



## *Project Report*

# **Open Space Cost/Benefit Analysis**

**Presented To:**  
**Future Open Space Preservation Committee**  
**Town of Cape Elizabeth**  
**320 Ocean House Road**  
**Cape Elizabeth, Maine 04107**

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## **Purpose and Approach**

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The purpose of this report is to “determine the cost and benefits to taxpayers of housing growth versus the preservation of undeveloped land” in the Town of Cape Elizabeth.<sup>1</sup> In particular, the report addresses four specific “neighborhood types” that represent different development alternatives drawn from existing housing developments currently present in the town:

1. an old, compact neighborhood alternative;
2. a traditional , large-lot subdivision alternative;
3. a clustered subdivision alternative;
4. a traditional condominium complex alternative; and
5. a condominium complex with added open space alternative.<sup>2</sup>

The questions motivating this report are, in essence, three:

1. What would be the fiscal impact on the town (both additional revenues earned and additional costs incurred) if any one of the five neighborhood types noted above were developed on the town’s remaining developable land?
2. What would be the fiscal impact if the same land were preserved as open space? and
3. Comparing the two, what would be the benefit-cost ratio of preserving the open space in question?

In order to answer these questions, Planning Decisions, Inc. (PDI) undertook four tasks:

1. We reviewed community impact studies conducted for two earlier developments – the Dominicus Crossing study dated May 4, 1996 and the Leighton Farm Subdivision study dated December 20, 2002;
2. We gathered and analyzed a wide variety of fiscal data taken from town records and census sources and a wide variety of housing and population data taken from town assessment records, census data and interviews with local real estate professionals;

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<sup>1</sup> Request for Bids, Town of Cape Elizabeth, Open Space Cost/Benefit Analysis for the Future Open Space Preservation Committee (FOSP), June 3, 2011, p. 1.

<sup>2</sup> See Appendix One for maps and descriptions of the neighborhood types.

3. We interviewed a range of town officials regarding the town's current capacity to provide services and the likely impact of additional residential development of the types noted above on the cost to maintain the current level of service now provided by the town.
4. We prepared estimates of future municipal costs based on various combinations of additional residential development and additional preservation of open space.

Together, the development alternatives described and the likely fiscal impacts of various combinations of these alternatives as they are spread over the amount of developable land remaining in Cape Elizabeth will provide citizens and town officials a means for evaluating the various "develop versus preserve" opportunities that will emerge over the years.

This report is organized in two sections:

1. **Setting the Geographic and Fiscal Context:** an examination of the amount of land in Cape Elizabeth for which the develop-preserve choice might apply and of recent fiscal and demographic trends in Cape Elizabeth;
2. **Projecting Forward:** an examination of the likely fiscal consequences of the five categories of potential new residential development and suggestions for applying the analysis to development and land use choices that will present themselves to the citizens of Cape Elizabeth in the future.

## 1. Setting the Geographic and Fiscal Context

Understanding the fiscal consequences of additional residential development compared to additional open space requires an understanding of two basic starting points:

- a. the *geographic context* – the volume of land potentially available for residential development or alternatively for preservation as open space; and
- b. the *fiscal context* – the current level of municipal services provided in Cape Elizabeth, the Town’s current utilization of capacity (staffing, building, vehicles, equipment, land) to provide such services, and the demographic, cultural and economic forces that drive the demand for such services. This fiscal context, in turn, is further divided into three elements—demographic elements, financial elements and management elements.

The purpose of this section of the report is to build that understanding by examining the volume and location of potentially developable land within the town and the demographic and fiscal trends in Cape Elizabeth over the past decade with an eye to establishing a baseline from which to make future projections.

### *a. the geographic context*

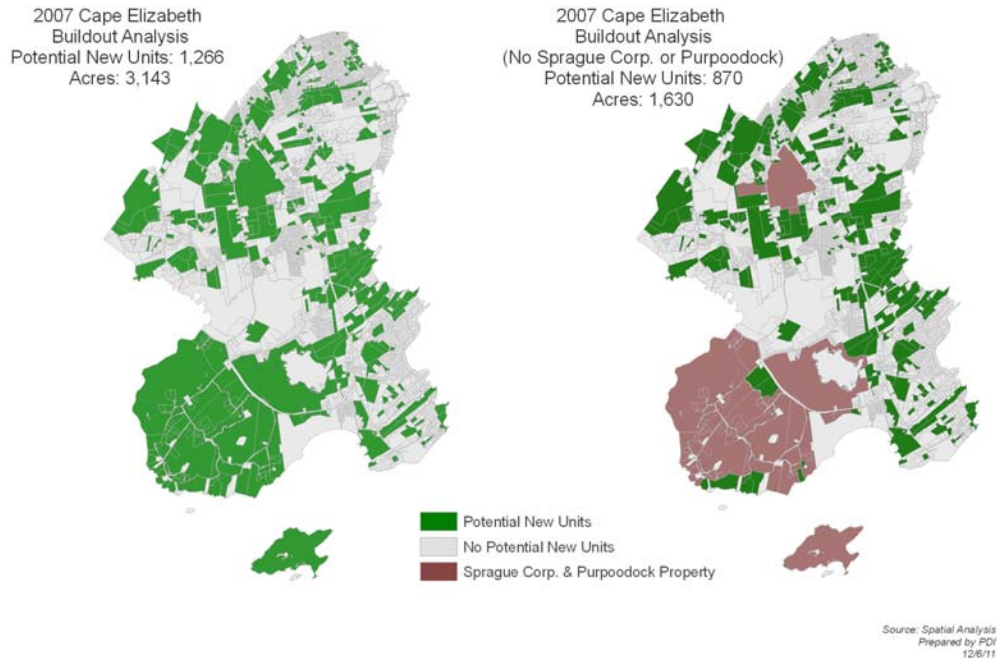
As part of its 2007 Comprehensive Plan, the town conducted a build-out analysis.<sup>3</sup> Based on the town’s existing zoning ordinance, the physical characteristics of undeveloped land, and a variety of development efficiency ratios applied to different portions of that land, the analysis concluded “that approximately 1,300 new housing units could potentially be accommodated on the remaining undeveloped land in Cape Elizabeth.”<sup>4</sup> Excluding land owned by the Sprague Corporation and the Purpoodock Golf Course, that number fell to 870 potential new dwelling units. The 1,300 housing-unit estimate encompasses approximately 3,100 acres, and the 870 unit estimate covers approximately 1,600 acres. Figure 1 below indicates the locations of this land.

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<sup>3</sup> Town of Cape Elizabeth Comprehensive Plan 2007, p. 147.

<sup>4</sup> *Ibid.*

• **Figure 1: Location of Potential Development/Preservation Choices**



Sources: Town of Cape Elizabeth Comprehensive Plan 2007 and assessor's database.

It is important to note here that the reason for estimating the amount of potentially developable land in Cape Elizabeth is not to suggest that it all could or should be developed or preserved, but rather to set the opportunity cost context of the develop-preserve choice. Suppose, for example, that the first developer to bring a proposal after the build-out analysis had been completed presented a 30-unit development on a particular 100-acre site. Then suppose that the parcel was conserved as open space. Under these conditions, the preservation would probably divert residential development to some other 100-acre parcel, thus, at least immediately, producing no significant fiscal impact. On the other hand, suppose a developer—20 years in the future—proposed the same 30-unit development on the last available piece of land suitable for development. Under those conditions, preservation of that land as open space would undeniably prevent whatever the fiscal consequences might be of developing the land as house lots. Indeed, the Comprehensive Plan explicitly recognized this fact by reducing its projection of new housing units beginning in 2018 because of “the reduced amount of developable land available, and the

increasing difficulty in developing the remaining parcels.”<sup>5</sup>

In short, the geographic context of the public policy choice helps define the fiscal context. If land preserved represents a small percentage of developable land, the fiscal impact of preservation will be relatively small, at least in terms of present value, because those consequences will not be felt until other land is developed or preserved. As the quantity of land to be preserved grows relative to the quantity of developable land available, the fiscal impact of a preservation choice will be greater because the fiscal consequences of that preservation will be experienced sooner. In the end, therefore, the true consequences of open space preservation cannot be determined on a parcel-by-parcel basis. It can, rather, be estimated only in the context of its ultimate outcome. If the first 100 acres preserved proves to be the only land preserved, its impact will be relatively small. If, on the other hand, it is simply the first piece of what ultimately becomes 1,000 preserved acres, its impact will be significant – not in and of itself, but as part of a larger total whose impact can be determined only in the distant future.

