2008 09

# PLAINVILLE

## *Community Profile*

**PHASE II** ANALYSIS

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# SUITABILITY ANALYSIS

*Note: for a more detailed methodology, see* Analysis Details *(p. 10.)*

Based on the data collected in Phase I, a suitability analysis was conducted to identify the optimal locations in town for an Incentive Housing Zone. The analysis first excluded locations that are, for all intents and purposes, undevelopable. These include areas targeted by the state for preservation and conservation, as well as existing parks and open space, and sensitive ecological features such as water bodies and ways, buffers, and wetlands.

The analysis then computed scores for the remaining land. These scores incorporate a range of factors that bear on the suitability of the land for an Incentive Housing Zone, such as the proximity of public transit lines and infrastructure (here, sewer lines), and the walkability of the area. (The latter by and large captures the density of settlement.) The scores furthermore include two factors that affect the cost and desirability of development. These are topography (steep grades elevate costs) and land cover (redevelopment of brown or grayfields sites is preferable to greenfields development.) All five factors—public transit, sewers, walkability, topography, and land cover—were added to give a total suitability score for every location in town. Scores were then grouped into five classes, color-coded, and mapped. Figure 1 (p. 5) presents the results of the analysis. Black denotes areas that, due to reasons laid out above, are undevelopable. Gray represents sites are developable in theory but are unsuitable in practice for an IHZ, while pink and red indicates places that would be better and best for one. Finally, white signifies places that are neither suitable nor unsuitable.

