Town of Plaistow, NH
Build-Out Analysis

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Rockingham Planning Commission
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Introduction

The Rockingham Planning Commission (RPC) performed this build-out using their in house Geographical Information Systems (GIS). Specifically using ArcGIS 9.1 Software, Spatial Analyst and Community Viz Extensions. The RPC also used Microsoft Excel Version 2003 extensively to do some of the statistical analysis.

'Build-out' refers to the time and circumstances at which an area can no longer accommodate more growth given a certain set of growth restraints. In this instance it is the point where all existing lots have been sub-divided as much as allowed under the current zoning to yield the maximum amount of residential and non-residential units. Though in reality build-out doesn't tend to happen, in this build-out RPC neglected the ideas of rezoning and redevelopment so RPC can see what a current build-out might look like.

Goals

The main goal of this build-out is to look both numerically and spatially at what the Town of Plaistow might see in terms of units, both residential and non-residential, given their current zoning, at build-out. Also RPC would like to look at the added amount of "leaseable" square footage that is possible in the non-residential areas of town.

Methodology

A build-out can be as complicated or as generalized as one cares to make it. RPC tried to maintain a balance to get solid build-out numbers while not expending too many resources trying to refine numbers that have little impact. In the process of researching this build-out RPC looked at five other municipal build-outs. These other build-outs had varied levels of complexity, ranging from a 2-year, $50,000 process to a 3-day, $1,200 process.

All followed this general process:

1. Acquire the GIS data from the town and other sources as needed. (Parcel data, Conservation easements, Town owned parcels, zoning… etc
2. Develop a building constraints layer
3. Link assessing data to the tax parcel map.
4. Overlay parcels, zoning, and constraints, and combine those to create a buildable layer with the attributes needed built into it.
5. Determine the amount of land that is still buildable for each parcel.
6. Calculate the number of lots given buildable land, frontage, and zoning.
7. Split new 'units' into residential and non-residential, and calculate number of new residents or additional square feet
8. Produce maps, report and Excel spreadsheet to convey this information both numerically and spatially.

Assumptions

This build-out analysis is designed to be a planning tool and has to make some assumptions to allow for completion in a reasonable amount of time. With this build-out RPC cannot accurately study the site-specific geography and geology of each parcel. Thus RPC must assume that wetlands and soils layers are sufficient to indicate geology/landscape. RPC cannot predict changes in the zoning, therefore this uses the zoning as it currently exists. RPC make the assumption that the GIS data used is accurate.

A. Zoning Districts as Defined by the Town

"I" - Industrial

The purpose of this district is to provide locations for the establishment of plants to improve employment opportunities and broaden the tax base in the community. These areas should be selected so that they will not adversely affect developed residential areas, will have good access to transportation facilities, and will have the potential for being served by public water and sewer systems. A variety of types of manufacturing activities, distribution facilities, and offices should be permitted, as well as certain support facilities, especially of a commercial nature.

"CI" - Commercial I

With today's reliance on automobile transportation and Plaistow's being the commercial center for an area beyond its boundaries, provisions need to be made within the Town for areas to serve as regional commercial centers. These areas should have good highway access, adequate off-street parking, proper lighting, police and fire protection, and adequate water and sewer services provided.

"CII" - Commercial II

This area encompasses that portion referred to as "Town Center" of the "older" Plaistow. It has all the characteristics of a rural New England Town through much of its area, which is to be preserved. To that extent, exterior changes on properties should be held to a minimum, yet allow for uses compatible with the existing residential character of the area.

"LDR" - Low Density Residential

The Low Density Residential Districts generally contain suitable soils and slopes for residential development, are accessible to other population centers, are feasible to be served with public facilities and utilities in the future, and are generally located farther from the Town center than MDR areas. The purpose of this district is to accommodate population growth at densities attractive to development, leaving natural resources free of scattered development or subdivisions, which would destroy the town's open spaces

landscape pursuits, and reducing congestion and burden on Town facilities and roads. It is the purpose of this district to allow for the protection of community resources for future residential and necessary ancillary development.

"ICR" - Integrated Commercial-Residential

The Integrated Commercial-Residential Area is designated to reflect the unique evolution of development in this section of the Town where, because of its isolated geographic location with respect to the remainder of the town, a commingling of residential structures and commercial structures has resulted and continues to result in a self-sustaining, community-within-a-community pattern. It is the purpose of this district to achieve objectives designed for both the CI and LDR Districts in the town.

"RC" - Residential-Conservation

The Conservation District is intended to protect an identified potential water source for the town. The area regulated by this table shall be defined as that land area identified by the 1978 report to the Town of Plaistow by Fenton-Keyes Engineering. The area is generally described as the land area within the Kelly Brook watershed encompassed by the two-hundred-two-foot contour, terminating at the northerly end at the Hampstead Town line and at the southerly end by the site of the proposed reservoir dam. In addition, the Conservation District shall extend to include a three-hundred-foot protective buffer around the area described above.