*b. The Fiscal Context*

*1. demographic elements*

Demand for municipal services is driven by people, property and regulations. More people and more property lead to increased demand for police and fire protection, education, maintenance and repair of public infrastructure, general government, recreation etc. At the same time, changes in the age, family composition and location of people and the types and locations of property affect the types and relative distribution of municipal services demanded. Finally, changes in regulatory requirements—such as rules governing groundwater runoff or the educational requirements of Emergency Medical Technicians—also change the demand for municipal services. Table 1 illustrates the basic demographic facts that have affected the Town of Cape Elizabeth over the past decade.

**Table 1: Selected Demographic Changes in Cape Elizabeth, 2000 & 2010**

<b>Item</b>	<b>2000</b>	<b>2010</b>	<b>Change</b>	<b>% Change</b>
Population, total	9,068	9,015	-53	-0.6%
Population 0-4	470	390	-80	-17.0%
Population 5-19	2,079	2,006	-73	-3.5%
total school enrollment	1,736	1,695	-41	-2.4%
Population 20-64	5,072	5,169	97	1.9%
Population 65+	1,447	1,450	3	0.2%

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<sup>5</sup> *Ibid.*



Housing Units (HU)	3,724	3,963	239	6.4%
Occupied HU = Households	3,488	3,616	128	3.7%

Sources: U.S. Bureau of the Census, 2000 Decennial Census and 2010 Decennial Census; school enrollment from Cape Elizabeth School Department.

While Cape Elizabeth has experienced very little overall population change, it has seen a substantial demographic shift from younger population groups to middle-aged population groups, and a resultant increase in the number of households. In addition, its growth in housing units has substantially outpaced its growth in households thus leaving a far larger stock of vacant housing units in 2010 than in 2000. This fact is important because it will affect the nature and volume of new construction likely to occur over the coming decade. Table 2 highlights these characteristics of the housing stock.

**Table 2: Selected Housing Changes in Cape Elizabeth, 2000 & 2010**

Item	2000	2010	Change	% Change
Housing Units (HU)	3,724	3,963	239	6.4%
Occupied HU = Households	3,488	3,616	128	3.7%
Vacant	236	347	111	47.0%
Vacant, for rent	38	42	4	10.5%
Vacant, for sale only	8	32	24	300.0%
Vacant, rented or sold	27	26	-1	-3.7%
For seasonal, recreational, or occasional use	140	193	53	37.9%
All other vacant	23	54	31	134.8%
Vacant excluding seasonal	96	154	58	60.4%

Sources: U.S. Bureau of the Census, 2000 Decennial Census and 2010 Decennial Census.

Between 2000 and 2010, the number of housing units (HU) in Cape Elizabeth increased nearly twice as much (+239) as the number of households (HH) (+128). Excluding units held for seasonal, recreational or occasional use, the number of vacant housing units increased by 58 over the decade, rising to 154. Depending on the housing preferences of potential future buyers (size, age, lot size, etc.) and the price flexibility of current owners, this overhang of vacant homes could have a substantial impact on the demand for construction of new housing units in Cape Elizabeth over the coming decade.

## *2. financial elements*

The other side of the fiscal context is the amount Cape Elizabeth actually spent on municipal services over the recent past. Table Three presents those data as gathered from various town annual financial reports and adjusted to ease

presentation and clarify categories.<sup>6</sup>

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<sup>6</sup> Town of Cape Elizabeth Annual Financial Report, June 30, 2001 through June 30, 2011. Figures are presented for FY2003 because reporting practices prior to that period make comparison with later years less accurate. Data reported by function were adjusted to take employee benefits from the "Other Expenditures and Transfers" category and put them in each major functional category to present a more accurate picture of the actual cost of each function. The balance of the "Other" category was included in "General Government." Debt Service and Capital Improvement is listed as a three year trailing average in order to smooth large annual variations, and, for 2011, includes the new category "Facilities." The one-time expenditure for bond refinancing in FY2010 is excluded. In order to incorporate the effects of inflation, actual reported figures are deflated to their 2003 values using the Consumer Price Index.

**Table 3: Inflation-Adjusted Expenditures by Function  
Cape Elizabeth, FY2003 & FY2011**

<b>Function</b>	<b>FY 2003</b>	<b>FY 2011</b>	<b>Change</b>	<b>% Change</b>
Education	\$14,568,738	\$15,946,742	\$1,378,004	9.5%
Culture, Parks & Human Services	\$1,493,723	\$1,631,940	\$138,217	9.3%
General Government	\$1,309,952	\$1,346,483	\$36,531	2.8%
Public Safety	\$1,600,690	\$1,697,450	\$96,760	6.0%
Public Works	\$1,464,232	\$1,588,650	\$124,418	8.5%
Debt Service & Capital Improvement	\$2,475,468	\$1,520,912	-\$954,557	-38.6%
Intergovernmental	\$782,596	\$798,799	\$16,203	2.1%
<b>Total</b>	<b>\$23,695,399</b>	<b>\$24,530,975</b>	<b>\$835,575</b>	<b>3.5%</b>

Sources: See footnote #6 above.

In order to present these expenditure totals in a way more relevant to potential future residential development, Table 4 divides the FY03 expenditure totals by the estimated number of households in 2002 and the FY11 expenditure totals by the number of households reported in the 2010 Census. It is important to note here that the expenditure totals for Education and Culture, Parks & Human Services are included unaltered. The other figures are discounted by 3% to reflect that portion of the other governmental functions serving the non-residential property and activities in the town. Since these properties account for 3% of the town's total assessed tax base, PDI, in consultation with town officials, decided to allocate a portion of expenditures to these properties in proportion to their share of the town's tax base. This adjustment simply highlights the fact that the primary driver of demand for municipal services in Cape Elizabeth is the number, location and demographic characteristics of its residents.

**Table 4: Inflation-Adjusted Expenditures per Household  
by Function Cape Elizabeth, FY2003 & FY2011**

<b>Function</b>	<b>FY 2003</b>	<b>FY 2011</b>	<b>Change</b>	<b>% Change</b>
Education	\$4,138	\$4,410	\$272	6.6%
Culture, Parks & Human Services	\$424	\$451	\$27	6.4%
General Government	\$361	\$361	\$0	0.1%
Public Safety	\$441	\$455	\$14	3.3%
Public Works	\$403	\$426	\$23	5.6%
Debt Service & Capital Improvement	\$682	\$408	-\$274	-40.2%

