Appendix B
Build-Out Analysis

Appendix B. Build-Out Analysis

B.1 Introduction

B.1.1. What Is a "Build-Out" and Why Is It Useful?

B.1.1.1. Definitions - What do the terms "Build-Out" and "Build-Out Analysis" mean?

The Massachusetts Executive Office of Environmental Affairs (EOEA) in its publication "The Buildout Book" defines "Build-Out" or "Buildout" as the state reached by a community when no additional development is possible because every piece of land is either already developed, permanently protected, or prohibited from being developed by constraints on development [such as wetlands or floodplains].

EOEA defines a" build-out analysis"-- in particular, the analysis that agency performed for all 351 Massachusetts communities--as "a series of GIS maps depicting existing and potential development and constraints on development based on existing local zoning and regulations".

A "Build-out" analysis is:

- a **planning tool**, to be used in conjunction with other planning tools, to project into the future what might happen with respect to development, including residential, commercial, industrial and institutional development.

-It is **based on both the physical characteristics of the land** (including both constraints on and opportunities for, development) and the **legal or regulatory constraints** imposed by federal, state, and local bylaws and regulations.

- It is a **projection**, not a **prediction,** of what will happen in the future.

- In its most complete form, it requires computer modeling to accomplish, thus is usually outside the scope of local planning boards and master plan committees to accomplish on their own without outside help.

- It can project changes in land use, population, housing, commercial, industrial and institutional development, solid waste generation, water usage, and municipal services required, among other things.

- It can generate **"Default" or "Do-Nothing" Build-out projections** based on the current situation, i.e. acres of land zoned for particular uses within various zoning districts, zoning bylaws and subdivision regulations currently in place, or

- It can generate **"What-If" Scenarios** to test-drive various recommendations for changing zoning, regulations, districts, etc.

- It is accompanied by **maps** of the Town.

B.1.1.2. Why Is a Build-Out Analysis Useful?

- It produces projections Town government may use to determine how many new municipal facilities might be needed when development in Town has "max'ed" out and to acquire land in appropriate areas of Town.

- The maps may help citizens and officials to visualize **opportunities for locating municipal buildings**, **places to encourage or discourage new private development of various types**, and **resources that require protection**.

- The numerical results provide a framework for discussing how the projected needs of future residents might be addressed and planned for in advance, so that the Town can set aside or purchase land, for example, and in other ways provide in an orderly way for the needs of the future.

B.1.2. What Are the Different Types of Build-Out Analysis Methodologies?

There are many different ways to conduct a build-out analysis. The methodology chosen depends on the time, data, and funds available. Three basic types are land use level build-out, parcel level build-out, and site design level build-out.

The land use build-out is the methodology used in the current Westport build-out. This method uses land use aerial mapping to determine the areas that are developable and the physical constraints on development. It relies on accurate, up-to-date mapping and is the least time-consuming and expensive method, costing approximately $5,000 to $10,000. It will tend to overestimate somewhat the potential future house lots compared to the parcel level build-out.

A parcel level build-out has the potential to be more accurate, but requires much more time and requires that accurate assessors parcel land use data be in a GIS database. The Water Works Group Build-Out of 1995[33] used this type of analysis, but not in conjunction with GIS. Therefore the accuracy is not as great as it potentially could be at the current time. This type of analysis costs approximately $25,000.

The site design level build-out is not normally used on a town-wide scale.. It requires that site designs be drawn for every vacant parcel. In a town such as Westport with many vacant parcels, it would be very time-consuming and costly. It might be used for planning a small area of town, such as a village or a highway corridor.

B.2 Previous Build-Out Scenarios

B.2.1. Introduction

Two previous build-out analyses using various methodologies were conducted. In 1987-88 a land used based build-out analysis was done as part of a Growth Management Study performed by LandUse Inc. This analysis used land use mapping to estimate constraints such as wetlands and floodplains, however the large amount of data currently available from MassGIS and Westport GIS was not available at that time. In 1995 the Water Works Group conducted a parcel-based build-out analysis, which relied on local parcel data, but which did not have the benefit of the natural factors mapping currently available on GIS, therefore was not a true analysis the buildable area of each individual parcel. In all build-out analyses, including those above-mentioned and the current EOEA analysis some factors must be input as general factors, such as 10-15% allowance for roads,

[33] Town of Westport--Build-Out Study, July 27, 1995, Water Works Group, Inc., P.O. Box 197, Westport.

buildable acreages discounted by 25 to 50% for wetlands and floodplains, etc. An original EOEA analysis conducted in 1999 was felt to have used grossly incorrect assumptions, such as the area of wetlands, and the frontage required by zoning. According, the Master Plan Update Committee contracted with Beals & Thomas, Inc. (BTI) to work with EOEA to re-calculate the analysis, using new wetland and land use GIS datalayers and more accurate assumptions.