"-AQ" – Aquifer District

The minimum lot size within that portion of the Aquifer Protection District that has a saturated thickness of 20 feet or greater and a transmissivity greater than 1,000 feet squared per day shall be three acres, or 130,680 square feet, unless some other provision of this article requires it to be greater

Though not designated in the Plaistow zoning ordinance, there is a provision to increase the required contiguous buildable land area required to place a structure on a lot if there is an identified stratified drift aquifer with a noticeable transmissivity. For the purposes of this build-out RPC use this as an overlay zoning district.

There are two other zones in town; those are the PRD and AEHC. These zones are special options that are allowed. Since these zones aren't spatially constrained, RPC can't accurately predict what may happen with them as time progresses. It would be possible to run another scenario of this build out assuming that the town would be built-out using these zones. It would likely yield less accurate numbers, and would require similar amounts of work to this build out.

B. Town Owned and Conservation Lands

It is assumed for this build-out that Conservation Lands listed from the RPC, Granit and the town are subject to conservation easements and thus shouldn't be included as buildable parcels. Town owned lands were considered buildable if they didn't have a building on them currently.

C. Frontage

Where a land that has build-out potential but lacks the frontage required to comply with the zoning, RPC assumed there would be a new road built. The new road and its amenities would require 10% of the buildable land mass. 10% of the total buildable land mass was subtracted before calculating the total buildable yield.

D. Buildable Lots to Units

The zoning ordinance only allows one unit per each parcel. Therefore there was an assumption that there will not be multifamily units.

Build-Out Inputs

Central to the inputs of this build-out are the zoning requirements. Below is the table of zoning requirements as taken from Plaistow's Zoning Ordinance. For the purpose of this build-out, buildable land is the land that is left after the constraints have been removed.

Zone	Name	min Lot size	min frontage	Min area per family	Max Height	Intended Uses
RC	Residential Conservation	217800	300	217800	Min (45ft or 3 stories)	residential
LDR	Low Density Residential	110,000	200	110,000	Min (45ft or 3 stories)	residential
MDR	Medium Density Residential	40,000	150	40,000	Min (45ft or 3 stories)	residential
CII	Commercial II	40,000	150	40,000	Min (45ft or 3 stories)	commercial uses only
CI	Commercial I	80,000	150	N/A	Min (45ft or 3 stories)	commercial uses only
IND	Industrial	80,000	150	N/A	Min (45ft or 3 stories)	industrial uses only
ICR	Integrated Commercial-Residential	80,000	150	110,000	Min (45ft or 3 stories)	commercial and low density residential uses

A. Constraints

Constraints are those layers which are removed from the buildable land mass. The constraints RPC considered in this build-out are wetlands, wetland buffers, conservation land, town owned land with buildings and currently built-out parcels and cemeteries.

1. Wetlands: Wetlands are a conglomeration of the U.S. Fish & Wildlife Service, National Wetlands Inventory (NWI) and the town wide base-map for wetlands.   The NWI is a course evaluation of wetlands that was done nationwide.
2. Wetland Buffer: This is a 100' buffer around all wetlands and surface water features in the town.
3. Conservation Land: This was derived from the Granit Conservation Lands layer, the Conservation lands layer from the RPC, and also from parcels identified in the assessing database as containing a conservation easement.
4. Town owned parcels: Since the town could sell or develop town owned properties, RPC only used parcels with an existing facility as constraints. This was decided upon in consultation with the town planner.
5. Cemeteries: These were removed per the assessing data

B. Zoning

A zoning layer was supplied to the RPC by the town planner in spring 2006; this zoning layer was used to complete this build-out

C. Parcels

The parcel layer was obtained from the town. This parcel layer is from the Applied Geographics, Inc layer. The parcels were linked to the assessing data to provide information about the current use and building status.

D. Stratified Drift Aquifer

A stratified drift aquifer layer (as supplied by USGS) was used to determine where in town there would need to be additional restrictions imposed due to higher than normal transmissivity of the soils.

E. Building Footprints

Some of these were supplied to the RPC from the town. The RPC digitized additional footprints from our 2003 NAIP (National Agricultural Imagery Program) aerial photographs; these are 1 Meter resolution photos.

Results

The results of the build-out show that there is room for growth in Plaistow. The largest area for growth is in the Residential zoned areas of town. The MDR zone could nearly triple in size. It should be noted however, these results do not have a timescale attached to them. We could see these build-out conditions happen in any timeframe. This build-out also assumes consistent zoning practices throughout time. Changes in zoning will change the actual build-out numbers.