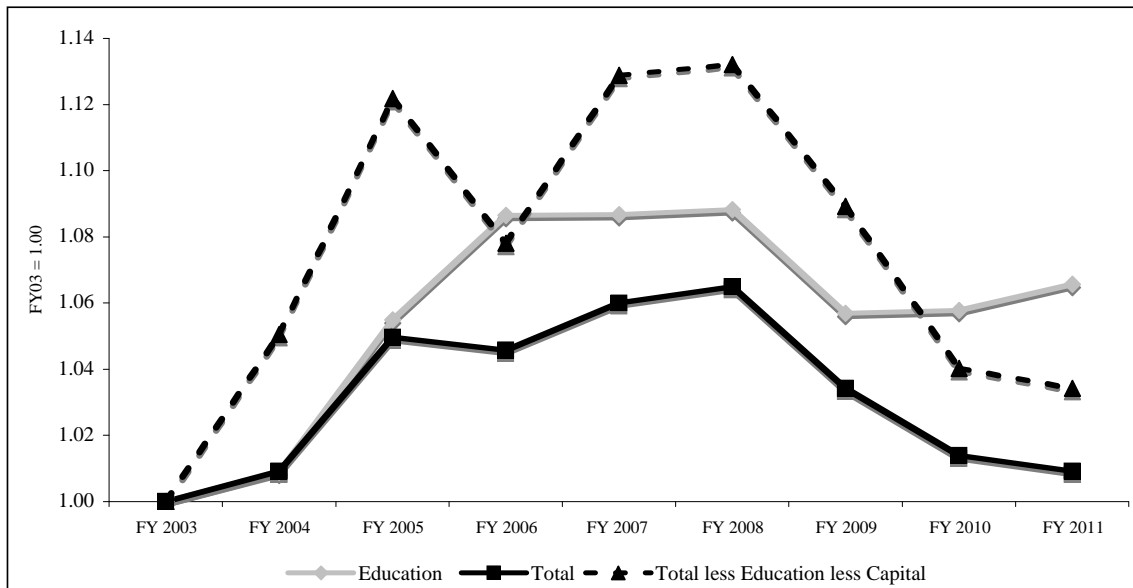
Intergovernmental	\$216	\$214	-\$1	-0.6%
Total	\$6,665	\$6,726	\$61	0.9%
Total less Education & Debt Service, Capital Improvement	\$1,845	\$1,908	\$63	3.4%

Sources: See footnote #6 above plus Census data for household numbers.

The most striking fact evident in Table 4 is how little overall costs per household changed over the period in spite of the demographic shifts reflected in Tables 1 and 2. Total inflation-adjusted municipal spending per household increased less than one percent over the eight-year period. The \$272 per household increase in cost for education was largely offset by the \$272 per household decrease in costs for debt service and capital improvements. Eliminating these two items, the increase per household for all other services was \$63, an increase of 3.4%.

This small overall change, however, masks increases and subsequent decreases that occurred during the period. This is evident in Figure 2 that depicts an index of inflation adjusted spending per household using FY 2003 as a baseline.

**Figure 2: Index of Inflation Adjusted Spending per Household for Selected Functions  
Cape Elizabeth, FY 2003 to FY 2011, FY 2003 = 1.00**



Sources: See footnote #6 above plus Census data for household numbers.

Between FY03 and FY06, inflation-adjusted education spending (the gray line) rose 8%, held that level for two more years before dropping to 6% over the FY03 level in FY09 and FY10 and then rising to 7% over the FY03 level in FY11. Total spending less education and debt service and capital spending (the dotted line) was even more volatile, rising to 13% above the FY03 level before falling back to 3% over the FY03 level. Total spending (the black line) reflected this volatility

although in a less exaggerated way, rising to 7% above the FY03 level in FY08 before falling to just 1% above the FY03 level in FY11.

### *3. management elements*

The central point to be drawn from the financial analysis presented above is that municipal spending is not linked in any simple formulaic way to number of households in the community. It is, rather, the result of departmental managers adjusting their human and capital resources to the changing needs of the community and the constraints of their budgets. This service management orientation was evident in all of the interviews conducted with town program managers as part of this project.<sup>7</sup> Several themes emerged illustrating forces other than simple number of people or households driving the demand for municipal services, thus creating the need for management flexibility in meeting them:

✓ *The nature of the need for service has changed*

For the police, the nature of crime has changed. More credit card fraud, identity theft, online commercial transactions and increased thefts have changed the type of police service provided and changed the measure of service from response time to an accident to speed of prosecution for a crime. There is increased need for investigative, detective work.

Similar changes are evident in Public Works where the primary job used to be snow plowing but over time has become maintenance of fields, trimming trees, clearing catch basins and generally maintaining a wider range of public infrastructure. Similarly, in Parks and Recreation, the changing nature of the population has resulted in changing programs and a wider range of on-call instructors.

✓ *Regulations have increased the complexity of service*

For rescue services provided by the Fire Department, the increased credentialing required for first responders along with the hours required at hospitals for post rescue debriefing has made it increasingly difficult to attract volunteers. For Public Works, increasing regulation regarding stormwater runoff has increased the complexity of maintenance operations and added significant training time for staff.

✓ *Employees must be cross trained to serve multiple purposes*

Public works mechanics also drive snow routes. A police officer does part-time

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<sup>7</sup> For a list of interviews, see Appendix Two below.

detective work. Parks & Recreation employees are program planners and managers; actual programming is provided by on-call instructors.

✓ *Regional cooperation increases flexibility*

Public Works can borrow a vehicle from South Portland on an “as available” basis. Fire and police services can draw on neighboring forces as needed. Animal control, dispatch, the tactical unit and the regional crime lab all are provided through regional cooperative services. Interlibrary loan services extend the value of a library now limited by a “buy a new book, discard an old one” policy dictated by the constraints of the current building.

The other theme to emerge from interviews with Department Heads was the general (with several notable exceptions) adequacy of the town’s current physical asset base. The school buildings and fields are adequate to meet current and likely future demand. In fact, presuming a relatively even distribution across all grades, the school system could absorb 200 more students. The fire and police stations are relatively new, provide adequate space for staff and are well positioned to respond to calls anywhere in the community. Public works has adequate building space, the sewage treatment plant is at 67% capacity, the transfer station is open four days per week and waste is hauled five times per week. Regular replacement schedules for vehicles will allow fire, police and public works to maintain current fleets. The Community Center, school buildings, athletic fields have capacity to serve more people (recognizing that fuller scheduling will mean less convenient times for some activities).

The major exceptions to the adequacy of capital facilities are the library and the transportation portion of community services. As noted above, the current library operates 45 hours per week (above the standard for comparable communities) and has no room for additional acquisitions. Any additional residential development would mean diminished library service on a per-person or per-household basis. In particular, additional families with young children would find serious limitations in the library’s ability to provide additional programming for their needs. Similarly, even as enrollment in the school system has declined, ridership on the town busses has increased. If this higher proportion of students taking the bus continued in an environment of increased residential development, the transportation service would have to add an extra bus (or busses) and additional route drivers.