B.2.2. Growth Management Plan of 1987-88[34]

The figures generated by this plan are compared with the EOEA build-out later in this chapter. This analysis predicted that the greatest impact of growth expected would be caused by the increase in school-aged children. An additional 800 school-aged children were projected by the year 2000. The actual increase was 516. The plan estimated that the school system was operating at 59% capacity at that time and could accommodate this growth. The authors noted, however, that if a majority of growth occurs in one sector of town, then there may be the need to site a new facility. Similarly, this plan noted that growth in the southern portion of town may necessitate a new fire substation, staffing and equipment. The authors proposed that the Town would need to consider increasing the size of the police force as a result of growth, but that the police station is adequate for the next decade (1988-98). Other future needs discussed were library expansion, solid waste disposal, and the capacity of Town Hall. Replacement of Hix Bridge was recommended within 5 yrs. An additional 1250 acres of land were projected to be developed by 2000. The projected new dwelling units were quite close to the actual growth that occurred in that time frame. However, the growth in population was less than projected, to some extent due to smaller household size. The dwindling economy may have led to ex-migration of younger workers, especially at the beginning of this time frame.

B.2.3. 1995 Water Works Group Build-Out

The results of this build-out are discussed in a later section. The analysis results only included projected dwelling units and population. The building lot area used was incorrect. Also, the assumption was made that APR's could be converted back to residential development.

Comparing analyses can be useful for gauging the validity of the current analysis and for seeing how economic, demographic and regulatory changes have affected the projections. For example, the nationwide trend toward smaller households leads to more residential land consumption to house fewer people. Increasing stormwater regulation means more land must be set aside for roads and associated drainage, leaving less land for house lots. The Rivers Protection Act takes additional acreage out of development.

[34] The Westport Growth Management Plan (1987-1988) LandUse, Incorporated.

B.3 EOEA Build-Out 2002

B.3.1 Methodology

B.3.1.1 Data Sources

Data was collected and reviewed by the Town's consultant, Planning Board Administrative Assistant and the Planning Board Chairman and several Master Plan Update Committee members. Data sources included the Westport Zoning By-Law and Rules & Regulations Governing the Subdivision of Land, the 1999 Westport Open Space Plan, the MacConnell land use MassGIS layer of 1999, the new 1:5000 GIS wetlands datalayer, data from discussions and other documents provided by Town officials.

The Westport Zoning Map GIS layer previously produced by MassGIS was only a generalized graphical representation. New zoning datalayers for both underlying districts and the Aquifer Protection overlay district were constructed by then Planning Board Chairman Tim Gillespie and staff. The Open Space Inventory Map was updated from the 1999 map with the help of the Westport Land Conservation Trust. The land use information was updated for changes since 1999 by the addition of a "recent subdivisions" GIS layer prepared by Tim Gillespie. The various data sources available for identifying wetland resources were reviewed and the Department of Environmental Protection/Wetlands Conservancy Program 1:5000 Mass GIS layer was identified as being most accurate and up to date. This choice agrees with the recommendation of EOEA in their Scope of Services and with the findings of other towns that have done build-outs and found that the National Wetlands Inventory seriously underestimated the extent of wetlands.

B.3.1.2. Assumptions and Methodology Overview

1. The assumption is that development will occur on land that is not now developed. Developed land includes the following categories from the MacConnell Land Use Inventory, with land use codes in parentheses: spectator and water-based recreation (8,9), residential (10,11,12,13), commercial (15), industrial (16), transportation (18), waste disposal(19), and water (20). Land used for mining (5) refers to gravel banks. The assumption is that they are available for re-development, as they are commonly re-used for residential subdivision, shopping centers, golf courses and other uses.

2. Developed land is subtracted from the total area of the town and categorized to leave a GIS layer showing undeveloped land with its associated zoning district designation.

3. Permanently-protected open space is defined by EOEA as, "land which is either held in fee ownership by a government agency or a private non-profit organization for the purpose of conservation or water supply protection or land with deeded limitations on development *e.g.* conservation restriction, APR or other permanent legal interest."