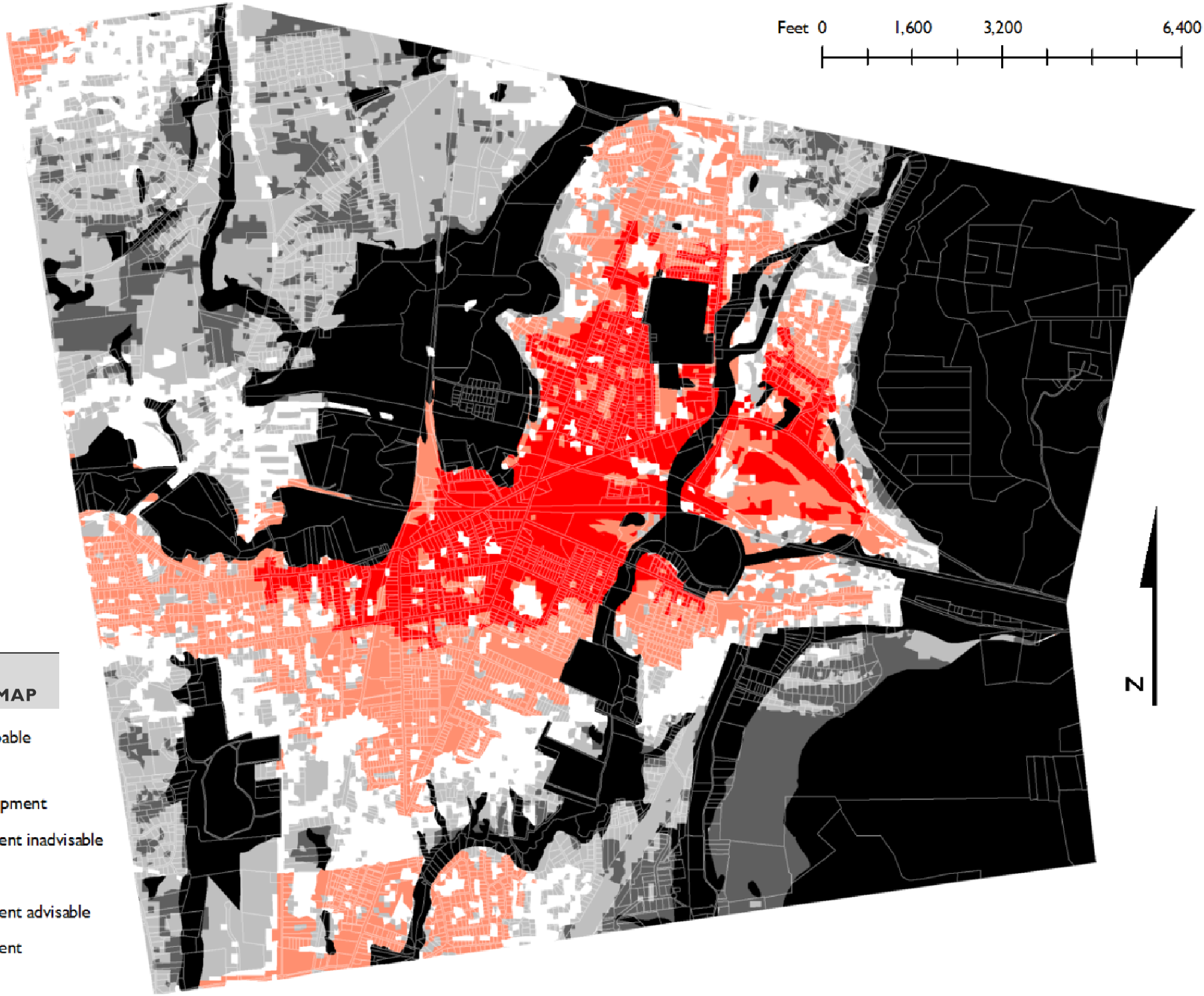



**FIGURE 1.**
**SUITABILITY MAP**

Undevelopable

**Developable**

No development

Development inadvisable

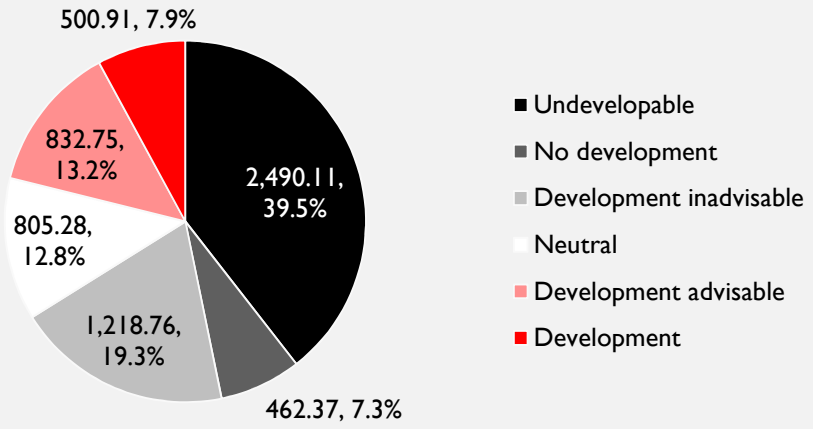
Neutral

Development advisable

Development

The results show that large amounts of suitable land are available in town. However, it should be noted that Figure 1 only attests to suitability for an Incentive Housing Zone. It does not speak to eligibility for an IHZ. This distinction is critical. To be eligible for funding under the IHZ program, no more than 25% of a town's land area may fall in IHZs. As Phase I elucidated, Plainville's convenient location and small geographic size has led it to attain a high level of development. This in turn, as Figure 1 shows, makes much of it *suitable* for an IHZ. Yet the 25% limit also means that decisions have to be made. Plainville may have plenty of land that is *suitable* for an IHZ, but if it is to win IHZ funds, it may not be able to designate all of it as an IHZ. It is therefore the recommendation of this analysis that, when constructing an IHZ, Plainville select and concentrate its efforts on the areas *most suitable* for an IHZ. These are namely the "development advisable" (pink) and, above all, the "development" (red) areas in the map above. Together, these two areas cover 1,835 acres, or 17.8% of the town (Figure 2, below) by area. This is well within the limit set by the state.

**FIGURE 2. ACREAGE BY SUITABILITY**




Though not integrated into the preceding map, data on endangered, threatened, and of concern species were factored into the suitability analysis. As the presence of these species may complicate the development of particular sites, Figure 3 (below) superimposes the potential or supposed locations of such species with this status onto the map above.

