

GIS as a Tool for Evaluating and Identifying Growth Centers in Rhode Island

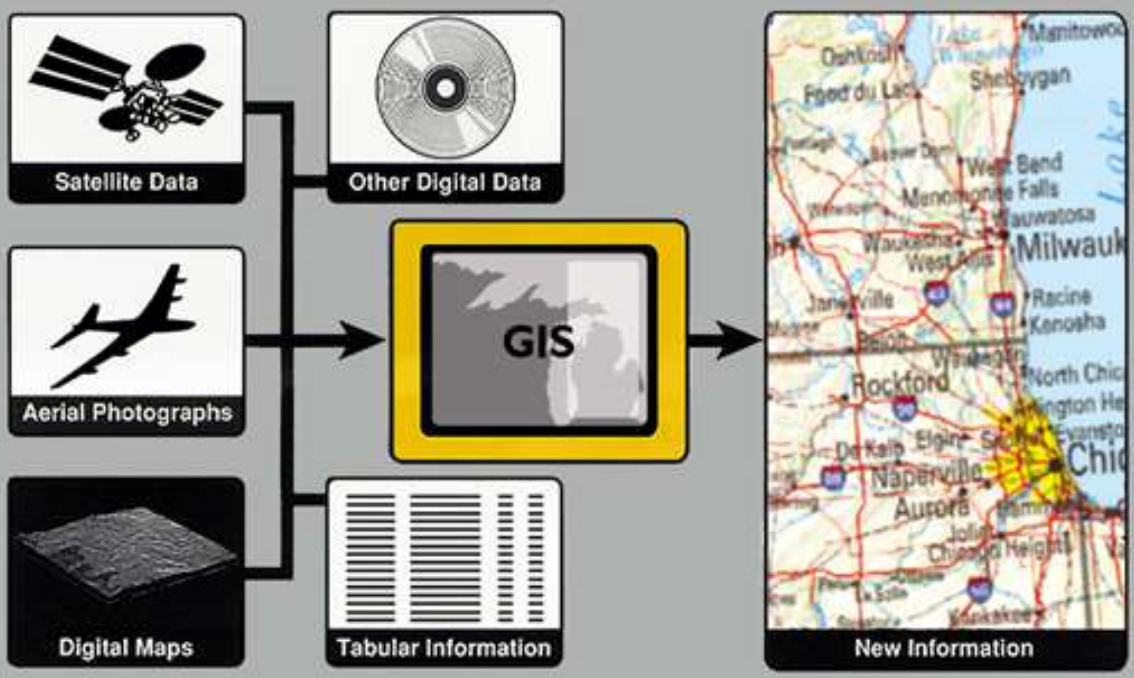
Main Street and Growth Centers 101
Power of Place Summit
May 11, 2012



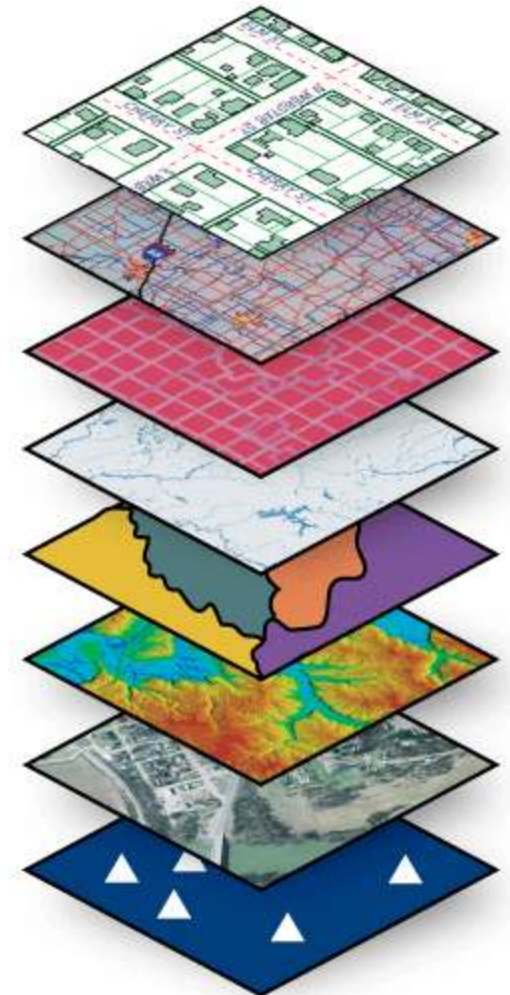
Brian Boisvert, Graduate Assistant, Roger Williams University