*4. neighborhood differences*

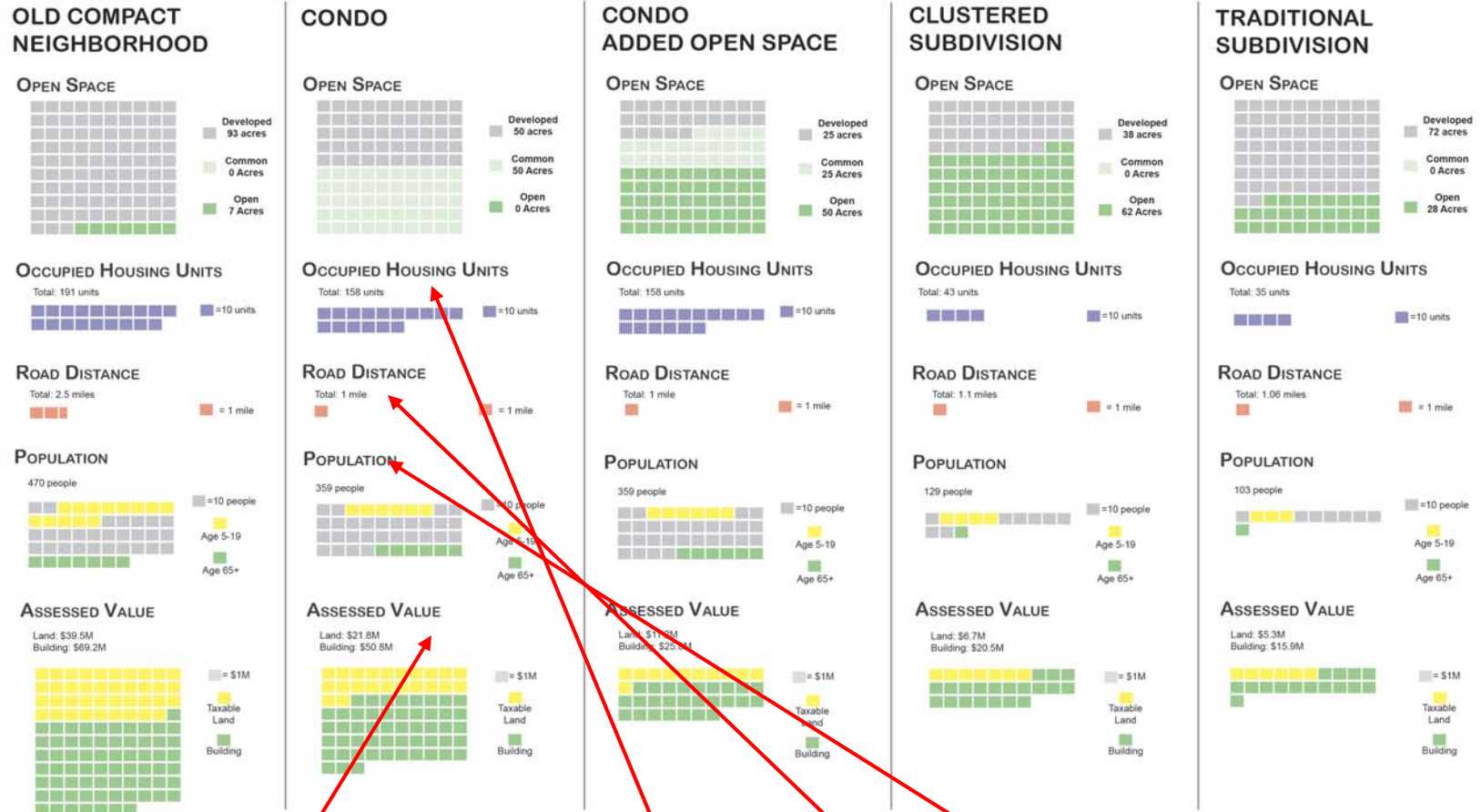
In addition to seeking to compare the cost of developing versus preserving land, this report also seeks to identify any significant differences in the cost of varying **types** of development. Appendix One presents maps, census data and assessing

data describing the characteristics of each of these neighborhood types. While they do vary considerably in geographic layout and demographic composition, these differences are likely to create significant fiscal impacts only as they push population and household numbers to the point where they tax the current staffing and facility capacities of the town as a whole. One more condominium development would probably create more demand for rescue services than an equivalent number of units developed in the old compact neighborhood model because of its higher proportion of elderly occupants. Conversely, one more clustered subdivision would probably bring in more school age children than an equivalent number of units in an old compact neighborhood or traditional subdivision, at least given the current demographic composition of these developments.

On a one-by-one, step-by-step basis, however, the specific type of development is less important to the delivery of municipal services than the overall number of units. On a case-by-case basis, each departmental manager said, in effect, "I would integrate the new unit(s) into my current capacity, rearrange schedules, assignments and staffing patterns and do my best to maintain current service levels." In short, no single type of residential development by itself would push the cost of services over a tipping point that would drive marginal costs over the current average cost per household. Therefore PDI standardized each neighborhood type to a 100-acre standard or template using the demographic and valuation data listed in the Appendix. Figure 3 presents this comparison in a visual way.

Figure 3: Characteristics of Neighborhood Type by 100-acre Standard

# DEVELOPMENT ALTERNATIVES (EXPANDED TO 100-ACRE STANDARD)





Sources: Census and Assessing data as listed in Appendix One.

To be redone, doubling the number of occupied housing units, the road distance, the population and the assessed value to reflect the fact that two condo developments would fit on 100 acres.

Table 4 lists the hypothetical extreme of each neighborhood prototype applied to the approximately 1,600 acres of land available for development.

**Table 4: Application of Each Development Alternative to 1,600 Acres**

Full Development	Old Compact Neighborhood	Traditional Subdivision	Clustered Subdivision	Condo	Condo w/ Extra Open Space
Developable land	1,600	1,600	1,600	1,600	1,600
New Open Space	108	354	994	788	0
New HH	3,056	557	684	2,531	5,061
New Taxable Value (\$1,000)	\$1,722,360	\$343,391	\$434,523	\$591,674	\$1,183,348
Town HH Total	6,672	4,173	4,300	6,147	8,677

Sources: Census and Assessing data as listed in Appendix One.

Table 4 obviously represents an extreme—indeed, three of the five exceed the maximum buildout described in the 2007 Comprehensive Plan—but this extreme is precisely the basis from which the fiscal impact of the develop-preserve choice must be made. The marginal cost of any additional development today is likely to be less than the current average cost per household, and the marginal saving of additional open space preservation is likely to be insignificant within the overall total of 1,600 acres available for development. The fiscal impact of the develop-preserve choice can be understood only in the context of the “end-game” of development for the town. For this reason, it is necessary to examine the likely future cost of development over a substantial range of new residential development to see where significant new jumps in capital facilities and staffing may be required and how much open space would have to be preserved to prevent the town from having to incur these additional expenses. This analysis is undertaken in the following section.

## 2. Projecting Forward

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In preparing this report, PDI reviewed two prior residential impact studies – the Dominicus Crossing report and the Leighton Farm report.<sup>8</sup> Both reports provide useful background information and helpful examples of how the fiscal impacts of development have been estimated in Cape Elizabeth. However, both are different from this open space analysis in two fundamental ways:

1. First, both were analyses of specific proposals for specific homes in specific locations whereas this report deals with the broader policy question of potential develop or preserve choices that may in the future arise in any of the 1,600 acres of potentially developable land in town; and
2. Second, both employed average cost calculations projected forward to estimate fiscal impacts. Both used neighboring homes to estimate likely future enrollment and existing average per pupil costs to project education expenses. Both used existing calls per home, public works expenditures per housing unit, solid waste generation and recreation expenditures per household as the basis for projecting forward the likely costs of the specific new residential housing units proposed.

Given the data and commentary presented in the *fiscal context* section above, however, it is clear that simple extension of existing average costs per household is not likely to provide the best estimate of the fiscal impact of additional residential development in Cape Elizabeth over the full extent of the land available for development. As is evident in Figure 2 above, inflation adjusted spending per household tended to rise over the earlier part of the past decade in large part because of higher capital expenditures than have been evident in recent years. The central fiscal question facing the Town of Cape Elizabeth, therefore, is, “At what level of additional residential development is the town likely to encounter a steep increase in cost per household because that level of development pushes town service providers beyond the capacities of their current staffing patterns, capital facilities and management flexibility.

One way to estimate such a threshold is to examine spending patterns for generally similar but slightly larger municipalities to which Cape Elizabeth might look, if not for guidance, at least experience. Table 5 presents such a comparison.

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<sup>8</sup> Planning Decisions, Inc. Community Impact Analysis – Dominicus Crossing, May 4, 1996.  
Planning Decisions, Inc. Fiscal Impact of the Leighton Farm Subdivision, December 20, 2002.

