Cairo Buildout Analysis

Introduction

A build-out analysis is an exercise designed to estimate the amount of development that can possibly occur if all developable land in a town, village, or county is fully built according to the municipality's current land use regulations. This buildout analysis uses the Town of Cairo's current land use regulations, considers environmental constraints that would limit development in certain areas, and calculates the total residential density allowed at full buildout of the Town. It does not predict when this buildout would occur, at what rate it would occur, or where it would occur first. It only predicts the possible end result.

The general steps followed to calculate full buildout conditions are:

1. Identify areas that already have residential development and therefore would not allow new development
2. Identify properties owned by government entities not likely to allow development
3. Identify areas in the town having environmental constraints that would not support new residential development
4. Calculate the amount of new residential development allowed by Cairo's current land use regulations in the remaining undeveloped areas of the Town.

A geographic information system (GIS) computer program was used to conduct this analysis. In essence, the analysis calculates the total land base of the town, subtracts all lands having environmental constraints and completely built areas form that land base, and then applies the town's development rules to calculate the number of allowable new residences. For purposes of this analysis, the buildout assumed that all new development will likely be single-family homes.

Things to Consider

Note that the results of all of these calculations are only estimates. The GIS layers used are not exact replicas of what is actually found in the real world, only representations of what is there. The processing of the data also introduces a certain amount of error, and can increase the inaccuracy of the data layers. The only way to get an accurate count of allowed residential uses on a particular property is to do an on-site survey of existing conditions.

There is some variation of total development potential based on how the developer and the Planning Board evaluate sites. Even though a town might require 1 acre of land per new parcel for a subdivision, that 1 acre may or may not be required to be totally buildable. For this reason the buildout outlined here is done in 3 ways. The first scenario assumes no subtraction for environmental constraints during subdivision. This would result in the absolute maximum number of new parcels for every potential subdivision of land. Since it is probably unrealistic to assume every property would or could be divided in this way, the

second scenario removes major water features, such as open water and streams, wetlands, and flood hazards. This is probably a better estimate of full buildout, but still doesn't account for all of the possible conditions on each parcel. Therefore, a the third scenario adds to the list of environmental constraints by including 100 foot buffers around all water features and wetlands, and also adds slopes over 15% grade. This scenario includes most all of the possible limits to development, but assumes every one of them will be avoided during subdivision. This case probably goes a little too far in assuming environmental constraint avoidance, and assumes every new parcel will need the full required acreage to be totally buildable. The true buildout potential most likely lies somewhere between the two extremes of scenario #1 and scenario #3.

The Buildout Process

The buildout starts with the Tax Parcel data obtained from Greene County Department of Planning and Economic Development. Other GIS layers were also used, such as roads, water features, wetlands, and topography. Extra information is added to the parcel data layer throughout the process.

The first step is to identify the existing land uses for each parcel. Existing residential uses are identified by using the Property Class code found in the table accompanying the GIS parcel layer. Generally, any parcel with a property class code in the 200 range is a residential use. Some commercial uses, such as mobile home parks and apartment buildings are also essentially residential uses, and were considered as residential uses for purposes of the Buildout calculations. The current residential uses are shown on the Existing Residential Use map using a small green dot placed on the parcel. The dot does not indicate the exact location of the building on the property; it only indicates there is a residential building on it. 3,262 existing residential dwelling units were identified using the GIS parcel layer.

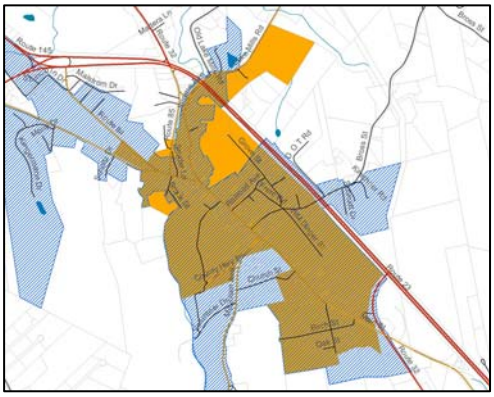
Figure 1: A portion of the map showing Existing Residential Uses. Each green dot represents one residential use.

