this area is zoned to allow development at two units per acre.

The designated areas of residential growth are located in a number of locations. The largest growth area is located between Spurwink Avenue and Sawyer Road north of Well's Road. This area was rezoned Residence B in accordance with the plan and has seen significant residential development in recent years. The other designated growth areas are much smaller and are shown on ***Figure CE-5***.

The Town's current zoning ordinance generally reflects this pattern of residential development.

Town of Cape Elizabeth, Maine

Portland Water District

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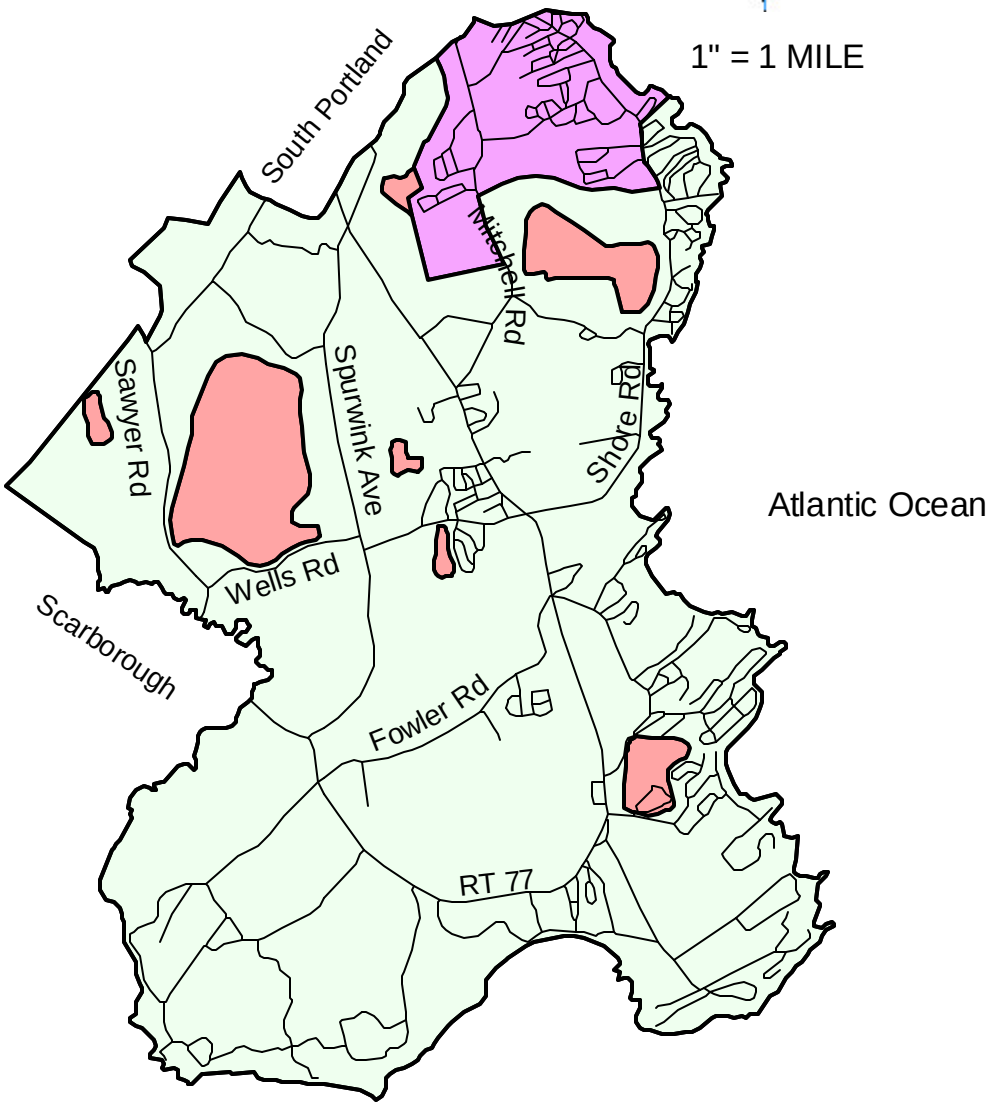

Legend

- Areas of Infill Growth
- Areas of Residential Growth
- Rural

Figure CE-5 Future Land Use Plan

CDM PLANNING DECISIONS MUSKIE SCHOOL

3.2.4 Implications of Residential Growth for the Water System

All of the areas designated for residential growth in the 1990 Comprehensive Plan and/or currently zoned for residential growth are within the current PWD water service area. In general, the geographic extent of the existing water system is adequate to service the anticipated growth.

In the long term, service to the Sprague lands in the southwest corner of the Town may need to be upgraded if significant residential development occurs. This area is currently serviced by a 4" water main but this is inadequate for fire protection. The Town has approved a master plan for the Sprague property that allows 62 lots to be created which could allow the development of 40-45 additional units.

3.3 Nonresidential Development And Employment Growth

3.3.1 Employment Trends

Employment growth in Cape Elizabeth is generally concentrated in and around the Town center or the Ocean House/Spurwink Ave. area. ***Table CE-4*** shows the employment growth in various areas of the Town based upon Maine Department of Labor data. During the 1990's, Cape Elizabeth saw a significant increase in total employment as well as an increase in the number of establishments.

For a variety of reasons, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

Table CE-4
Employment Growth 1990-2000

	Establishments		Employment	
	1990	**2000**	**1990**	**2000**
OCEAN HOUSE RD	28	34	195	415
SPURWINK AVE	8	14	81	335
SHORE RD	10	10	50	115
TWO LIGHTS RD	6	8	46	103
SCOTT DYER RD	2	7	D	D
Total	**160**	**219**	**1237**	**1924**

D=Disclosure Not Permitted

3.3.2 Anticipated Nonresidential Growth Patterns

The 1990 Comprehensive Plan anticipates limited nonresidential development in the community. Most new commercial development will probably be located within existing developed, commercially zoned areas. The potential does exist for additional development in the Inn by the Sea area of Route 77 if this area is sewered in the future.

The Town's current zoning ordinance closely reflects the pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial development are already zoned for nonresidential or mixed use and served by the PWD system.

3.3.3 Implications for the Water Supply

All of the areas designated for commercial growth and zoned for nonresidential uses are located within the current water service area. Therefore, nonresidential development as envisioned by the Town will have no implications for the geographic coverage of the water system.

3.4 Other Considerations Related To The Water System

There are no other considerations relevant in Cape Elizabeth.

Section 4
Population Projection and Water Use Trends for Cumberland

4.1 Existing Water Service Area

The Town of Cumberland is serviced by two segments of the Portland Water District's distribution system. The Cumberland Foreside area including the Route One and Route 88 corridors and extending westerly to the Middle Road is serviced by one portion of the PWD system (***see Figure C-1***). This segment includes a five million gallon standpipe located off Route 88 near the Yarmouth-Cumberland line.

The second segment of the system provides service to the Route 9 corridor from the Falmouth line, north to the North Yarmouth line, the Tuttle Road east to the Middle Road (where it interconnects with the Foreside segment), and Cumberland Center. A main also extends westerly from Route 9 providing service to the Blanchard Road corridor as far west as the Cumberland Fairgrounds. The methodology for developing the water service area graphic shown in ***Figure C-1*** is contained in Appendix A.

4.2 Residential Development and Population Growth

4.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Cumberland experienced significant residential development, primarily single-family homes. A review of building permit records identified 499 new housing units constructed between 1990 and 1999. Residential development occurred throughout the Town (***see Figure C-2***).

Of the new residential units built during the 90's, approximately 291 or 58% were located within the PWD service area with the balance located in areas not served by public water. ***Table C-1*** shows the distribution of the new units by Census block group.

4.2.2 Population Trends

During the 1990's, the year-round population of the Town of Cumberland grew from 5,867 in 1990 to 7,159 in 2000 or an increase of almost 1,300 residents or 22.0%. This population growth, like the residential development, occurred throughout the community. ***Table C-2*** shows the distribution of the population growth by Census block groups.

Portland
Water District

Town of Cumberland, Maine

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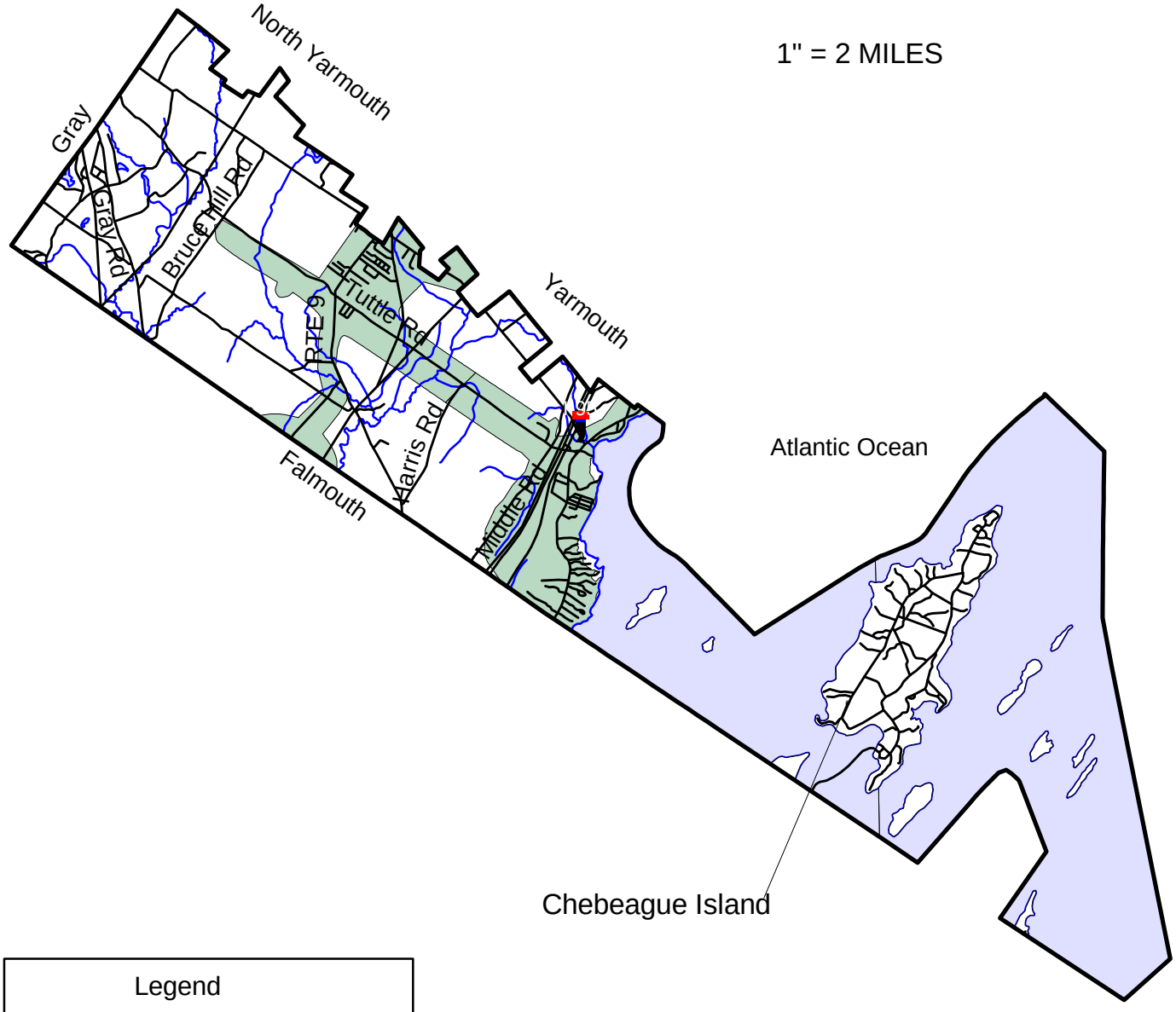

Legend

- Streams/Rivers
- PWD Service Areas
- Lakes/Ponds

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Fig. C-1 Existing PWD Service Area

CDM MUSKIE SCHOOL PLANNING DECISIONS

Portland Water District

Town of Cumberland, Maine

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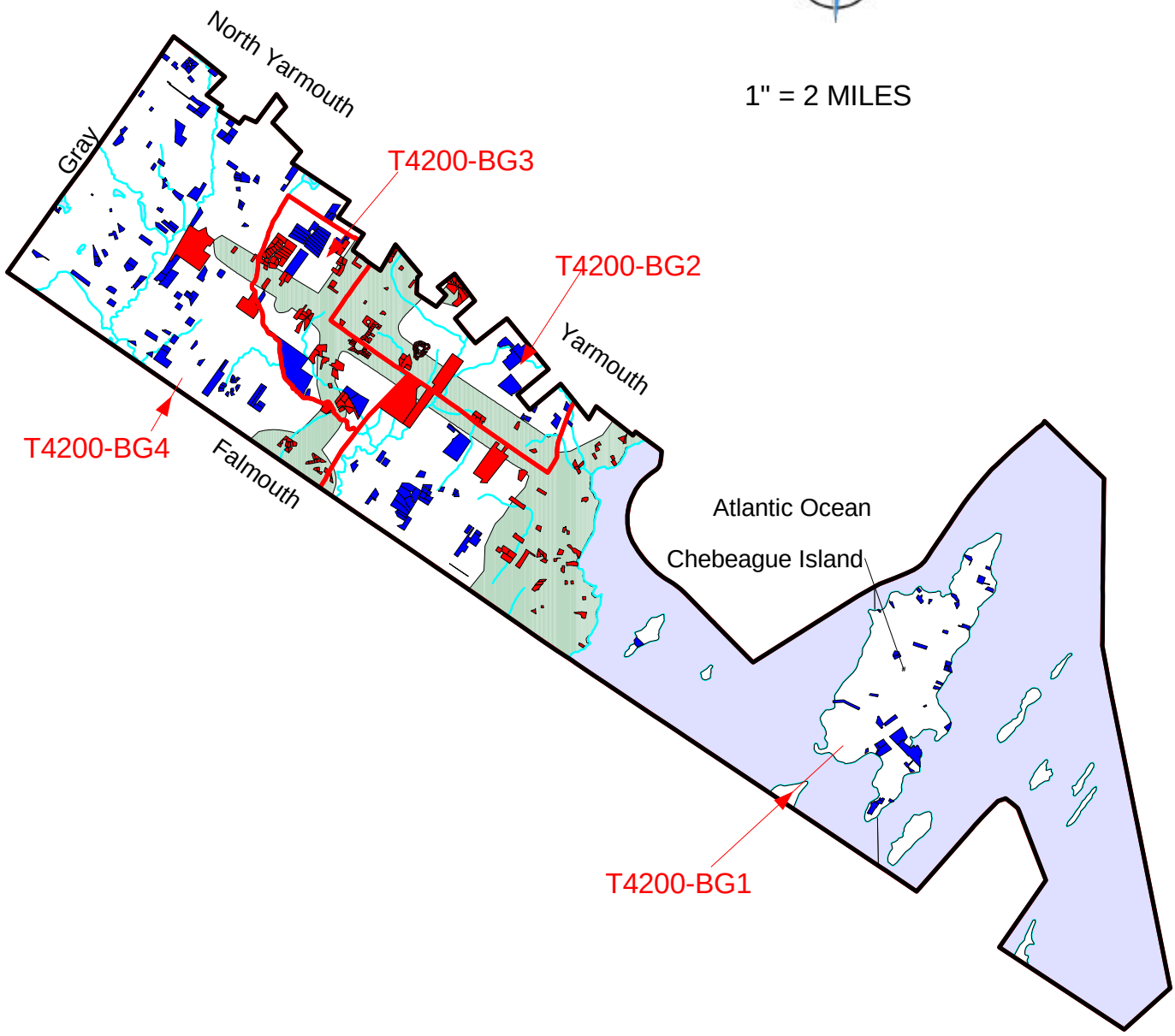
1" = 2 MILES



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- Permits Outside PWD Service Area
- Permits Inside PWD Service Area
- Census 2000 Block Groups
- PWD Service Area

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Fig. C-2 New Housing Units 1990-99

CDM MUSKIE SCHOOL PLANNING DECISIONS

Table C-1
Distribution of New Dwelling Units
Town of Cumberland 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
T4200 BG1	Foreside, south of Tuttle Road, and Chebeague	120	24.0	42
T4200 BG2	North of Tuttle Road including part of Cumberland Center	146	29.3	93
T4200 BG3	Cumberland Center & western fringe	101	20.2	78
T4200 BG4	West Cumberland and Range Road	132	26.5	20
Total Town		**499**	**100.0%**	**58%**

Source: Town of Cumberland Building Permit Records and PWD Service Area Maps

Table C-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T4200 BG1	1,823	2,079	256	14.0
T4200 BG2	1,354	1,698	344	25.4
T4200 BG3	844	1,185	341	40.4
T4200 BG4	1,846	2,197	351	19.0
Total Town	**5,867**	**7,159**	**1,292**	**22.0**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Cumberland will grow to approximately 10,560 residents by 2020 with a range of 9,795 to 11,519. The Town's 1998 Comprehensive Plan projected that the Town's population would continue to grow, but does not include specific population projections.

As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Cumberland. The PACTS projections forecast that Cumberland's year-round population will grow to 10,682 by 2025. This implies a 2020 estimate of 9,950, about the low estimate shown here. A comparison of the forecasts is shown in ***Figure C-3***.

Figure C-4 shows the population of each Census block group in Cumberland from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in the Appendix.

Table C-3 shows the estimated population in each Cumberland block group for 2020 and an estimate of the distribution of population inside and outside the current Portland Water District Service Area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Since it is unknown whether growth will tend to be concentrated in the areas currently served by the district or in areas outside the district, two forecasts are shown. These are based on the "high" growth scenario in order to provide a "maximum demand" estimate against which PWD can test for the adequacy of the water supply system. Details of how these forecasts were prepared are contained in the Appendix.

Table C-3
Forecast 2000-2020 Population Growth by Block Group
And Location Relative to PWD Service Area

	Growth Concentrated			
	INSIDE PWD Service Area		OUTSIDE PWD Service Area	
	In PWD	Out of PWD	In PWD	Out of PWD
T4200 BG1	1,478	1,678	1,315	1,841
T4200 BG2	2,501	184	1,507	1,177
T4200 BG3	1,827	509	1,222	1,114
T4200 BG4	659	2,684	199	3,144
TOTAL	**6,464**	**5,055**	**4,243**	**7,276**

Figure C-3
Cumberland Population Forecasts

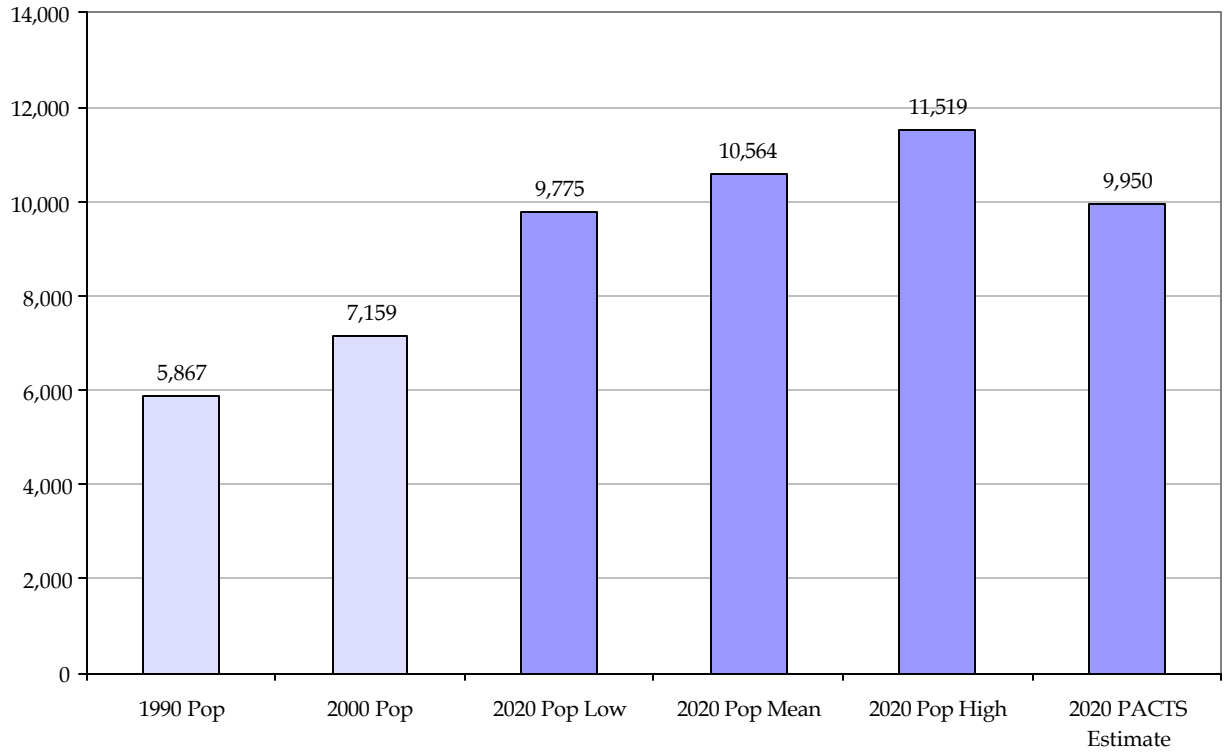
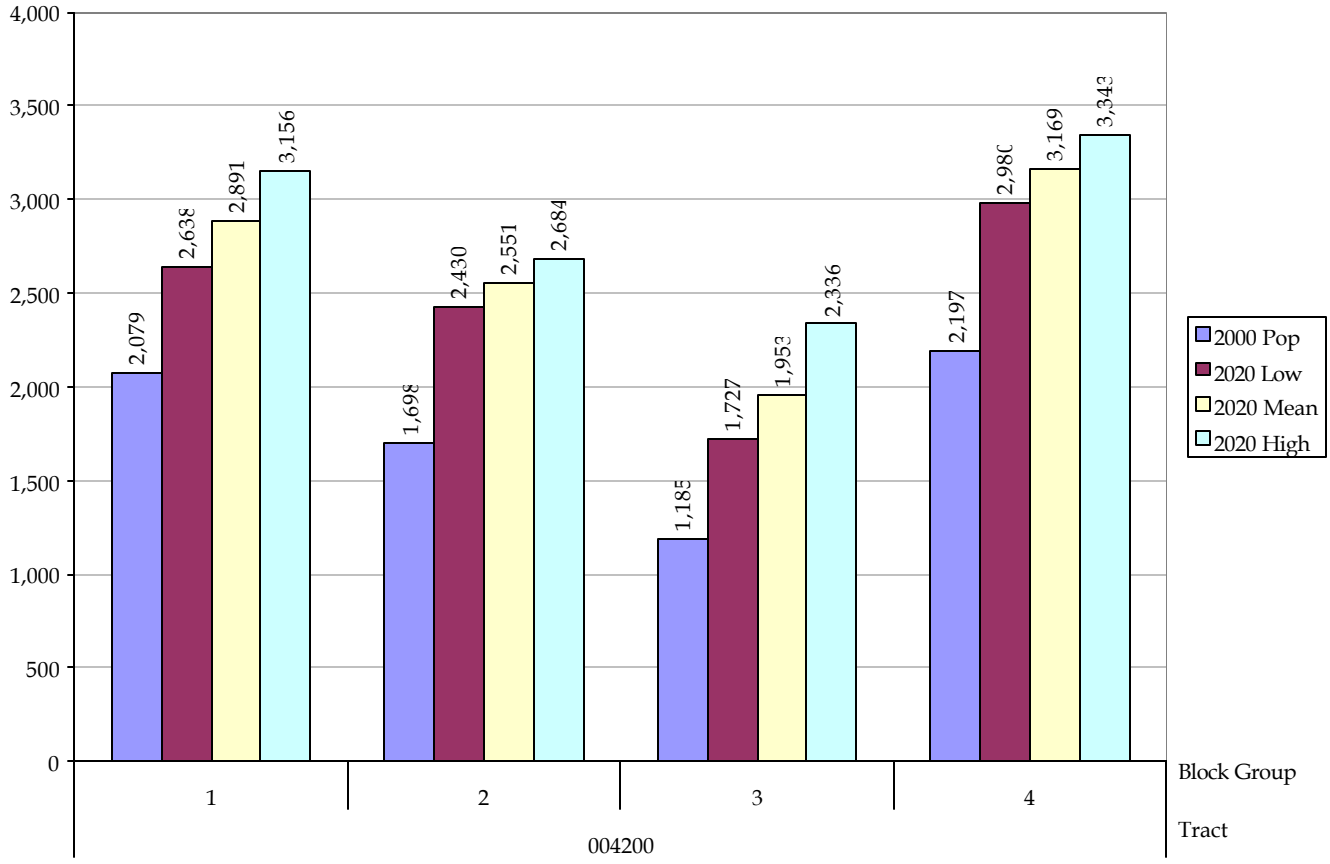


Figure C-4
Cumberland Population Forecast by Block Group



4.2.3 Planned Residential Growth Patterns

The Town's adopted Comprehensive Plan (1998) and zoning ordinances provide the best indicators of the Town's desired pattern of future residential growth. The desired patterns of growth reflected in these documents are not necessarily consistent with the population forecasts.

The 1998 Comprehensive Plan establishes a policy of retaining the rural areas of the community by discouraging residential development in these areas. The Plan also establishes complementary policies for accommodating residential growth in areas that can be provided with public services including sewer and water service as well as infill development within existing developed areas. The plan identifies appropriate areas for infill development and for accommodating residential growth in the community (***see Figure C-5***). This includes areas designated as:

- Low Density Residential Areas
- Medium Density Residential Areas
- Proposed Medium Density Residential Areas

The Plan envisions that these areas are or can be serviced by public water and that the density of development will be high enough to make public water both desirable and practical. The following provides an overview of the areas of Cumberland included within these residential designations:

Low Density Residential Area – This area encompasses the Cumberland Foreside neighborhood including the Route 88 corridor and extends inland to Route One in many areas. This area is designated for low-density residential development. Since much of the area is already developed, the Plan envisions that this area will see some infill residential development. The area is currently zoned for acre and a half lots with public sewerage.

Medium Density Residential Areas – These areas are designated for village-style, medium density residential development at 1 unit per acre with public sewage disposal. Higher densities are allowed for duplex or multifamily development. The Plan recommends allowing infill development on lots as small as 15,000 square feet in these areas. This designation includes Cumberland Center and its fringes and an area of West Cumberland west of Route 100.

Medium Density Expansion Areas – These areas are designated for residential development at a density comparable to existing village patterns. The Plan proposes allowing residential subdivisions at a density of one unit per acre with public water and sewerage required. This includes areas on both sides of Tuttle Road east of Cumberland Center. It should be noted that this area has not yet been rezoned to Medium Density Residential.