**FIGURE 3. SUITABILITY MAP WITH SPECIES OF CONCERN**

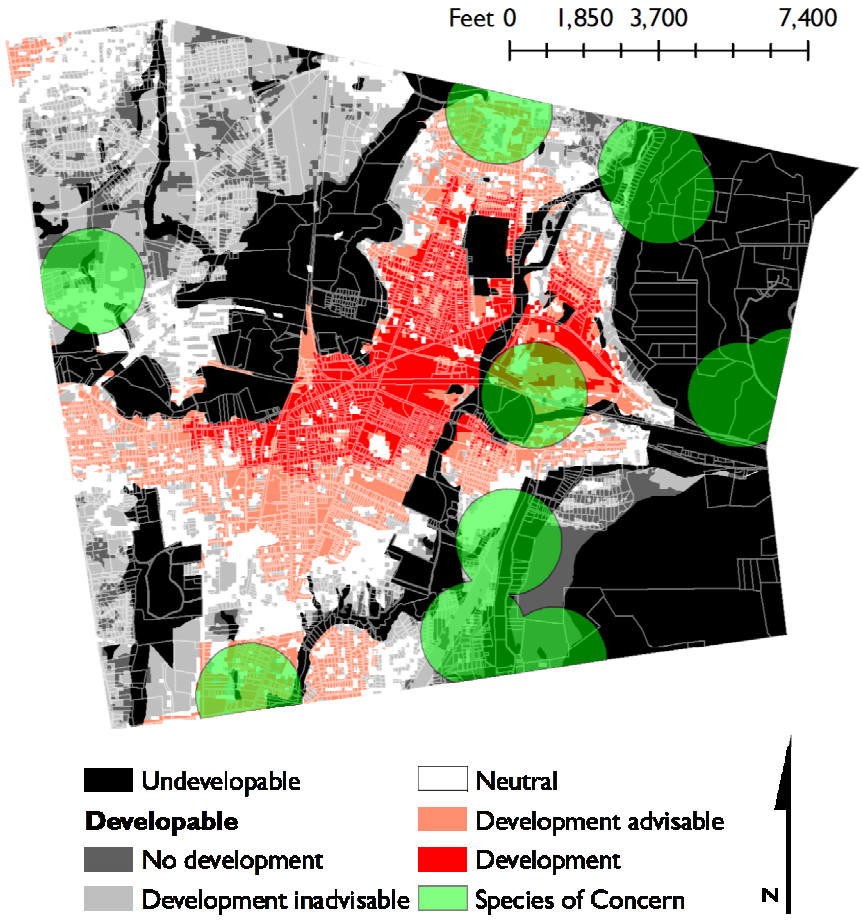
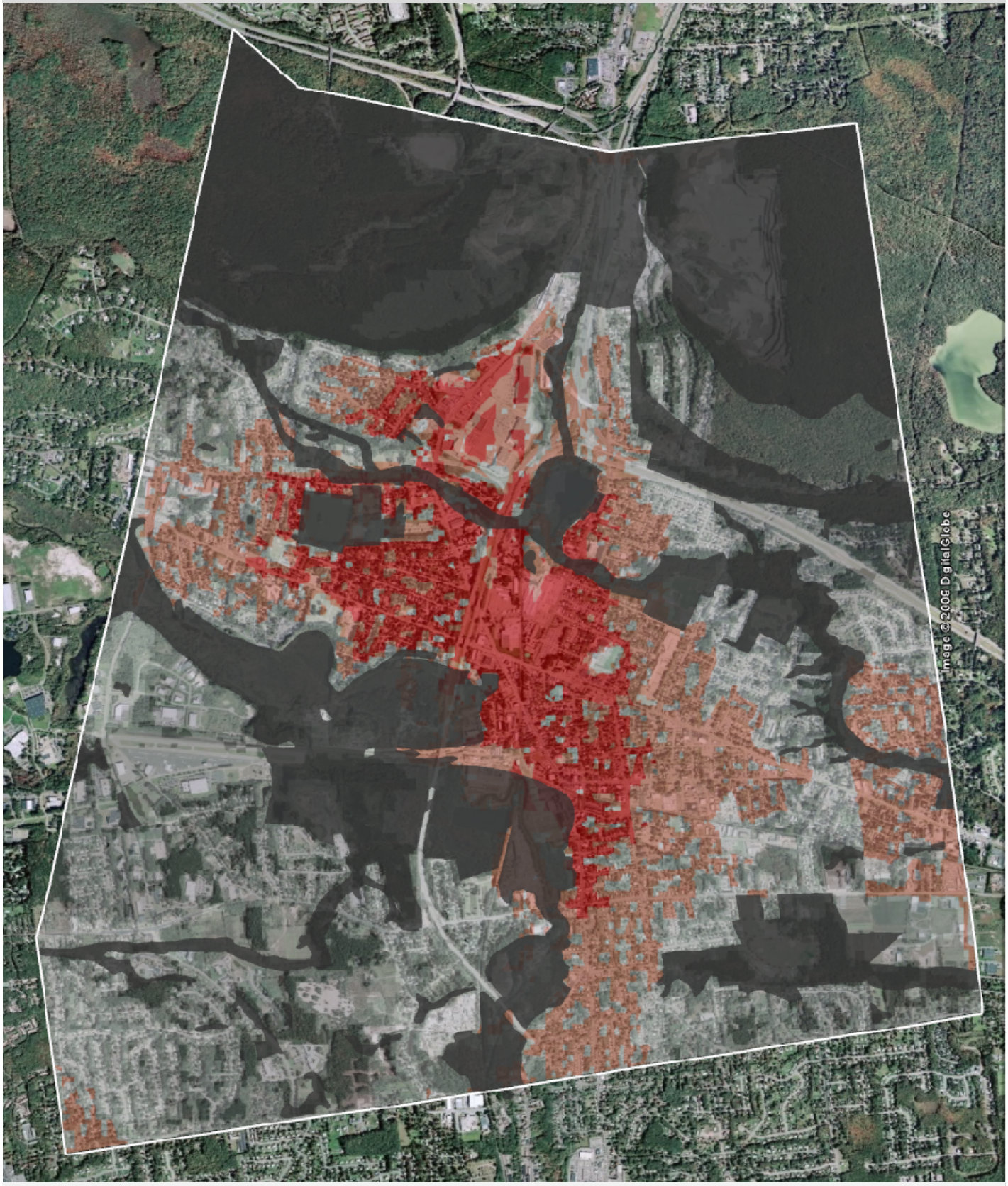