The Sewer District layer was used to determine the allowed residential development density within the hamlet area, and areas outside the sewer district. A column added to the parcel's attribute table shows the minimum lot size for each location.

	Minimum Lot Size
Hamlet area in the sewer district	20,000 square feet
All other areas	1.25 acres

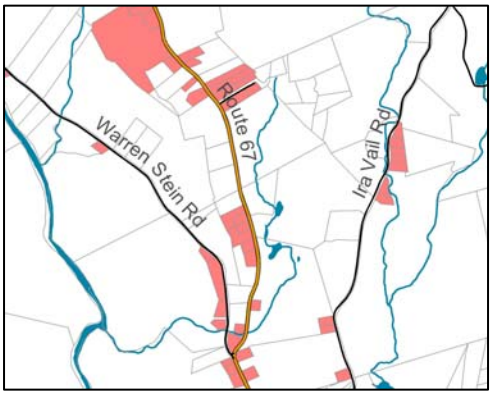
Figure 2: This map shows the sewer district in orange, with a blue hatched overlay depicting the water district.

There is no adjustment in the allowed density for parcels within the water district.



Fully built parcels were identified by using the Property Class code, calculating the total area of the parcel, and comparing it with the minimum lot size required in the area where the parcel is located. For example, an existing residence on a 2 acre parcel outside the sewer district is designated as fully built. The property cannot be subdivided into two conforming 1.25 acre lots. Further inspection using the Aerial Photographs identified more parcels that were developed in a way that would not allow further subdivision. Houses placed in the middle of a large lot would be one example. Some intensively developed non-residential uses were removed. State owned lands, cemeteries, and churches were also removed after inspection of the aerial photos.

Figure 3: The red areas in this map depict parcels that are considered fully built.



What's left after subtracting the fully built parcels is a layer showing the buildable parcels in the municipality; parcels that can potentially be further subdivided and/or built upon.

Figure 4: The green areas in this map depict parcels that can accomodate further development.

The next step is to identify any environmental features that would constrain development. Two categories of constraints were identified. Water based constraints, which include open water, streams, wetlands, and flood plains comprise the first category. Slopes over 15%, and 100 foot buffers around open water and wetlands were included in the second category of constraints. These constraint layers were then merged together into a new layer, and used like a "cookie-cutter", removing the constraints from the already identified buildable parcels.

Figure 5: Areas with environmental constraints limiting further development are shown in orange.

The result of all of these operations is a layer showing the developable area within the remaining buildable parcels found in the town. This is the layer the final computations are performed on.

Figure 6: After removing the environmental constraints from the buildable parcels, these buildable areas are left (in green).

The Buildout Formula

The formula used for the calculations is:

((Remaining developable area x 0.85) / Minimum Lot Size) – Any Existing Residential Uses

The 0.85 multiplication factor is used to allow room for new roads, and any other infrastructure needs. The final calculation provides the potential buildout for the entire town based on current development regulations.

Results of the Buildout Calculations

	Existing Dwelling Units	Number of Parcels	Number of Parcels that would allow more residential development
Hamlet with sewer	274	296	30
Outside the sewer district	2,988	3,954	780
Total	**3,262**	**4,250**	**1,282**

	Current Buildout with No Constraints Removed	Current Buildout with Water Constraints Removed	Current Buildout with Water and Slope Constraints Removed
Hamlet with sewer	97	95	88
Outside the sewer district	17,257	15,892	10,976
Total	**17,354**	**15,987**	**11,064**

Figure 8:
Potential Buildout Without Considering Constraints. Each red dot represents one potential new residence.

This results in 17,354 potential new residences.

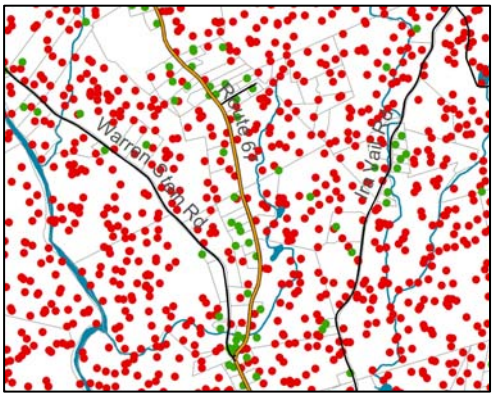


Figure 7: Potential Buildout Considering Major Water Constraints.