ZONING	Sum of Existing Units	New Units Before PB Restrictions	New Units After PB Restrictions
C-1	328	463	418
C-2	305	68	49
I	34	284	253
ICR	175	179	177
LDR	1022	1018	609
LDR/MD	0	19	19
MDR	1134	691	569
RC	2	35	10
Grand Total	3000	2757	2104

Conclusions

This build-out should be used by the Planning Staff and landuse boards in the Town to help in making future decisions. This type of tool is very helpful in to aid in updates of the master plan and future zoning changes. This type of build-out can also be used to prioritize parcels for targeted development or conservation.

This Build-Out process is only as accurate as its data, and as such should be updated periodically as conditions change in town.

One of the major products of this build out is an Excel spreadsheet with the current building potential for each parcel, this is "self-updating" and will automatically adjust the build out number as you manipulate the spreadsheet.

Also included are three maps, these show current zoning, current parcels, current building footprints. Estimated yield for each parcel and also a visual respresentation of build-out.
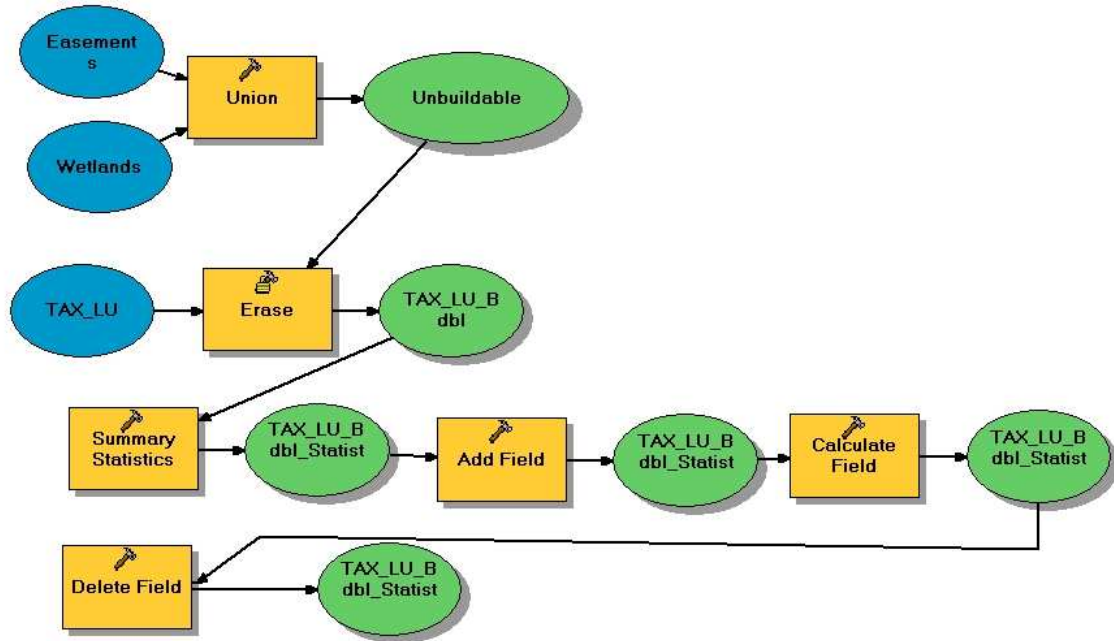
After the completion of the buildout the Planning Dept asked the RPC to reevaluate this build-out with respect to 'PDR' or open space related to developments. The Planning Board and Planning Office provided a list to the RPC of additional lands that should be removed from the build-out as absolute constraints.
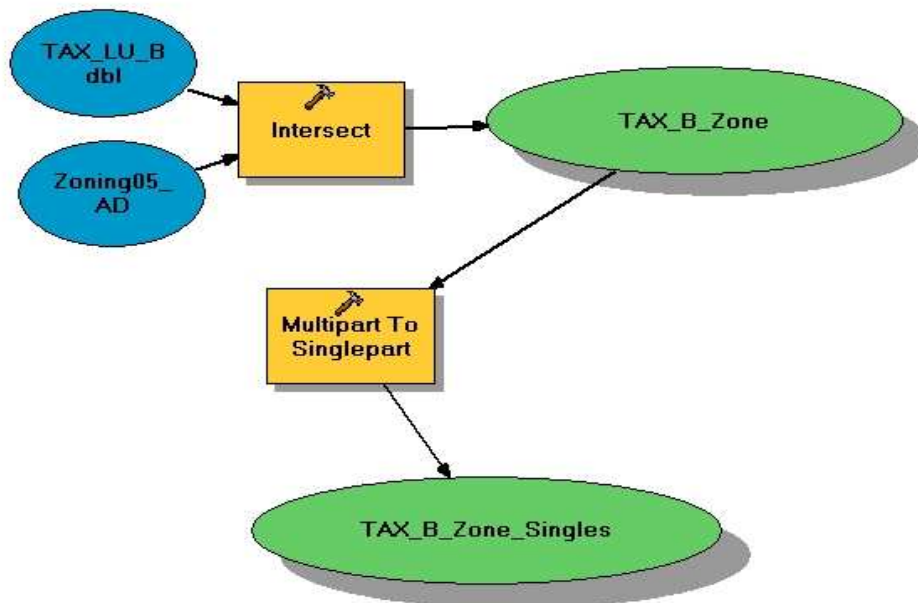
Appendix A.
Maps