Edgar Adams, Professor of Architecture, Roger Williams University

Introduction to Geographic Information System (GIS)



Source: http://egsc.usgs.gov/isb/pubs/gis_poster/

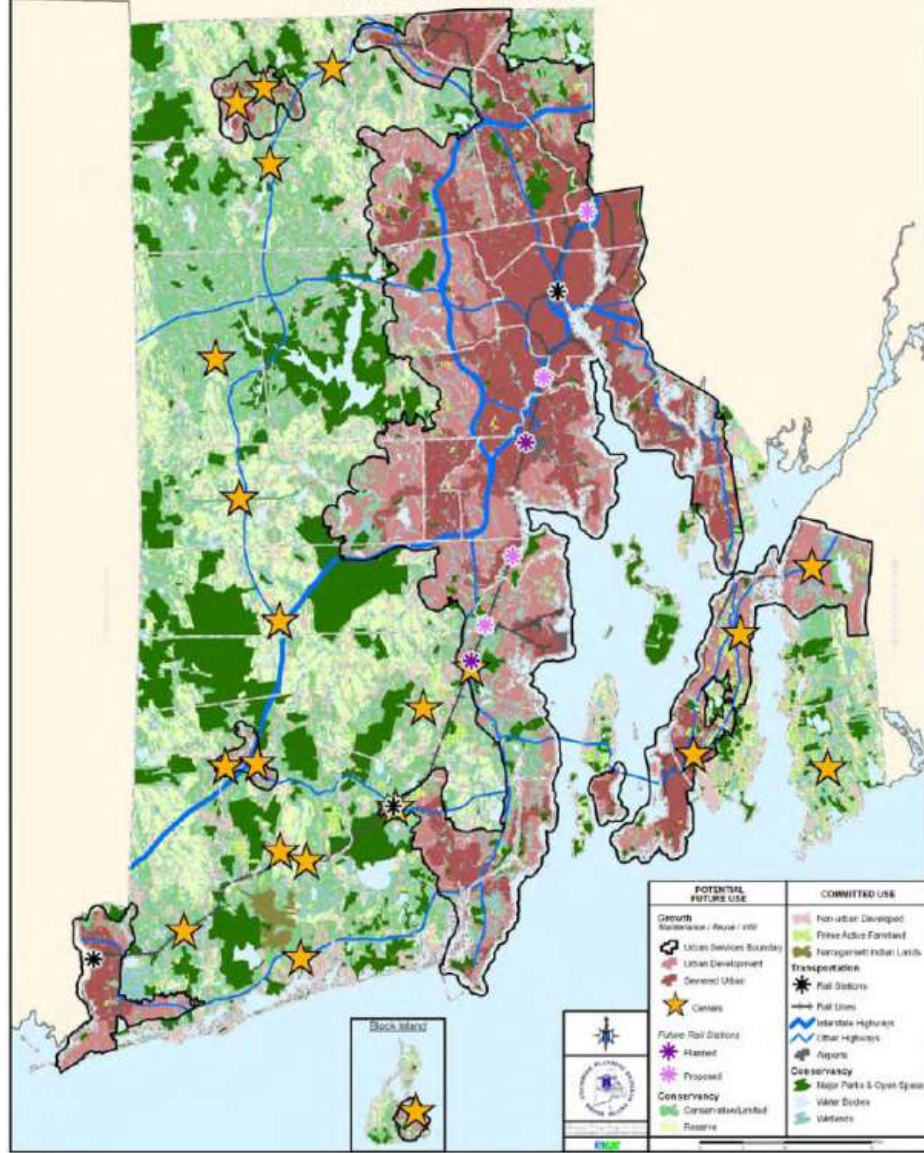


Source: <http://www.igic.org/about/index.html>

Main Street Districts & Growth Centers 101

Land Use 2025 and Our Study

Figure 121-02(1)
Future Land Use 2025



Growth Centers Identified in LU 2025

- HARRISVILLE Village
- CHEPACHET Village
- NORTH FOSTER Village
- HOPE VALLEY Village
- WYOMING Village
- CHARLESTOWN Village
- CAROLINA Village
- SHANNOCK Village
- NOOSENECK Village
- WICKFORD JCT Village
- WEST KINGSTON Village
- PORTSMOUTH Town
- MIDDLETOWN Town
- LITTLE COMPTON Village
- BLOCK ISLAND Village
- TIVERTON Village
- EXETER Village
- COVENTRY Village
- BRADFORD Village
- PASCOAG Village
- NASONVILLE Village