Figure 4 and Figure 5 (below) superimpose the suitability map derived above on satellite images of the town of and downtown Plainville. These images set the IHZ suitability of the land in relief against the structures and other human uses that currently occupy it.

**FIGURE 4. SATELLITE OVERLAY (TOWN)**




Undevelopable
No development
Development inadvisable
Neutral
Development advisable
Development

**FIGURE 5. SATELLITE OVERLAY (CENTER)**

# ANALYSIS DETAILS

The first step of the analysis was data harvesting. Geospatial data on the subjects below were collected, derived, or created:

| Subject | Source | Use |
|---|---|---|
| Town boundary | CT DEP | Bounds |
| State highways | Tele Atlas | Identification |
| Watercourse buffers | Derived/CT DEP | Exclusion |
| Bodies of water | Derived/CT DEP | Exclusion |
| Wetlands | Derived/CT DEP | Exclusion |
| Open space, preservation areas, conservation areas ("state plan") | Derived/CT OPM | Exclusion |
| State parks | CT DEP | Exclusion |
| Municipal parks | Tele Atlas | Exclusion |
| Slopes | Derived/USGS | Filter |
| Land cover | UConn CLEAR | Filter |
| Public transit | Self-created | Filter |
| Walkability | Self-created/Walkscore | Filter |
| Sewer lines | Derived/CCRPA | Filter |
| Endangered, threatened, and of concern species | CT DEP | Overlay |
| Parcels | CCRPA | Overlay |