Town of Cumberland, Maine

Portland Water District

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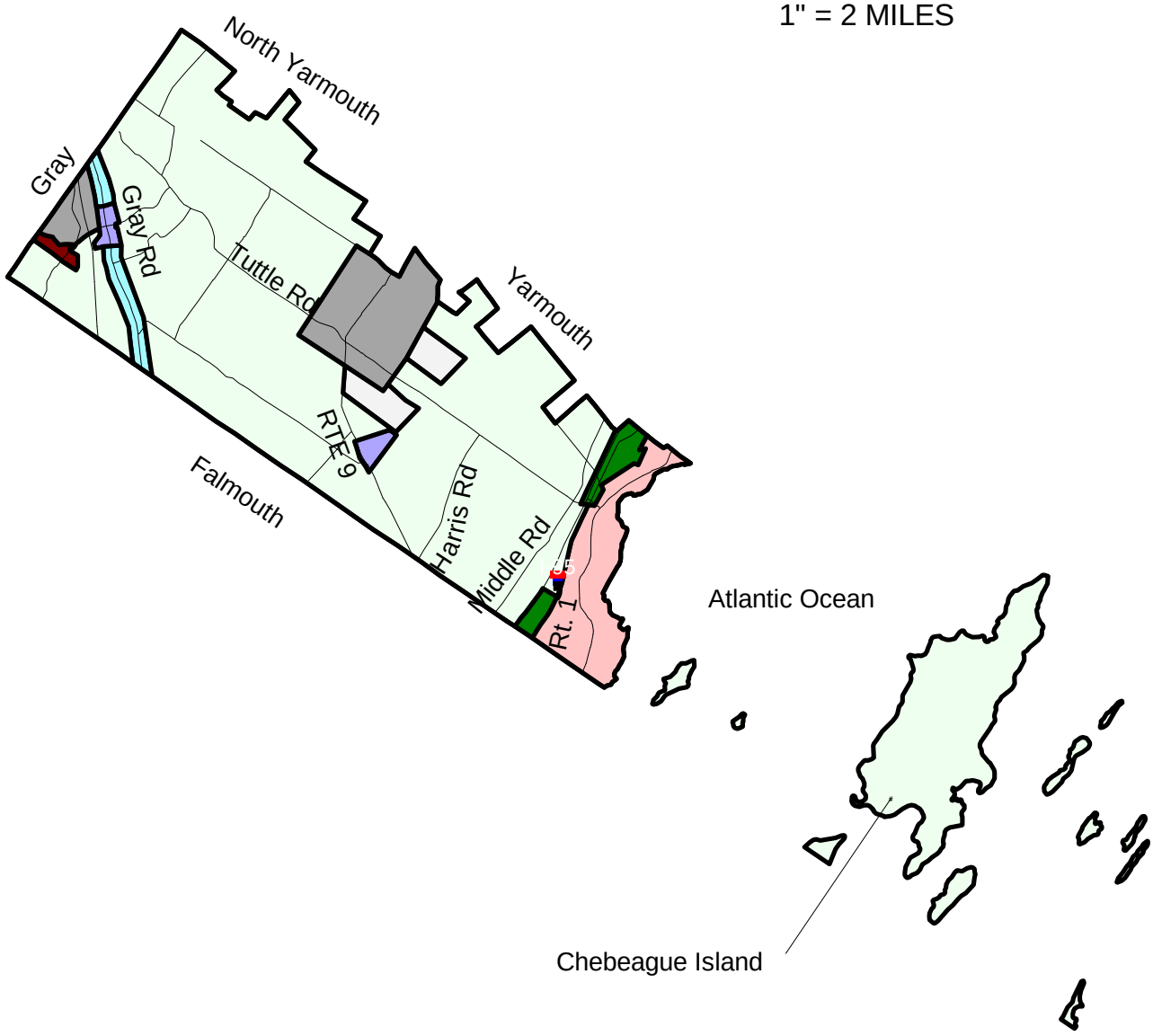
1" = 2 MILES



Legend

- Highway Commercial
- Office Commercial
- Industrial
- Light Business
- Low Density Residential
- Medium Density Residential
- Proposed Medium Density Residential
- Rural

Draft
Figure C-5 Future Land Use Plan

CDM PLANNING DECISIONS MUSKIE SCHOOL

4.2.4 Implications of Residential Growth for the Water System

Many of the areas designated for residential growth in the 1998 Comprehensive Plan are within the current PWD water service area including Cumberland Center and Cumberland Foreside. Extension of the public water system will be required in the proposed Medium Density Residential areas to allow residential development as envisioned by the 1998 Comprehensive Plan.

4.3 Nonresidential Development And Employment Growth

4.3.1 Employment Trends

The Town of Cumberland is not a major employment center. The local school system is the Town's largest employer. Employment in Cumberland is generally concentrated in and around Cumberland Center and in the Blanchard Road corridor. ***Table C-4*** shows the employment growth in various areas of the Town based upon Maine Department of Labor data. During the 1990's, Cumberland saw no change in total employment or in the number of establishments.

For a variety of reasons, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

(Insert Table C-4)

4.3.2 Anticipated Nonresidential Growth Patterns

The 1998 Comprehensive Plan anticipates limited nonresidential growth in Cumberland. The Plan envisions that the growth that does occur will be located within the existing commercial and industrial zones (***see Figure C-5***) including the following:

- Office Commercial areas along Route One
- The Light Business District along much of the Route 100 corridor
- The West Cumberland Industrial area
- Highway Commercial Areas on Route 9 south of Cumberland Center and on Route 100 in West Cumberland

The Town's current zoning ordinance reflects the pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial and industrial development are already zoned for nonresidential use.

4.3.3 Implications for the Water Supply

While some of the areas designated for commercial and industrial growth and zoned for nonresidential uses are located within or adjacent to the current water service area, the Route 100 corridor in West Cumberland is not currently served. The Comprehensive Plan does not, however, envision that public water will be extended to this area to serve future development. Therefore, nonresidential development as envisioned by the Town will have few, if any, implications for the geographic coverage of the water system.

4.4 Other Considerations Related To The Water System

During discussions with Town staff, including the Town Manager, other issues were identified that have potential implications for the water system:

Dead Ends in the Existing System -- The staff noted that there are a number of dead ends in the existing system and that it would be desirable to interconnect these mains to improve service and flows. This is especially important for the Greeley Road and Middle Road.

Groundwater Quality -- The Town staff identified a number of areas in the Route 100 corridor where groundwater contamination issues may lead to consideration of the extension of public water to serve the impacted areas.

Reconstruction of Blanchard Road – The Town plans to reconstruct the Blanchard Road in the foreseeable future. This will require that the Town make a decision prior to reconstruction as to whether the existing water main should be extended further to the west toward Route 100.

Groundwater Availability – There is an area on Bruce Hill and in the area of the Homestead Lane subdivision where it is very difficult to obtain an adequate supply of groundwater. Extension of public water into this area may be necessary at some point in the future.

The Comprehensive Plan also raises the issue of the treatment of the former Portland Water District wells off the Greeley Road. These wells formerly were used to supply Cumberland Center but are no longer in active use. The Plan suggests that the Town and PWD develop a wellhead protection program for these wells to protect the quality of the groundwater in their vicinity to maintain options for the future use of this supply.

Section 5
Population Projection and Water Use Trends for Falmouth

5.1 Existing Water Service Area

Much of the developed area of Falmouth, as well as some of the developing areas, are served by the Portland Water District's distribution system (***see Figure F-1***). Almost the entire area east of Middle Road, including the Route One and Foreside Road (Route 88) corridors, is serviced by public water. The Pleasant Hill area as well as the Falmouth Road/High School/Woodlands area is also served. Public water is available in the Exit 10 – West Falmouth Corner areas of Route 100 (the Gray Road) and extends out the Winn Road to the Cumberland town line. PWD also services a small area adjacent to Highland Lake on the Windham town line through mains located in Windham.

5.2 Residential Development and Population Growth

5.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Falmouth experienced significant residential development, primarily single-family homes. A review of building permit records identified 945 new housing units constructed between 1990 and 1999. Residential development occurred throughout the Town (***see Figure F-2***), but was greatest in Census Tract 2502 especially Block Group 1 (the Pleasant Hill-Middle Road area) and Block Group 3, the Woodville-Woods Road area.

Of the new residential units built during the 90's, approximately 750 or 79% were located within the PWD service area with the balance located in areas not served by public water. ***Table F-1*** shows the distribution of the units by Census block group.

5.2.2 Population Trends

During the 1990's, the year-round population of the Town of Falmouth grew from 7,610 in 1990 to 10,310 in 2000 or an increase of 2,700 residents or 35.5%. This population growth, like the residential development, occurred primarily in Census Tract 2502, especially in Block Groups 1 and 3, the areas west of the Middle Road. ***Table F-2*** shows the distribution of the population growth by Census block groups.

Portland Water District

Town of Falmouth, Maine

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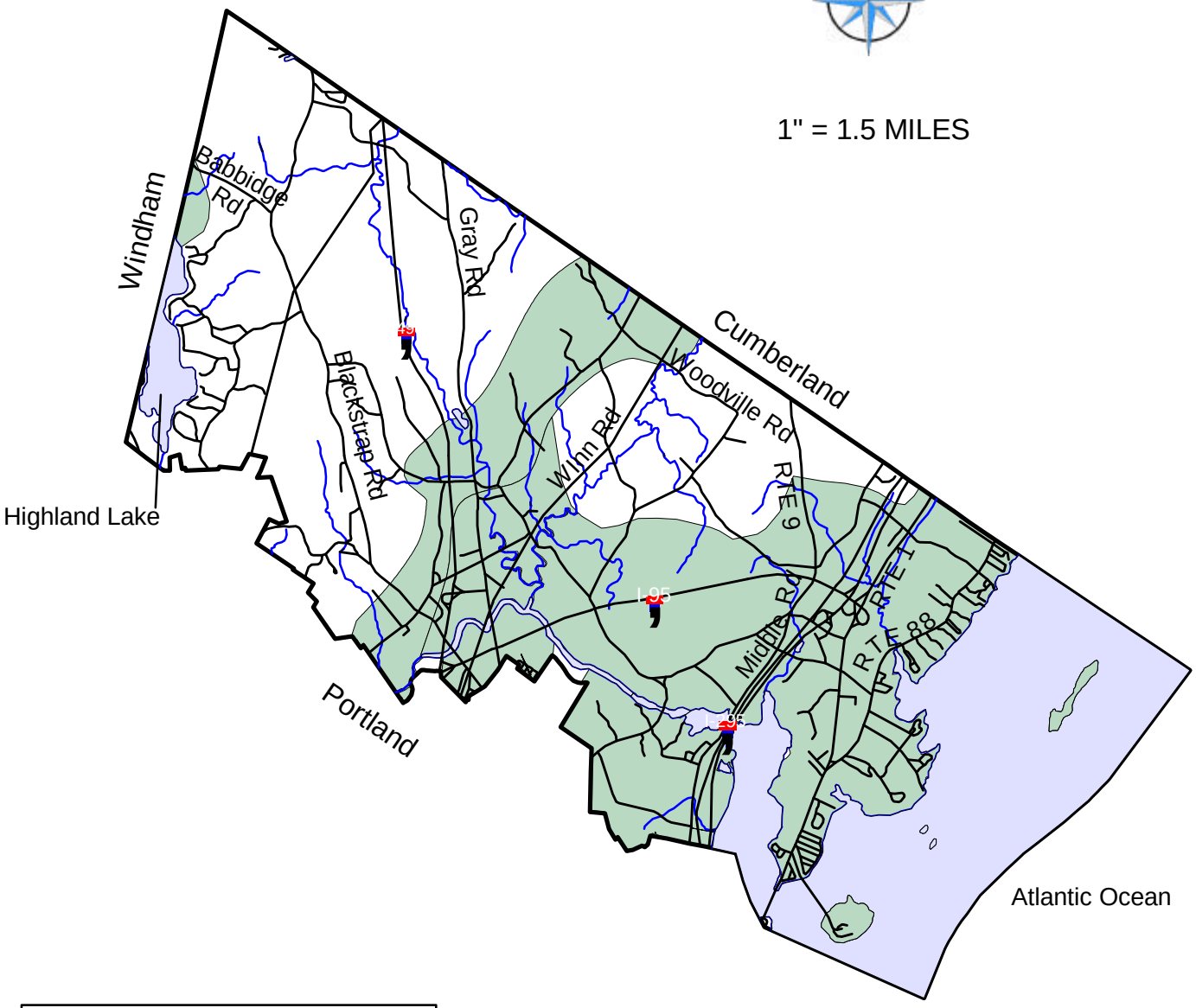

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- Streams/Rivers
- PWD Service Areas
- Lakes/Ponds

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Fig. F-1 Existing PWD Service Area

CDM MUSKIE SCHOOL PLANNING DECISIONS

Portland Water District

Town of Falmouth, Maine

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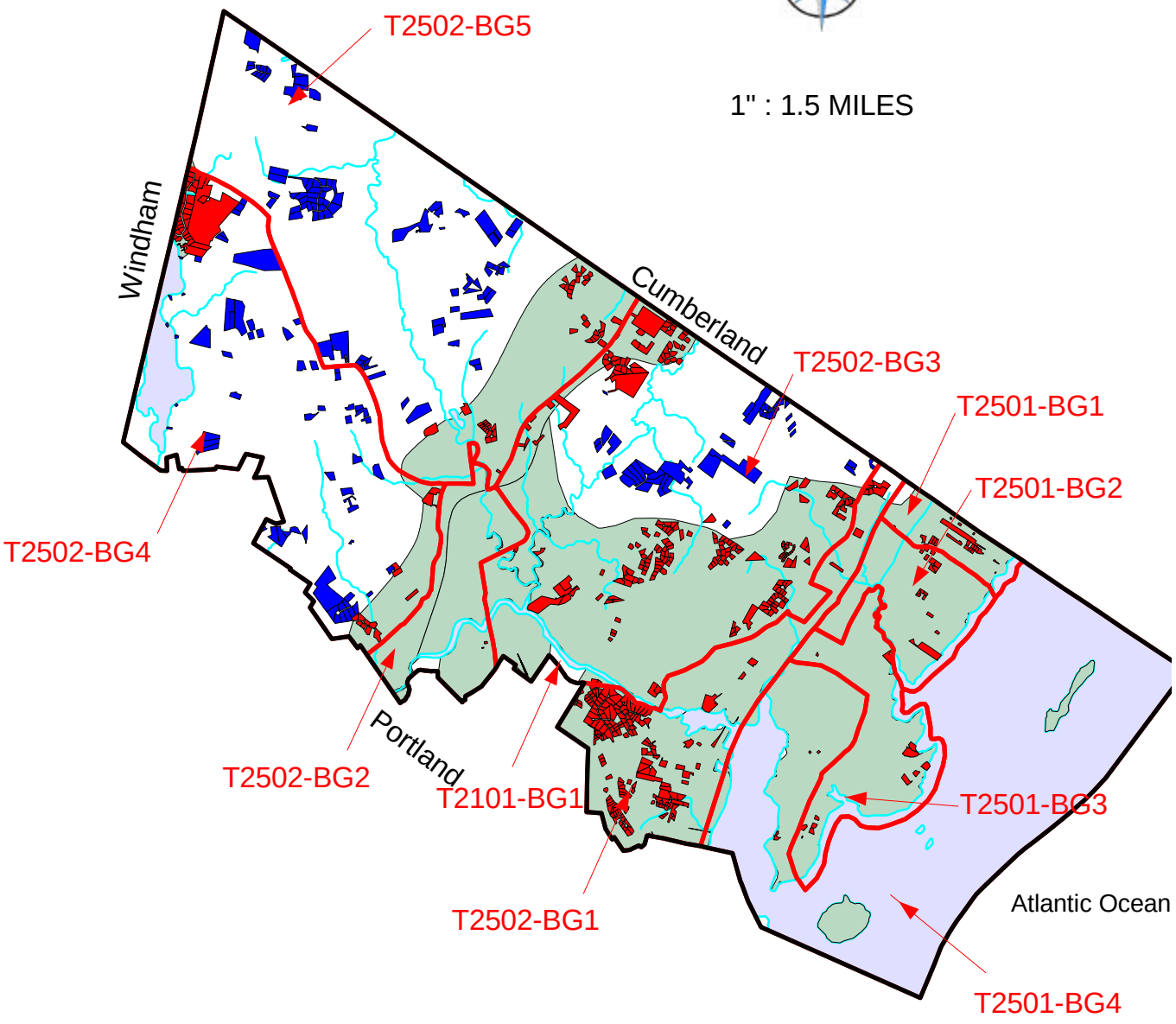

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- Permits Outside PWD Service Area
- Permits Inside PWD Service Area
- Census 2000 Block Groups
- PWD Service Area

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Fig. F-2 New Housing Units 1990-99

CDM MUSKIE SCHOOL PLANNING DECISIONS

Table F-1
Distribution of New Dwelling Units
Town of Falmouth 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
T2501 BG1	North End of Route One, Route 88 Corridors	21	2.2	100
T2501 BG2	Johnson Road/Bucknam Road	132	14.0	100
T2501 BG3	Foreside/Lunt Road	12	1.3	100
T2501 BG4	Presumpscot Estuary	6	0.6	100
T2502 BG1	Pleasant Hill – Middle Road	251	26.6	100
T2502 BG2	Exit 10/West Falmouth Corridor	11	1.2	100
T2502 BG3	Woodville/Woods Roads	271	28.7	83
T2502 BG4	Blackstrap/Mast Road	110	11.6	43
T2502 BG5	Winn Road/Hurricane Road	131	13.9	31
Total Town		**945**	**100.0%**	**79%**

Source: Town of Falmouth Building Permit Records and PWD Service Area Maps

Table F-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T2501 BG1	615	671	56	9.1
T2501 BG2	725	913	188	25.9
T2501 BG3	828	887	59	7.1
T2501 BG4	998	996	(2)	-0.2
T2502 BG1	987	1,765	778	78.8
T2502 BG2	605	588	(17)	-2.8
T2502 BG3	1,024	1,946	922	90.0
T2502 BG4	1,000	1,278	278	27.8
T2502 BG5	828	1,266	438	52.9
Total Town	**7,610**	**10,310**	**2,700**	**35.5%**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Falmouth will grow to approximately 18,650 residents by 2020 with a range of

15,021 to 24,923. The Town's 2000 Comprehensive Plan projected that the Town's population would continue to grow and projected the Town's population in 2009 based upon three growth scenarios, low (50 units/year), medium (100 units/year), high (150 units/years), resulting in projections of 10,700, 11,900, and 13,150 respectively.

As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Falmouth. The PACTS projections forecast that Falmouth's year-round population will grow to 14,061 by 2025. This implies a 2020 estimate of 13,057, which is significantly less than the low estimate shown here. A comparison of the forecasts is shown in ***Figure F-3***.

Figure F-4 shows the population of each Census block group in Falmouth from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in the Appendix.

Table FG-3 shows the estimated population in each Falmouth block group for 2020 and an estimate of the distribution of population inside and outside the current Portland Water District Service Area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Since it is unknown whether growth will tend to be concentrated in the areas currently served by the district or in areas outside the district, two forecasts are shown. These are based on the "high" growth scenario in order to provide a "maximum demand" estimate against which PWD can test for the adequacy of the water supply system. Details of how these forecasts were prepared are contained in the Appendix.Table F-3

Forecast 2000-2020 Population by Block Group And Location Relative to PWD Service Area

	Growth Concentrated			
	INSIDE PWD Service Area		OUTSIDE PWD Service Area	
	In PWD	Out of PWD	In PWD	Out of PWD
T2501 BG1	1,163	--	1,157	--
T2501 BG2	1,590	--	1,590	--
T2501 BG3	1,543	--	1,543	--
T2501 BG4	1,737	--	1,737	--
T2502 BG1	5,644	--	5,644	--
T2502 BG2	1,017	--	1,017	--
T2502 BG3	5,861	1,167	4,025	3,003
T2502 BG4	958	1,284	232	2,009
T2502 BG5	949	2,011	609	2,351
TOTAL	**20,461**	**4,461**	**17,554**	7,362

Figure F-3
Falmouth Population Forecasts

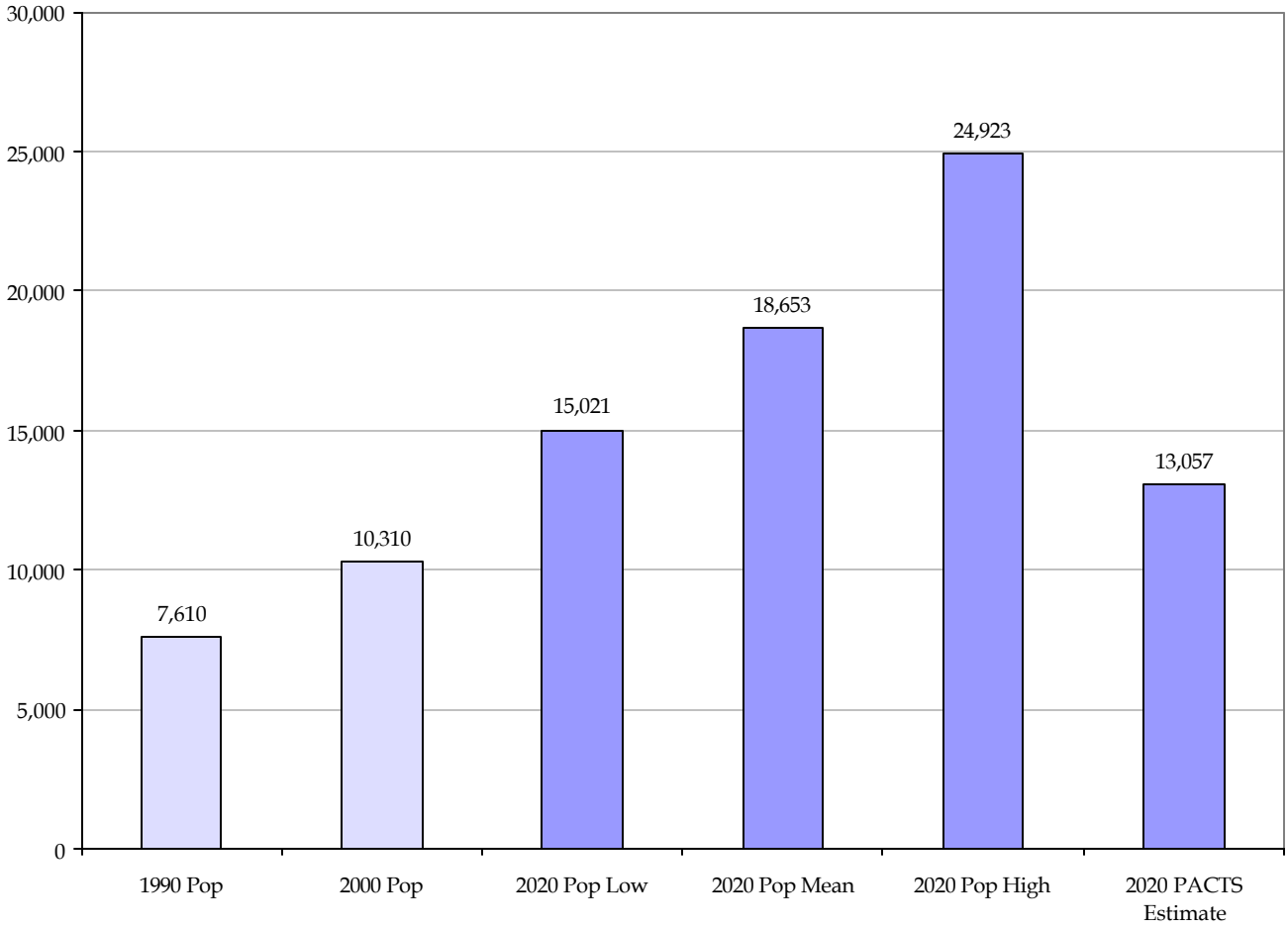
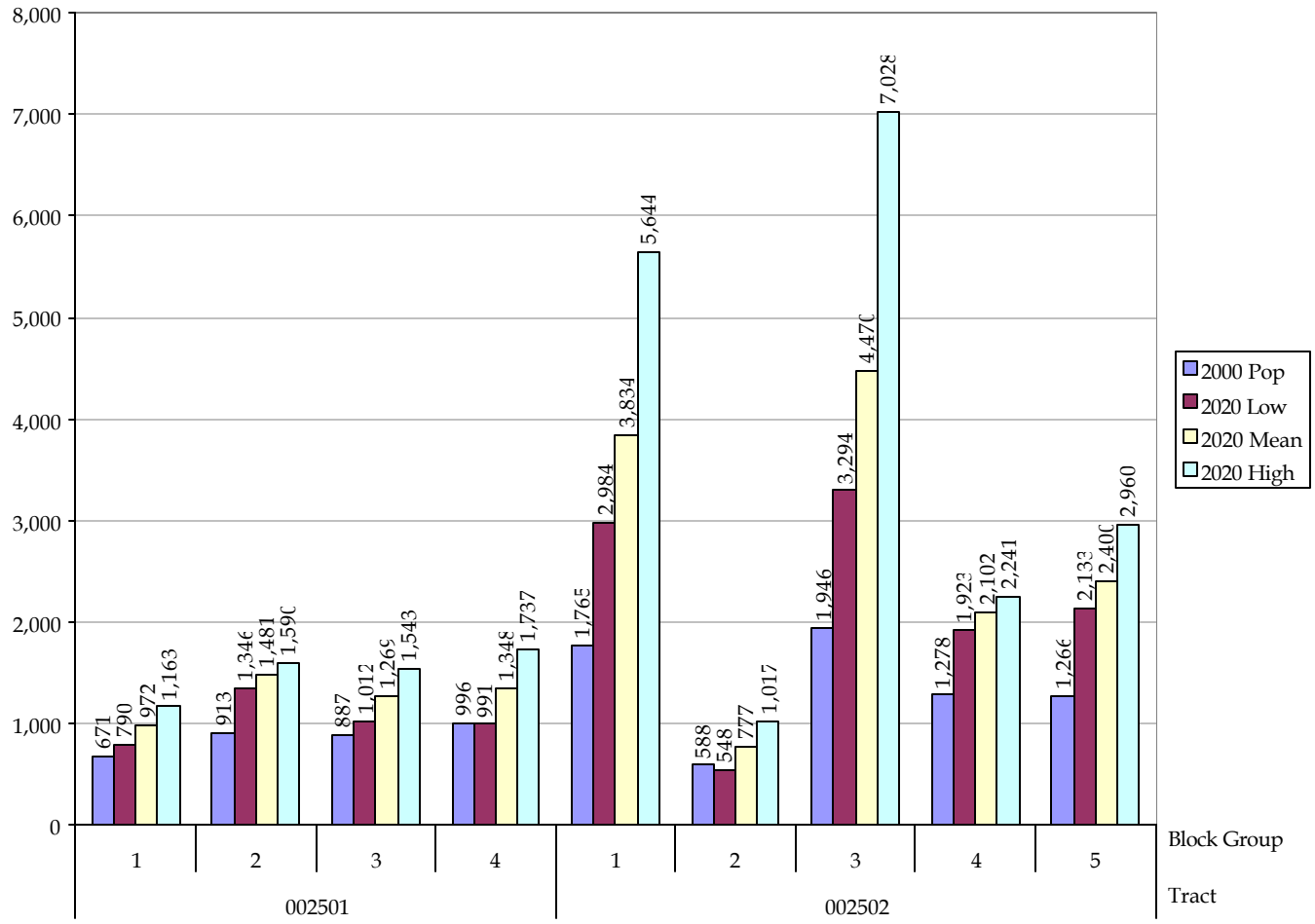


Figure F-4
Falmouth Population Forecast by Block Group



5.2.3 Planned Residential Growth Patterns

The Town adopted an Update of its Comprehensive Plan in 2000. This document provides the best indication of the Town's desired pattern of future residential growth even though the Update does not identify specific residential growth areas for the community. The Plan divides the community into three categories; areas of infill growth, areas of master planned growth, and areas reserved for rural development (***see Figure F-5***). As part of its recommendations, the Plan calls for the development of "Master Plans" for the developing areas of the community. The Town is currently beginning the process of developing the "master Plans" for the areas designated for planned growth. This process will result in a better indication of where more intense residential development may occur in the future. The patterns of growth reflected in this document are not necessarily consistent with the population forecasts.

The 2000 Update of the Comprehensive Plan envisions the following types of residential growth for the three different categories of areas:

- The Infill Growth Areas are mostly developed and any future growth will fill in existing vacant land around existing neighborhoods with a similar development pattern.
- The Master Planned Growth Areas contain vast tracts of undeveloped land and have the most options for managing growth because of the availability of water and sewer.
- The Rural Development Areas include the most rural sections of the community where future development will occur on private wells and septic systems resulting in low-density development patterns.