**Table 5: Demographic and Fiscal Comparisons, Selected Towns**

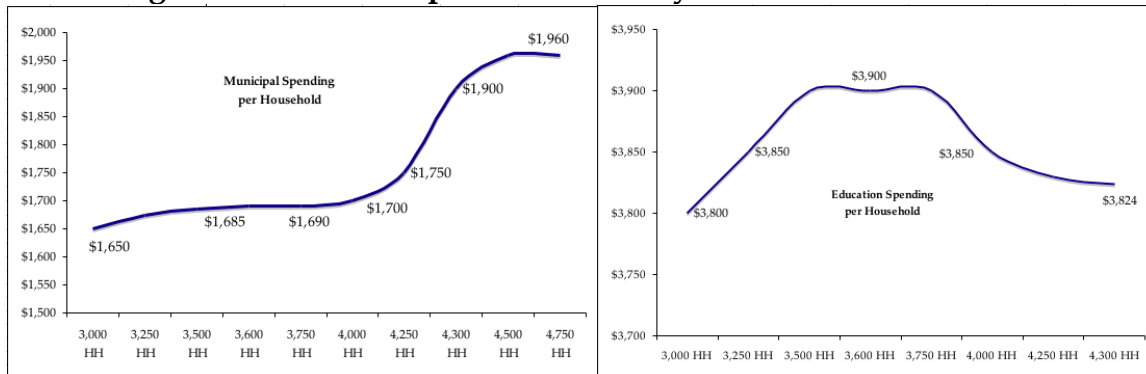
Measure	Gray	Cape Elizabeth	Falmouth	Gorham	Scarborough
2010 Population	7,761	9,015	11,185	16,381	18,919
2010 Households	3,156	3,616	4,334	5,719	7,506
2010 Enrollment	n.a.	1,696	2,101	2,652	3,304
FTE Employment per 1,000 HH					
Municipal	11.4	16.3	19.6	19.9	27.6
Education	n.a.	76.3	81.0	78.0	76.7
Total Payroll per 1,000 HH					
Municipal	\$1,366	\$1,694	\$1,977	\$1,935	\$2,986
Education	n.a.	\$3,891	\$3,824	\$3,157	\$3,222

Sources: Census of Population and Census Bureau Annual Survey of Public Employment and Payroll. <http://www.census.gov/govs/apes/>.

At least from this sample, it is clear that both municipal (all but education) employment and payroll seem to jump to a new plateau somewhere between 3,000 households, between 3,600 households and 4,300 households and then again, somewhere between 16,000 and 19,000 households. Education employment and payroll, in contrast, seems to hit some economy of scale beyond 4,300 households.

These totals combined with the conclusions of the interviews with Cape Elizabeth’s department heads point to a roughly S-shaped fiscal cost curve something like the hypothetical curve represented in Figure 4 below and an inverted U curve for educational costs per household over the range of households from 3,000 to 4,300.

**Figure 4: Fiscal Cost per Household by Number of Households**



Sources: Census of Population and Census Bureau Annual Survey of Public Employment and Payroll. <http://www.census.gov/govs/apes/>.

For municipal (non-educational) costs, inter-municipal data and interviews with town departmental managers suggest that Cape Elizabeth is currently operating along the flat part of the S curve and is likely to see stable or gradually increasing average costs per household for its next 200 to 400 households. Somewhere in

the 4,000 household range it is likely to begin to experience more sharply accelerating per household costs as the current physical and staffing capacities reach their limits.

For education costs, Cape Elizabeth faces a position of excess capacity where additional residential development is likely to reduce per household costs. Assuming an ability to accommodate an additional 200 students and assuming the current student-per-household ratio of 0.47 implies a capacity to absorb an additional 426 residential units with no material increase in overall educational costs and a declining cost-per-household ratio.

All of this analysis underlies the conclusion that it is useful from a fiscal standpoint to think of the develop-preserve choice less on a case-by-case basis than on a final target basis. If Cape Elizabeth can acquire sufficient open space or so arrange its residential development as to limit the number of households to less than roughly 4,200 it is likely to avoid a spike in cost per household—a movement of marginal cost per household up the S curve—resulting from the need to move staffing up to a higher level to maintain service standards and to increase capital facilities.

The exact shape and location of the S curve cannot be determined precisely outside a particular situation. Clearly, the nature of future development, as is evident in the 100-acre prototypes prepared for each neighborhood type, will have different overall effects on the ultimate number of households in Cape Elizabeth. For example, consider the Cluster Subdivision build-out development alternative in column 4 of Table 4 above: 1,600 acres developed into 994 acres of open space and 684 housing units. Suppose the town acquired an additional 300 acres of open space thus reducing the number of housing units developed by 128 units and thus reducing the total number of housing units in the town from 4,300 to 4,128. Suppose further that the total per household cost of providing services in the 4,100 housing-unit range was \$6,500, slightly less than the \$6,700 figure today.

Suppose further that the total per household cost of providing services to 4,300 households was \$8,000—substantially up the S curve, reflecting the crossing of a capacity threshold. Accepting these suppositions, the fiscal savings from the open space purchase would be \$8,000 per household or just over \$1.0 million for the 128 houses. If the 300 acres could be obtained for less than \$1.0 million, then the purchase could be said to have produced a fiscal cost savings.

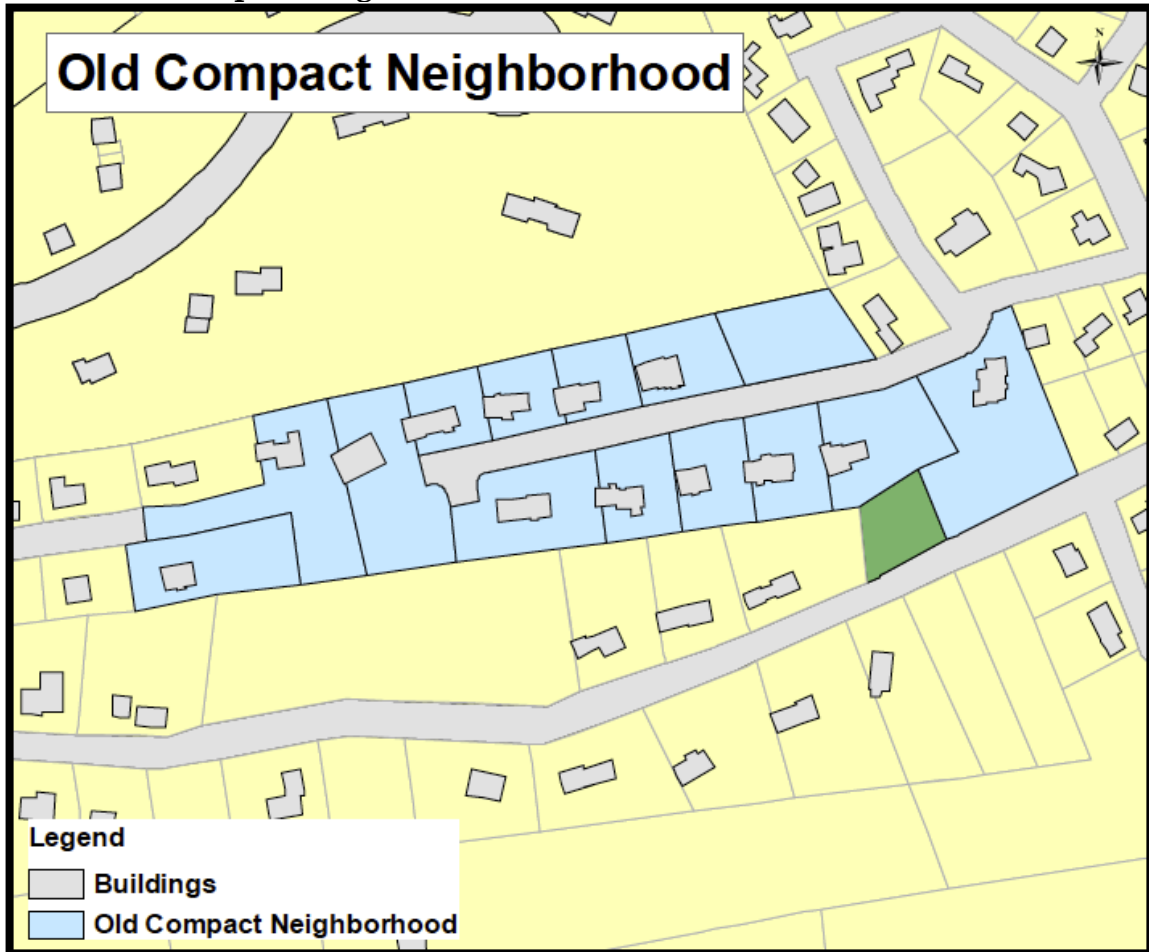
However, these “savings” do not take into account the lost revenue of the 128 units not developed. Presuming an assessed value of \$635,00 per unit and a tax rate of \$15.18 per thousand, the 128 units not developed represent lost revenue of

approximately \$1.2 million. In this light, the open space acquisition clearly does not pay for itself.