Source: Land Use 2025

Main Street Districts & Growth Centers 101

Technical Paper 160: Mapping Potential Sites Suitable for Higher Density Residential Development

- Goal: Map vacant areas that have potential to support higher density residential development based on statewide GIS data and community input
- Only evaluated areas within the Urban Service Boundary

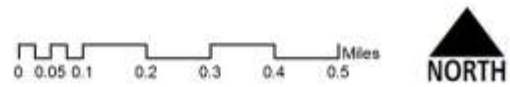
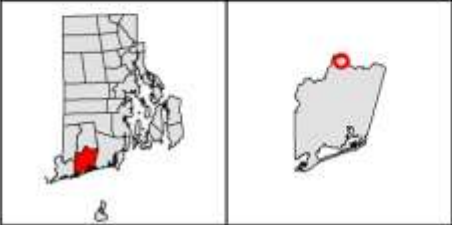
In order to build on this study we...

- Used TP 160 as a guide
- Focused on communities outside of the Urban Services Boundary
- Established a methodology for evaluating developed and undeveloped land according to criteria created in Land Use 2025.
- Looked at the potential to evaluate existing centers and identifying new growth centers using the weighted overlay tool in ArcMap 10.

Initial Survey of Data

Carolina
Charlestown RI

Legend
growth06_Buffer10
















Initial Survey of Data


Carolina
Charlestown RI


Criteria Considered:

6. Provide a variety of transportation choices

Legend

-  growth06_Buffer10
-  Town Border
-  Roads and Highways
-  Inland Water
-  Wetlands
-  Streams
-  RIPTA Park and Ride Stops
-  RIPTA Stops
-  RIPTA Routes
-  Roads and Highways
-  Bike Lanes and Hiking Trails
-  Active Railbeds
-  Inactive Railbeds

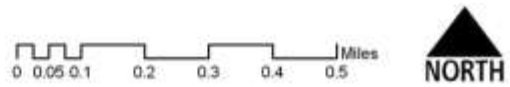






RIGIS Layers Used:
 Railroad Right of Way
 Ripta Bus Stops (including Park and Rides)
 Ripta Bus Routes
 Bike Paths