Town of Falmouth, Maine

Portland Water District

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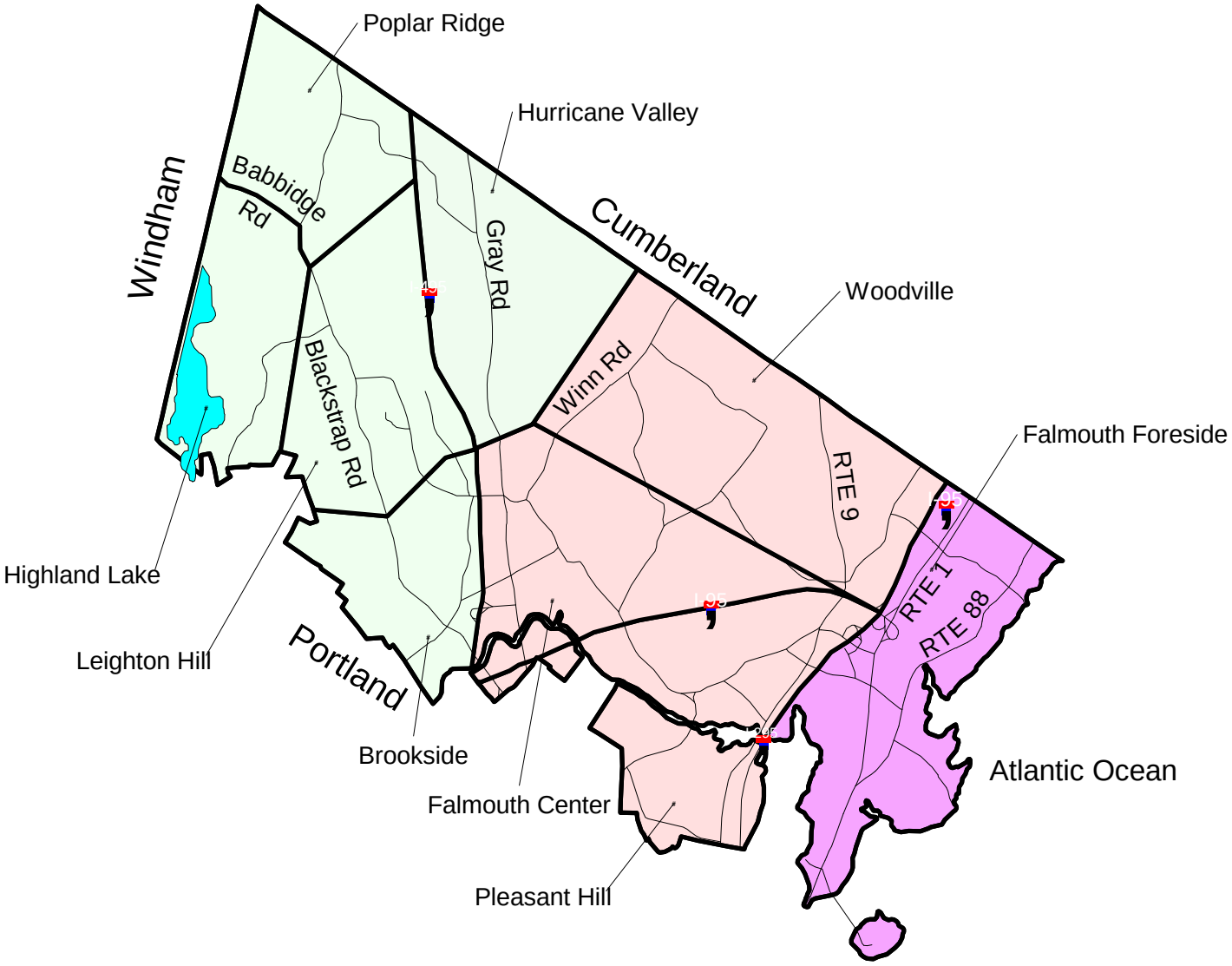

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- Rural
  - Leighton Hill
  - Brookside
  - Poplar Ridge
  - Hurricane Valley
  - Highland Lake
- Master Planned Growth
  - Falmouth Center
  - Falmouth Corners
  - Woodville
  - Pleasant Hill
- Areas of Infill Growth
  - Falmouth Foreside

Draft
Figure F-5 Future Land Use Plan

CDM

PLANNING DECISIONS

MUSKIE SCHOOL

The Town's current zoning ordinance does not fully reflect this pattern of residential use, especially in the area designated for Master Planned Growth. The Town's zoning in this area may need to be adjusted depending on the outcome of the current master planning process.

5.2.4 Implications of Residential Growth for the Water System

Many of the areas designated for residential growth in the 2000 Update of the Comprehensive Plan are within the current PWD water service. The northern portion of the Planned Residential Growth area is currently not served by public water. If the Master Planning process results in this area being designated for more intense development, extension of the PWD water system may be required.

5.3 Nonresidential Development And Employment Growth

5.3.1 Employment Trends

Falmouth functions as a significant employment center. While employers are located throughout the community, the largest concentration of jobs is located in the Route One corridor and adjacent side streets. During the 1990's, Falmouth saw a significant increase in both total employment and the number of establishments.

Employment growth in Falmouth was generally concentrated in the Route One corridor and adjacent areas and in the Route 100 corridor including the Exit 10 area. Table F-4 shows the employment growth in various areas of the Town based upon Maine Department of Labor data.

For a variety of reasons1, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

5.3.2 Anticipated Nonresidential Growth Patterns

The Town's Comprehensive Plan anticipates that nonresidential development will continue to occur in the existing commercial areas including the Route One area, the Exit 10 area, and the Route 100 corridor including West Falmouth Corner. Most of these areas are serviced with public water.

The Town's current zoning ordinance closely reflects the pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial and industrial development are already zoned for nonresidential or mixed use.

5.3.3 Implications for the Water Supply

Most of the areas designated for commercial and industrial growth and zoned for nonresidential uses are located within or adjacent to the current water service area. Therefore,

nonresidential development as envisioned by the Town will have few, if any, implications for the geographic coverage of the water system.

5.4 Other Considerations Related To The Water System

During discussions with Town staff, other issues were identified that have potential implications for the water system:

Fire Protection Flows – The Falmouth Fire Chief identified concerns with the lack fire protection water supplies in the Blackstrap, Babbidge Road, and Woodville Road areas.

Groundwater Quality – Staff also identified problems with the quality of the groundwater in the area of Longwoods Road near the town line and in the Indian Way area.

Section 6
Population Projection and Water Use Trends for Gorham

6.1 Existing Water Service Area

The Portland Water District's principal transmission lines run from Sebago Lake and the Water Treatment Plant in Standish through the eastern side of Gorham. These mains provide water service to the adjacent areas including Little Falls Village, the Town's public works facility on the Huston Road, portions of the Gray Road/Route 202/Libby Avenue area, the Mosher's Corner area, and the Gorham Industrial Park (*see Figure G-1*). In addition, service is provided in the Mosher Road corridor.

Water service is also available in Gorham Village. This system takes water from the gravity system at the eastern edge of Gorham Village and pumps it to a standpipe located off Flaggy Meadow Road on the westerly side of the village. This system provides service to all of Gorham Village including the University of Southern Maine campus which uses the PWD system to feed its internal water system. The methodology for developing the water service area graphic shown in Figure G-1 is contained in Appendix A.

6.2 Residential Development and Population Growth

6.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Gorham experienced significant residential development, primarily single-family homes. A review of building permit records identified 1,021 new housing units constructed between 1990 and 1999. Residential development occurred throughout the Town (*see Figure G-2*).

Of the new residential units built during the 90's, approximately 590 or 58% were located within the PWD service area with the balance located in areas not served by public water. Table G-1 shows the distribution of the units by Census block group.

2.2.2 Population Trends

During the 1990's, the year-round population of the Town of Gorham grew from 11,856 in 1990 to 14,141 in 2000 or an increase of almost 2,300 residents or 19.3%. This population growth, like the residential development, occurred throughout the community. Table G-2 shows the distribution of the population growth by Census block groups.

Portland
Water District

Town of Gorham, Maine

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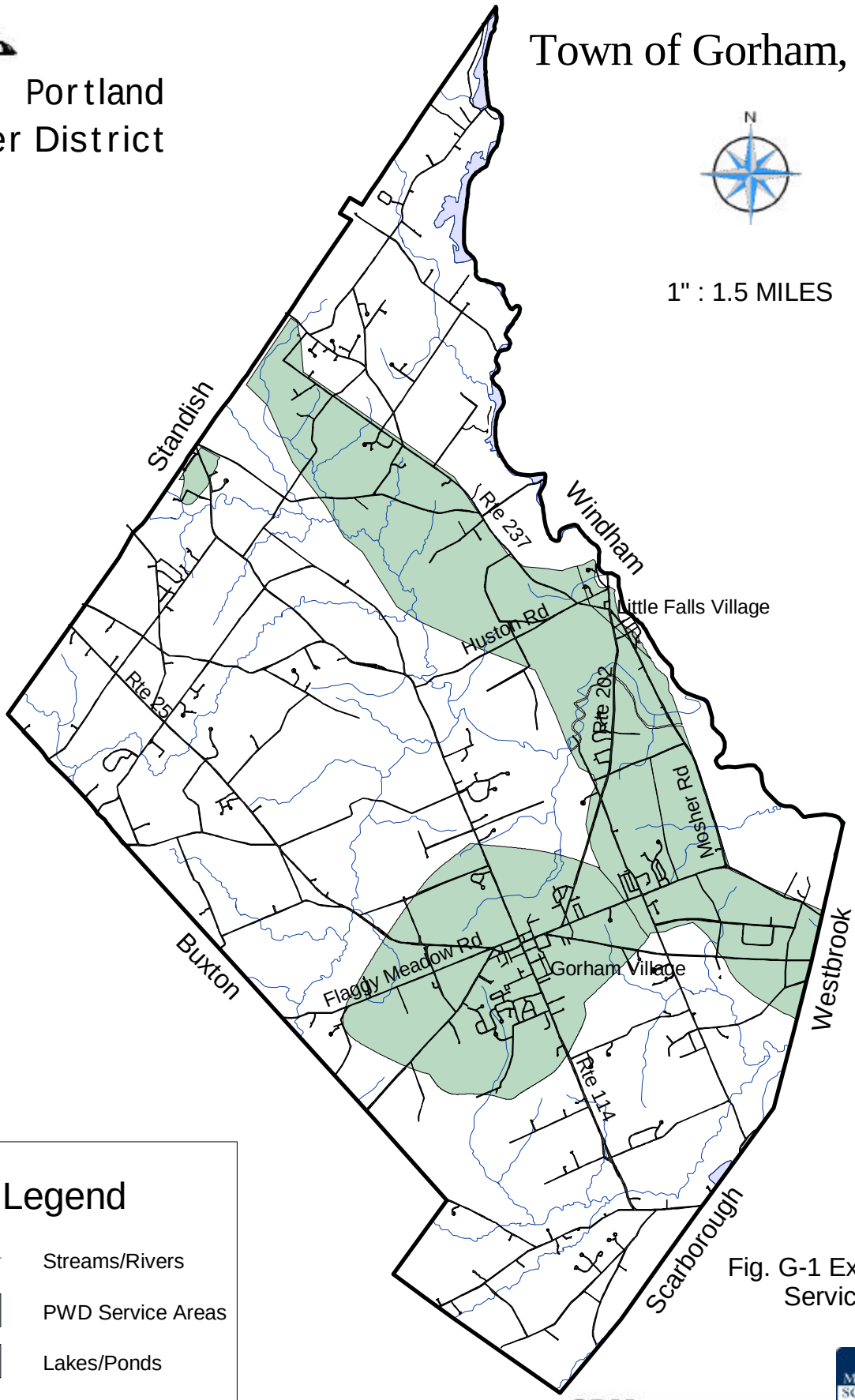
1" : 1.5 MILES



Legend

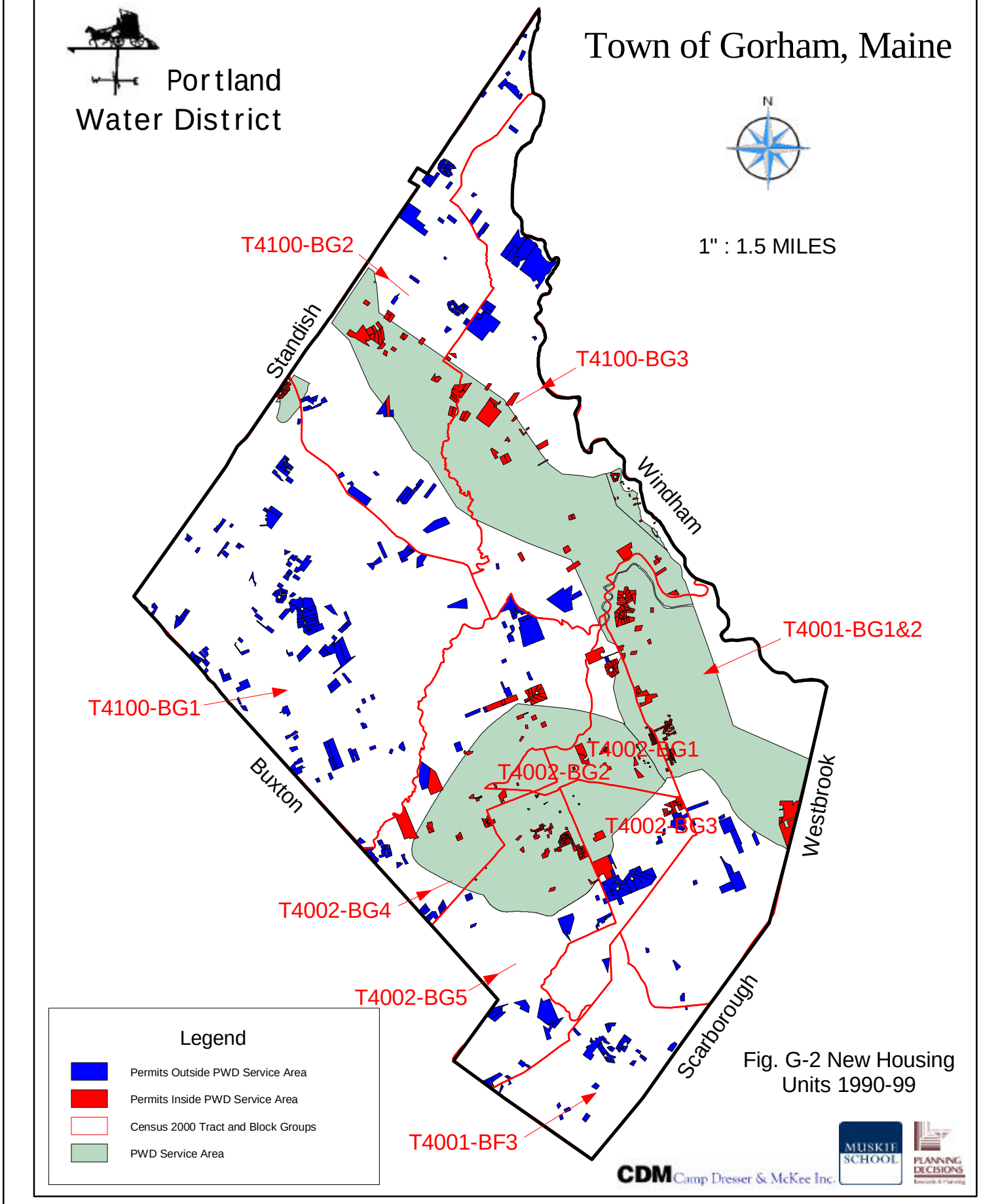
- Streams/Rivers
- PWD Service Areas
- Lakes/Ponds

Fig. G-1 Existing PWD Service Area

CDM Camp Dresser & McKee Inc.

MUSKIE SCHOOL

PLANNING DECISIONS


Portland
Water District
Town of Gorham, Maine
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1" : 1.5 MILES
T4100-BG2
T4100-BG3
T4001-BG1&2
T4100-BG1
T4002-BG1
T4002-BG2
T4002-BG3
T4002-BG4
T4002-BG5
T4001-BF3
Standish
Windham
Buxton
Westbrook
Scarborough
Legend
Permits Outside PWD Service Area
Permits Inside PWD Service Area
Census 2000 Tract and Block Groups
PWD Service Area
Fig. G-2 New Housing Units 1990-99
CDM Camp Dresser & McKee Inc.
MUSKIE SCHOOL
PLANNING DECISIONS

Table G-1
Distribution of New Dwelling Units
Town of Gorham 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
T4001 BG1&2	East Gorham	117	12.6	89
T4001 BG3	South Gorham	36	3.9	0
T4002 BG1	NE quad of Gorham Village	199	21.4	100
T4002 BG2	NW quad of Gorham Village	2	0.2	100
T4002 BG3	SE quad of Gorham Village	40	4.3	38
T4002 BG4	Fort Hill & West	71	7.6	49
T4002 BG5	SW quad of Gorham Village	107	11.5	78
T4100 BG1	West Gorham/Dingley Springs	177	19.0	12
T4100 BG2	Little Falls – River	107	11.5	28
T4100 BG3	White Rock/North Gorham	75	8.1	69
Total Town		**931**	**100.0%**	**58%**

Source: Town of Gorham Building Permit Records PWD Service Area Maps

Table G-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T4001 BG1 & 2	1,015	1,283	268	27.6
T4001 BG3	1,155	1,247	92	8.0
T4002 BG1	1,265	1,702	437	34.5
T4002 BG2	1,017	1,041	24	2.4
T4002 BG3	801	913	112	14.0
T4002 BG4	881	1,116	235	26.7
T4002 BG5	1,427	1,743	316	22.1
T4100 BG1	1,752	2,210	458	26.1
T4100 BG2	1,157	1,402	245	21.2
T4100 BG3	1,386	1,484	98	7.1
Total Town	**11,856**	**14,141**	**2,285**	**19.3%**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Gorham will grow to approximately 20,000 residents by 2020 with a range of 18,581 to 21,856. The Town's 1993 Comprehensive Plan projected that the Town's population would increase to approximately 14,000 by 2001 or slightly below the growth reported by the Census. Local population projections beyond 2000 were not included in the plan. As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Gorham. The PACTS projections forecast that Gorham's year-round population will grow to 20,338 by 2025. This implies a 2020 estimate of 19,100, about the low estimate shown here. A comparison of the forecasts are shown in Figure G-3.

Figure G-4 shows the population of each Census block group in Gorham from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in Appendix A.

Table G-3 shows the estimated population in each Gorham block group for 2020 and an estimate of the distribution of population inside and outside the current Portland Water District Service Area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Since it is unknown whether growth will tend to be concentrated in the areas currently served by the district or in areas outside the district, two forecasts are shown. These are based on the "high" growth scenario in order to provide a "maximum demand" estimate against which PWD can test for the adequacy of the water supply system. Details of how these forecasts were prepared are contained in Appendix A.

Table G-3

Forecast 2000-2020 Population Growth by Block Group and Location Relative to PWD Service Area

	Growth Concentrated			
	INSIDE PWD Service Area		OUTSIDE PWD Service Area	
	In PWD	Out of PWD	In PWD	Out of PWD
T4001 BG1 & 2	1,857	232	1,158	931
T4001 BG3	--	1,770	--	1,770
T4001 BG1	3,066	--	2,900	181
T4001 BG2	1,477	--	1,477	--
T4002 BG3	486	810	317	979
T4002 BG4	886	911	636	1,161
T4002 BG5	2,033	590	830	1,794
T4100 BG1	420	3,112	21	3,511
T4100 BG2	582	1,497	402	1,677
T4100 BG3	1,463	648	869	1,242
TOTAL	**12,270**	**9,570**	**8,610**	**13,246**

Figure G-3
Gorham Population Forecasts

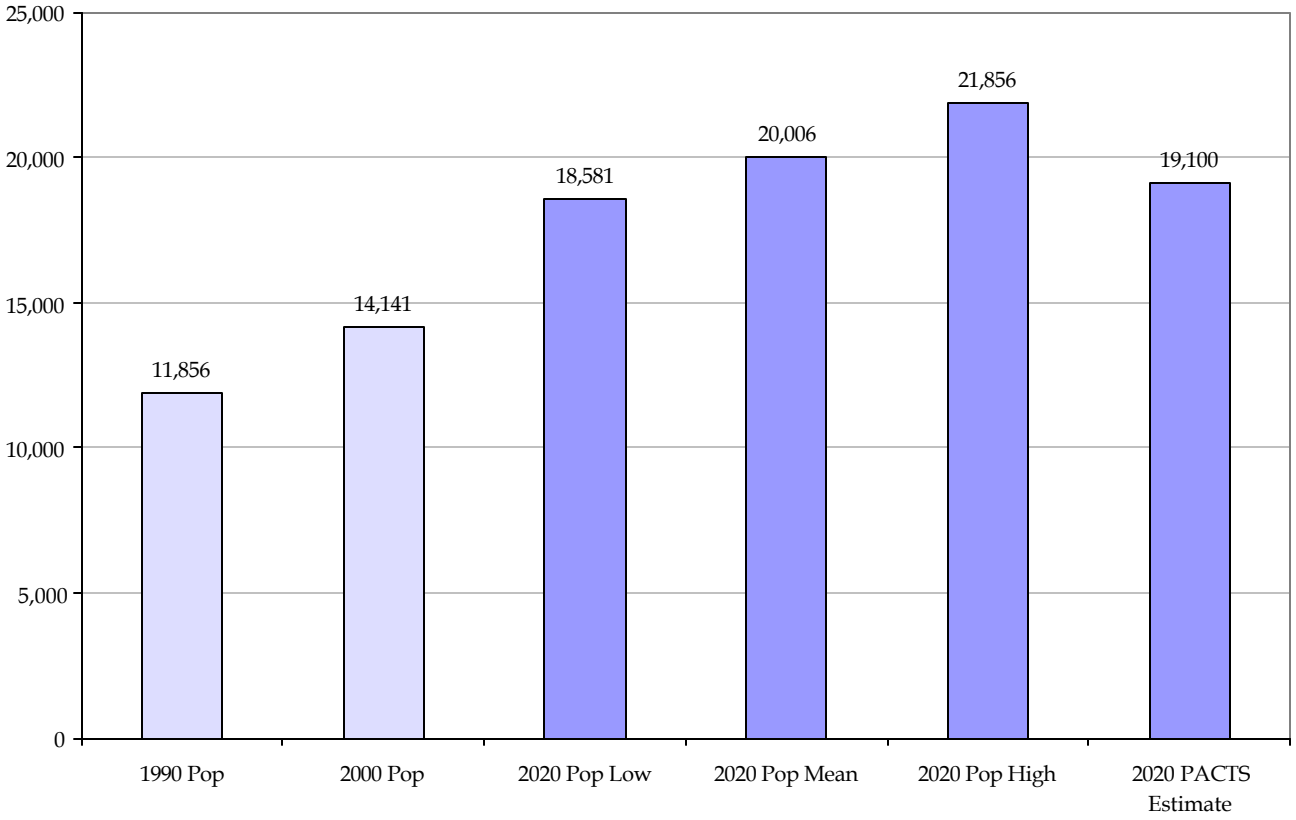
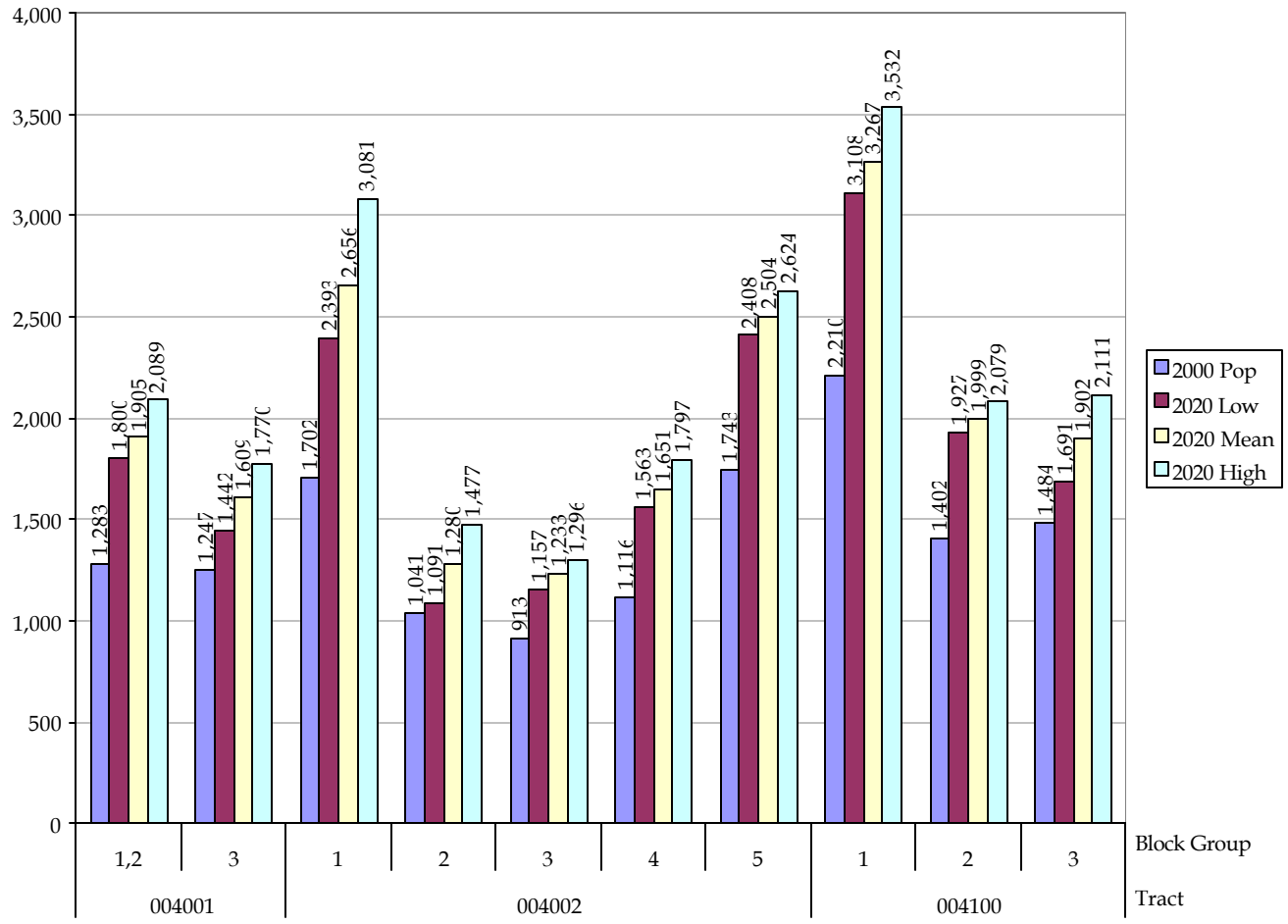


Figure G-4
Gorham Population Forecast by Block Group



6.2.3 Planned Residential Growth Patterns

The Town's adopted Comprehensive Plan (1993) and zoning ordinances provide the best indicators of the Town's desired pattern of future residential growth. It is, however, important to note that the Town is currently reviewing its residential growth patterns to determine if revisions to the plan and/or zoning ordinance are desired. The desired patterns of growth reflected in these documents are not necessarily consistent with the population forecasts.

The 1993 Comprehensive Plan identifies appropriate areas for accommodating residential growth in the community (*see Figure G-5*). This includes areas designated as:

- Village Residential Areas
- Village Expansion Areas
- Outlying Neighborhood Areas including neighborhood center's and neighborhood residential subareas
- Moderate Density Residential Areas

The Plan envisions that most of these areas are or can be serviced by public water and that the density of development will be high enough to make public water both desirable and practical. The following provides an overview of the areas of Gorham included within these residential designations:

Village Residential Areas – These areas are designated for a "continuation of high density, village neighborhoods" at densities of up to 6 to 8 dwelling units per acre. This includes the built-up residential areas of Gorham Village and Little Falls Village.

Village Expansion Areas – These areas are designated for residential development at a density comparable to existing village patterns. This includes areas on the south side of Gorham Village on both sides of South Street and an area to the north of Little Falls Village along Route 237.

Outlying Neighborhood Areas – These are traditional neighborhood centers in West Gorham, Dingley Springs, North Gorham, White Rock, and South Gorham. The plan envisions residential development at a density of up to 1 to 1.5 units per acre with on-site sewage disposal.

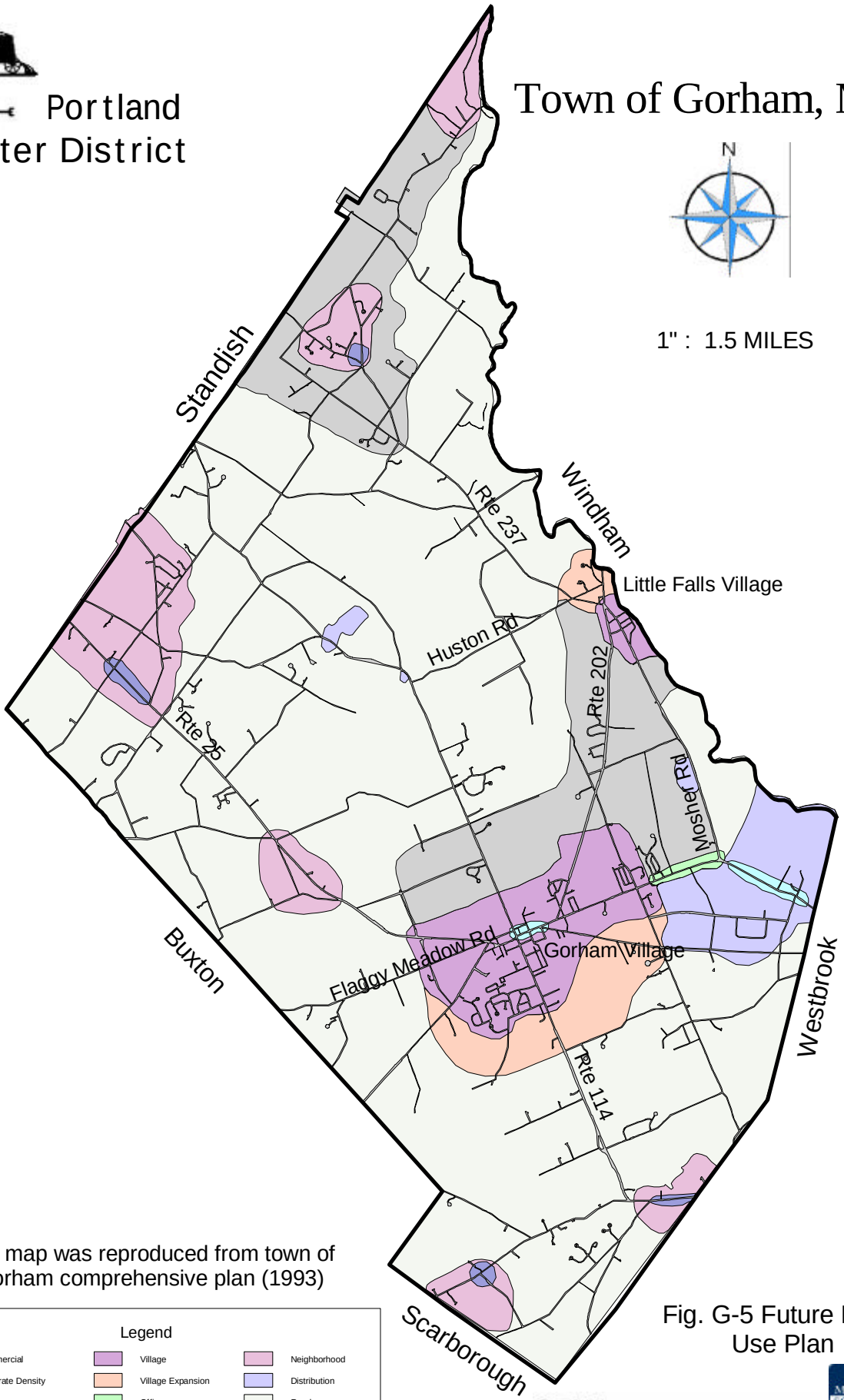
Moderate Density Residential Areas – These areas are designated for suburban-style, moderate density residential development at ½ to 1 unit per acre with on site sewage disposal. This designation includes a large area on the north side of Gorham village extending to Little Falls and the Mosher Road area and the area along the Standish Town line extending from White Rock to North Gorham.