The central conclusion of this analysis is not that there is a “correct” fiscal impact number to be applied to each develop-preserve choice that becomes available. It is, rather, that the develop-preserve choice must always be seen in the context of the overall total number of households in the community and where that number stands along the S-shaped cost per household curve at any given point in time.

## Appendix One: Neighborhood Types

### 1. Old Compact Neighborhood.



Census Data	2000 Census Block 37.01/1018	2010 Census Block 37.01/1018
Total Housing Units (HU)	15	172
Occupied Housing Units (HH)	14	154
Population Total	38	379
Population/HH	2.71	2.46
% Pop 0-19	34%	30%
% Pop 65+	16%	14%

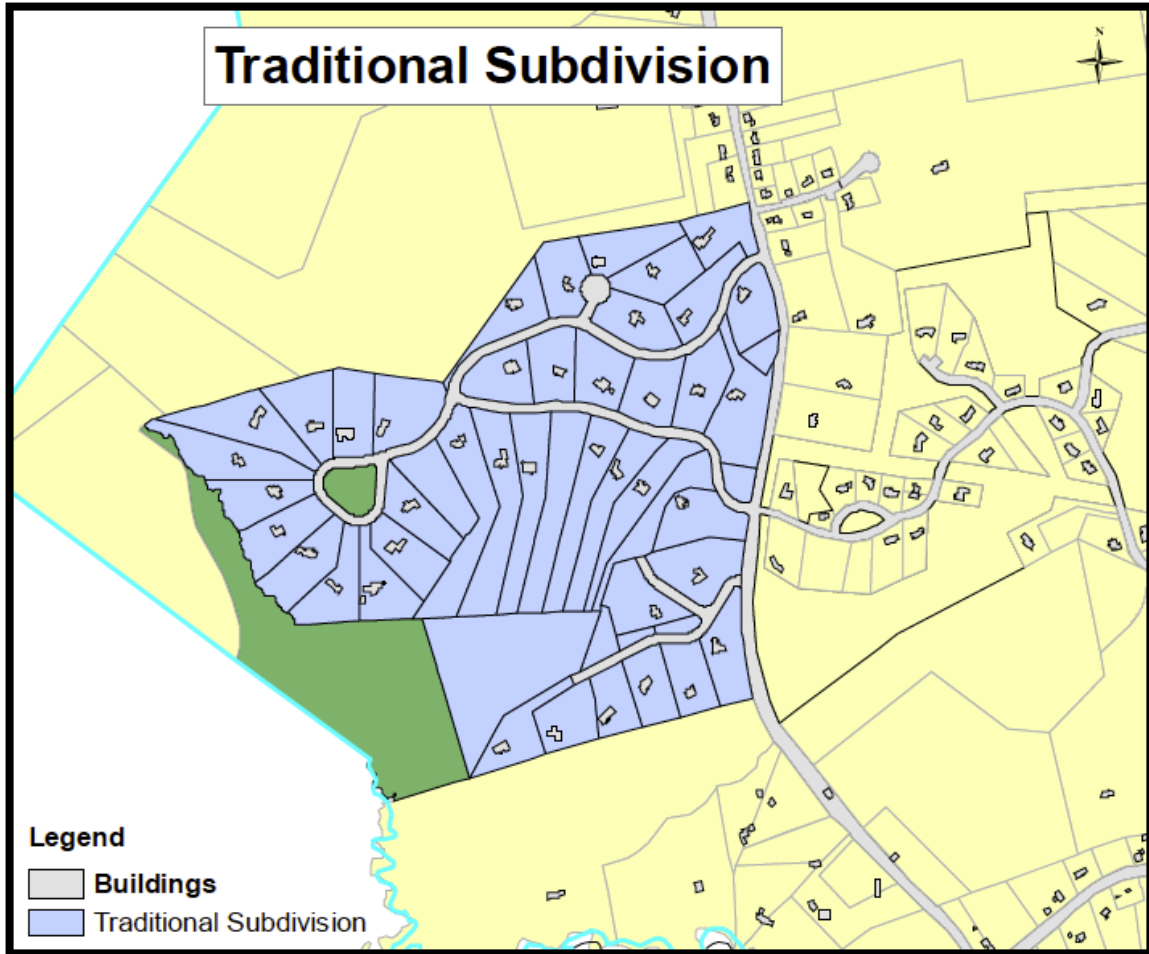
Source: Bureau of the Census, 2000 and 2010.

2011 Assessing Data	Old Compact Neighborhood		
	Developed	Exempt	Total
Totals			
acres	5.4	0.4	5.8
parcels	13	1	14
dwelling units (DU)	13	0	11
land value	\$2,113,400	\$163,600	\$2,277,000
building value	\$4,696,500		\$3,987,300
total value	\$6,809,900	\$163,600	\$6,264,300
road distance (feet)			763
Average per acre			
dwelling units (DU)	2.42		1.91
open space			0.07
land value	\$393,557	\$419,487	\$395,313
building value	\$874,581		\$692,240
total value	\$1,268,138	\$419,487	\$1,087,552
road distance (feet)			132
Average per DU			
acres	0.41		0.52
land value	\$162,569		\$207,000
building value	\$361,269		\$362,482
total value	\$523,838		\$569,482
road distance (feet)			69

Source: Town of Cape Elizabeth assessor's database and Annual Report, 2011.