Transportation



Main Street Districts & Growth Centers 101

Initial Survey of Data

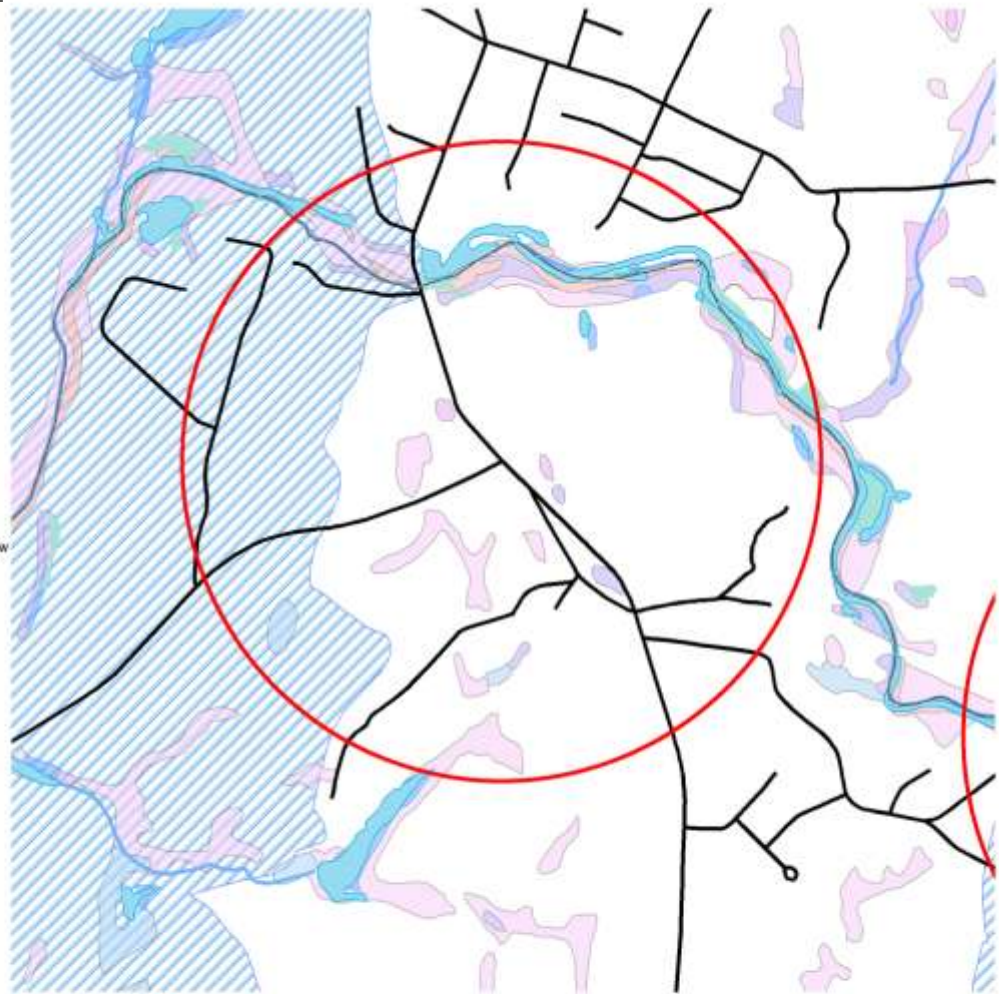
Carolina
Charlestown RI

Criteria Considered:

5. Protect and enhance critical environmental resources

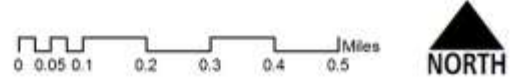
Legend

growth06_Buffer10	Wetland Description
Town Border	Emergent Wetland: Emergent Forest
Roads and Highways	Emergent Wetland: Marsh/Wet Meadow
Inland Water	Estuarine Emergent Wetland
Wetlands	Estuarine Open Water
Streams	Estuarine Scrub-Shrub Wetland
Streams	Forested Wetland: Coniferous
	Forested Wetland: Dead
	Forested Wetland: Deciduous
	Lacustrine Open Water
	Marine:Estuarine Rocky Shore
	Marine:Estuarine Unconsolidated Sh
	Palustrine Open Water
	Riverine Nontidal Open Water
	Riverine Tidal Open Water
	Scrub-Shrub Swamp
	Scrub-Shrub Wetland: Shrub Fen or
	Upland
	Com Well Head Protection Area
	Surface Water Protection Area
	Pond WQ Assessment
	Ground Recharge Area



RIGIS Layers Used:
 Community Well Head Protection Area
 Lakes, ponds and reservoirs
 Wetlands
 Streams
 Ground Water Recharge Areas
 Surface Water Protection Areas