Portland Water District

Town of Gorham, Maine

N

1" : 1.5 MILES



This map was reproduced from town of Gorham comprehensive plan (1993)

Legend

Commercial	Village	Neighborhood
Moderate Density	Village Expansion	Distribution
Center	Office	Rural

Fig. G-5 Future Land Use Plan

CDM Camp Dresser & McKee Inc.

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PLANNING DECISIONS

The Town's current zoning ordinance generally reflects this pattern of residential use with a few exceptions. The Town has three residential zones, Urban Residential (similar to the Village Residential designation in the Plan), Suburban Residential (similar to the moderate-density residential designation) and Rural. The principle discrepancies between the 1993 Comprehensive Plan and the current zoning ordinance are:

- The area south of Gorham Village has never been added to the Village Residential Zone and areas east of South Street remain zoned suburban residential
- The area north of Gorham Village along the Fort Hill Road remains zoned rural rather than moderate density residential.
- The neighborhood residential zones in outlying areas of West Gorham, South Gorham, and Dingley Springs were never created.

6.2.4 Implications of Residential Growth for the Water System

Many of the areas designated for residential growth in the 1993 Comprehensive Plan and/or currently zoned Urban Residential or Suburban Residential are within the current PWD water service area including Gorham Village and Little Falls Village. Extension of public water may be required in the following areas to allow residential development as envisioned by the 1993 plan:

- The area on both sides of South Street south of Gorham Village (note: water main extensions are occurring in this area).
- The area along the Gray Road between Gorham Village and Little Falls
- The area between White Rock and North Gorham if this area is ever rezoned for high density residential development.
- The area north of Gorham Village along the Fort Hill Road if this area is rezoned for higher density residential development.
- The area along Route 25 near the Standish line if this area is rezoned to higher density residential development.

6.3 Nonresidential Development And Employment Growth

6.3.1 Employment Trends

Employment growth in Gorham is generally concentrated in and around Gorham Village and in the area of the Gorham Industrial Park east of Gorham Village. Table G-4 shows the employment growth in various areas of the Town based upon Maine Department of Labor data.

This data does not accurately reflect employment at USM since the university does not breakdown location of employment between the campuses.

Table G-4
Employment Growth 1990-2000

	Establishments		Employment	
	1990	**2000**	**1990**	**2000**
Bartlett Road		6	177	367
Main St	62	67	1,121	1,570
New Portland Rd	5	7	<50	350-500
Sanford Drive		8		100-200
Charter Oak Plaza				100-200
Wentworth Drive				100-200
TOTAL	**273**	**371**	**4,542**	**4,704**

During the 1990's, Gorham saw a modest increase in total employment but a significantly larger increase in the number of establishments. This suggests that many of the new establishments are small with limited employees. In addition, changes in occupancy in the industrial park are reflected in these numbers.

For a variety of reasons, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

6.3.2 Anticipated Nonresidential Growth Patterns

The 1993 Comprehensive Plan identifies a number of areas for commercial and industrial growth (*see Figure G-5*). These include the following:

- Village Commercial Areas
- Outlying Neighborhood Centers
- Production-Distribution Areas
- Commercial Areas

- Office Areas

The Plan envisions that most of these areas will be serviced with public water. The following provides an overview of the areas of Gorham included within these commercial-industrial designations:

Village Commercial Areas – These are the mixed use areas in the core of Gorham Village and Little Falls Village.

Outlying Neighborhood Centers – These are the historic centers of the outlying neighborhoods and are envisioned to accommodate small scale retail uses to serve primarily local needs. These neighborhood centers are located in Dingley Springs, White Rock, North Gorham, and South Gorham.

Production – Distribution Areas – These are areas designated for a variety of industrial, manufacturing, distribution, and service uses. They include the Gorham Industrial Park area, and outlying areas such as the brickyard and Phinney Lumber.

Commercial Areas – These are areas designated for retail, service, and specialty commercial uses. The Plan designates the Lower Main Street area in East Gorham as a commercial area.

Office Areas – These areas are designated for small scale office and service uses and moderate density residential use. The only area designated as an office area in the plan is the portion of Main Street from Libby Avenue to Mosher's Corner.

The Town's current zoning ordinance closely reflects the pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial and industrial development are already zoned for nonresidential or mixed use.

6.3.3 Implications for the Water Supply

Most of the areas designated for commercial and industrial growth and zoned for nonresidential uses are located within or adjacent to the current water service area. Therefore, nonresidential development as envisioned by the Town will have few, if any, implications for the geographic coverage of the water system.

6.4 Other Considerations Related To The Water System

During discussions with Town staff, including the Town Planner, other issues were identified that have potential implications for the water system:

Fire Protection Flows in Gorham Village – The Gorham Fire Chief has identified concerns with the fire flows and pressure in portions of Gorham Village. The Town Planner noted that the

connection of the Village system to the Huston Road water main via Fort Hill has been mentioned as a possible solution to this problem.

Groundwater Quality – The Town Planner identified a number of areas where groundwater quality issues may lead to consideration of the extension of public water to serve the impacted area. This includes:

- The Dingley Spring Estates area near the Standish line that is currently serviced with a community water system.
- Areas at the south end of Brackett Street that suffer from poor groundwater quality as a result of high salinity levels.
- The former Maine Metal Finishing (Silvex) site on the County Road in South Gorham.

Section 7
Population Projection and Water Use Trends for Scarborough

7.1 Existing Water Service Area

Both the Portland Water District and the Biddeford – Saco Water Company provide public water service to portions of the Town of Scarborough. The Biddeford – Saco Water Company serves the Blue Point and Pine Point areas south of the Scarborough Marsh. The balance of the Town is served by PWD.

East of the Maine Turnpike, the PWD service area covers most of the developable areas (***see Figure S-1***). Within this area, service is not provided in a few neighborhoods including most of Scottow Hill Road, a portion of Sawyer Road, portions of Highland Avenue, Chamberlain Road, and Fogg Road.

West of the Maine Turnpike, the PWD service area is very limited. The only area with water service is a portion of the Gorham Road (Route 114) extending about 1,500 feet west of the Turnpike.

7.2 Residential Development and Population Growth

7.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Scarborough experienced a large amount of residential development, primarily single-family homes. A review of building permit records identified 1,759 new housing units constructed between 1990 and 1999. Residential development occurred throughout the Town (***see Figure S-2***).

Of the new residential units built during the 90's, approximately 1,520 or 86% were located with the PWD service area with the balance located in areas not served by public water. The following table shows the distribution of the units by Census block group.

7.2.2 Population Trends

During the 1990's, the year-round population of the Town of Scarborough grew from 12,518 in 1990 to 16,970 in 2000 or an increase of approximately 4,450 residents or 35.6%. This population growth was concentrated in those areas experiencing significant residential development. ***Table S-2*** shows the distribution of the population growth by Census block groups.

Portland
Water District

Town of Scarborough, Maine

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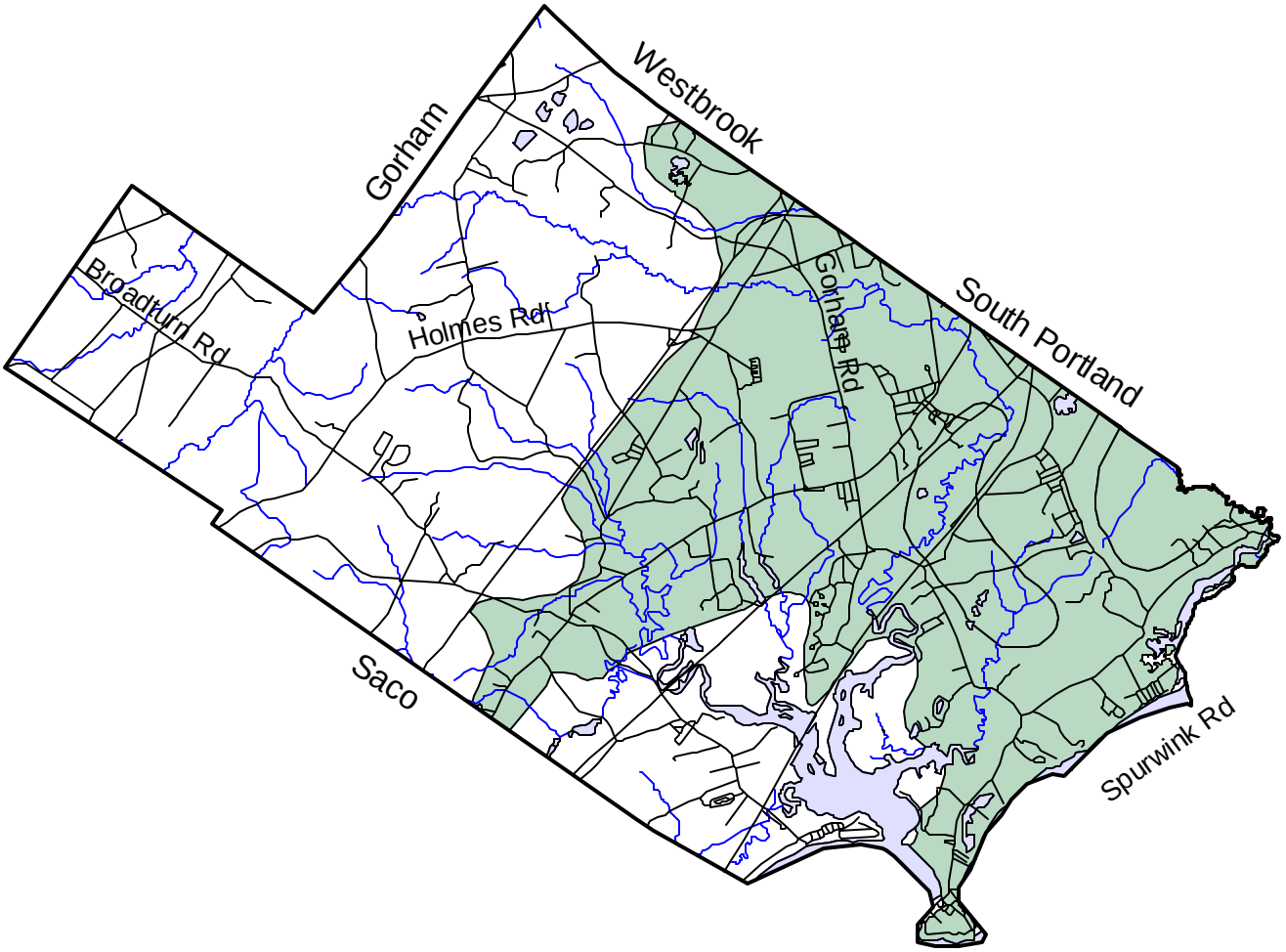

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- Streams/Rivers
- PWD Service Areas
- Lakes/Ponds

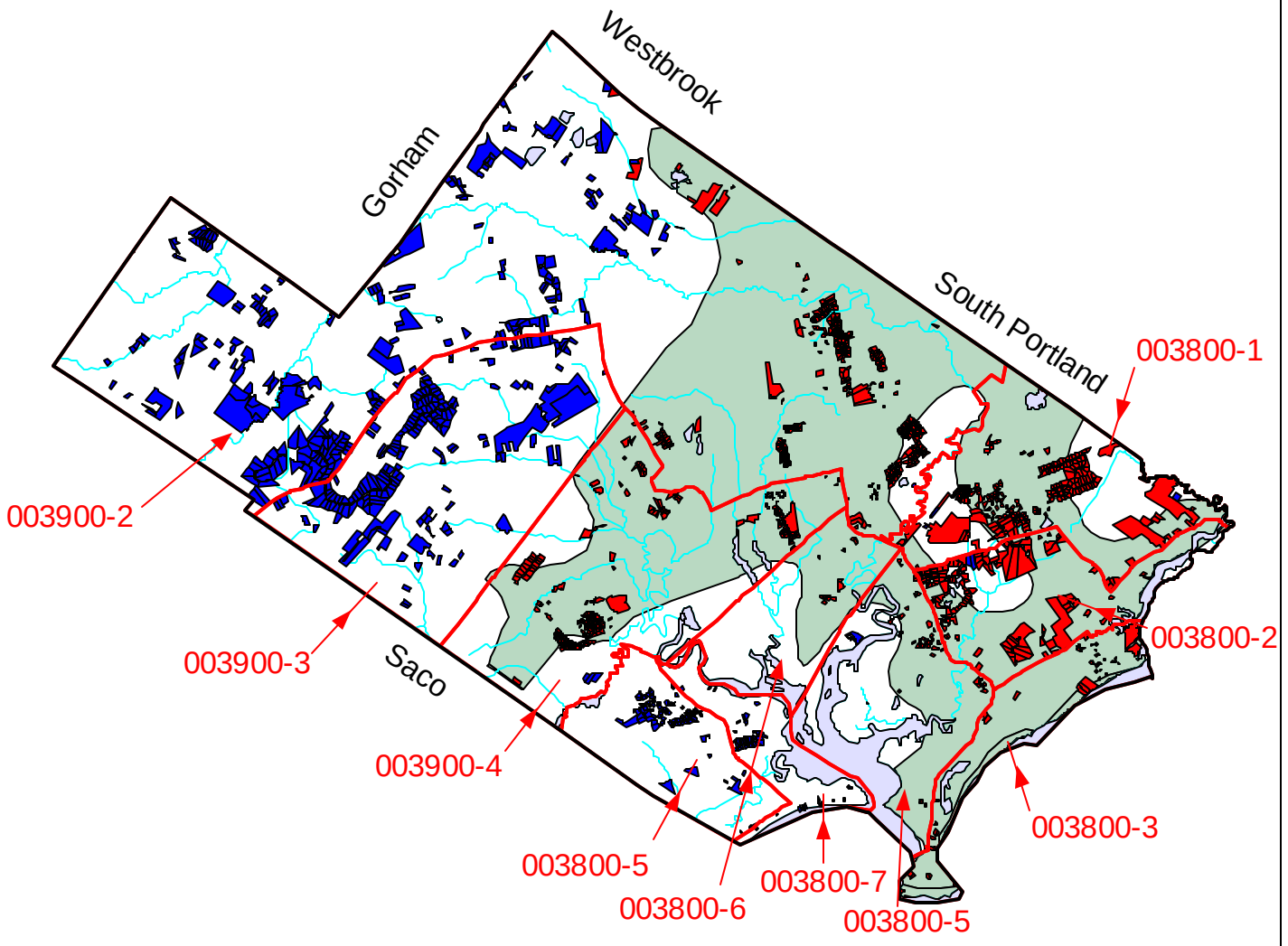
Fig. SC-1 Existing PWD Service Area

CDM

Town of Scarborough, Maine

Portland Water District

1" = 1.75 MILES



Legend

- Permits Outside PWD Service Area
- Permits Inside PWD Service Area
- Census 2000 Block Groups
- PWD Service Area

Fig. S-2 New Housing Units 1990-99

CDM

Table S-1
Distribution of New Dwelling Units
Town of Scarborough 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
T0038 BG1	Pleasant Hill	232	13.2	99
T0038 BG2	Spurwink/Libby River	123	7.0	99
T0038 BG3	Prouts Neck/Higgins Beach	250	14.2	100
T0038 BG5	South/West of Black Point Road	41	2.3	95
T0038 BG6	??	9	0.5	100
T0038 BG7	Pine Point/North of Pine Pt. Road	42	2.4	0
T0038 BG8	South of Pine Point Road	85	4.8	0
T0039 BG1	Oak Hill	295	16.8	100
T0039 BG2	Eight Corners/N. Scarborough/ Burnham Road	241	13.7	18
T0039 BG3	Turnpike to Holmes Road Area	135	7.7	0
T0039 BG4	Route One – Oak Hill/Dunstan	306	17.4	99
Total Town		**1,759**	**100.0%**	**86%**

Note: Block Group 4 in Tract 0038 was separate in 1990 but was included in Block Group 3 in 2000
Note: Block Group 9 in Tract 0038 was separate in 1990 but was included in Block Group 8 in 2000
Source: Town of Scarborough Building Permit Records and PWD Service Area Maps

Table S-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T0038 BG1	1,555	2,240	685	44.1
T0038 BG2	540	926	386	71.5
T0038 BG3	700	695	(5)	-1.2
T0038 BG5	909	905	(4)	-0.4
T0038 BG6	1,064	1,145	81	7.6
T0038 BG7	635	733	98	15.4
T0038 BG8	590	943	353	59.8
T0038 BG1&4	3,915	5,815	1,900	48.5
T0039 BG2	1,773	2,277	504	28.4
T0039 BG3	837	1,291	454	54.2
Total Town	**12,518**	**16,970**	**4,452**	**35.6%**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Scarborough will grow to approximately 30,000 residents by 2020 with a range of 26,100 to 35,700. The Town's 1994 Comprehensive Plan projected that the Town's population would increase to 13,900 to 16,100 by 2003 depending on the rate of growth. The high projection for 2003 is slightly below the growth reported by the Census. Local population projections beyond 2003 were not included in the plan.

As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Scarborough. The PACTS projections forecast that Scarborough's year-round population will grow to 24,282 by 2025. This implies a 2020 estimate of 22,516, which is significantly lower than the low estimate shown here. A comparison of the forecasts is shown in ***Figure S-3***.

Figure S-4 shows the population of each Census block group in Scarborough from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in the Appendix.

Table S-3 shows the estimated population in each Scarborough block group for 2020 and an estimate of the distribution of population inside and outside the current Portland Water District Service Area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Since it is unknown whether growth will tend to be concentrated in the areas currently served by the district or in areas

outside the district, two forecasts are shown. These are based on the "high" growth scenario in order to provide a "maximum demand" estimate against which PWD can test for the adequacy of the water supply system. Details of how these forecasts were prepared are contained in the Appendix.

Table S-3
Forecast 2000-2020 Population by Block Group
And Location Relative to PWD Service Area

	Growth Concentrated			
	INSIDE PWD Service Area		OUTSIDE PWD Service Area	
	In PWD	Out of PWD	In PWD	Out of PWD
T0038 BG1	4,648	--	4,588	60
T0038 BG2	2,723	--	2,701	22
T0038 BG3	1,199	--	1,199	--
T0038 BG5	1,489	76	521	1,045
T0038 BG6	1,987	--	784	1,203
T0038 BG7	--	1,266	--	1,266
T0038 BG8	--	2,409	--	2,409
T0038 BG1&4	12,829	--	12,785	44
T0039 BG2	--	4,005	--	4,005
T0039 BG3	837	2,235	548	2,523
TOTAL	**25,712**	**9,991**	**23,126**	**12,577**

Figure S-3
Scarborough Population Forecasts

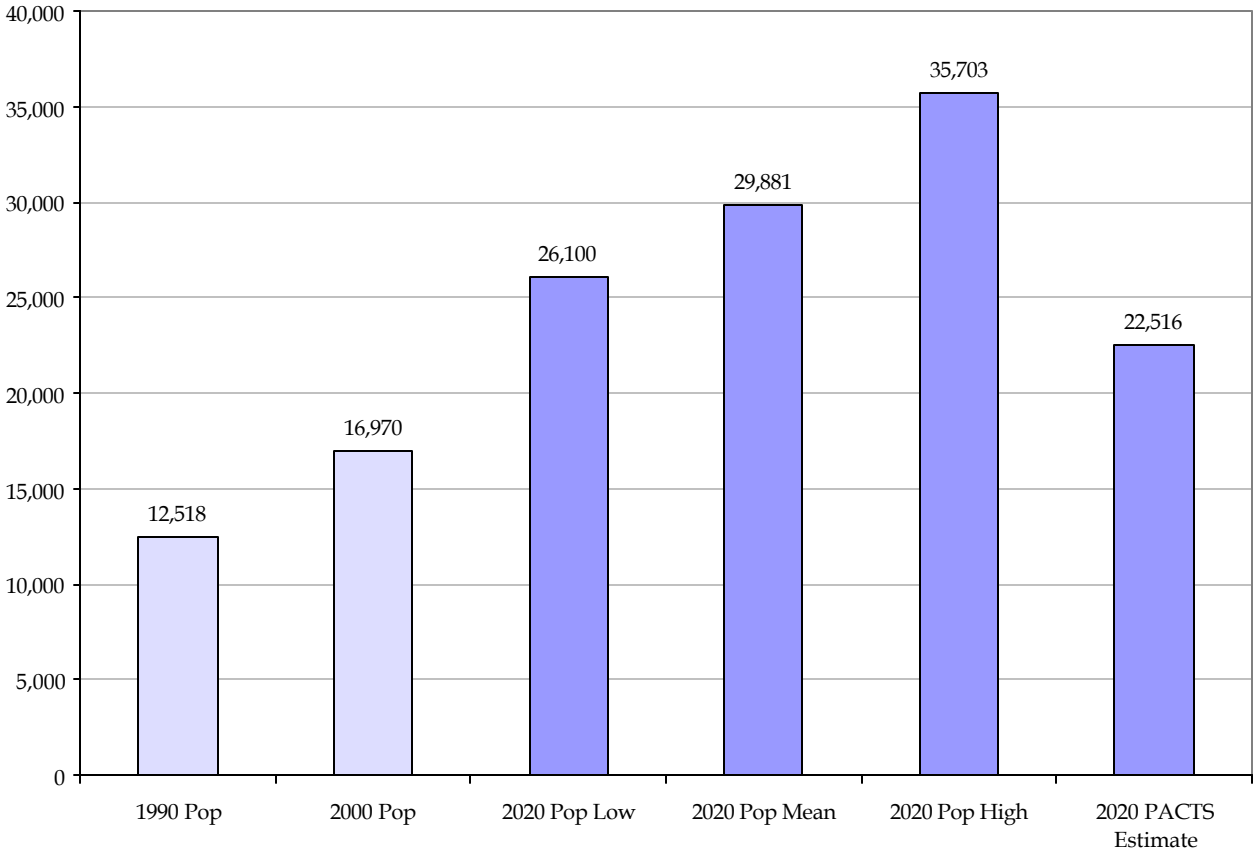
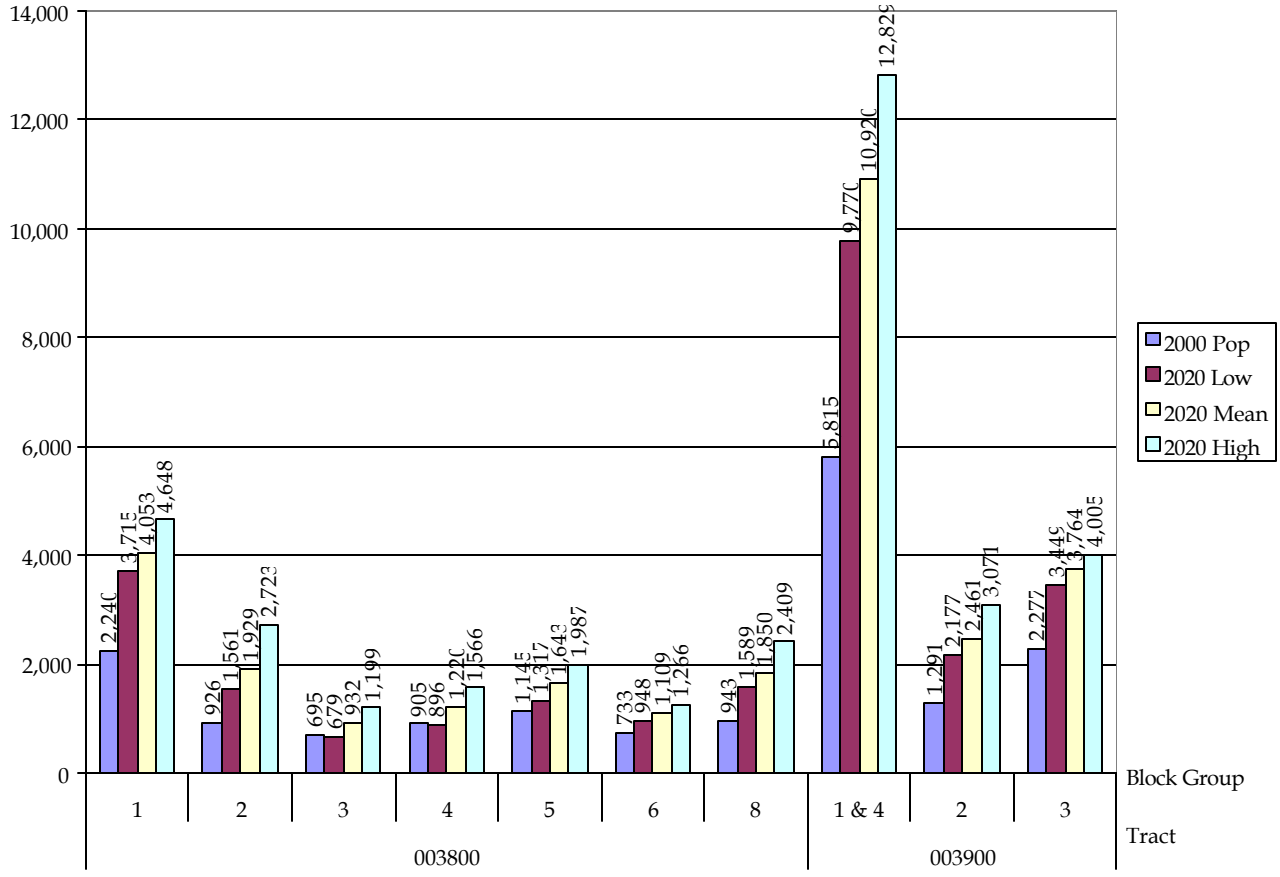


Figure S-4
Scarborough Population Forecast by Block Group



7.2.3 Planned Residential Growth Patterns

The Town's adopted Comprehensive Plan (1994) and zoning ordinances provide the best indicators of the Town's desired pattern of future residential growth. It is, however, important to note that the Town is currently reviewing its residential growth patterns to determine if revisions to the plan and/or zoning ordinance are desired. The desired patterns of growth reflected in these documents are not necessarily consistent with the population forecasts.

The 1993 Comprehensive Plan identifies appropriate areas for accommodating residential growth in the community (***see Figure S-5***). This includes areas designated as:

- Village Residential Areas
- Village Expansion Areas
- Outlying Neighborhood Areas including neighborhood center's and neighborhood residential subareas
- Moderate Density Residential Areas

The Plan envisions that most of these areas are or can be serviced by public water and that the density of development will be high enough to make public water both desirable and practical. The following provides an overview of the areas of Scarborough included within these residential designations:

Village Residential Areas – These areas are designated for a "continuation of high density, village neighborhoods" at densities of up to 6 to 8 dwelling units per acre. This includes the built-up residential areas of Scarborough Village and Little Falls Village.

Village Expansion Areas – These areas are designated for residential development at a density comparable to existing village patterns. This includes areas on the south side of Scarborough Village on both sides of South Street and an area to the north of Little Falls Village along Route 237.

Outlying Neighborhood Areas – These are traditional neighborhood centers in West Scarborough, Dingley Springs, North Scarborough, White Rock, and South Scarborough. The plan envisions residential development at a density of up to 1 to 1.5 units per acre with on-site sewage disposal.

Moderate Density Residential Areas – These areas are designated for suburban-style, moderate density residential development at ½ to 1 unit per acre with on site sewage disposal. This designation includes a large area on the north side of Scarborough village extending to Little Falls and the Mosher Road area and the area along the Standish Town line extending from White Rock to North Scarborough.