This results in 15,987 potential new residences.

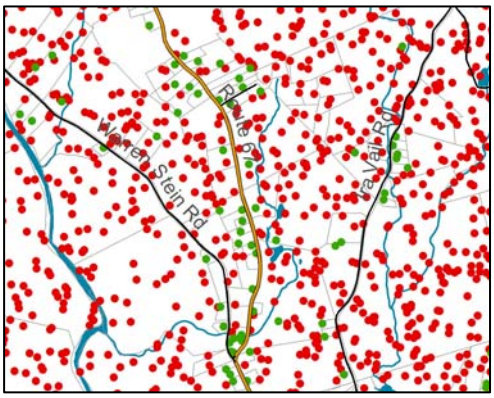
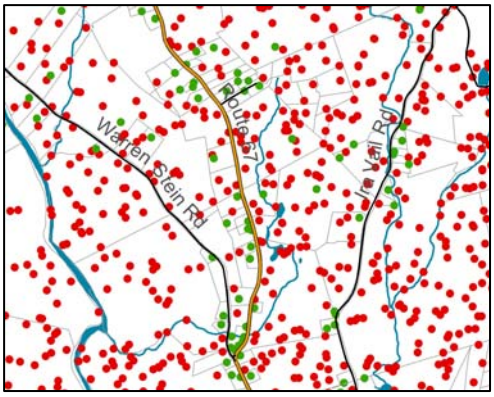


Figure 9: Potential Buildout Considering All Environmental Constraints.

This results in 11,064 potential new residences.



Buildout Analysis Outline

1. Assemble municipal boundaries and parcel boundaries, edit so they are coincident
2. Clean up the parcel layer by identifying missing information, and updating it by comparing with aerial photos where possible
3. Add a field to the parcel layer that identifies existing residential uses for each parcel
   (Map: showing Existing Residential Uses)
4. Assemble sewer district boundaries, and edit so they coincide with parcels to the extent possible
5. Add minimum lot sizes/density requirements to the sewer and parcel layers
   (Map: showing Water and Sewer Districts)
6. Union the parcel layer and the sewer district layer (Unioning is a GIS term, which is a process that merges the two layers together, thus identifying which district a parcel is in, and splits parcels that span two districts)
   A. Clean up the union by identifying slivers (another GIS term, meaning a very small polygon, usually an artifact from another GIS process), and either deleting them or merging them with adjacent polygons
7. Identify undersized lots, which are parcels smaller than the minimum lot size for the area in which it's located.
   (Map: showing Under Sized Lots, both built and vacant)
8. Identify fully built parcels by comparing building status with each parcels lot size requirements
   A. Parcels with existing residences that cannot be further subdivided
   B. Commercial/Public uses that are not likely to be developed, such as Rod and Gun clubs, Businesses, cemeteries, nature preserves
   C. Properties owned by government agencies that are not likely to be developed, such as Parks, State owned lands, Town/County highway garages, etc.

   (Map: showing Fully Built Parcels)
9. Identify buildable parcels remaining
   (Map: showing Buildable Parcels)
10. Clip constraint layers to the town's border
    A. Water and streams
    B. 100 foot buffer of water and streams
    C. Wetlands - NYSDEC, and Federal (if available)
    D. 100 foot buffer of wetlands
    E. Flood Hazards
    F. Steep Slopes (over 15% grade)

    (Map: showing Environmental Constraints)
11. Merge all constraints into a single "cookie-cutter" layer
    (Map: showing All Constraints Merged)
12. Remove the constraints layer from the Buildable Parcel layer to produce a Buildable Area layer
    (Map: showing remaining Buildable Area)
13. Perform the buildout calculations on the Buildable Area layer
    (Maps: showing the Full Buildout using 3 different scenarios)