Hydrological Considerations



Main Street Districts & Growth Centers 101

Initial Survey of Data

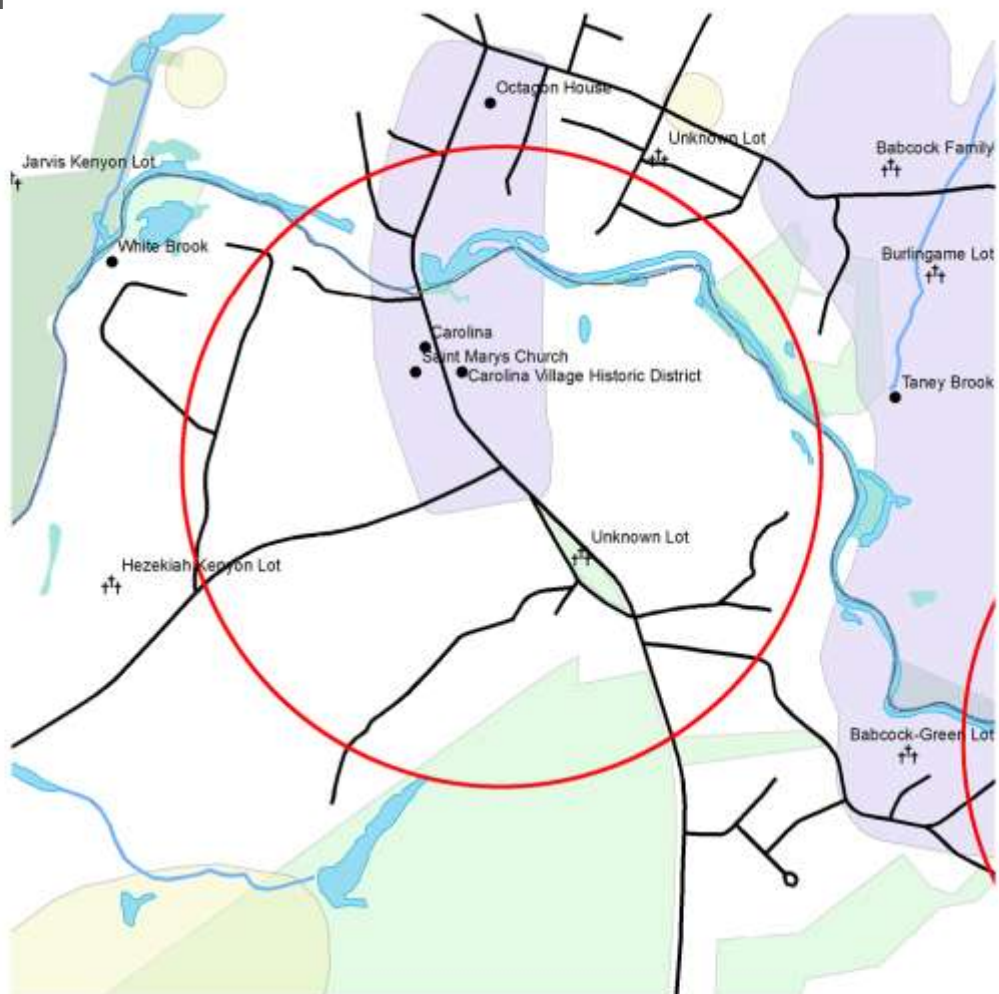
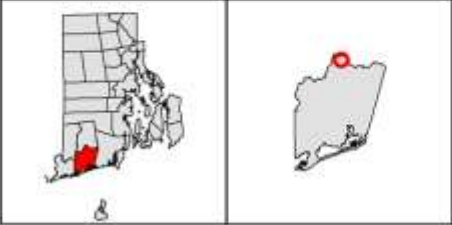
Carolina
Charlestown RI

Criteria Considered:

5. Protect and enhance critical environmental resources
7. Promote community design that contributes to a sense of place

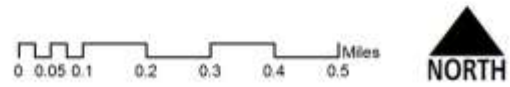
Legend

-  growth06_Buffer10
-  Town Border
-  Roads and Highways
-  Inland Water
-  Wetlands
-  Streams
-  Historic Cemeteries
-  Historic Points
-  Geographic Names
-  Scenic Areas
-  Rare species
-  State Conservation
-  Local Conservation



RIGIS Layers Used:
 Natural Heritage Areas (rare species)
 Historic Sites
 Historic Cemeteries
 Scenic Views
 Geographic Names
 Conservation Lands: Municipal and NGO
 Conservation Lands: State of Rhode Island
 State Conservation and Rec. Open Space 1990