Town of Scarborough, Maine

Portland Water District

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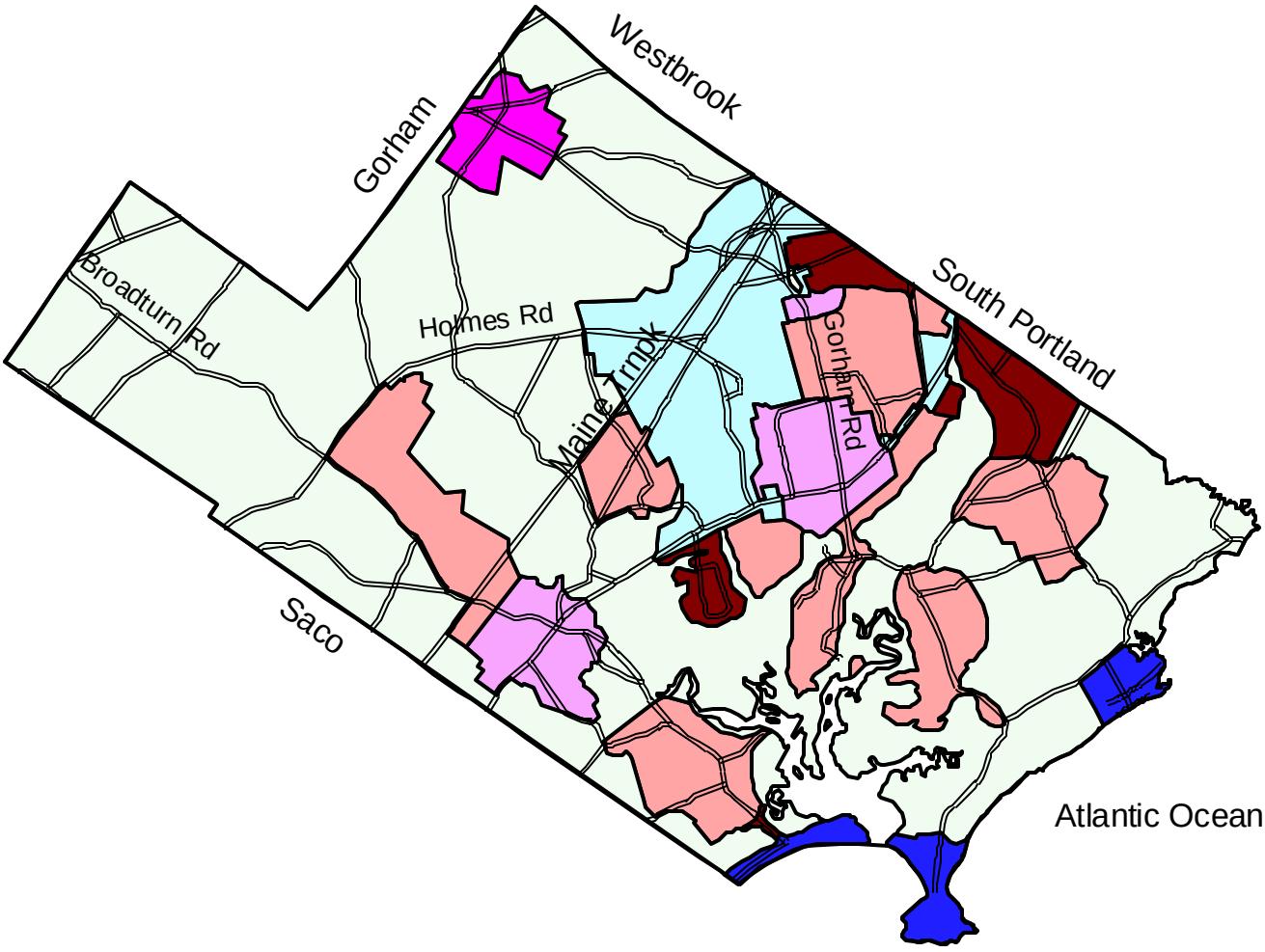
1" = 1.75 MILES



Legend

- Industrial
- Rural
- Neighborhood
- Village Compact
- Coastal Village
- Edge City
- Hamlet

Fig. S-5 Future Land Use Plan

CDM PLANNING DECISIONS MUSKIE SCHOOL

The Town's current zoning ordinance generally reflects this pattern of residential use with a few exceptions. The Town has three residential zones, Urban Residential (similar to the Village Residential designation in the Plan), Suburban Residential (similar to the moderate-density residential designation) and Rural. The principle discrepancies between the 1993 Comprehensive Plan and the current zoning ordinance are:

- The area south of Scarborough Village has never been added to the Village Residential Zone and areas east of South Street remain zoned suburban residential
- The area north of Scarborough Village along the Fort Hill Road remains zoned rural rather than moderate density residential.
- The neighborhood residential zones in outlying areas of West Scarborough, South Scarborough, and Dingley Springs were never created.

7.2.4 Implications of Residential Growth for the Water System

Many of the areas designated for residential growth in the 1993 Comprehensive Plan and/or currently zoned Urban Residential or Suburban Residential are within the current PWD water service area including Scarborough Village and Little Falls Village. Extension of public water may be required in the following areas to allow residential development as envisioned by the 1993 plan:

- The area on both sides of South Street south of Scarborough Village (note: water main extensions are occurring in this area).
- The area along the Gray Road between Scarborough Village and Little Falls
- The area between White Rock and North Scarborough if this area is ever rezoned for high density residential development.
- The area north of Scarborough Village along the Fort Hill Road if this area is rezoned for higher density residential development.
- The area along Route 25 near the Standish line if this area is rezoned to higher density residential development.

7.3 Nonresidential Development And Employment Growth

73.1 Employment Trends

Employment growth in Scarborough is generally concentrated in and around Scarborough Village and in the area of the Scarborough Industrial Park east of Scarborough Village. Table S-4 shows the employment growth in various areas of the Town based upon Maine Department

of Labor data. This data does not accurately reflect employment at USM since the university does not breakdown location of employment between the campuses.

During the 1990's, Scarborough saw a modest increase in total employment but a significantly larger increase in the number of establishments. This suggests that many of the new establishments are small with limited employees. In addition, changes in occupancy in the industrial park are reflected in these numbers.

For a variety of reasons1, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

7.3.2 Anticipated Nonresidential Growth Patterns

The 1993 Comprehensive Plan identifies a number of areas for commercial and industrial growth (***see Figure S-5***). These include the following:

- Village Commercial Areas
- Outlying Neighborhood Centers
- Production-Distribution Areas
- Commercial Areas
- Office Areas

The Plan envisions that most of these areas will be serviced with public water. The following provides an overview of the areas of Scarborough included within these commercial-industrial designations:

Village Commercial Areas – These are the mixed use areas in the core of Scarborough Village and Little Falls Village.

Outlying Neighborhood Centers – These are the historic centers of the outlying neighborhoods and are envisioned to accommodate small scale retail uses to serve primarily local needs. These neighborhood centers are located in Dingley Springs, White Rock, North Scarborough, and South Scarborough.

Production – Distribution Areas – These are areas designated for a variety of industrial, manufacturing, distribution, and service uses. They include the Scarborough Industrial Park area, and outlying areas such as the brickyard and Phinney Lumber.

Commercial Areas – These are areas designated for retail, service, and specialty commercial uses. The Plan designates the Lower Main Street area in East Scarborough as a commercial area.

Office Areas – These areas are designated for small scale office and service uses and moderate density residential use. The only area designated as an office area in the plan is the portion of Main Street from Libby Avenue to Mosher's Corner.

The Town's current zoning ordinance closely reflects the pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial and industrial development are already zoned for nonresidential or mixed use.

7.3.3 Implications for the Water Supply

Most of the areas designated for commercial and industrial growth and zoned for nonresidential uses are located within or adjacent to the current water service area. Therefore, nonresidential development as envisioned by the Town will have few, if any, implications for the geographic coverage of the water system.

7.4 Other Considerations Related To The Water System

During discussions with Town staff, including the Town Planner, other issues were identified that have potential implications for the water system:

Fire Protection Flows in Scarborough Village – The Scarborough Fire Chief has identified concerns with the fire flows and pressure in portions of Scarborough Village. The Town Planner noted that the connection of the Village system to the Huston Road water main via Fort Hill has been mentioned as a possible solution to this problem.

Groundwater Quality – The Town Planner identified a number of areas where groundwater quality issues may lead to consideration of the extension of public water to serve the impacted area. This includes:

- The Dingley Spring Estates area near the Standish line that is currently serviced with a community water system.
- Areas at the south end of Brackett Street that suffer from poor groundwater quality as a result of high salinity levels.
- The former Maine Metal Finishing (Silvex) site on the County Road in South Scarborough.

Section 8
Population Projection and Water Use Trends for Standish

8.1 Existing Water Service Area

The Portland Water District provides water service in very limited areas of the Town of Standish. Standish Village, the Route 35 corridor east of Route 25, Sebago Lake Village, White's Bridge Road and Saint Joseph's College are within the PWD service area (***see Figure ST-1***). In addition, Steep Falls Village is serviced by a separate, freestanding system.

8.2 Residential Development and Population Growth

8.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Standish experienced significant residential development, primarily single-family homes. A review of building permit records identified 780 new housing units constructed between July 1991 and December 2000 although some data is incomplete. Residential development occurred throughout the Town but it is not possible to accurately locate the pattern of this development.

Of the new residential units built during this period, approximately 36 or 5% were located within the PWD service area with the balance located in areas not served by public water.

8.2.2 Population Trends

During the 1990's, the year-round population of the Town of Standish grew from 7,677 in 1990 to 9,285 in 2000 or an increase of just over 1,600 residents or 20.9%. This population growth, like the residential development, occurred throughout the community. ***Table ST-2*** shows the distribution of the population growth by Census block groups.

Portland
Water District

Town of Standish, Maine

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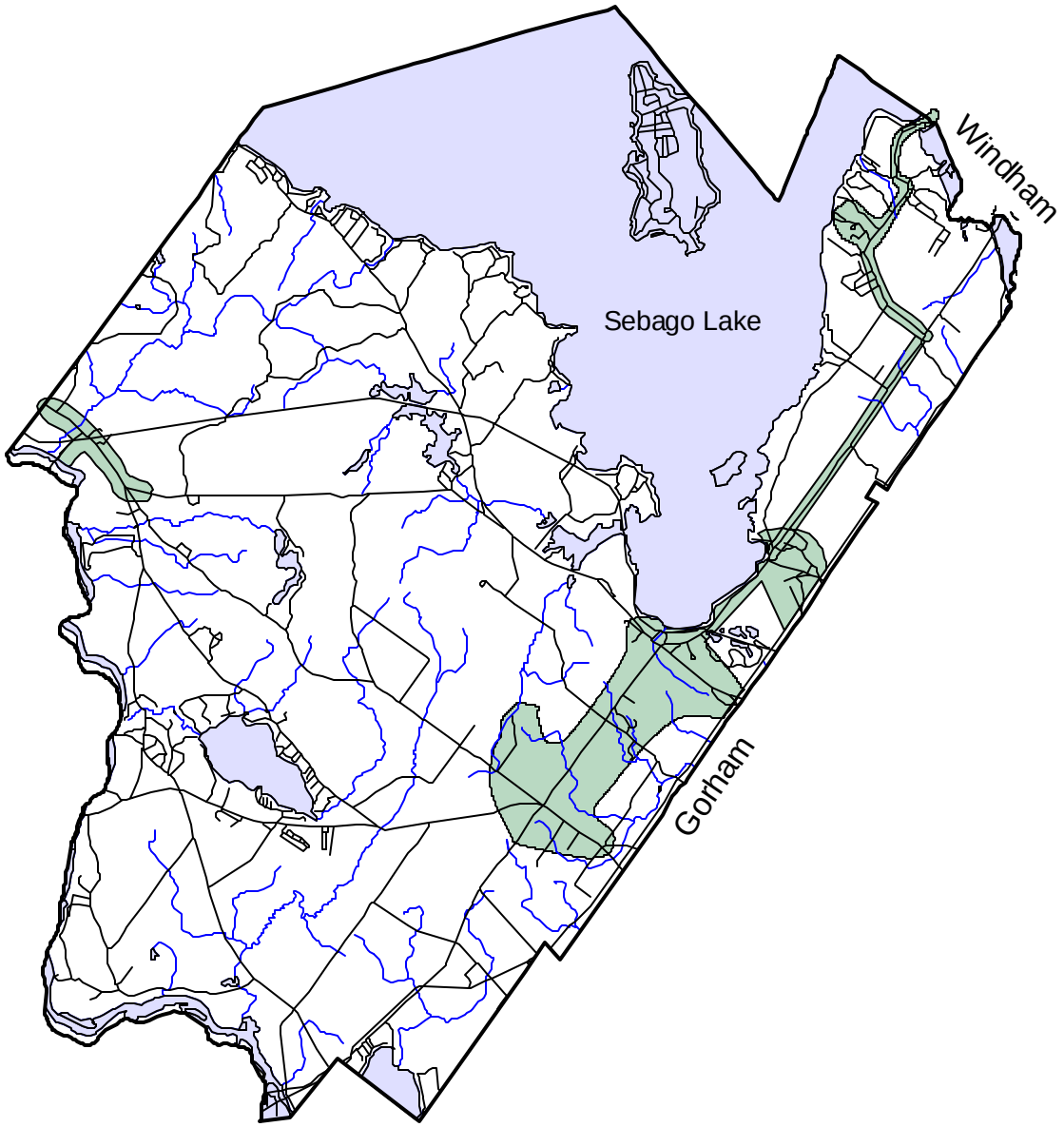


Legend

- Streams/Rivers
- PWD Service Area
- Lakes/Ponds

Fig.S-1 Exisitng PWD Service Area

CDM

MUSKIE SCHOOL

PLANNING DECISIONS

Figure St-2
Distribution of Standish Housing Permits

Data Unavailable

Table ST-1
Distribution of New Dwelling Units
Town of Standish 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
CT1700 BG's 1,2,3, & 4	Entire Town	780	100.0	5

Source: Town of Standish Building Permit Records and PWD Service Area Maps

Table ST-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T1700 BG1	2,174	2,555	381	17.5
T1700 BG2	3,179	3,952	773	24.3
T1700 BG3	590	621	31	13.7
T1700 BG4	1,734	2,157	423	24.4
Total Town	**7,677**	**9,285**	**1,608**	**20.9%**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Standish will grow to approximately 13,500 residents by 2020 with a range of 12,727 to 14,217. The Town's 1992 Comprehensive Plan projected that the Town's population would increase to approximately 8,900 by 2000 or somewhat below the growth reported by the Census. Local population projections beyond 2000 anticipated that the Town's population would grow to 9,936 by 2010.

As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Standish. The PACTS projections forecast that Standish's year-round population will grow to 14,038 by 2025. This implies a 2020 estimate of 13,100. A comparison of the forecasts are shown in ***Figure ST-3***.

Figure ST-4 shows the population of each Census block group in Standish from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in the Appendix.

Table ST-3 shows the estimated population in each Standish block group for 2020 and an estimate of the distribution of population inside and outside the current Portland Water District Service Area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Since it is unknown whether growth will tend to be concentrated in the areas currently served by the district or in areas outside the district, two forecasts are shown. These are based on the "high" growth scenario in order to provide a "maximum demand" estimate against which PWD can test for the adequacy of the water supply system. Details of how these forecasts were prepared are contained in the Appendix.

Table ST-3
Forecast 2000-2020 Population by Block Group
And Location Relative to PWD Service Area

	Growth Concentrated			
	INSIDE PWD Service Area		OUTSIDE PWD Service Area	
	In PWD	Out of PWD	In PWD	Out of PWD
T1700 BG1	68	3,742	68	3,742
T1700 BG2	799	5,349	799	5,349
T1700 BG3	166	733	166	733
T1700 BG4	504	2,856	504	2,856
TOTAL	**1,537**	**12,680**	**1,537**	**12,680**

Figure ST-3
Standish Population Forecasts

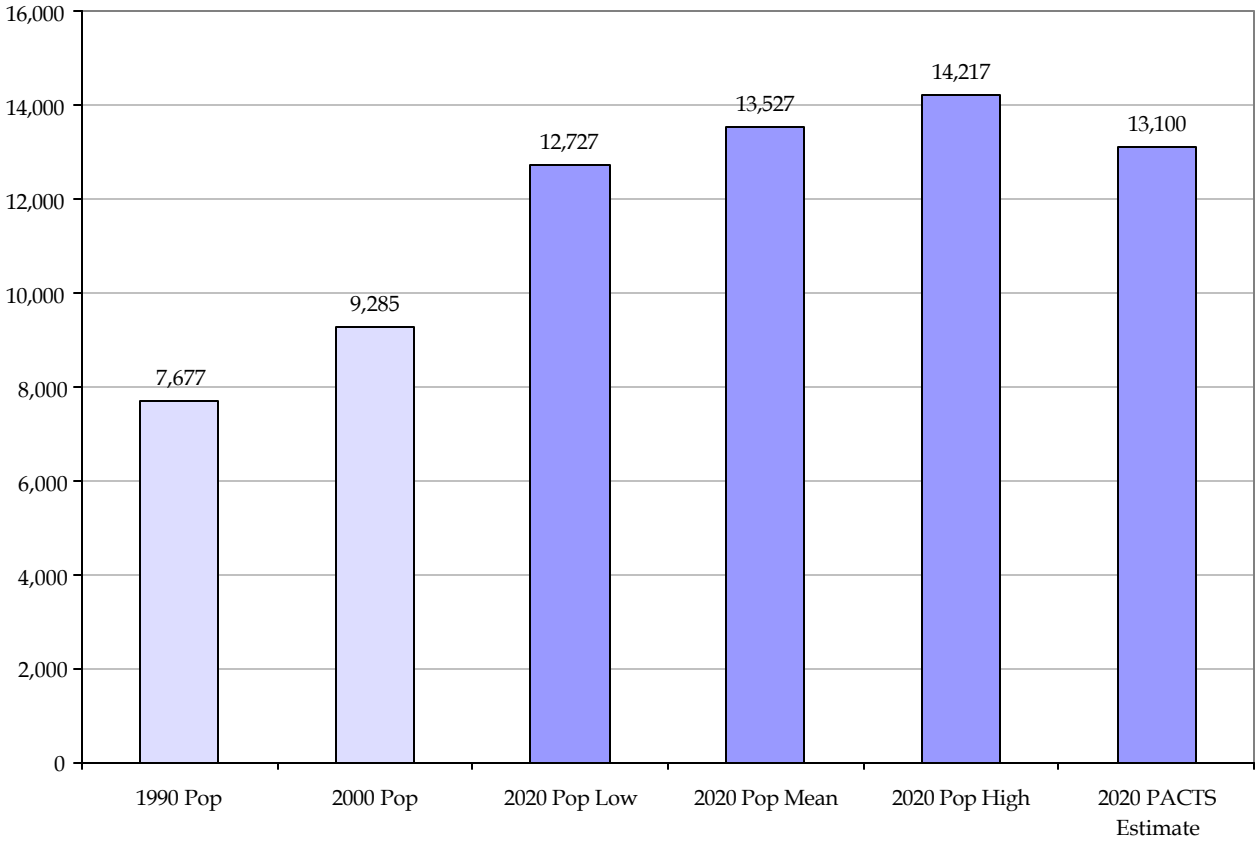
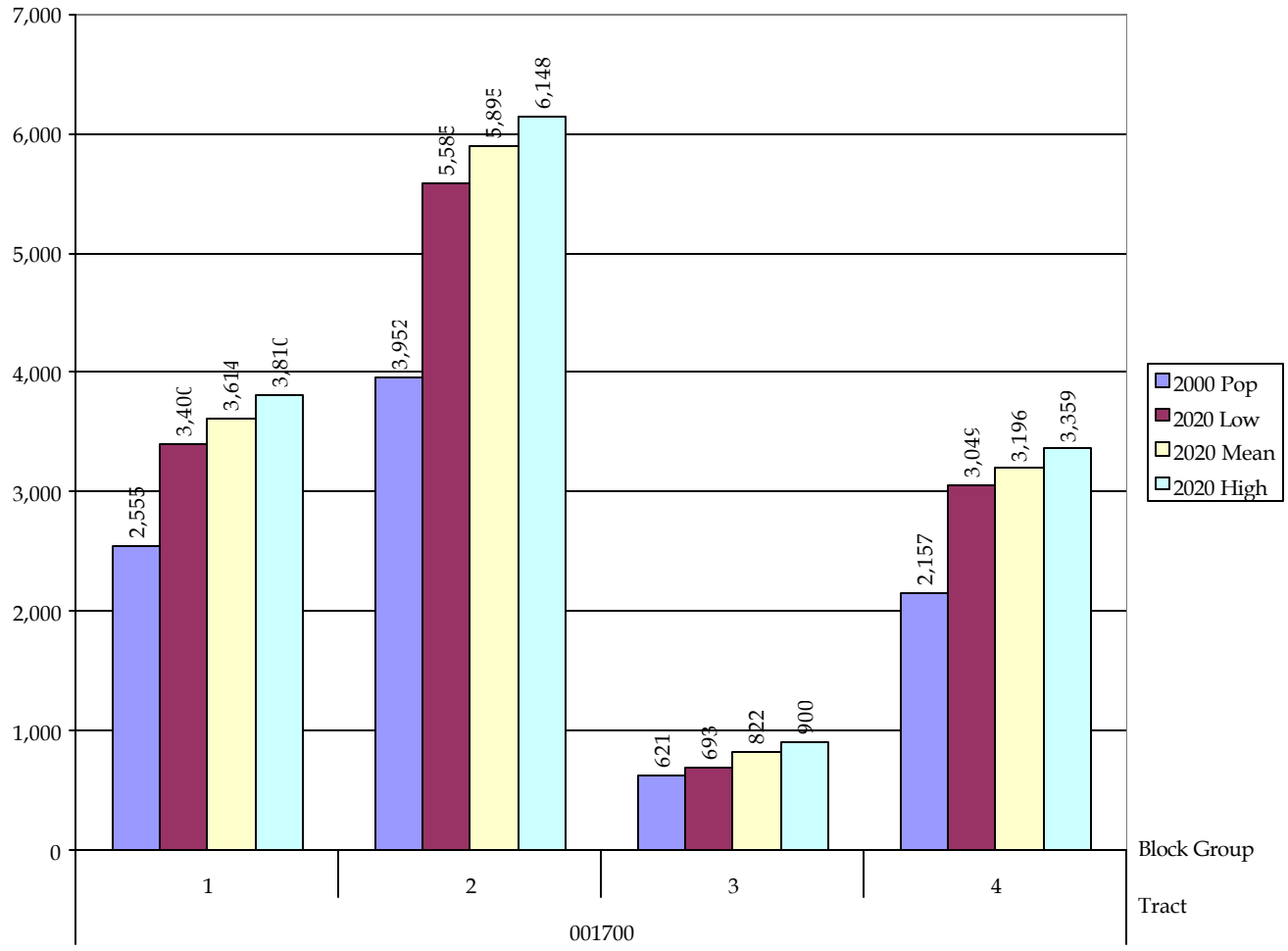


Figure ST-4
Standish Population Forecast by Block Group



8.2.3 Planned Residential Growth Patterns

The Town's adopted Comprehensive Plan (1993) and zoning ordinances provide the best indicators of the Town's desired pattern of future residential growth. It is, however, important to note that the Town is currently reviewing its residential growth patterns to determine if revisions to the plan and/or zoning ordinance are desired. The desired patterns of growth reflected in these documents are not necessarily consistent with the population forecasts.

The 1993 Comprehensive Plan identifies appropriate areas for accommodating residential growth in the community (***see Figure ST-5***). This includes areas designated as:

- Village Residential Areas
- Village Expansion Areas
- Outlying Neighborhood Areas including neighborhood center's and neighborhood residential subareas
- Moderate Density Residential Areas

The Plan envisions that most of these areas are or can be serviced by public water and that the density of development will be high enough to make public water both desirable and practical. The following provides an overview of the areas of Standish included within these residential designations:

Village Residential Areas – These areas are designated for a "continuation of high density, village neighborhoods" at densities of up to 6 to 8 dwelling units per acre. This includes the built-up residential areas of Standish Village and Little Falls Village.

Village Expansion Areas – These areas are designated for residential development at a density comparable to existing village patterns. This includes areas on the south side of Standish Village on both sides of South Street and an area to the north of Little Falls Village along Route 237.

Outlying Neighborhood Areas – These are traditional neighborhood centers in West Standish, Dingley Springs, North Standish, White Rock, and South Standish. The plan envisions residential development at a density of up to 1 to 1.5 units per acre with on-site sewage disposal.

Moderate Density Residential Areas – These areas are designated for suburban-style, moderate density residential development at ½ to 1 unit per acre with on site sewage disposal. This designation includes a large area on the north side o f Standish village extending to Little Falls and the Mosher Road area and the area along the Standish Town line extending from White Rock to North Standish.

Town of Standish, Maine

Portland Water District

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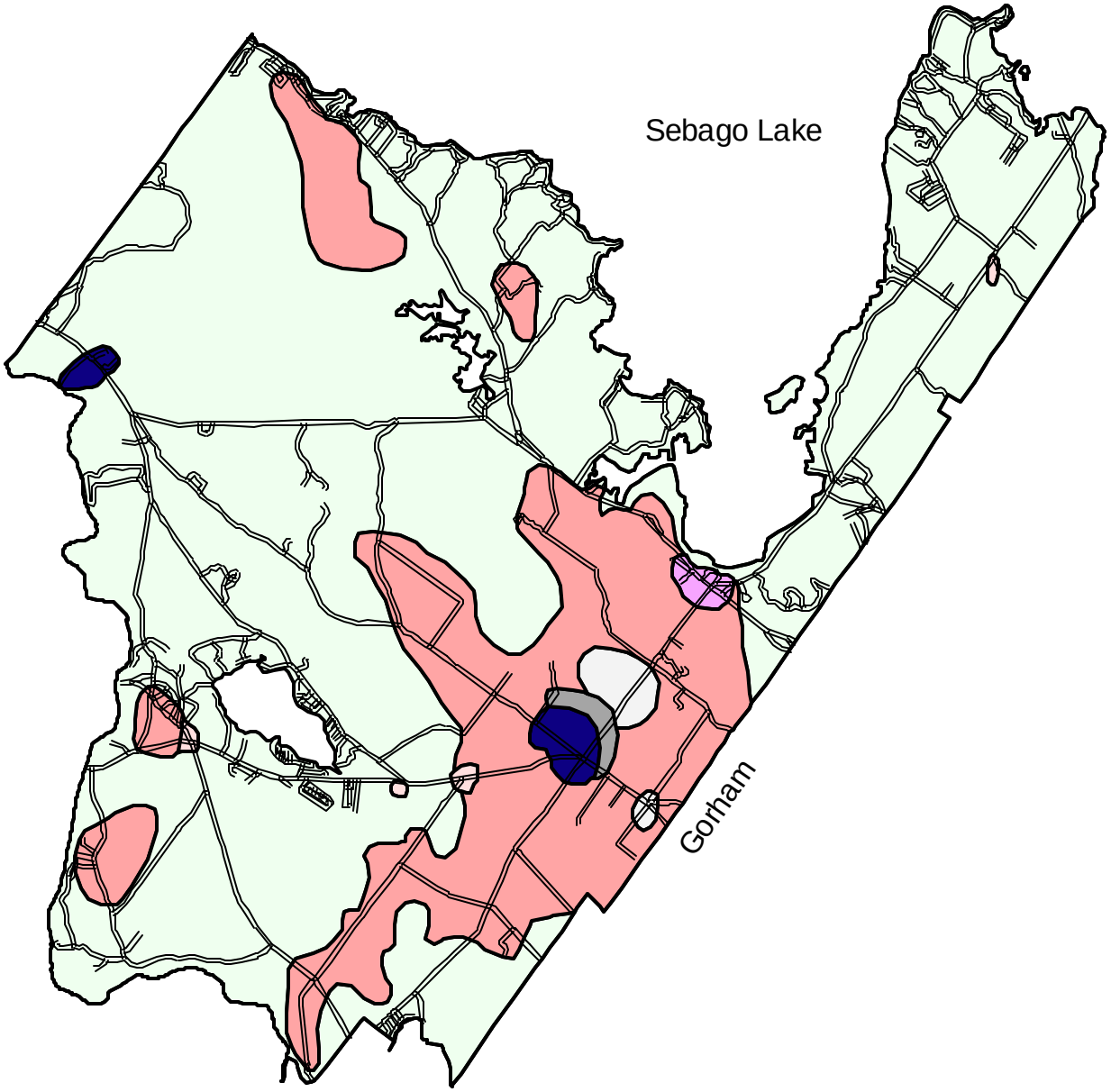
1" = 1.75 MILES



Legend

- Neighborhood
- Low Intensity Commercial
- Medium Density Nonresidential
- Medium Density Residential
- Rural
- Village
- Village Center

Figure ST-5 Future Land Use Plan

CDM

PLANNING DECISIONS

MUSKIE SCHOOL

The Town's current zoning ordinance generally reflects this pattern of residential use with a few exceptions. The Town has three residential zones, Urban Residential (similar to the Village Residential designation in the Plan), Suburban Residential (similar to the moderate-density residential designation) and Rural. The principle discrepancies between the 1993 Comprehensive Plan and the current zoning ordinance are:

- The area south of Standish Village has never been added to the Village Residential Zone and areas east of South Street remain zoned suburban residential
- The area north of Standish Village along the Fort Hill Road remains zoned rural rather than moderate density residential.
- The neighborhood residential zones in outlying areas of West Standish, South Standish, and Dingley Springs were never created.