## 2. Traditional Subdivision



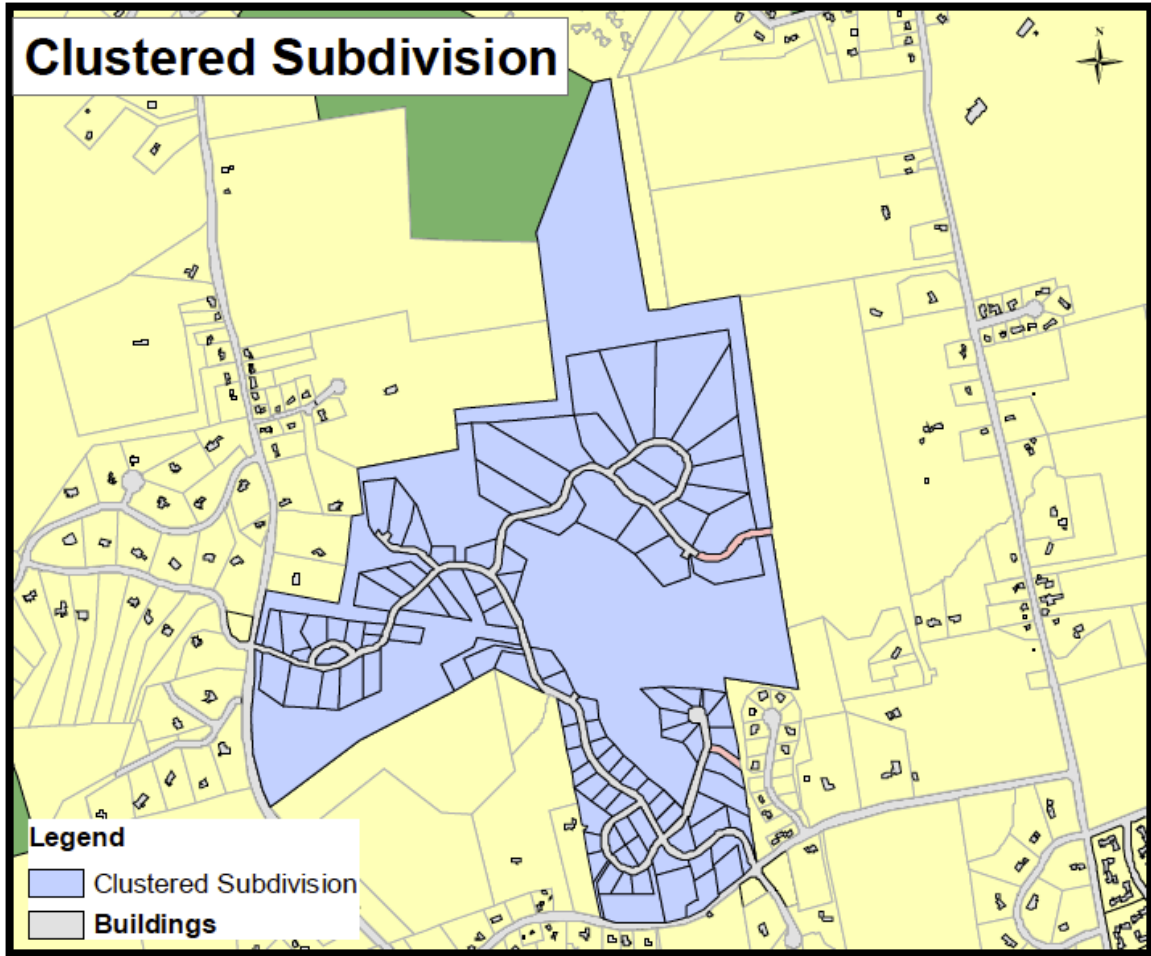
Census Data	2000 Census Block 37.02/3002-03	2010 Census Block 37.02/2004-05
Total Housing Units (HU)	60	68
Occupied Housing Units (HH)	59	66
Population Total	206	195
Population/HH	3.49	2.95
% Pop 0-19	40%	31%
% Pop 65+	2%	8%

Source: Bureau of the Census, 2000 and 2010.

2011 Assessing Data Use Characteristic	Traditional Subdivision			
	Developed	Developable	Open	Total
Totals				
acres	90.6	7.8	28	126.4
parcels	41	3	2	46
dwelling units (DU)	41	0	0	41
land value	\$6,224,300	\$31,407	\$293,132	\$6,548,839
building value	\$18,473,500			\$18,473,500
total value	\$24,697,800	\$31,407	\$293,132	\$25,022,339
road distance (feet)				7,061
<b>Average per acre</b>				
dwelling units (DU)	0.45			0.32
open space				0.22
land value	\$68,731	\$10,469	\$0	\$51,819
building value	\$203,992			\$146,174
total value	\$272,723	\$10,469	\$0	\$197,993
road distance (feet)				56
<b>Average per DU</b>				
acres	2.21			3.08
land value	\$151,812			\$159,728
building value	\$450,573			\$450,573
total value	\$602,385			\$610,301
road distance (feet)				172

Source: Town of Cape Elizabeth assessor's database and Annual Report, 2011.

### 3. Clustered Subdivision.



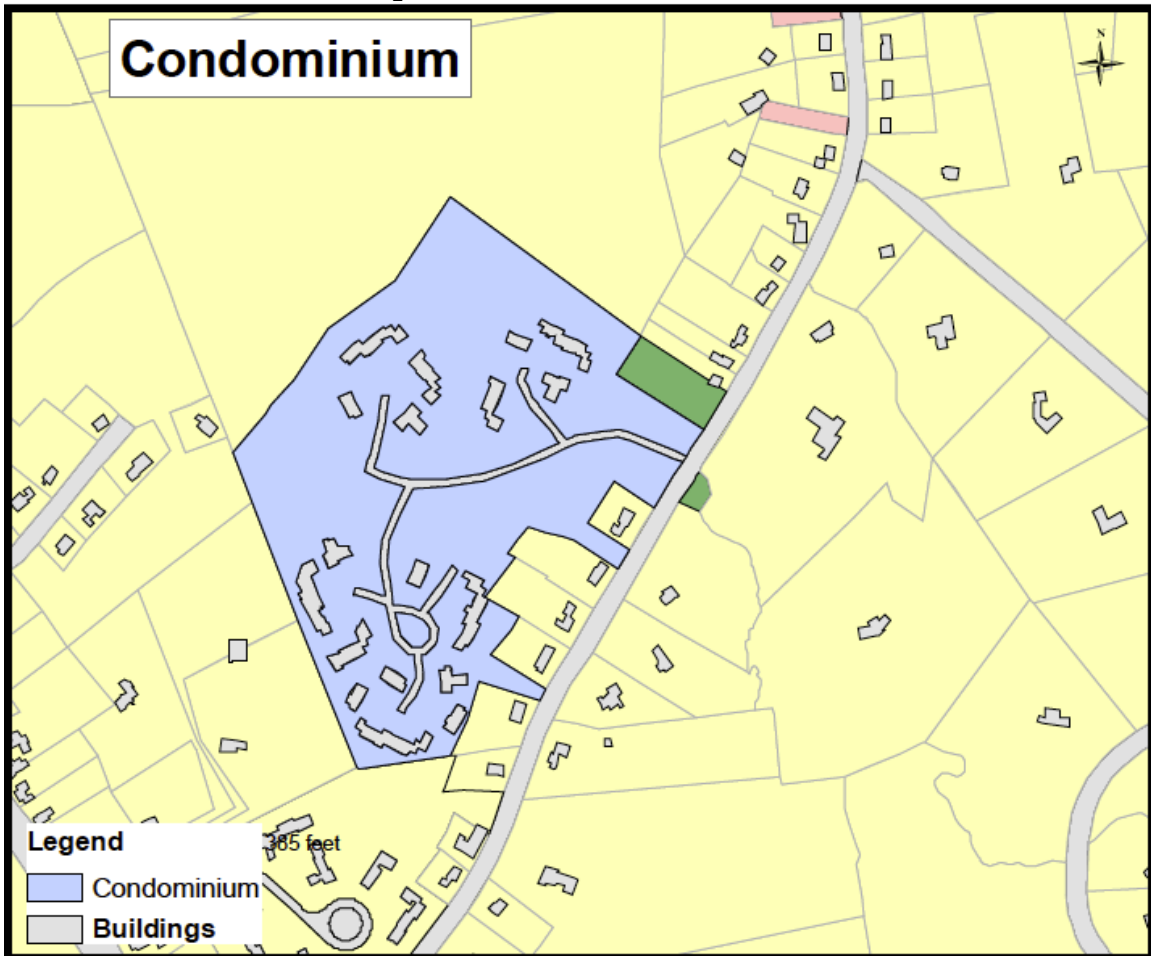
Census Data	2000 Census Block 37.02/3001, 04	2010 Census Block 37.02/2006, 10
Total Housing Units (HU)	66	162
Occupied Housing Units (HH)	62	156
Population Total	163	469
Population/HH	2.63	3.01
% Pop 0-19	29%	37%
% Pop 65+	19%	11%

Source: Bureau of the Census, 2000 and 2010.