Natural and Cultural Resources



Main Street Districts & Growth Centers 101

Overview of Methodology

A Geographic Approach

1. Ask
2. Acquire
3. Examine
4. Analyze
5. Act



Source: http://www.esri.com/what-is-gis/overview.html#geographic_panel

RIGIS

SURVEY OF DATA AVAILABLE

Steps to prepare for the overlay analysis



1. A Sustainable Rhode Island
2. The Greenspace System
3. Community Design
4. Infrastructure

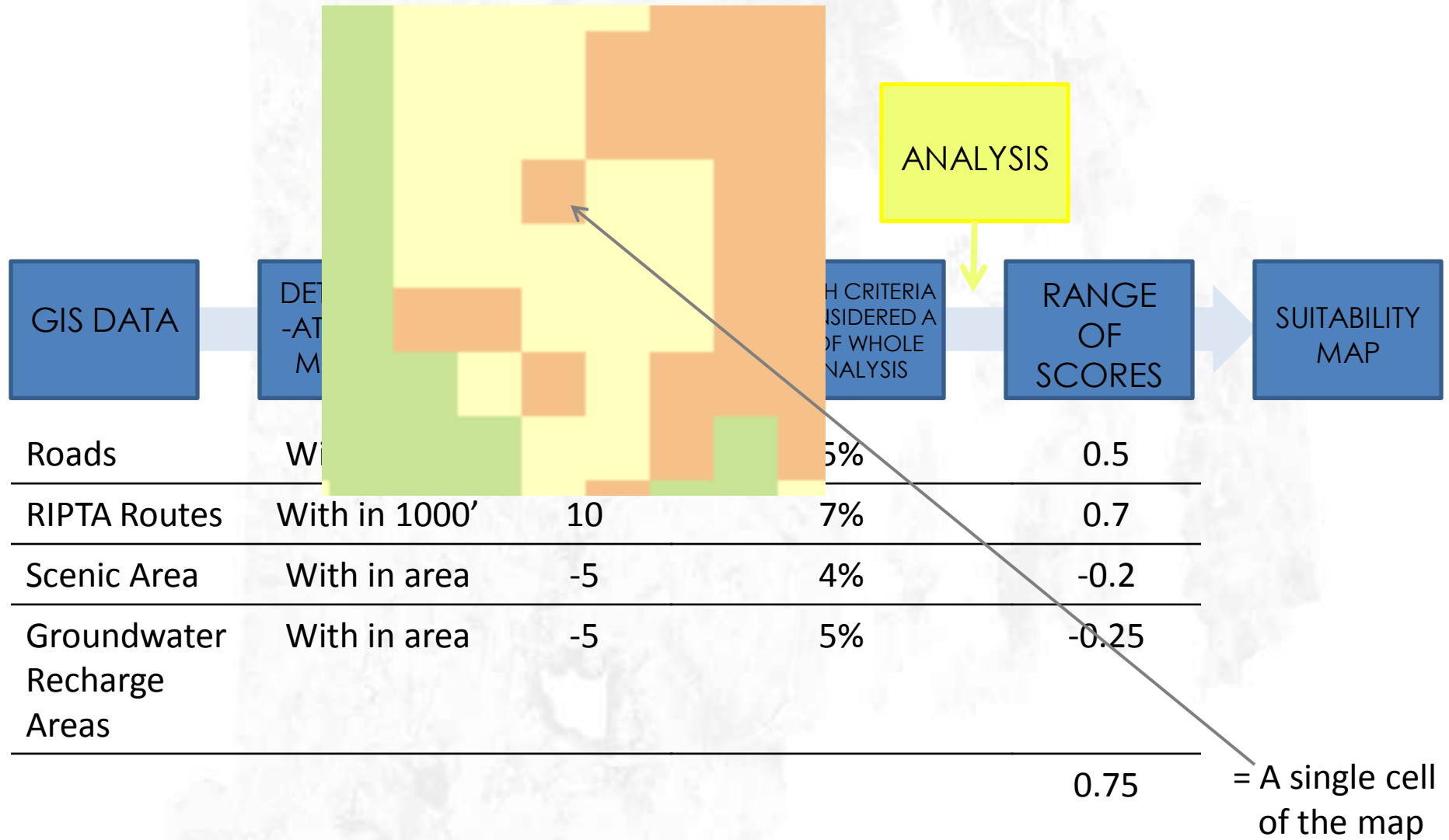
Determining Goals and Metrics

Growth Planning Council: 2002	Land Use 2025: 2006*	
GOALS / Objectives	GOALS / Objectives	Measurable Criteria
Strengthen and encourage growth in existing centers	A Sustainable Rhode Island	
<ul style="list-style-type: none"> <i>The preferred locations for growth centers are areas with existing infrastructure and public services.</i> <i>Infill projects, reuse of brownfields sites, and conversion of underutilized structures have priority over greenfield sites.</i> 	<p><i>A sustainable Rhode Island that is beautiful, diverse, connected and compact with a distinct quality of place in our urban and rural centers, and abundance of natural resources, and a vibrant sustainable economy.</i></p> <ul style="list-style-type: none"> <i>Focus growth within the urban services boundary and in centers of different sizes and types; support traditional centers instead of new development.</i> <i>Support regional and watershed-wide planning to coordinate policy development and promote cooperative implementation of plans, programs, and projects affecting more than one community.</i> <p>Policies: (LUP-1,2,9,12,21,33,34,41,42,43)</p>	<p>(+) Proximity to public facilities / services (+) Proximity of underutilized structures (+) Existing density of center (-) Groundwater Considerations (-) Capacity to build on soil</p>