All layers were clipped to the town boundary (itself created by selection) to limit the study to Plainville. Layers were further derived as follows. Water features were buffered to one-hundred feet, broadening the coverage of the bodies of water layer and creating a watercourse buffer layer (from linear features.) A wetlands layer was derived by excising all non-wetland soils from a soils layer. The *Locational Guide Map from the Conservation and Development Policies Plan for Connecticut* (the "state plan") was edited to remove all features aside from Existing, Preserved Open Space; Preservation Areas; and Conservation Areas. (Conservation Areas subsumed under Neighborhood Conservation areas were also deleted.) A slope layer was

created from a seamless ⅓ arc second DEM. This layer was then reclassified into four categories: under 15%, 15 up to 20%, 20 up to 25%, and above 25% percent rise. Bus lines for the Central Connecticut region, which includes Plainville, were digitized from scratch as point-to-point routes and converted to a give a public transit layer, which was buffered at 1/20th mile intervals up to one mile, inclusive. Scores were scraped via an automated script from walkscore.com for points spaced at 200 foot longitude and latitude spacing to yield a walkability layer for the entire town.[1] Finally, sewer lines were buffered at 1/100th mile intervals up to 1/10th mile, inclusive. To assist in data exploration and visualization, all of the aforementioned layers were plotted as maps.

The data used were the most recent and most authoritative available. Redundant layers were inspected for accuracy. Those that seemed consistent were discarded; those that differed were all retained so that areas that should be off-limits to development would not be erroneously marked as suitable.[2] (By the same token, this also has the potential effect of classifying areas suitable for development as unsuitable. However, given that this analysis only *identifies* areas that may be suitable and does not actually give the go-ahead for development, a modicum of error in the analysis should not pose a problem. If anything, it should make the analysis err on the right side, that of caution.) The spatial analysis comprised four steps. They were carried out in the order listed below:

| Step | Description |
|---|---|
| **Scoring** | A new field was added to each of the five layers. This field was calculated for every record in the respective layer. Values ranged from -1 to +1, except for slope, which ran from -1.5 (for a slope of greater than or equal to 25%) to 0.[3] Forests were assigned a score of +1 in the land cover layer, while barren and developed land was awarded -1. All other land covers were assigned 0. Public transit, sewer lines, and walkability layer values were scaled proportional to the buffer interval distance from the line (for the |

[1] *"Walk Score calculates the walkability of an address by locating nearby stores, restaurants, schools, parks, etc…. The number of nearby amenities is the leading predictor of whether people walk… The Walk Score algorithm awards points based on the distance to the closest amenity in each category. If the closest amenity in a category is within .25 miles… we assign the maximum number of points. The number of points declines as the distance approaches 1 mile…—no points are awarded for amenities further than 1 mile. Each category is weighted equally and the points are summed and normalized to yield a score from 0–100." For more detail, see walkscore.com.*

[2] *The three open space and park layers exemplify this.*

[3] *Slopes under 15% were not considered to be an advantage, or a reason to build at a certain site per se, but rather the absence of disadvantage (hence the score of zero.)*

| Step | Description |
|---|---|
| | first two layers) or the score determined (for the last layer.) |
| **Combination** | These five layers were joined (via union) in geometry and attributes with a copy of the town boundary layer. A total field was created and computed according to the formula:[4] [total] = [slope] + [land cover] + [public transit] + 2 × [walkability] + ½ × [sewer lines] |
| **Classification** | Features in the copy layer were divided into five groups and shaded and tinted according to the suitability score computed in step 3. From least to most suitable, the classes are: no development (dark gray), development inadvisable (light gray), neutral (white), development advisable (light red), and development (dark red.) |
| **Superimposition** | Layers with the use "exclusion" (i.e. undevelopable land) were graphically overlaid in black onto this copy. The species and parcels layers were then overlaid on top of these (in green and white, respectively.)[5] |

[4] *Due the manifold dividends walkable neighborhoods pay, the walkability factor was doubly weighted. Preliminary analysis revealed that the sewer line factor skewed the results. Thus, it was decreased to half-weight.*

[5] *This layer was not integrated in step 2 but rather kept to the end because of its advisory nature: it merely adverts to the fact that species considered endangered, threatened, or of concern at some point have been seen or may be expected to manifest themselves at the location denoted.*

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