In ArcGIS software it is possible to create "models." The models can be saved to redo a complicated process in the future. For this build-out the RPC created 5 models.
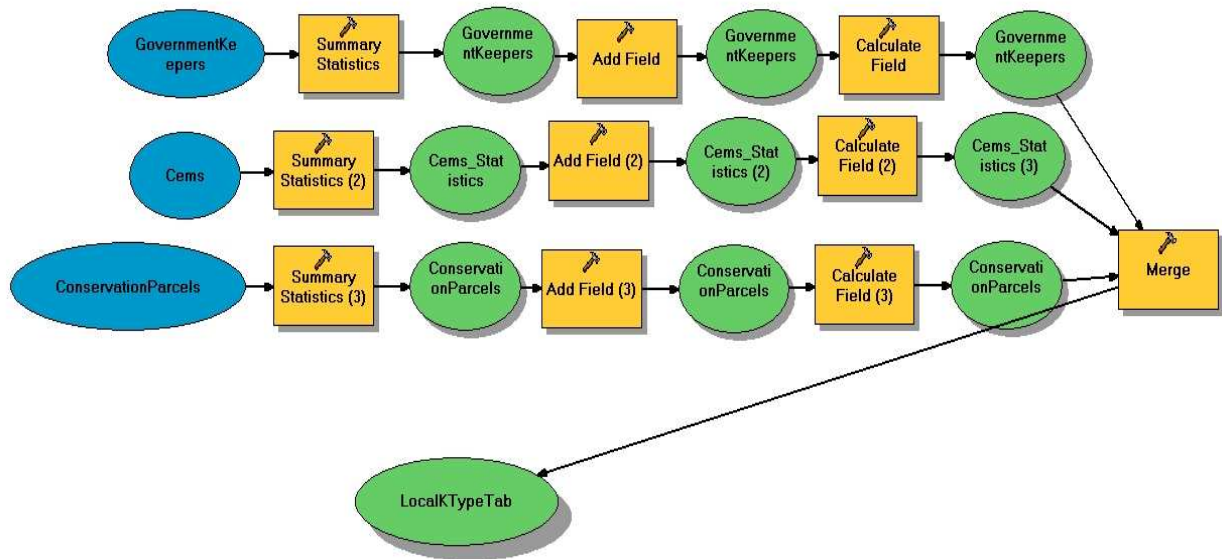
Model 1. This removes the constraints layers from the overall tax parcels.

Model 2. This model adds the Aquifer zones into the tax parcels layer
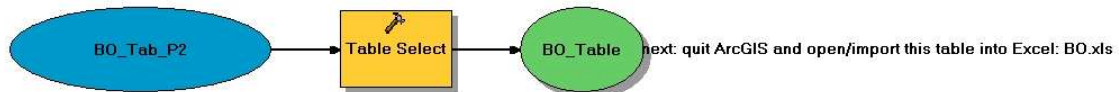
Model 3. This combines all of the constraints layers into one.

Model 4. This finishes the spatial analysis thus leaving only a buildable area

Model 5. This exports the results to a table that RPC use in Excel to complete more complicated statistical analysis.

Appendix C.
Build-Outs Referenced

1.) Laconia, NH– "City of Laconia, New Hampshire Build-Out Analysis" September 2005, Lakes Region Planning Commission/David Wickliffe

2.) South Kingstown, RI – "South Kingstown Build-Out Model" January 2006, The Environmental Simulation Center, Ltd.

3.) Londonderry, NH – "Town of Londonderry Buildout Analysis" December 2005, John Vogl

4.) Amherst, MA - "Amherst Build-out Analysis & Future Growth Study" October 2002. Town of Amherst/Niels la Cour

Appendix D.
Community Viz Software

The RPC had anticipated using the Community Viz "Scenario 360" extension to help with the build-out process. This extension and its Build-out tool are quickly becoming new "buzz-words" within the GIS community. RPC did try the version 2.1 of the extension and found the software crashed so often that it was not viable for this project. The RPC also purchased and tried the version 3.1 of this extension. While version 3.1 didn't crash, the RPC discovered it has a fundamental flaw in its build-out methodology. Community Viz is a tool with great potential. It allows the user to change the base assumptions on the fly and see results within minutes. The Community Viz extension also allows visualization of the build-out that in the past was hard to achieve by way of conventional GIS capabilities. The RPC was able to reproduce those visualizations on Map 3.