Encourage growth in appropriately scaled centers	<ul style="list-style-type: none"> <i>While the configuration of an identified growth center will vary from community to community, growth centers should be small enough to be comfortably walked. Municipally-identified growth centers should be no larger than an area with an approximately ¼ to ½ mile radius from its center to its edge in all directions (approximately ½ square mile to maximum of 1 square mile area).</i> 	<p>Criteria for future analysis: •Brown and Greyfield sites •Job Density</p>
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Protect and enhance critical environmental resources	The Greenspace System	
<ul style="list-style-type: none"> <i>The center avoids converting working lands, such as prime farmland and forestland, into development.</i> <i>The center protects the local watershed and/or does not negatively impact critical and/or resource areas</i> 	<ul style="list-style-type: none"> <i>Permanently protect critical natural resources.</i> <i>Provide a diverse, well-balanced system of public outdoor recreation facilities.</i> <i>Ensure that shoreline areas compose a significant portion of the Greenspace system.</i> <p>Policies: (LUP-3,10,11,13,14,15,17,18,19)</p>	<p>(-) Prime farmland w/in center (-) Prime contiguous forest w/in Center (-) Proximity to sensitive environmental resources (-) Proximity to critical watershed resources (-) Previously Established Conservation Areas (-) Areas prone to flooding (-) Coastal considerations</p>