8.2.4 Implications of Residential Growth for the Water System

Many of the areas designated for residential growth in the 1993 Comprehensive Plan and/or currently zoned Urban Residential or Suburban Residential are within the current PWD water service area including Standish Village and Little Falls Village. Extension of public water may be required in the following areas to allow residential development as envisioned by the 1993 plan:

- The area on both sides of South Street south of Standish Village (note: water main extensions are occurring in this area).
- The area along the Gray Road between Standish Village and Little Falls
- The area between White Rock and North Standish if this area is ever rezoned for high density residential development.
- The area north of Standish Village along the Fort Hill Road if this area is rezoned for higher density residential development.
- The area along Route 25 near the Standish line if this area is rezoned to higher density residential development.

8.3 Nonresidential Development And Employment Growth

8.3.1 Employment Trends

Employment growth in Standish is generally concentrated in and around Standish Village and in the area of the Standish Industrial Park east of Standish Village. Table ST-4 shows the employment growth in various areas of the Town based upon Maine Department of Labor data.

This data does not accurately reflect employment at USM since the university does not breakdown location of employment between the campuses.

Table St-5
Principal Employment Locations

	Employers		Employment	
	1990	2000	1990	2000
ROUTE 25		16		295
OSSIPEE TRAIL E		14		361
NORTHEAST RD		6	1000-1250	300-400
OSSIPEE TRAIL		6		175-200
ROUTE 114		6		<50
BLAKE RD		4		50-100
SACO RD				300-400
WHITES BRIDGE RD		4		400-500
Total	119	155	2967	2856

During the 1990's, Standish saw a modest decrease in total employment but a significantly larger increase in the number of establishments. This suggests that many of the new establishments are small with limited employees. In addition, changes in occupancy in the industrial park are reflected in these numbers.

For a variety of reasons, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

8.3.2 Anticipated Nonresidential Growth Patterns

The 1993 Comprehensive Plan identifies a number of areas for commercial and industrial growth (see Figure ST-5). These include the following:

- Village Commercial Areas
- Outlying Neighborhood Centers
- Production-Distribution Areas
- Commercial Areas
- Office Areas

The Plan envisions that most of these areas will be serviced with public water. The following provides an overview of the areas of Standish included within these commercial-industrial designations:

Village Commercial Areas – These are the mixed use areas in the core of Standish Village and Little Falls Village.

Outlying Neighborhood Centers – These are the historic centers of the outlying neighborhoods and are envisioned to accommodate small scale retail uses to serve primarily local needs. These neighborhood centers are located in Dingley Springs, White Rock, North Standish, and South Standish.

Production – Distribution Areas – These are areas designated for a variety of industrial, manufacturing, distribution, and service uses. They include the Standish Industrial Park area, and outlying areas such as the brickyard and Phinney Lumber.

Commercial Areas – These are areas designated for retail, service, and specialty commercial uses. The Plan designates the Lower Main Street area in East Standish as a commercial area.

Office Areas – These areas are designated for small scale office and service uses and moderate density residential use. The only area designated as an office area in the plan is the portion of Main Street from Libby Avenue to Mosher's Corner.

The Town's current zoning ordinance closely reflects the pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial and industrial development are already zoned for nonresidential or mixed use.

8.3.3 Implications for the Water Supply

Most of the areas designated for commercial and industrial growth and zoned for nonresidential uses are located within or adjacent to the current water service area. Therefore, nonresidential development as envisioned by the Town will have few, if any, implications for the geographic coverage of the water system.

8.4 Other Considerations Related To The Water System

During discussions with Town staff, including the Town Planner, other issues were identified that have potential implications for the water system:

Fire Protection Flows in Standish Village – The Standish Fire Chief has identified concerns with the fire flows and pressure in portions of Standish Village. The Town Planner noted that the connection of the Village system to the Huston Road water main via Fort Hill has been mentioned as a possible solution to this problem.

Groundwater Quality – The Town Planner identified a number of areas where groundwater quality issues may lead to consideration of the extension of public water to serve the impacted area. This includes:

- The Dingley Spring Estates area near the Standish line that is currently serviced with a community water system.
- Areas at the south end of Brackett Street that suffer from poor groundwater quality as a result of high salinity levels.
- The former Maine Metal Finishing (Silvex) site on the County Road in South Standish.

Section 9
Population Projection and Water Use Trends for Windham

9.1 Existing Water Service Area

A significant portion of Windham is served by the Portland Water District's distribution system (***see Figure W-1***). PWD services Windham through two distinct systems. The first system is the Windham Center system in which water is pumped into Windham via Bridgton Road (Route 302) and the Windham Center Road. This system serves the Route 202 corridor from South Windham to Foster's Corner and from Foster's Corner along Route 302 to the Page Road. A main in River Road from Route 202 serves the Windham Correctional Facility and residents in the South Windham area. A second system serves the Route 302 corridor from the Raymond line to Page Road. The Routes 35 and 115 corridors are also served by this system. PWD also provides service to an expansive seasonal water system that is activated from May to October and feeds the Pettingill Pond, Little Sebago Lake, Collins Pond, and the Sebago Lake Basin areas.

9.2 Residential Development and Population Growth

9.2.1. Recent Residential Development Patterns

During the 1990's, the Town of Windham experienced significant residential development, primarily single-family homes. A review of building permit records identified 1,040 new housing units constructed between 1990 and 1999. Residential development occurred throughout the Town (***see Figure W-2***), but the largest number of units was constructed in the South Windham/Foster Corner's areas and north of North Windham.

Of the new residential units built during the 90's, approximately 820 or 79% were located within the PWD service area with the balance located in areas not served by public water. ***Table W-1*** shows the distribution of the units by Census block group.

9.2.2 Population Trends

During the 1990's, the year-round population of the Town of Windham grew from 13,020 in 1990 to 14,904 in 2000 or an increase of almost 1,900 residents or 14.5%. This population growth, like the residential development, occurred throughout the community. ***Table W-2*** shows the distribution of the population growth by Census block groups. Population growth was greatest in the Route 202 corridor from South Windham through Foster's Corner and extending along the River Road.

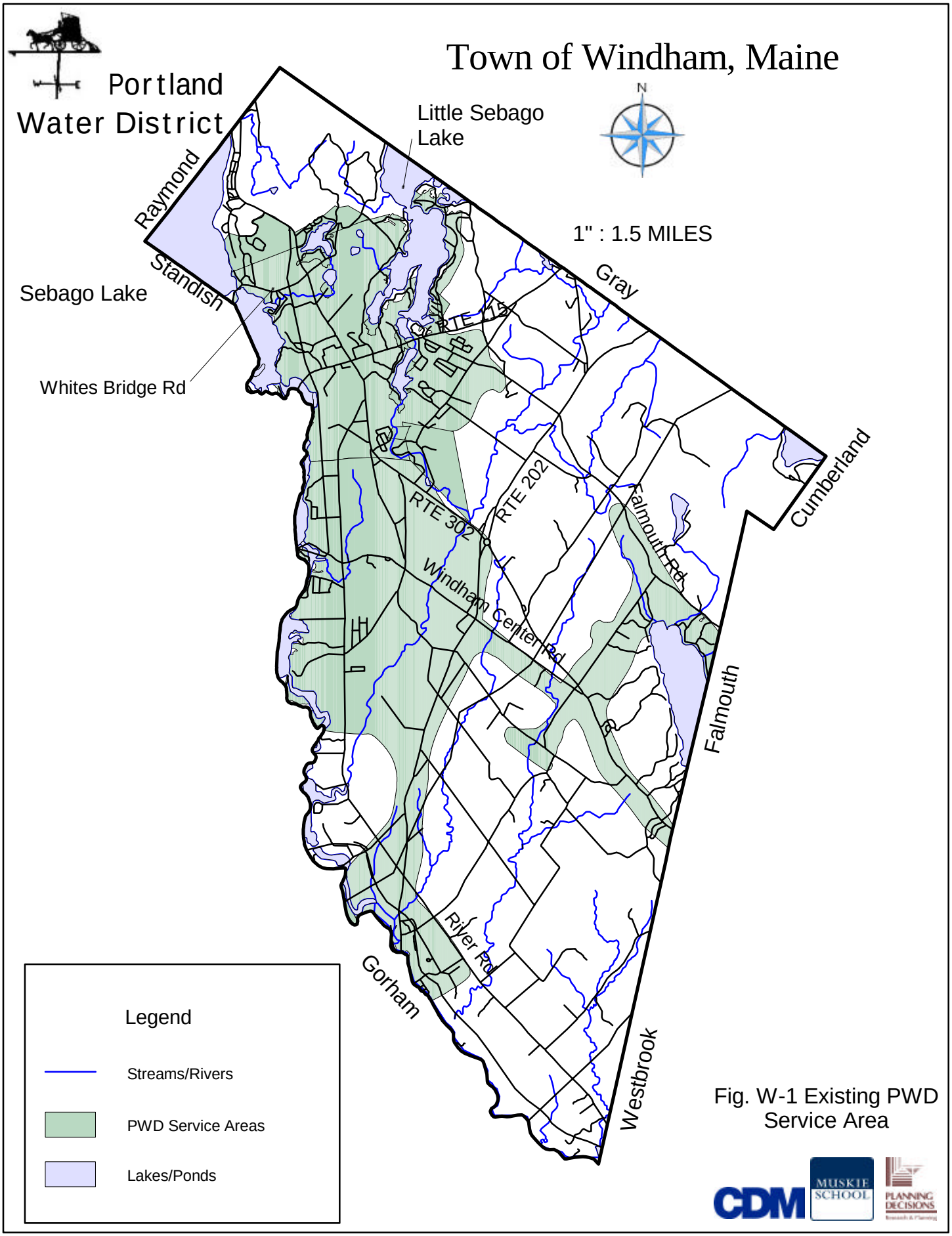


Fig. W-1 Existing PWD Service Area

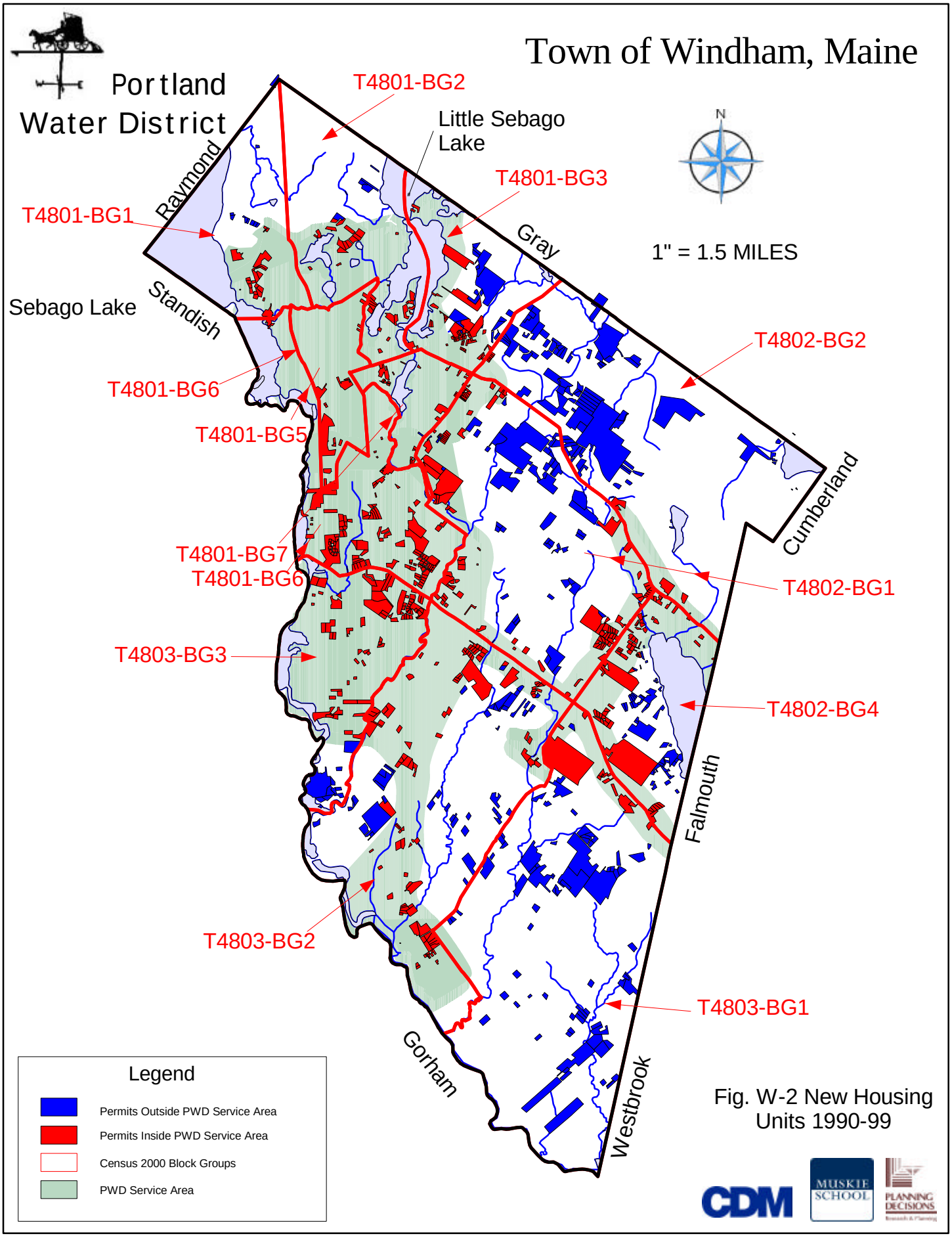

Town of Windham, Maine
Portland Water District
T4801-BG2
Little Sebago Lake
T4801-BG3
T4801-BG1
Raymond
Gray
N
1" = 1.5 MILES
Sebago Lake
Standish
T4802-BG2
T4801-BG6
T4801-BG5
Cumberland
T4801-BG7
T4801-BG6
T4802-BG1
T4803-BG3
T4802-BG4
Falmouth
T4803-BG2
T4803-BG1
Gorham
Westbrook
Legend
Permits Outside PWD Service Area
Permits Inside PWD Service Area
Census 2000 Block Groups
PWD Service Area
Fig. W-2 New Housing Units 1990-99
CDM
MUSKIE SCHOOL
PLANNING DECISIONS

Table W-1
Distribution of New Dwelling Units
Town of Windham 1990 – 1999

Tract and Block Group	Location	# of Units	% of Town Total	% with Water Service
T4801 BG1	North end of Route 302	32	3.1	69
T4801 BG2	West of Little Sebago	39	3.8	87
T4801 BG3	East of Little Sebago	95	9.1	81
T4801 BG5	Windham Hill/Pope Road	18	1.7	100
T4801 BG6	Route 302/Whites' Bridge	137	13.2	100
T4801 BG7	North Windham	36	3.5	97
T4802 BG1	Foster's Corner	175	16.8	71
T4802 BG2	Libby Hill/Route 202	91	8.8	12
T4802 BG4	Highland Lake	106	10.2	59
T4803 BG1	Land of Nod/River Road	86	8.3	14
T4803 BG2	South Windham/Route 202	146	14.0	71
T4803 BG3	Windham Hill/River Road	79	7.6	89
Total Town		**1,040**	**100.0%**	**79%**

Source: Town of Windham Building Permit Records and PWD Service Area Maps

Table W-2
Population Growth 1990 – 2000

Tract and Block Group	1990 Population	2000 Population	Change 90 – 00	% Change 90 - 00
T4801 BG1	744	808	64	8.6
T4801 BG2	756	818	62	8.2
T4801 BG3	1,110	1,220	110	9.9
T4801 BG5, 6,7	3,026	3,350	324	10.7
T4802 BG1	1,048	1,450	402	38.4
T4802 BG2	727	921	194	26.7
T4802 BG4	1,307	1,429	122	9.3
T4803 BG1, 2	3,374	3,842	468	13.9
T4803 BG3	928	1,066	138	14.9
Total Town	**13,020**	**14,904**	**1,884**	**14.5**

Population projections prepared by the Muskie School of Public Service anticipate that the population of Windham will grow to approximately 19,600 residents by 2020 with a range of 18,357 to 20,988. The Town's 1993 Comprehensive Plan projected that the Town's population would increase to approximately 16,000 by 2000 or somewhat more than the growth reported by the Census. Local population projections beyond 2000 envisioned the Town growing to about 17,500 by 2010 based upon state projections.

As part of its update of the Regional Transportation Plan, the Portland Area Comprehensive Transportation Study (PACTS) prepared population projections for Windham. The PACTS projections forecast that Windham's year-round population will grow to 22,934 by 2025. This implies a 2020 estimate of 21,300, about the high estimate shown here. A comparison of the forecasts is shown in ***Figure W-3***.

Figure W-4 shows the population of each Census block group in Windham from the 2000 Census and three forecasts of the population for each block group for the year 2020. These forecast figures show the lowest, highest, and mean forecasts from four different forecasting techniques. The details of the forecasting methods are presented in the Appendix.

Table W-3 shows the estimated population in each Windham block group for 2020 and an estimate of the distribution of population inside and outside the current Portland Water District Service Area. The "high" population forecast is used as the basis of this forecast in order to provide a conservative test of the current system's capacities. Since it is unknown whether growth will tend to be concentrated in the areas currently served by the district or in areas outside the district, two forecasts are shown. These are based on the "high" growth scenario in order to provide a "maximum demand" estimate against which PWD can test for the adequacy of the water supply system. Details of how these forecasts were prepared are contained in the Appendix.

Table W-3
Forecast 2000-2020 Population by Block Group
And Location Relative to PWD Service Area

	Growth Concentrated			
	INSIDE PWD Service Area		OUTSIDE PWD Service Area	
	In PWD	Out of PWD	In PWD	Out of PWD
T4801 BG1	735	334	276	793
T4801 BG2	944	139	473	609
T4801 BG3	1,309	306	679	935
T4801 BG5, 6,7	4,439	45	4,306	178
T4802 BG1	2,776	128	2,588	188
T4802 BG2	1,484	--	1,442	41
T4802 BG4	1,351	540	446	1,329
T4803 BG1, 2	869	4,292	2,219	2,942
T4803 BG3	835	592	673	754
TOTAL	**14,740**	**6,376**	**13,102**	**7,770**

Figure W-3
Windham Population Forecasts

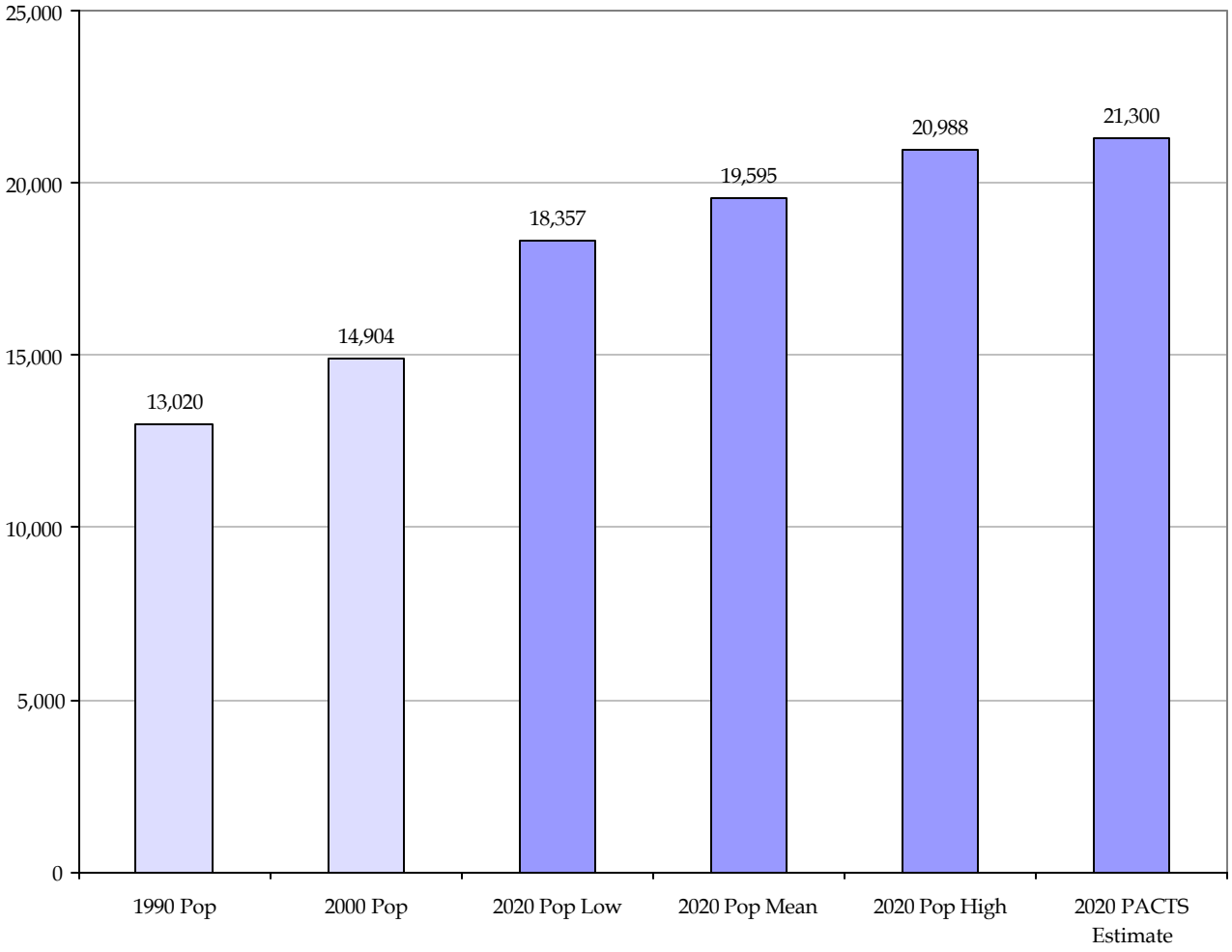
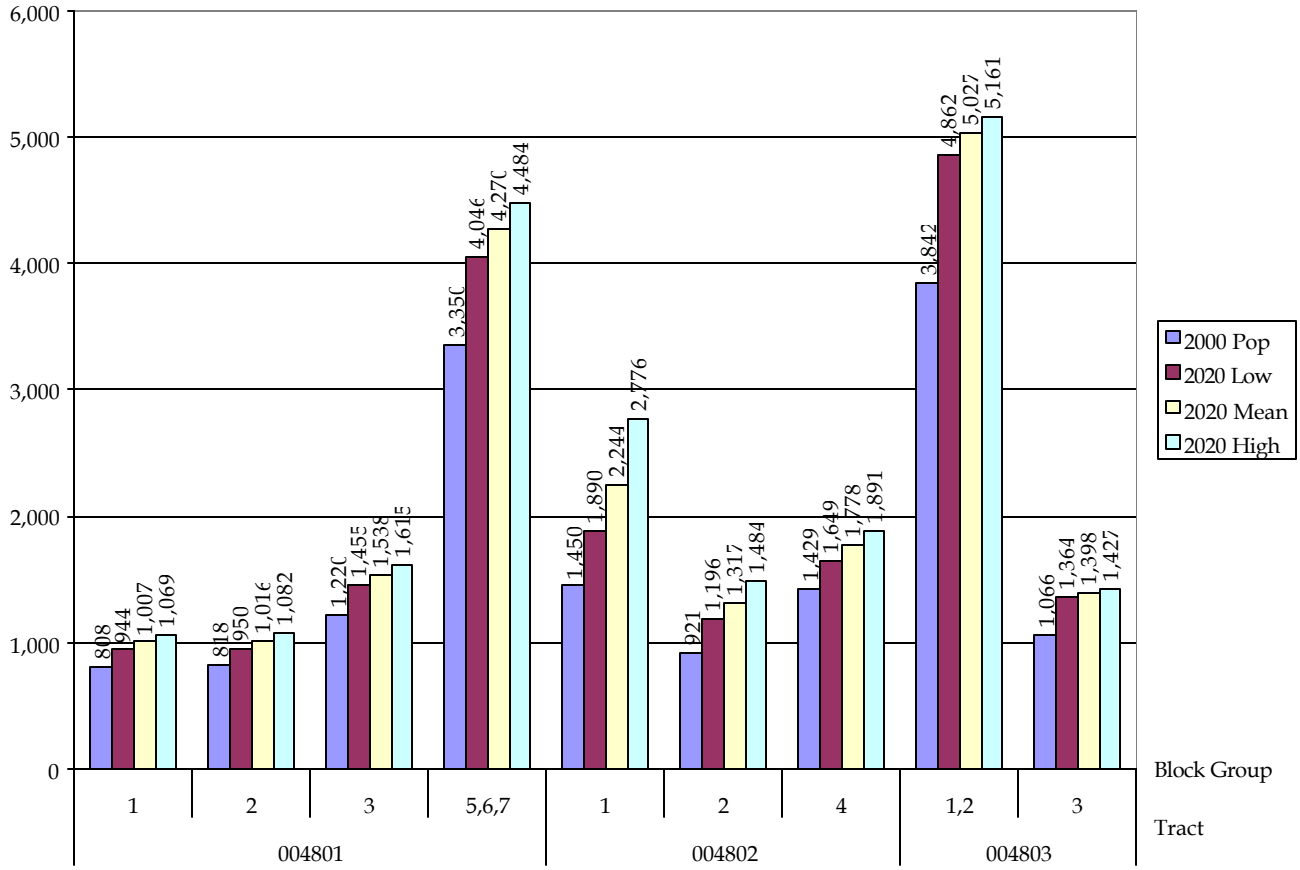


Figure W-4
Windham Population Forecast by Block Group



9.2.3 Planned Residential Growth Patterns

The Town is currently in the process of updating the Comprehensive Plan that was adopted in 1993. That Plan and the Town's zoning ordinances provide the best current indicators of the Town's desired pattern of future residential growth but this may change as the updated plan is developed. The desired patterns of growth reflected in these documents are not necessarily consistent with the population forecasts.

The 1993 Comprehensive Plan identifies appropriate areas for accommodating residential growth in the community (***see Figure W-5***). This includes areas designated as:

- Light Density Residential
- Medium Density Residential

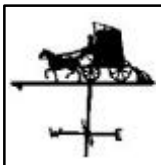
The Plan envisions that most of these areas are or can be serviced by public water and that the density of development will be high enough to make public water both desirable and practical. Most of the balance of the Town that is not designated for nonresidential development is designated as rural and is currently zoned Farm or Farm-Residential. While the avowed purpose of these zones is to retain the rural character of these areas, significant residential development is occurring in these areas on one to two acre lots.

The following is an overview of the areas of Windham included within the residential growth designations:

Light Density Residential Areas – These areas are designated primarily for single-family homes at a density of one dwelling units per acre (40,000 SF lots). This zone includes the residential area west of the White's Bridge Road to the Raymond town line.

Medium Density Residential Areas – These areas are designated for suburban-style, moderate density residential development at approximately two units per acre with public water. Single-family homes served by public water are allowed on 20,000 square foot lots while multifamily housing is allowed at a density of 15,000 square feet per unit or almost 3 units per acre. This designation includes a large area on the east side of North Windham (***see Figure W-5)*** and areas in South Windham along the River Road.

Town of Windham, Maine



Portland Water District

1" = 1.5 Miles

Raymond

Gray

Standish

Sebago Lake

Whites Bridge Rd

RTE 115

RTE 302

RTE 202

Falmouth Rd

Cumberland

Windham Center Rd

Albion

Falmouth

Gorham

River Rd

Westbrook

Source: Summerized from the Comprehensive Plan and Zoning Map

Legend

- Light Density Residential
- Medium Density Residential
- Rural
- Commercial
- Enterprise District
- Industrial

Fig. W-5 Future Land Use Plan

CDM

PLANNING DECISIONS

MUSKIE SCHOOL

The Town's current zoning ordinance generally reflects this pattern of residential use.