4. Permanently-protected open space acreage is subtracted from undeveloped land to produce a datalayer of undeveloped, unprotected land.

5. Absolute Constraints on Development

Only areas that can neither be built upon nor contribute to how much building is allowable are mapped as absolute constraints. Whether there are any absolute constraints in a town often depends on whether there are any restrictive local bylaws and regulations that treat resource areas such as wetlands and floodplains. In Westport, for example, wetland area may be counted towards meeting the 60,000 square-foot building lot area requirement. Therefore, wetlands on a lot are not an absolute constraint. Since building is allowed in flood plain areas if it complies with the provisions of the Zoning Bylaw

Flood Plain Districts and has all permits required by federal, state, and town agencies, flood plains, also, are not an absolute constraint on development. In fact, there appear to be no additional absolute constraints on development in Westport other than developed land and permanently protected land.

6. After subtracting the areas of absolute constraint from the unprotected, undeveloped land, one is left with the area of unprotected, undeveloped land which could potentially be developed or contribute to development.

7. Partial constraints on development may allow only a certain percentage of the gross area to be developed. Examples of partial constraints on development in Westport are wetlands and floodplains. The Aquifer Protection District is not considered a partial constraint in Westport because it does not restrict the density or significantly restrict the type of development in the overlay district.

8. After determining what partial constraints exist, the map layer showing developable land is overlain with the map layer showing land which is partially constrained, and produces a map showing potentially developable land with all the partial constraints noted and the zoning districts identified.

9. Summary tables are produced from the polygon attribute table for potentially developable land from Step 8. One table gives, for each zoning district (Residence/Agricultural, Business, and Unrestricted) the total developable area with each type of constraint.

B.3.1.3. Analysis

After producing the summary tables, further analysis is undertaken to estimate the impacts of build-out by zoning district.

For the Residence/Agricultural district, the number of residential units that may be developed is estimated. For the Business district, the total square footage of commercial building floor area is estimated. Since Westport has no restrictions on residential building in non-residential districts, it is assumed that residential units will continue to be built in these mixed-use districts at a ratio similar to the ratio of residential to business or unrestricted use that exists today. Since Westport has not met its quota of affordable housing, it is also assumed that some multi-family housing via comprehensive permits will be built in business districts, especially since along the Rte 6 corridor, there is water service from Fall River, and there is a proposal to build multi-family under Chapter 40B in the Central Village business district.

The estimate of the number of future residential lots in a district takes into account the area of lots required for roads, irregular lots, and the frontage and area requirements.

The estimate of commercial/industrial floor area square footage also takes into account parking requirements, percentage lot cover, height restrictions, and local regulations.

B.3.2 Results

B.3.2.1. Build-Out Impacts Summary

Table B-1 is a revised version of the Build-Out Impacts Summary table produced by Beals & Thomas and EOEA in 2002. Map B-1, Composite Development, shows developable land, land with partial constraints, and land with multiple constraints. The original 1999 EOEA analysis was thought by Westport to be inaccurate because it contained wrong assumptions on zoning and out of date data. It calculated 20,174 developable acres and projected 36,591 additional residents. The current analysis has significantly reduced that estimate, but still represents a worst-case scenario. The numbers in Table B-1

will likely be revised downward as more land is developed and the actual constraints on development become clearer. However, the analysis may underestimate growth due to demolition of older small houses and replacement with larger units. This analysis shows only what may happen under current zoning. Alternative scenarios may be developed showing the impacts of build-out under different zoning patterns using the Alternative Futures Tool available from EOEA. Table B-2 compares the current Build-Out Analysis with previous studies. It can be seen that the current study lies in between the figures from the Growth Management Study and those from the Water Works Study.

Table B-1. 2002 EOEA Build-Out Analysis Summary Table

BUILD-OUT IMPACTS SUMMARY

Total area excluding River & embayments (acres)	31,658	(approx. 49.46 sq. miles)	
Buildable Land (acres)	17,739		56%
No constraints		13,419	42%
Single partial constraints		3,662	12%
Multiple partial constraints		659	2%
Non-Buildable Land, Water (acres)	13,919		44%
New Residential Lots	9,513		
New Dwelling Units	9,996		
New Residential Subdivision Roads (miles) [1]	138		
New Commercial/Industrial Floor Area (sq. feet)	10,201,950		
Additional Residential Water Use (gallons/day) [2]	1,869,305		
Additional Commercial/Industrial Water Use (gallons/day) [3]	765,146		
Additional Municipal Solid Waste, Recycled (tons) [4]	9,097		
Additional Municipal Solid Waste, Non-Recycled (tons) [5]	3,689		
Additional Residents [6]	24,924		
Additional Students [7]	3,491		
Additional Road Miles	138		