2011 Assessing Data	Clustered Subdivision			
	Developed	Developable	Open	Total
Totals				
acres	67	17	137	220
parcels	81	13	8	102
dwelling units (DU)	81	0	0	81
land value	\$12,729,900	\$2,030,500	\$190,900	\$14,951,300
building value	\$38,831,100			\$38,831,100
total value	\$51,561,000	\$2,030,500	\$190,900	\$53,782,400
road distance (feet)				12,738
<b>Average per acre</b>				
dwelling units (DU)	1.22			0.37
open space				
land value	\$191,398	\$120,935	\$1,398	\$68,084
building value	\$583,839			\$176,827
total value	\$775,237	\$120,935	\$1,398	\$244,911
road distance (feet)				58
<b>Average per DU</b>				
acres	0.82			2.71
land value	\$157,159			\$184,584
building value	\$479,396			\$479,396
total value	\$636,556			\$663,980
road distance (feet)				157

Source: Town of Cape Elizabeth assessor's database and Annual Report, 2011.

#### 4. Condominium Complex.



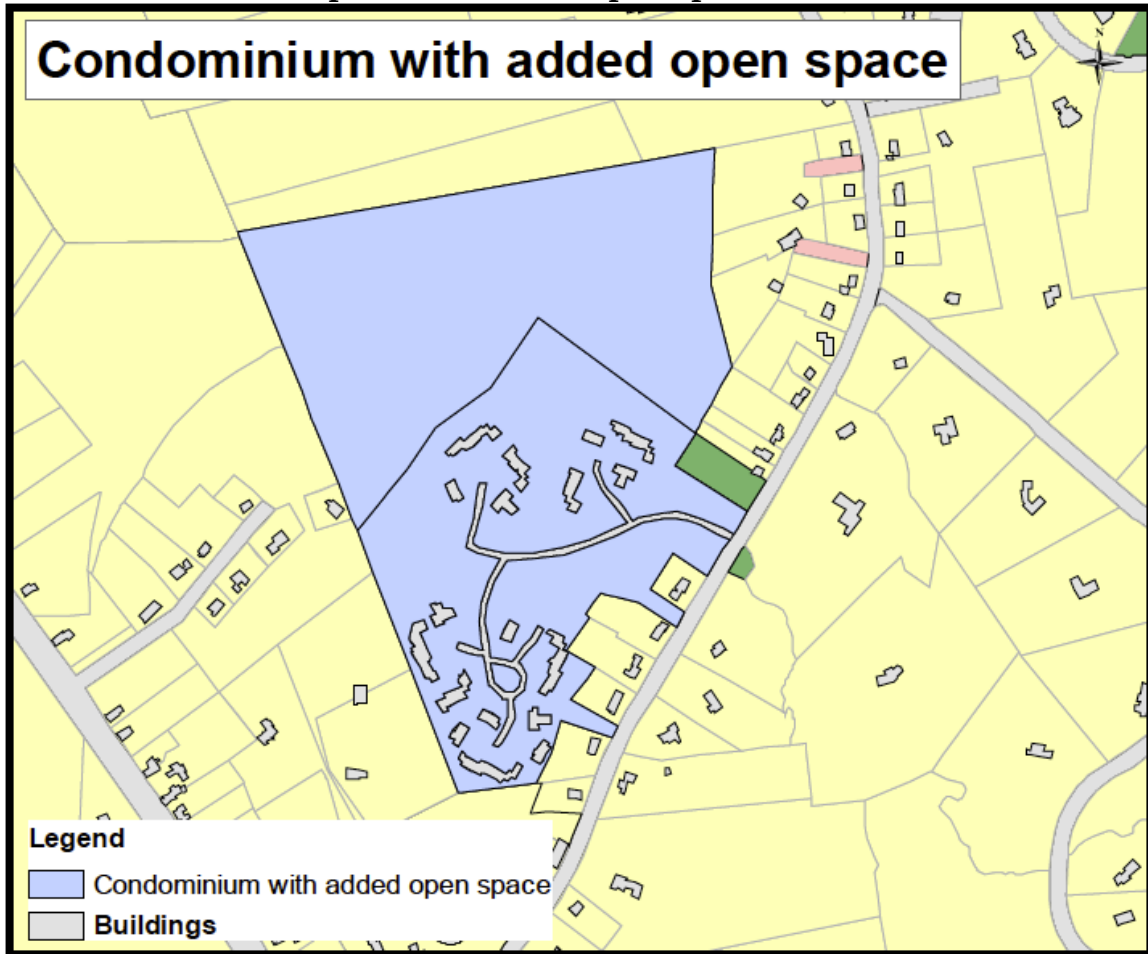
Census Data	2000 Census Block 37.01/2016	2010 Census Block 37.01/2016
Total Housing Units (HU)	22	345
Occupied Housing Units (HH)	21	318
Population Total	49	722
Population/HH	2.33	2.27
% Pop 0-19	53%	21%
% Pop 65+	6%	16%

Source: Bureau of the Census, 2000 and 2010.

2011 Assessing Data	Condominium Complex		
Use Characteristic	Developed	Exempt	Total
Totals			
acres	21.2	0	21.2
parcels	66	0	66
dwelling units (DU)	66	0	66
land value	\$4,620,000	\$0	\$4,620,000
building value	\$10,760,200	n.a.	\$10,760,200
total value	\$15,380,200	\$0	\$15,380,200
road distance (feet)			2,197
Average per acre			
dwelling units (DU)	3.12		3.12
open space			
land value	\$218,233	\$0	\$218,233
building value	\$508,276		\$508,276
total value	\$726,509	\$0	\$726,509
road distance (feet)			53
Average per DU			
acres	0.32		0.32
land value	\$70,000		\$70,000
building value	\$163,033		\$163,033
total value	\$233,033		\$233,033
road distance (feet)			33

Source: Town of Cape Elizabeth assessor's database and Annual Report, 2011.

## 5. Condominium Complex with Added Open Space



Census Data	2000 Census Block 37.01/2016	2010 Census Block 37.01/2016
Total Housing Units (HU)	22	345
Occupied Housing Units (HH)	21	318
Population Total	49	722
Population/HH	2.33	2.27
% Pop 0-19	53%	21%
% Pop 65+	6%	16%

Source: Bureau of the Census, 2000 and 2010.

<b>2011 Assessing Data</b>	<b>Condominium Complex with added Open Space</b>		
Use Characteristic	Developed	Exempt	Total
Totals			
acres	21.2	20.56	41.7
parcels	66	0	66
dwelling units (DU)	66	0	66
land value	\$4,620,000	\$51,400	\$4,671,400
building value	\$10,760,200		\$10,760,200
total value	\$15,380,200	\$51,400	\$15,431,600
road distance (feet)			2,197
<b>Average per acre</b>			
dwelling units (DU)	3.12		1.58
open space			0.49
land value	\$218,233	\$2,500	\$111,943
building value	\$508,276		\$257,853
total value	\$726,509	\$2,500	\$369,796
road distance (feet)			53
<b>Average per DU</b>			
acres	0.32		0.63
land value	\$70,000		\$70,779
building value	\$163,033		\$163,033
total value	\$233,033		\$233,812
road distance (feet)			33

Source: Town of Cape Elizabeth assessor's database and Annual Report,



## Appendix Two: Interviews

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Name	Position	date
Michael McGovern	Town Manager	July 28 and September 27
Matthew Sturgis	Tax Assessor	July 29 and September 27
Pauline Aportia	Business Manager	September 21 and October 20
Peter Gleeson	Fire/Rescue Chief	September 27
Neil Williams	Police Chief	October 13
Robert Malley	Director, Public Works Department	September 30
Jay Sherma	Library Director	September 23
Meredith Nadeau	Superintendent of Schools	October 20
Maureen O'Meara	Town Planner	monthly
Janet Hoskin	Director, Cape Elizabeth Community Services	October 25