9.2.4 Implications of Residential Growth for the Water System

While much of the area designated as Medium Density Residential in the North Windham area is within the current PWD water service area, some of the Light Density Residential area along the Raymond line is not. The recent water main extension along Route 302 will make water service to this area possible.

In the South Windham area, the PWD system serves most of the Medium Density Residential areas.

This suggests that the Town's desired pattern of residential development as set forth in the 1993 Comprehensive Plan and Zoning Ordinance will not require significant expansion of the PWD system.

9.3 Nonresidential Development And Employment Growth

9.3.1 Employment Trends

The Town of Windham is a significant employment center. Employment is generally concentrated in and around North Windham, South Windham including the Correctional Center, the balance of the Route 302 corridor and the Route 202 corridor. Table W-4 shows the employment growth in various areas of the Town based upon Maine Department of Labor data.

Table 2-4
Windham Major Employment Locations

	Employers		Employment	
	1990	**2000**	**1990**	**2000**
ROOSEVELT TRAIL - 302	135	224	1645	2701
RIVER RD	11	17	<25	100
ROUTE 115	N/A	11	N/A	142
GRAY RD	8	9	<50	425
MAIN ST	4	9	<50	50-75
WINDHAM CTR RD	4	9	300-400	500-600
MALLISON FALLS RD				200-300
SCHOOL RD				200-300
WEST MAIN ST				300-400
WINDHAM PLAZA				100-200
Grand Total	416	492	4563	6159

During the 1990's, Windham saw a sizable increase in total employment (about 35%) but a smaller increase in the number of establishments (18%). This suggests that the average size of establishments has increased reflecting more larger businesses in the community.

For a variety of reasons, the street-level data used in this analysis is imperfect, and should be used only to indicate the general location of a major employment centers. More detailed data from town or other officials should be gathered in order to fully assess the nonresidential patterns of growth in the town.

9.3.2 Anticipated Nonresidential Growth Patterns

The 1993 Comprehensive Plan identifies a number of areas for commercial and industrial growth (***see Figure W-5***). These include the following:

- Route 302 Commercial Areas
- South Windham Commercial Area
- South Windham Industrial Areas
- The new Enterprise District off Route 302

The Plan envisions that these areas will be serviced with public water. The Town's current zoning ordinance closely reflects this pattern of nonresidential growth set out in the Comprehensive Plan. Essentially all of the designated areas for commercial and industrial development are already zoned for nonresidential use.

9.3.3 Implications for the Water Supply

Most of the areas designated for commercial and industrial growth and zoned for nonresidential uses are located within or adjacent to the current water service area. Therefore, nonresidential development as envisioned by the Town will have few, if any, implications for the geographic coverage of the water system. If the Enterprise Zone develops as currently envisioned by the Town, this could create a significant additional demand on the PWD system.

9.4 Other Considerations Related To The Water System

During discussions with Town staff, including the Town Planner and Code Enforcement Officer, other issues were identified that have potential implications for the water system:

Fire Protection Flows in the Windham Center Area – The Windham Fire Chief expressed concerns that during dry seasons there is not enough water capacity in the tank to accommodate the larger pump trucks.

Gaps in the Current System – Town staff expressed concerns that there are a few gaps in the current network that make water service not available for some users within areas where public water is generally available. These include the Varney Road area where the pressurized and non-pressurized systems come together and the Albion Road.

Route 302 Reconstruction – If Route 302 east of Foster's Corner is reconstructed, the Town will need to decide if a water main should be installed in this portion of the road.

Highland Lake – The area on the west side of Highland Lake is densely developed with seasonal camps. Part of this area has PWD water service but the remainder does not. At some point, it may be necessary to provide public water to the balance of this area.

Expansion of the Windham Correctional Center – If the State expands the Correctional Center in the future, this could significantly increase the water demand in the South Windham area.

Appendix A
Analysis and Forecasting Methods

1. Population Forecasts

Population data for each community was taken from the 1990 and 2000 Censuses. The 2000 Census data used was the redistricting data released in April, 2001. Data is shown for each block group and tract. In order to compute changes from 1990-2000, it was necessary to combine certain block groups into larger groups. All tables in the report show the 2000 block group numbers. Where block groups have been combined, the two groups are shown together.

In forecasting population growth, forecasts for each block group defined by the Census are prepared using four approaches under which the block group's growth rate for 2000-2010 is the same as:

1. the *block group's* for 1990-2000.

2. the *town's* growth rate for 1990 -2000

3. The *block group's* share of Cumberland County growth in 1990-2000 applied to a forecast of Cumberland County population growth in 2000-2020.

4. The *block group's* share of the town's 2000 population applied to the town's share of Cumberland County population growth.

Forecasting approaches 3 and 4 utilize a long term economic and demographic forecast of Cumberland county prepared by the USM Center for Business and Economic Research. The Cumberland county forecast used here is the same forecast used as the base forecast for the municipal traffic forecasts prepared by the Greater Portland Council of Governments for the Portland Area Comprehensive Transportation Study (PACTS). The PACTS forecasts are used for comparison purposes here, although they were prepared using slightly different methods of disaggregating from county to town-level forecasts. The forecasts used here also begin with actual 2000 population as a base year, compared with 1999 estimates for the PACTS forecasts.

The block group forecasts are summed to yield the forecasts for the town population, except in the case of the Portland, South Portland, and Westbrook forecasts

shown below. In the case of these cities, forecasts of population were estimated at the city-level only using the rate of population growth 1990-2000 and the city's share of population growth in Cumberland County.

2. Residential Growth

The objective of the residential growth trends analysis is to show where residential growth is occurring in relation to the existing water supply network. Locating residential growth in terms of the Census geographic summary units, at the block group level, allows those growth trends to be used in conjunction with the Census data from 1990 and 2000.

Ideally, the most accurate method of determining growth in water service would be to link new building permits in the study period to customer records of active water service (to identify whether the new residential units or business establishment are "in-service area" or "out-of-service area") and then to use address information in the customer record base to locate each new served structure within the desired geographic summary areas (e.g., Census Block Group). In practice, data to build this type of model does not yet exist.

An approach was developed to utilize existing data. The objective is to match town records of new occupied residential structures to the geographically-located records of the property ownership lots. The key to this methodology is the ability to use the Assessor's "Map and Lot" identifiers as a matching field to join new building permit data to geo-located tax parcel information to locate each permit.

There are limitations to this approach. First, the match rate between building permit and map/lot locations is never 100% due to continuing updates of the map/lot records. The match rates for towns where appropriate map/lot data is available ranged from a low of 79% for Cape Elizabeth to 95% for both Cumberland and Falmouth, with most rates being in this higher range. We judge these rates to be adequate for estimating the trend in location patterns of growth. No GIS-compatible parcel maps were available for Standish. Suitable parcel maps for Windham had to be constructed from other records. This approach was not needed in Cape Elizabeth, which is entirely within the PWD service area.

The number of units associated with each permit was taken from records (e.g., Duplex, 2 units, Apartments, x units) and the final computation of the proportions of growth in- and out-of-service are based on numbers of units, not numbers of permits.

Second, we used a set of assumptions to assign tax lots with permits as being "in-PWD-water-service" or "out-of-PWD-water-service." The digital location of permits within the District's network of water service is itself a "proxy" for counting each customer by actual hookup or account. Working with PWD Technical Services, a parcel was considered "in-service" for this analysis if one of the following two conditions is met:

1. The parcel is within, or intersects, the Water Service Area as defined by the PWD's own geographic model of their network or

2. The parcel is within 300 feet of a water main.

Updated water main data was added to this analysis during the project period. Not all of these assignments will be classified 100% correctly as with any proxy method. The bias in this approach is to over-classify new residential growth as having PWD water service, and thus it is a conservative estimate from a growth management standpoint.

Because Block Group boundaries are not congruent with tax parcels, the assignment of parcels to Block Groups resulted in a small number (10-40) of parcels split into two or more Block Groups. These records were manually edited so that the parcel was assigned to the Block Group that represented the dominant location for the property, e.g., the location of the street frontage and/or water main, or the larger part of the parcel when nonsignificant "fragments" were created.

Finally, the analysis is limited to new residential growth from 1990-99. The cut-off in 1999 was in recognition of the need for year 2000 updates of digital parcel data in all of the towns (although some updates through April 2000 occurred for some towns). The 1999 cutoff assures more comparability and reliability of the data that was used, and indeed this was reflected in somewhat better match rates than when year 2000 permits are included.

3. Forecast of Population Growth Inside and Outside the PWD Service Area

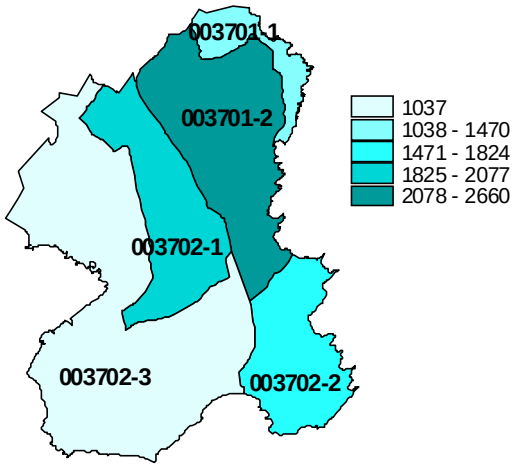
The forecasts of population growth from 2000 to 2020 for each block group are based on the "high" forecast discussed above in Section A. Two scenarios are prepared, one emphasizing growth inside the PWD service area and one emphasizing growth outside. This allows planning for the water system to test the adequacy of current and future capacity against the maximum growth scenario. It also allows tests of growth affecting the current system and growth that might take place outside the current

system.

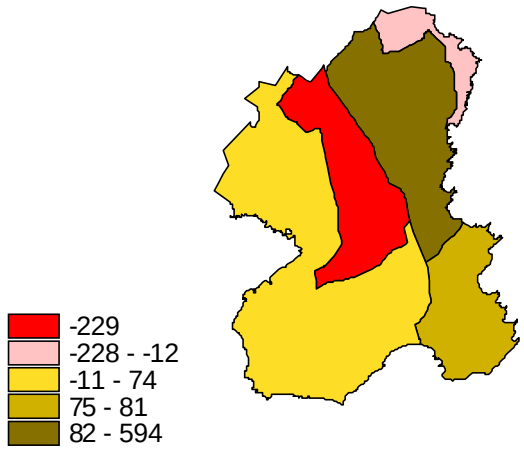
Two forecasting methods were used to prepare the scenarios. One divided the town between the population inside- and outside -service area based on the actual distribution of residential growth in each block group over 1990-1999 as discussed above. The other divided the population based on the physical area of the PWD service area in the town. The basis for this calculation was the map of the service area supplied in GIS format by PWD. Using this data, the area of the service territory in each block group could be calculated in Arc View. The *higher* of these two methods of forecasting is then used, with the highest forecast in each block group inside the PWD service area used to construct the scenario emphasizing growth within the service territory, and the highest forecast for each block group outside the service territory used as the basis for that forecast.

Appendix B
Detailed Town Data

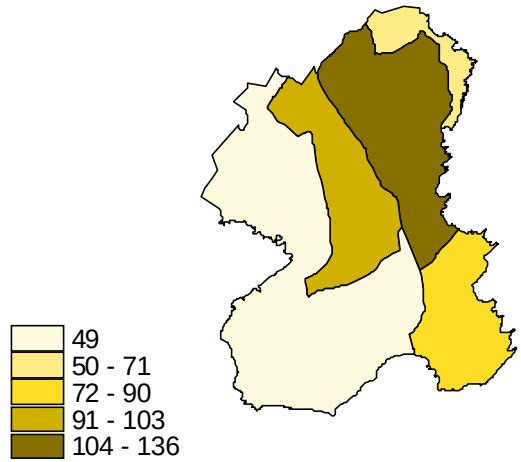
Table B-1 Cape Elizabeth Population Forecast							
	2000-2010 Estimated Population Change Based On:						
Town and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth- 1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
T3701 BG1	-6	33	-8	42	-8	42	15
T3701 BG2	282	59	330	75	59	330	187
T3702 BG1	-118	46	-162	59	-162	59	-44
T3702 BG2	40	41	51	52	40	52	46
T3702 BG3	36	23	45	29	23	45	34
TOWN	**234**	**202**	**256**	**256**	**202**	**256**	**237**
	2010-2020 Estimated Population Change Based On:						
	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth- 1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
T3701 BG1	-6	38	-6	42	-6	42	17
T3701 BG2	312	77	266	76	76	312	183
T3702 BG1	-111	57	-130	58	-130	58	-32
T3702 BG2	41	49	41	52	41	52	45
T3702 BG3	37	26	36	29	26	37	32
TOWN	**239**	**405**	**206**	**259**	**206**	**405**	**277**
	Total Population: History and Forecast						
	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
T3701 BG1	1,470	1,462	1,485	1,512	1,456	1,502	1,553
T3701 BG2	2,660	2,719	2,847	2,990	2,795	3,029	3,302
T3702 BG1	2,077	1,915	2,033	2,136	1,785	2,002	2,194
T3702 BG2	1,824	1,864	1,870	1,876	1,904	1,915	1,927
T3702 BG3	1,037	1,060	1,071	1,082	1,086	1,103	1,120
TOWN	**9,068**	**9,021**	**9,305**	**9,595**	**9,027**	**9,551**	**10,096**



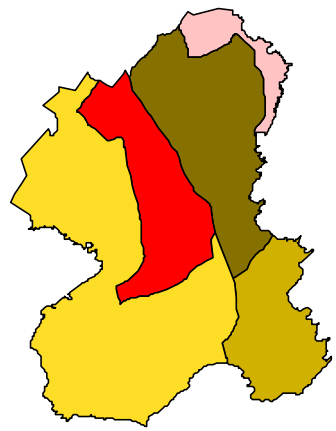
Population 2000



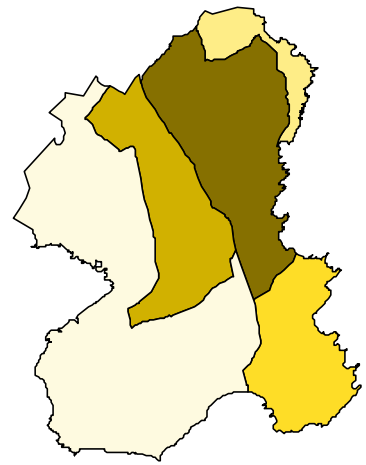
Population Growth 2000-2020
Based on 1990-2000 Block Group Growth



Population Growth 2000-2020
Based on 1990-2000 Town Growth



Population Growth 2000-2020
Based on Block Group Share of Cumberland County Growth



Population Growth 2000-2020
Based on Town Share of Cumberland County Growth

Figure B-1
Cape Elizabeth

2000 Population Distribution by Block Group &
Comparison of Population Forecasting Methods

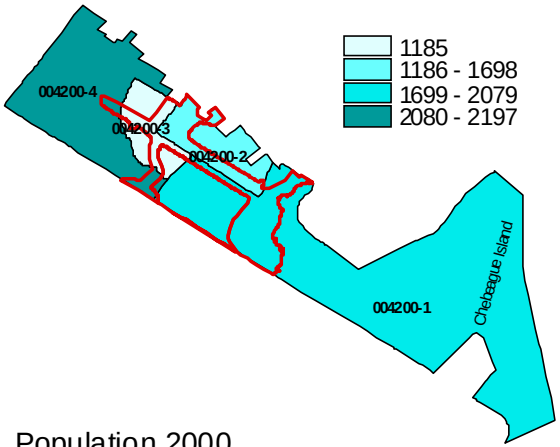
Portland Water District

MUSKIE SCHOOL

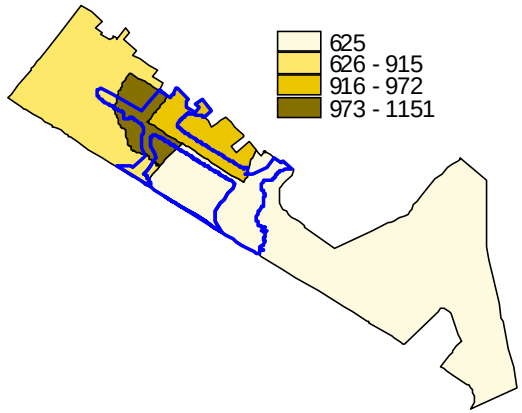
Table B-2 Cumberland Population Forecast

Tract and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth-1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
	2000-2010 Estimated Population Change Based On:						
T4200 BG1	292	458	335	491	292	491	394
T4200 BG2	431	374	450	401	374	450	414
T4200 BG3	479	261	446	280	261	479	367
T4200 BG4	418	484	459	519	418	519	470
TOWN	**1,620**	**1,577**	**1,691**	**1,691**	**1,577**	**1,691**	**1,645**
	2010-2020 Estimated Population Change Based On:						
T4200 BG1	333	591	267	492	267	591	420
T4200 BG2	541	463	358	403	358	541	441
T4200 BG3	672	304	355	281	281	672	403
T4200 BG4	497	632	366	522	366	632	504
TOWN	**1,977**	**3,153**	**1,346**	**1,772**	**1,346**	**3,153**	**2,062**

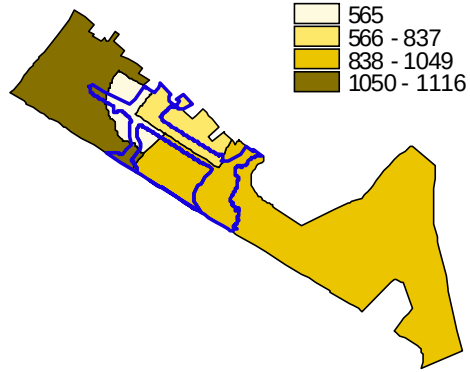
	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
	Total Population: History and Forecast						
T4200 BG1	2,079	2,371	2,471	2,565	2,638	2,891	3,156
T4200 BG2	1,698	2,072	2,110	2,144	2,430	2,551	2,684
T4200 BG3	1,185	1,446	1,550	1,664	1,727	1,953	2,336
T4200 BG4	2,197	2,615	2,664	2,710	2,980	3,169	3,343
TOWN	**7,159**	**8,504**	**8,795**	**9,083**	**9,775**	**10,564**	**11,519**



Population 2000

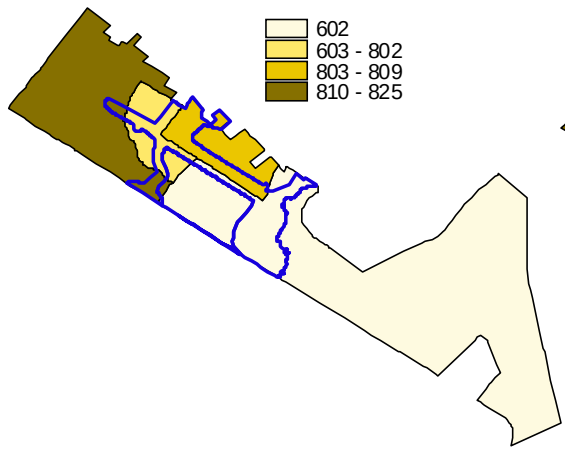


Population Growth 2000-2020
Based on 1990-2000 Block Group Growth

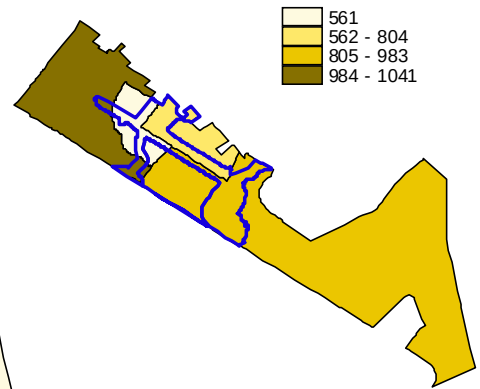


Population Growth 2000-2020
Based on 1990-2000 Town Growth

PWD Service Area in Outline



Population Growth 2000-2020
Based on Block Group Share of Cumberland County Growth



Population Growth 2000-2020
Based on Town Share of Cumberland County Growth

Figure B-2
Cumberland

2000 Population Distribution by Block Group &
Comparison of Population Forecasting Methods

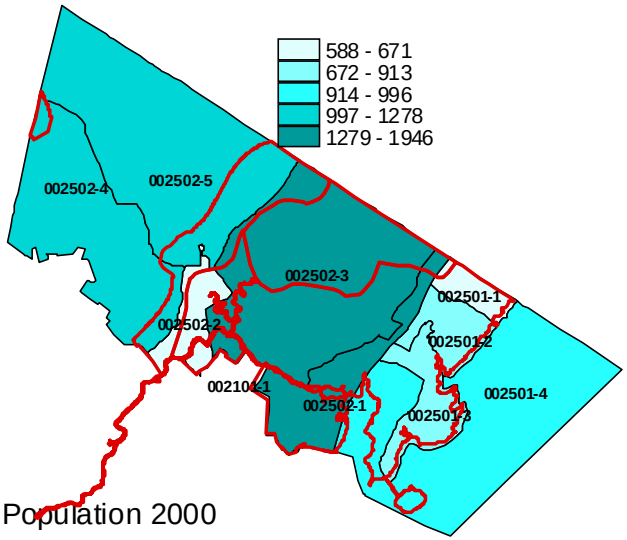
Portland Water District

MUSKIE SCHOOL

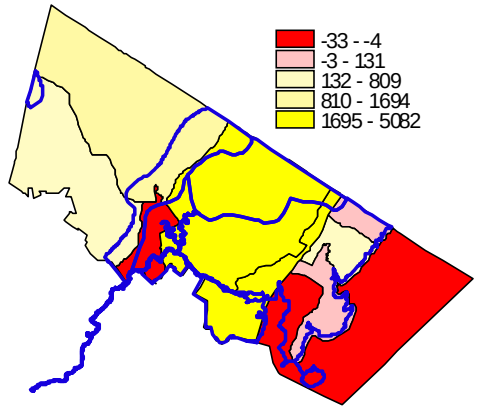
Table B-3 Falmouth Population Forecast

Tract and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth-1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
	2000-2010 Estimated Population Change Based On:						
T2501 BG1	61	238	73	230	61	238	151
T2501 BG2	237	324	246	313	237	324	280
T2501 BG3	63	315	77	304	63	315	190
T2501 BG4	(2)	353	(3)	341	(3)	353	173
T2502 BG1	1,391	626	1,018	605	605	1,391	910
T2502 BG2	(17)	209	(22)	202	(22)	209	93
T2502 BG3	1,752	690	1,207	667	667	1,752	1,079
T2502 BG4	355	453	364	438	355	453	403
T2502 BG5	670	449	573	434	434	670	532
TOWN	**4,511**	**3,658**	**3,534**	**3,534**	**3,534**	**4,511**	**3,809**
	2010-2020 Estimated Population Change Based On:						
T2501 BG1	67	254	58	228	58	254	152
T2501 BG2	298	353	196	312	196	353	290
T2501 BG3	68	342	61	302	61	342	193
T2501 BG4	(2)	388	(2)	338	(2)	388	180
T2502 BG1	2,488	733	810	620	620	2,488	1,163
T2502 BG2	(16)	221	(18)	199	(18)	221	97
T2502 BG3	3,330	821	960	688	688	3,330	1,450
T2502 BG4	454	510	290	439	290	510	423
T2502 BG5	1,024	504	456	438	438	1,024	606
TOWN	**6,111**	**7,316**	**2,812**	**3,929**	**2,812**	**7,316**	**5,042**

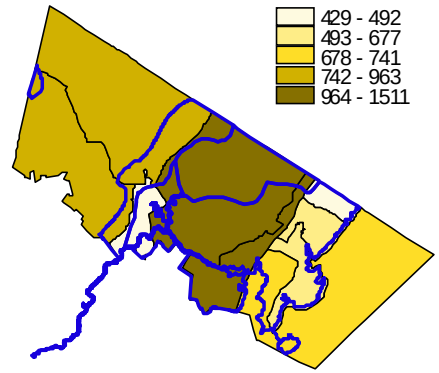
	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
	Total Population: History and Forecast						
T2501 BG1	671	732	821	909	790	972	1,163
T2501 BG2	913	1,150	1,191	1,237	1,346	1,481	1,590
T2501 BG3	887	950	1,076	1,202	1,012	1,269	1,543
T2501 BG4	996	993	1,168	1,349	991	1,348	1,737
T2502 BG1	1,765	2,364	2,671	3,156	2,984	3,834	5,644
T2502 BG2	588	566	680	797	548	777	1,017
T2502 BG3	1,946	2,606	3,020	3,698	3,294	4,470	7,028
T2502 BG4	1,278	1,633	1,679	1,731	1,923	2,102	2,241
T2502 BG5	1,266	1,695	1,795	1,936	2,133	2,400	2,960
TOWN	**10,310**	**12,690**	**14,101**	**16,015**	**15,021**	**18,653**	**24,923**



Population 2000



Population Growth 2000-2020
Based on 1990-2000 Block Group Growth



Population Growth 2000-2020
Based on 1990-2000 Town Growth

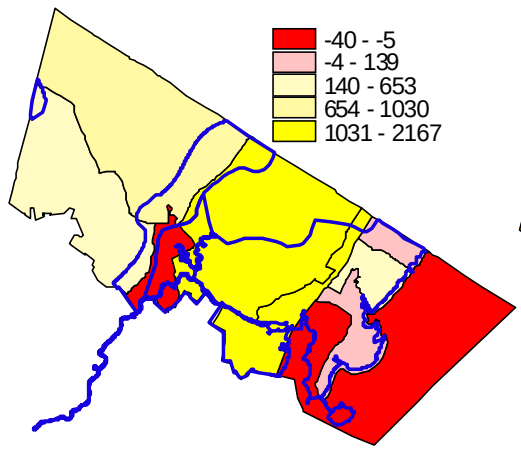
PWD Service Area in Outline

Figure B-3
Falmouth

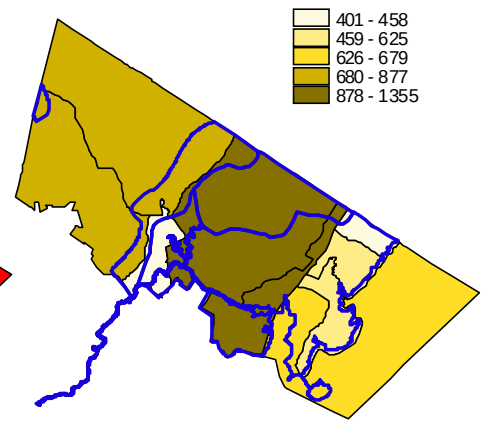
2000 Population Distribution by Block Group &
Comparison of Population Forecasting Methods

Portland Water District

MUSKIE SCHOOL

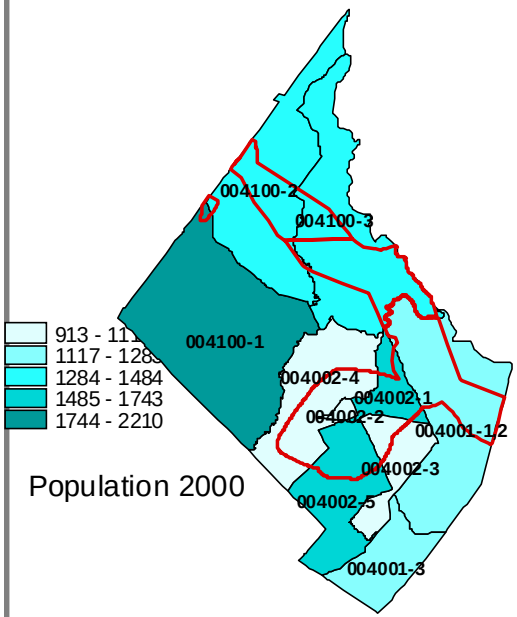


Population Growth 2000-2020
Based on Block Group Share of
Cumberland County Growth