Notes:

1. Based on the assumption that 50% of the new residential lots will have frontage on new subdivision roads.
2. Based on 75 gallons per day per person.
3. Based on 75 gallons per 1,000 square feet of floor space.
4. Based on 730 lbs per person per year. All waste estimates are for residential uses only.
5. Based on 296 lbs per person per year.
6. Based on 2.62 persons per household (2000 US Census).
7. Based on 0.367 students per household (2000 US Census).

Table B-2. COMPARISON OF BUILD-OUT ANALYSES

	Vacant Lots Available for Build-Out	Additional Lots from Subdivisible	Acreage Available for Build-Out	Dwelling Units	Population

		Parcels			
1993 BUILD-OUT Water Works Group[1]					
Existing in 1987				5,119	13,485
Potential at 1993 density of 2.63 people per dwelling unit	264	12,392	21,403	12,392	32,644
Total at Build-Out				**17,511**	**46,129**
[1]Assumes all parcels >3 Ac subdivisible, 2.63 persons per household, 1.5 acres building lots (zoning is 1.3 acres), wetlands count as acreage, APR's are fully convertible. Only calculated D.U.'s & Pop.					

1987-88 Growth Mgt. Plan[2,3,4,5]					
Existing (1987)				4,554	13,688
Potential from prime developable land at build-out			4,673	3,393	10,517
Potential from add'l acreage with partial constraints			5,500	3,667	11,368
Total potential			10,173	7,060	21,885
Total at Build-Out				**11,614**	**35,573**
[2]Prime developable acreage excludes public land and land with environmental constraints. Raw acreage discounted 25% for roads, frontage, density, etc.					
[3]Partially constrained land discounted 50% for wetlands, poor soils.					
[4]Arithmetic not consistent between calculations for prime land and constrained land. Consistent arithmetic would give 3,993 lots for constrained land, and 7,386 total potential lots.					
[5]Based on 1987 household size of 3.1 persons					

Table B-2. COMPARISON OF BUILD-OUT ANALYSES (continued)

	Vacant Lots Available for Build-Out	Additional Lots from Subdivisible Parcels	Acreage Available for Build-Out	Dwelling Units	Population
2002 EOEA Build-Out					
Existing (2000 Census)				5,821	14,183
Potential from Buildable Land no constraints (acres)			13,419		
Buildable Land single constraint			3,662		
Buildable Land with Multiple partial constraints			659		
Total potential[6]			17,740	9,996	24,924
Total at Build-Out				**15,817**	**39,107**
[6]Population based on 2.62 persons per household (U.S. Census 2000)					

B.3.3. Summary and Future Actions

From 1990 to 2002, housing units (almost all single-family units) increased by an average of 80 per year. At 0.367 students per household, an additional 29 school-aged children may be projected per year, and by 2010 (from 2004) an additional 205 school-aged children, most of whom will attend Westport public schools (approximately 15% attend private schools). The actual increase in students, however, seems to be approximately 64 additional per year, perhaps because more children are living in the newer housing units being developed. One must look both at housing unit creation and demographics to project future demand.

By estimating the cost of community services for each housing unit and for each square foot of commercial development then calculating revenues versus expenses, one can estimate the fiscal impact of future development and test-drive differing scenarios for zoning the Town.

Projected water use will be further refined by the EOEA Water Assets Study of 2004, and will allow for better estimates of the limits to growth and be helpful for detailed water supply planning and protection. Estimates of solid waste generation and increases in road mileage have implications for staffing and facilities development for the Board of Health and Highway Department. Roadway miles at build-out are expected to be double the length of roads in Westport today. Provisions for stormwater management and possible acquisition for stormwater detention and infiltration will become even more critical. The increase in traffic must be planned for by creating a hierarchy of roads.

Certain impacts of build-out are less able to be quantified. It is clear, however, that with the length of roads doubling, the vegetated rural landscape will be cleared in some areas, and scenic views will be obstructed in other areas along the roads. The views that most people enjoy from the roads will be much different from today unless provisions are enacted to cluster development away from roadsides and to preserve vegetated buffers between new development and the roads.

This page is intentionally blank.