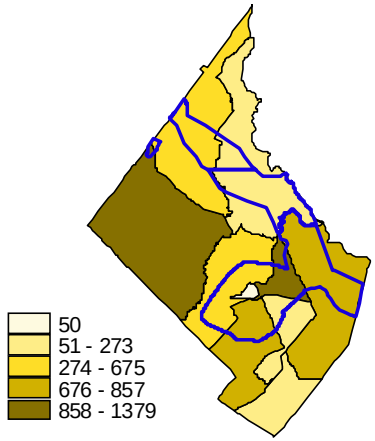


Population Growth 2000-2020
Based on Town Share of
Cumberland County Growth

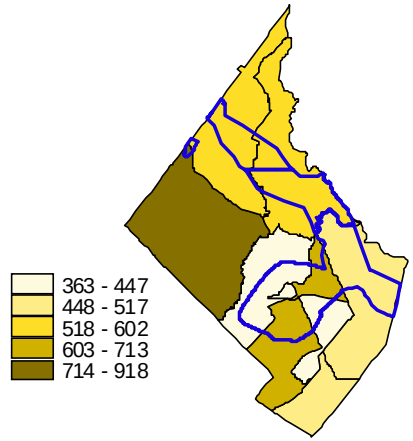
Table B-4 Gorham Population Forecast							
2000-2010 Estimated Population Change Based On:							
Tract and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth- 1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
T4001 BG1,2	354	247	351	271	247	354	306
T4001 BG3	99	240	120	264	99	264	181
T4002 BG1	588	328	572	360	328	588	462
T4002 BG2	25	201	31	220	25	220	119
T4002 BG3	128	176	147	193	128	193	161
T4002 BG4	298	215	308	236	215	308	264
T4002 BG5	386	336	414	369	336	414	376
T4100 BG1	578	426	600	467	426	600	518
T4100 BG2	297	270	321	297	270	321	296
T4100 BG3	105	286	128	314	105	314	208
TOWN	**2,857**	**2,725**	**2,991**	**2,991**	**2,725**	**2,991**	**2,891**
2010-2020 Estimated Population Change Based On:							
T4001 BG1,2	452	270	279	272	270	452	318
T4001 BG3	107	262	96	262	96	262	182
T4002 BG1	791	368	455	363	363	791	494
T4002 BG2	25	215	25	218	25	218	121
T4002 BG3	146	187	117	192	117	192	160
T4002 BG4	377	232	245	236	232	377	272
T4002 BG5	471	377	329	370	329	471	387
T4100 BG1	729	492	477	472	472	729	543
T4100 BG2	360	297	255	297	255	360	302
T4100 BG3	112	316	102	312	102	316	211
TOWN	**3,407**	**5,451**	**2,380**	**3,269**	**2,380**	**5,451**	**3,627**
Total Population: History and Forecast							
	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
T4001 BG1,2	1,283	1,530	1,587	1,637	1,800	1,905	2,089
T4001 BG3	1,247	1,346	1,427	1,508	1,442	1,609	1,770
T4002 BG1	1,702	2,030	2,162	2,290	2,393	2,656	3,081
T4002 BG2	1,041	1,066	1,160	1,259	1,091	1,280	1,477
T4002 BG3	913	1,041	1,073	1,104	1,157	1,233	1,296
T4002 BG4	1,116	1,331	1,379	1,420	1,563	1,651	1,797
T4002 BG5	1,743	2,079	2,117	2,152	2,408	2,504	2,624
T4100 BG1	2,210	2,636	2,725	2,803	3,108	3,267	3,532
T4100 BG2	1,402	1,672	1,696	1,719	1,927	1,999	2,079
T4100 BG3	1,484	1,589	1,691	1,795	1,691	1,902	2,111
TOWN	**14,141**	**16,320**	**17,016**	**17,687**	**18,581**	**20,006**	**21,856**



Population 2000



Population Growth 2000-2020
Based on 1990-2000 Block Group
Growth



Population Growth 2000-2020
Based on 1990-2000 Town Growth

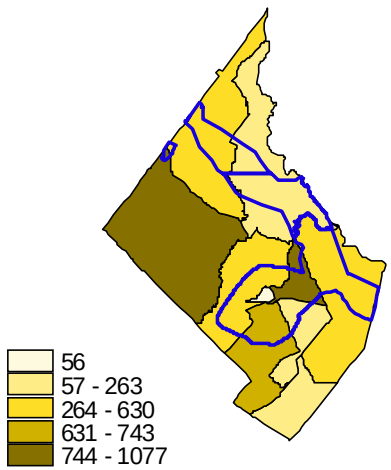
PWD Service Area in Outline

Figure B-4
Gorham

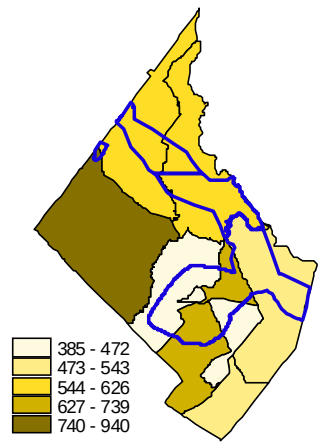
2000 Population Distribution by Block Group &
Comparison of Population Forecasting Methods

Portland Water District

MUSKIE SCHOOL



Population Growth 2000-2020
Based on Block Group Share of
Cumberland County Growth



Population Growth 2000-2020
Based on Town Share of
Cumberland County Growth

Table B -5 Scarborough Population Forecast

2000-2010 Estimated Population Change Based On:

Tract and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth- 1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
T3800 BG1	987	797	897	769	769	987	862
T3800 BG2	662	329	505	318	318	662	454
T3800 BG3	(8)	247	(7)	239	-8	247	118
T3800 BG5*	(4)	322	(5)	311	-5	322	156
T3800 BG6	87	407	106	393	87	407	248
T3800 BG7	113	261	128	252	113	261	188
T3800 BG8**	564	335	462	324	324	564	421
T3900 BG1&4	2,822	2,068	2,487	1,997	1,997	2,822	2,344
T3900 BG2	700	459	594	443	443	700	549
T3900 BG3	647	810	660	782	647	810	725
TOWN	**6,571**	**6,035**	**5,828**	**5,828**	**5,828**	**6,571**	**6,065**

2010-2020 Estimated Population Change Based On:

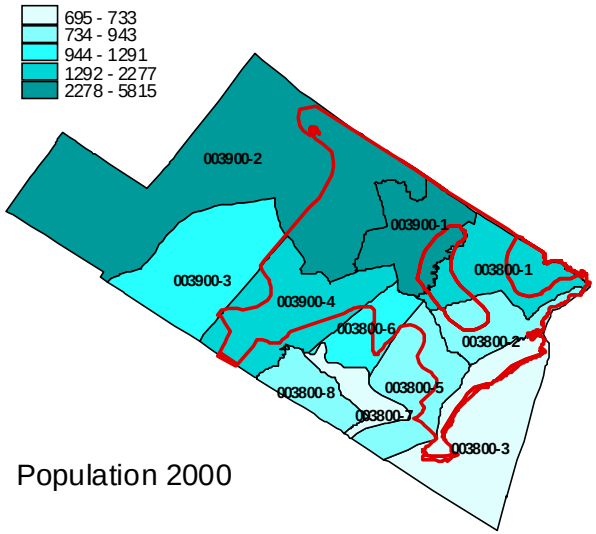
T3800 BG1	1,421	902	714	785	714	1,421	955
T3800 BG2	1,135	347	402	320	320	1,135	551
T3800 BG3	(8)	257	(5)	236	(8)	257	120
T3800 BG5*	(4)	339	(4)	307	(4)	339	160
T3800 BG6	94	435	84	390	84	435	251
T3800 BG7	131	272	102	250	102	272	189
T3800 BG8**	902	354	368	326	326	902	487
T3900 BG1&4	4,192	2,777	1,979	2,147	1,979	4,192	2,774
T3900 BG2	1,080	494	473	448	448	1,080	624
T3900 BG3	831	918	525	791	525	918	767
TOWN	**8,908**	**12,071**	**4,637**	**6,940**	**4,637**	**12,071**	**8,139**

Total Population: History and Forecast

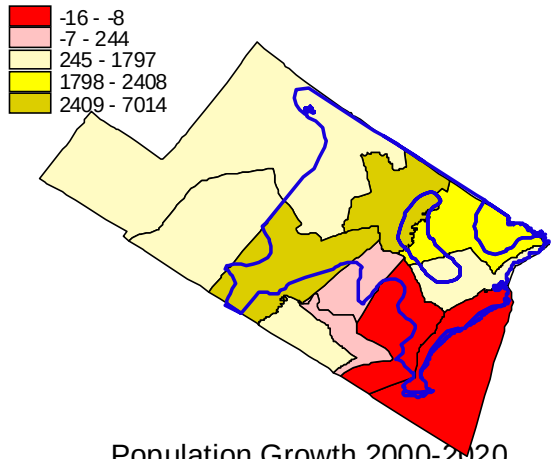
Tract and Block Group	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
T3800 BG1	2,240	3,001	3,098	3,227	3,715	4,053	4,648
T3800 BG2	926	1,241	1,377	1,588	1,561	1,929	2,723
T3800 BG3	695	687	812	942	679	932	1,199
T3800 BG5*	905	900	1,060	1,227	896	1,220	1,566
T3800 BG6	1,145	1,232	1,392	1,552	1,317	1,643	1,987
T3800 BG7	733	846	920	994	948	1,109	1,266
T3800 BG8**	943	1,263	1,362	1,507	1,589	1,850	2,409
T3900 BG1&4	5,815	7,791	8,147	8,637	9,770	10,920	12,829
T3900 BG2	1,291	1,730	1,837	1,991	2,177	2,461	3,071
T3900 BG3	2,277	2,924	2,998	3,087	3,449	3,764	4,005
TOWN	**16,970**	**21,615**	**23,004**	**24,752**	**26,100**	**29,881**	**35,703**

* In 2000 Census Block Group 4 of the 1990 Census was combined with Block Group 3

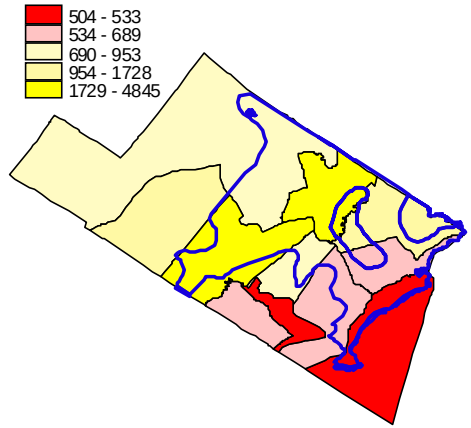
** In 2000 Census, Block Group 9 of the 1990 Census was combined with Block Group 8.



Population 2000



Population Growth 2000-2020
Based on 1990-2000 Block Group Growth

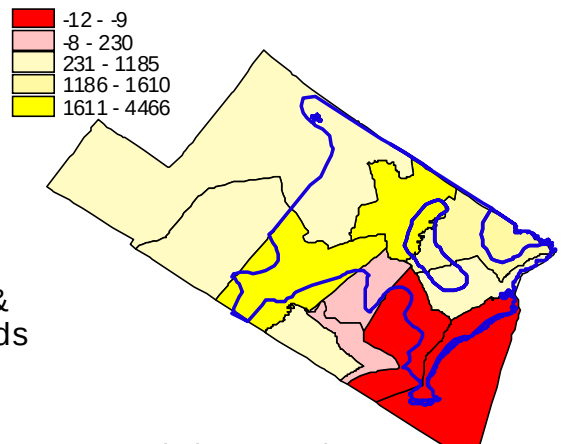


Population Growth 2000-2020
Based on 1990-2000 Town Growth

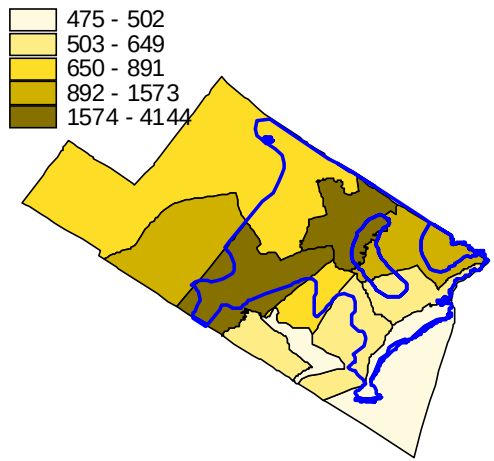
PWD Service Area in Outline

Figure B-5
Scarborough

2000 Population Distribution by Block Group &
Comparison of Population Forecasting Methods



Population Growth 2000-2020
Based on Block Group Share of Cumberland County Growth



Population Growth 2000-2020
Based on Town Share of Cumberland County Growth

Portland Water District

MUSKIE SCHOOL

Table B -6 Standish Population Forecast

2000-2010 Estimated Population Change Based On:

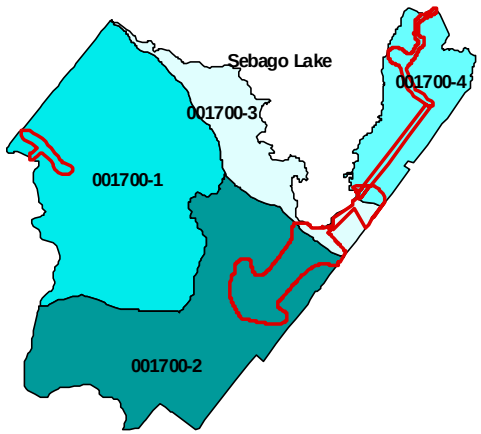
Tract and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth-1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
T1700 BG1	448	535	499	579	448	579	515
T1700 BG2	961	828	1,012	896	828	1,012	924
T1700 BG3	85	130	41	141	41	141	99
T1700 BG4	526	452	554	489	452	554	505
TOWN	**2,020**	**1,945**	**2,105**	**2,105**	**1,945**	**2,105**	**2,044**

2010-2020 Estimated Population Change Based On:

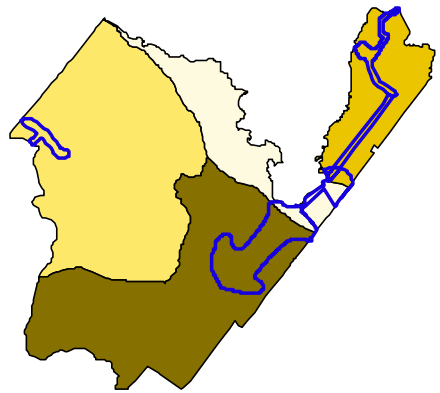
T1700 BG1	526	682	397	583	397	682	547
T1700 BG2	1,195	1,180	805	918	805	1,195	1,024
T1700 BG3	97	139	32	139	32	139	102
T1700 BG4	655	557	441	493	441	655	536
TOWN	**2,443**	**3,890**	**1,675**	**2,236**	**1,675**	**3,890**	**2,561**

Total Population: History and Forecast

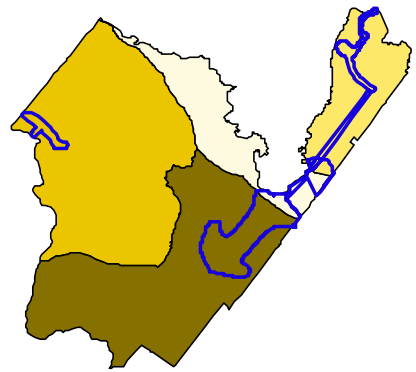
Tract and Block Group	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
T1700 BG1	2,555	3,003	3,067	3,128	3,400	3,614	3,810
T1700 BG2	3,952	4,780	4,871	4,953	5,585	5,895	6,148
T1700 BG3	621	661	720	760	693	822	900
T1700 BG4	2,157	2,609	2,659	2,705	3,049	3,196	3,359
TOWN	**9,285**	**11,052**	**11,317**	**11,546**	**12,727**	**13,527**	**14,217**



Population 2000



Population Growth 2000-2020
Based on 1990-2000 Block Group Growth



Population Growth 2000-2020
Based on 1990-2000 Town Growth

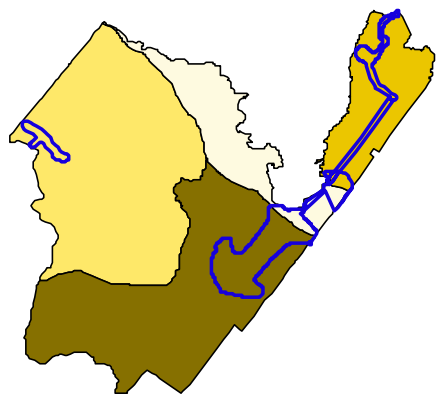
PWD Service Area in Outline

Figure B-6
Standish

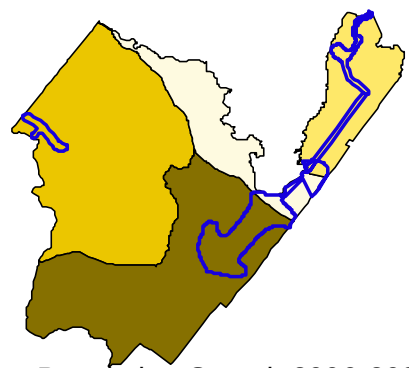
2000 Population Distribution by Block Group &
Comparison of Population Forecasting Methods

Portland Water District

MUSKIE SCHOOL



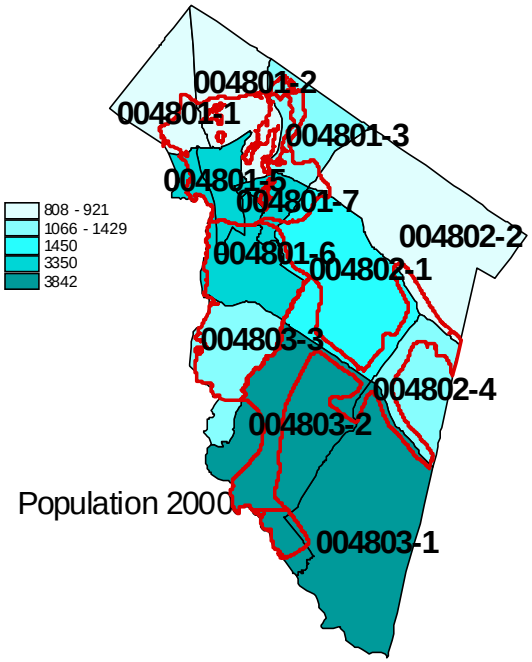
Population Growth 2000-2020
Based on Block Group Share of Cumberland County Growth



Population Growth 2000-2020
Based on Town Share of Cumberland County Growth

Table B-7 Windham Population Forecast

Tract and Block Group	1990-2000 Block Group Growth Rate	1990-2000 Town Growth Rate	Share of Cumberland County Growth-1990-2000	Share of Town Population in 2000	Minimum	Maximum	Mean
	2000-2010 Estimated Population Change Based On:						
T4801 BG1	70	117	84	132	70	132	100
T4801 BG2	67	118	81	133	67	133	100
T4801 BG3	121	177	144	199	121	199	160
T 4801 BG5,6,7	359	485	424	546	359	546	453
T4802 BG1	556	210	526	236	210	556	382
T4802 BG2	246	133	254	150	133	254	196
T4802 BG4	133	207	122	233	122	233	174
T4803 BG3	533	556	613	626	533	626	582
T4803 BG1,3	159	154	181	174	154	181	167
TOWN	**2,243**	**2,157**	**2,429**	**2,429**	**2,157**	**2,429**	**2,314**
	2000-2010 Estimated Population Change Based On:						
T4801 BG1	75	123	67	131	67	131	99
T4801 BG2	73	125	65	132	65	132	99
T4801 BG3	133	191	115	198	115	198	159
T 4801 BG5,6,7	397	594	337	548	337	594	469
T4802 BG1	770	230	419	238	230	770	414
T4802 BG2	311	142	202	150	142	311	201
T4802 BG4	146	227	98	231	98	231	176
T4803 BG3	607	699	487	633	487	699	607
T4803 BG1,3	182	165	144	173	144	182	166
TOWN	**2,568**	**4,313**	**1,962**	**2,611**	**1,962**	**4,313**	**2,864**
	Total Population: History and Forecast						
	2000 Population	2010 Forecast Population (Low)	2010 Forecast Population Mean)	2010 Forecast Population (High)	2020 Forecast Population (Low)	2020 Forecast Population Mean)	2020 Forecast Population (High)
T4801 BG1	808	878	908	938	944	1,007	1,069
T4801 BG2	818	885	917	950	950	1,016	1,082
T4801 BG3	1,220	1,341	1,379	1,417	1,455	1,538	1,615
T 4801 BG5,6,7	3,350	3,709	3,801	3,890	4,046	4,270	4,484
T4802 BG1	1,450	1,660	1,830	2,006	1,890	2,244	2,776
T4802 BG2	921	1,054	1,116	1,172	1,196	1,317	1,484
T4802 BG4	1,429	1,551	1,602	1,659	1,649	1,778	1,891
T4803 BG3	3,842	4,375	4,421	4,462	4,862	5,027	5,161
T4803 BG1,3	1,066	1,220	1,232	1,245	1,364	1,398	1,427
TOWN	**14,904**	**16,672**	**17,206**	**17,740**	**18,357**	**19,595**	**20,988**



Population 2000

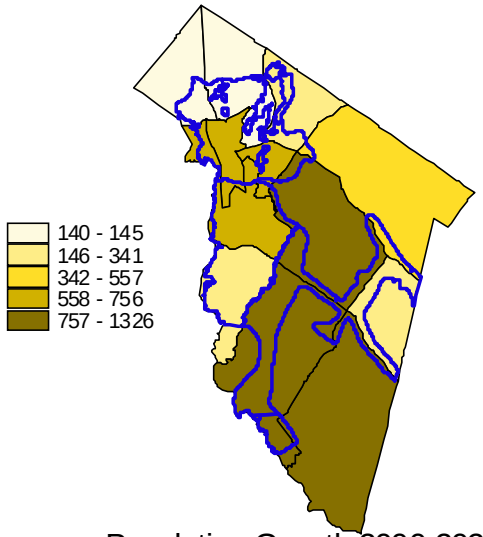
PWD Service Area in Outline

Figure B-7
Windham

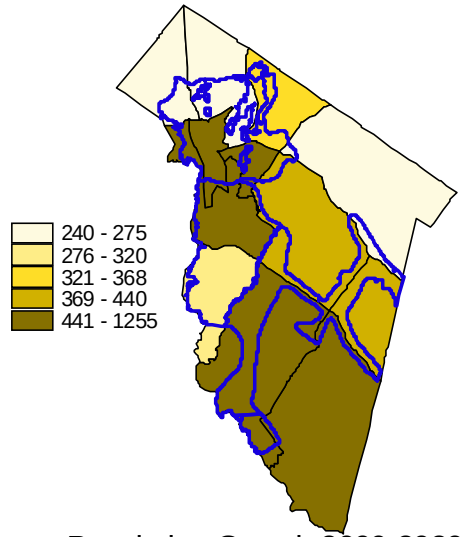
2000 Population Distribution by Block Group & Comparison of Population Forecasting Methods

Portland Water District

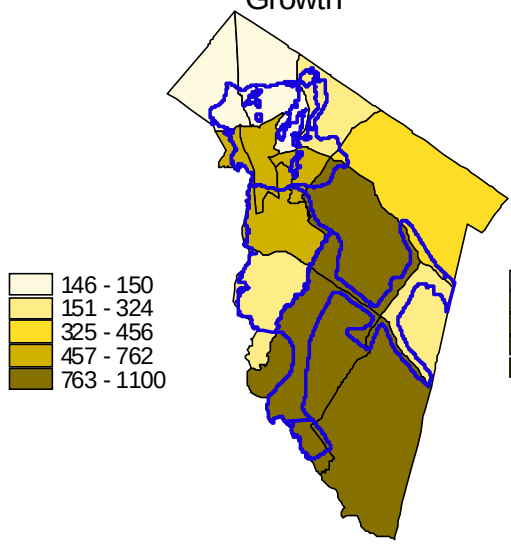
MUSKIE SCHOOL



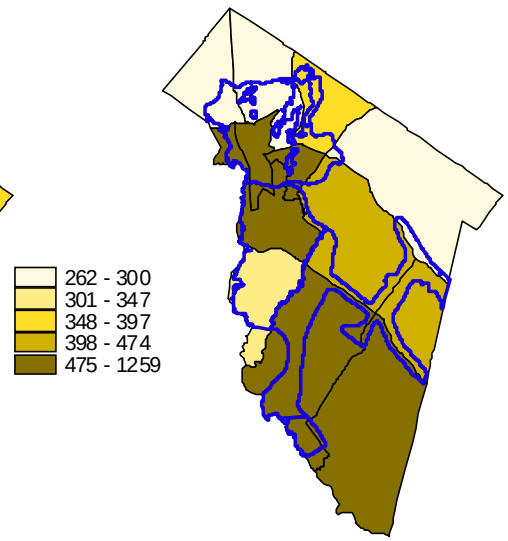
Population Growth 2000-2020 Based on 1990-2000 Block Group Growth



Population Growth 2000-2020 Based on 1990-2000 Town Growth



Population Growth 2000-2020 Based on Block Group Share of Cumberland County Growth



Population Growth 2000-2020 Based on Town Share of Cumberland County Growth

Table A-8
Housing Permits by Town 1990-1999
and Distribution Inside and Outside
of the Portland Water District Service Area
Source: Municipal Data

Town	Tract and Block Group	1990-99 Permits	% IN PWD	% OUT PWD	% of Town Total
Cape Elizabeth	T3701 BG1	32	100.0%	0.0%	9.4%
	T3701 BG2	85	100.0%	0.0%	24.9%
	T3702 BG1	144	100.0%	0.0%	42.1%
	T3702 BG2	48	100.0%	0.0%	14.0%
	T3702 BG3	33	100.0%	0.0%	9.7%
Town Total		**342**	**100.0%**	**0.0%**	**100.0%**
Cumberland	T4200 BG1	120	41.7%	58.3%	24.0%
	T4200 BG2	146	93.2%	6.9%	29.3%
	T4200 BG3	101	78.2%	21.8%	20.2%
	T4200 BG4	132	19.7%	80.3%	26.5%
Town Total		**499**	**58.3%**	**41.7%**	**100.0%**
Falmouth	T2501 BG1	21	100.0%	0.0%	2.2%
	T2501 BG2	132	100.0%	0.0%	14.0%
	T2501 BG3	12	100.0%	0.0%	1.3%
	T2501 BG4	6	100.0%	0.0%	0.6%
	T2502 BG1	251	100.0%	0.0%	26.6%
	T2502 BG2	11	100.0%	0.0%	1.2%
	T2502 BG3	271	83.4%	16.6%	28.7%
	T2502 BG4	110	42.7%	57.3%	11.6%
	T2502 BG5	131	32.1%	67.9%	13.9%
Town Total		**945**	**79.2%**	**20.8%**	**100.0%**
Gorham	T4001 BG1&2	117	88.9%	11.1%	12.6%
	T4001 BG3	36	100.0%	0.0%	3.9%
	T4002 BG1	199	99.5%	0.5%	21.4%
	T4002 BG2	2	100.0%	0.0%	0.2%
	T4002 BG3	40	37.5%	62.5%	4.3%
	T4002 BG4	71	49.3%	50.7%	7.6%
	T4002 BG5	107	77.5%	22.5%	11.5%
	T4100 BG1	177	11.9%	88.1%	19.0%
	T4100 BG2	107	28.0%	72.0%	11.5%
	T4100 BG3	75	69.3%	30.7%	8.1%
Town Total		**931**	**58.0%**	**42.0%**	**100.0%**
Scarborough	T3800 BG1	232	98.7%	1.3%	13.2%
	T3800 BG2	123	99.2%	0.8%	7.0%
	T3800 BG3	250	100.0%	0.0%	14.2%
	T3800 BG5	41	95.1%	4.9%	2.3%
	T3800 BG6	9	100.0%	0.0%	0.5%
	T3800 BG7	42	0.0%	100.0%	2.4%
	T3800 BG8	85	0.0%	100.0%	4.8%
	T3900 BG1	295	99.7%	0.3%	16.8%
	T3900 BG2	241	17.8%	82.2%	13.7%
	T3900 BG3	135	0.0%	100.0%	7.7%
	T3900 BG4	306	99.0%	1.0%	17.4%

Table A-8
Housing Permits by Town 1990-1999
and Distribution Inside and Outside
of the Portland Water District Service Area
Source: Municipal Data

Town	Tract and Block Group	1990-99 Permits	% IN PWD	% OUT PWD	% of Town Total
Scarborough Total		**1759**	**86.3%**	**13.8%**	**100.0%**

Table A-8
Housing Permits by Town 1990-1999
and Distribution Inside and Outside
of the Portland Water District Service Area
Source: Municipal Data

Town	Tract and Block Group	1990-99 Permits	% IN PWD	% OUT PWD	% of Town Total
Windham	T4801 BG1	32	68.8%	31.3%	3.1%
	T4801 BG2	39	87.2%	12.8%	3.8%
	T4801 BG3	95	81.1%	19.0%	9.1%
	T4801 BG5	18	100.0%	0.0%	1.7%
	T4801 BG6	137	100.0%	0.0%	13.2%
	T4801 BG7	36	97.2%	2.8%	3.5%
	T4802 BG1	175	71.4%	28.6%	16.8%
	T4802 BG2	91	12.1%	87.9%	8.8%
	T4802 BG4	106	58.5%	41.5%	10.2%
	T4803 BG1	86	14.0%	86.1%	8.3%
	T4803 BG2	146	71.2%	28.8%	14.0%
	T4803 BG3	79	86.1%	13.9%	7.6%
Town Total		**1040**	**78.7%**	**21.4%**	**100.0%**
Standish	**All**	**780**	**4.6%**	**95.4%**	**100.0%**