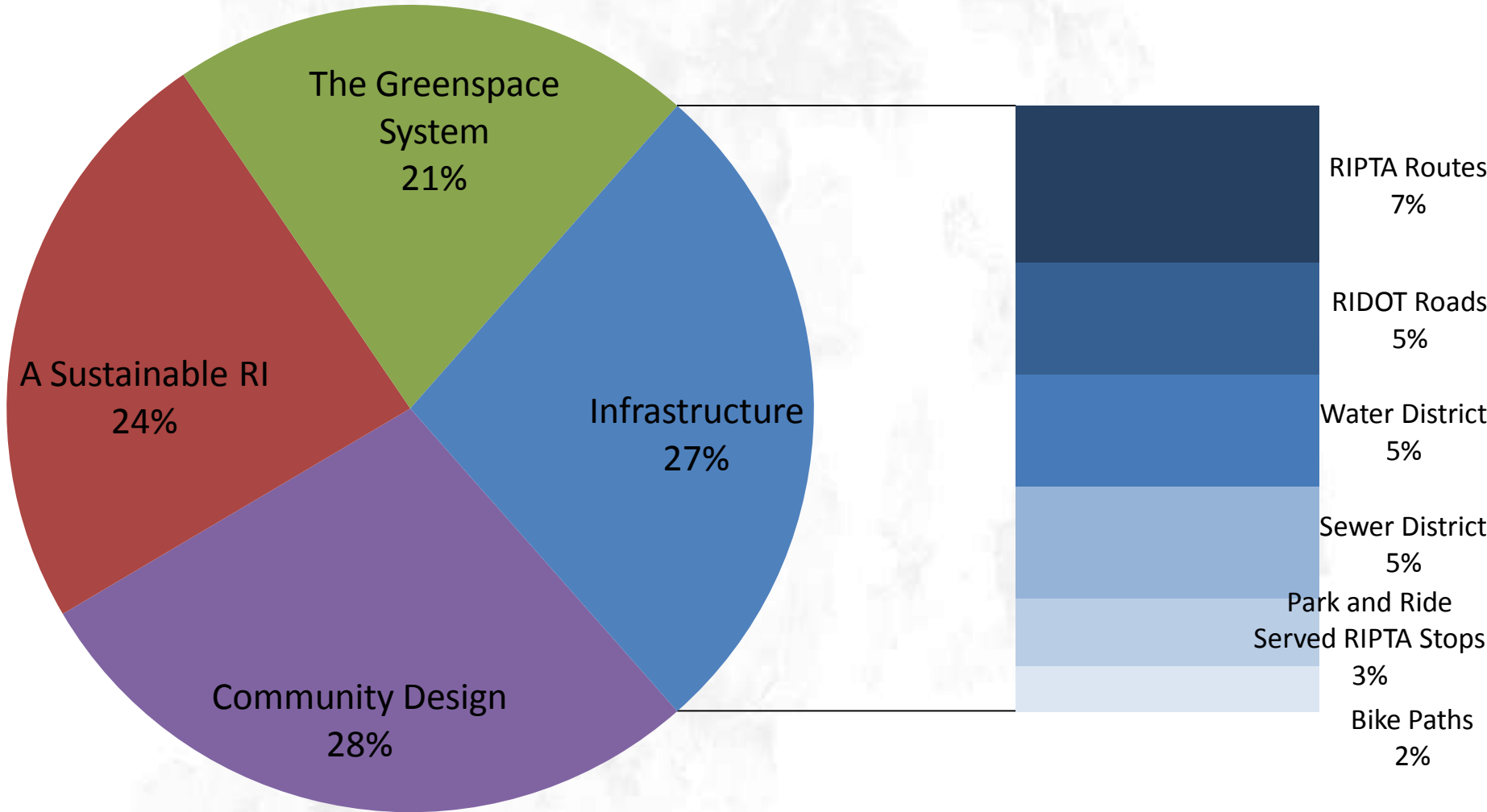
Determining Goals and Metrics

Growth Planning Council: 2002	Land Use 2025: 2006*	
GOALS / Objectives	GOALS / Objectives	Measureable Criteria
<p>Promote community design that creates a sense of place</p>	<p>Community Design</p>	
<ul style="list-style-type: none"> Community design within the centers encourages interactions among people, facilitate vibrant and safe street life, and maximize a strong sense of local community in harmony with the natural setting. 	<p><i>Excellence in community design: communities that are of high quality, energy efficient, safe and healthful, distinct, diverse and aesthetically pleasing; communities that are rich in natural, historical, cultural, and recreational resources; communities that provide abundant economic opportunities.</i></p>	<p>(+) Walkability of Center (+) Mixed Use Center (+) Civic building, uses or spaces (+) Amount of developable land (-) Areas of cultural or ecological importance</p>
<p>Create a range of housing opportunities and choices</p>	<ul style="list-style-type: none"> Give a majority of the State's residents the opportunity to live in traditional neighborhoods, near growth centers. 	
<ul style="list-style-type: none"> Residential housing includes a range of housing opportunities, including single-family and multiple-household units for purchase or rental, and should cover a range of prices to address a full spectrum of income levels. 	<ul style="list-style-type: none"> Preserve and enhance special districts and special places, supporting particular uses and resources. 	
<p>Include mixed land uses</p>	<ul style="list-style-type: none"> Provide a diverse, affordable housing stock. 	
<ul style="list-style-type: none"> Centers include a mix of housing, significant employment opportunities, schools, commercial and industrial uses, and civic/public spaces and buildings. 	<ul style="list-style-type: none"> Increase energy efficiency through building design and location. <p>Policies: (LUP-4,7,16,20,22,23,24,25)</p>	
<p>Scale new infrastructure to support compact growth</p>	<p>Infrastructure</p>	
<ul style="list-style-type: none"> Planned infrastructure is sized to support designated compact growth, not a sprawl development pattern. 	<ul style="list-style-type: none"> Maintain fully functional water and sewer systems; focus development to maximize the investment and capacity of these community assets. 	<p>(+) Proximity to existing sewer (+) Proximity to public water (+) Proximity to public transit (+) Proximity to major roadway</p>
<p>Provide a variety of transportation choices</p>	<ul style="list-style-type: none"> Protect drinking water supply resources. 	
<ul style="list-style-type: none"> Locations with convenient access to mass transit (existing or planned) are preferred. Centers are encouraged to include public transit hubs/stations to connect local routes. Center layout, density, and design should encourage public transit, walking, and biking over automobile use for local trips. 	<ul style="list-style-type: none"> Utilize infrastructure to avoid or mitigate significant negative environmental impacts from development. Locate new infrastructure in appropriate areas. Promote intermodal centers and greater reliance on transit. <p>Policies: (LUP-6,8,28,29,30,31,32,35,36,37,38,39,40)</p>	<p>Criteria for future analysis: (+) Availability of well water</p>

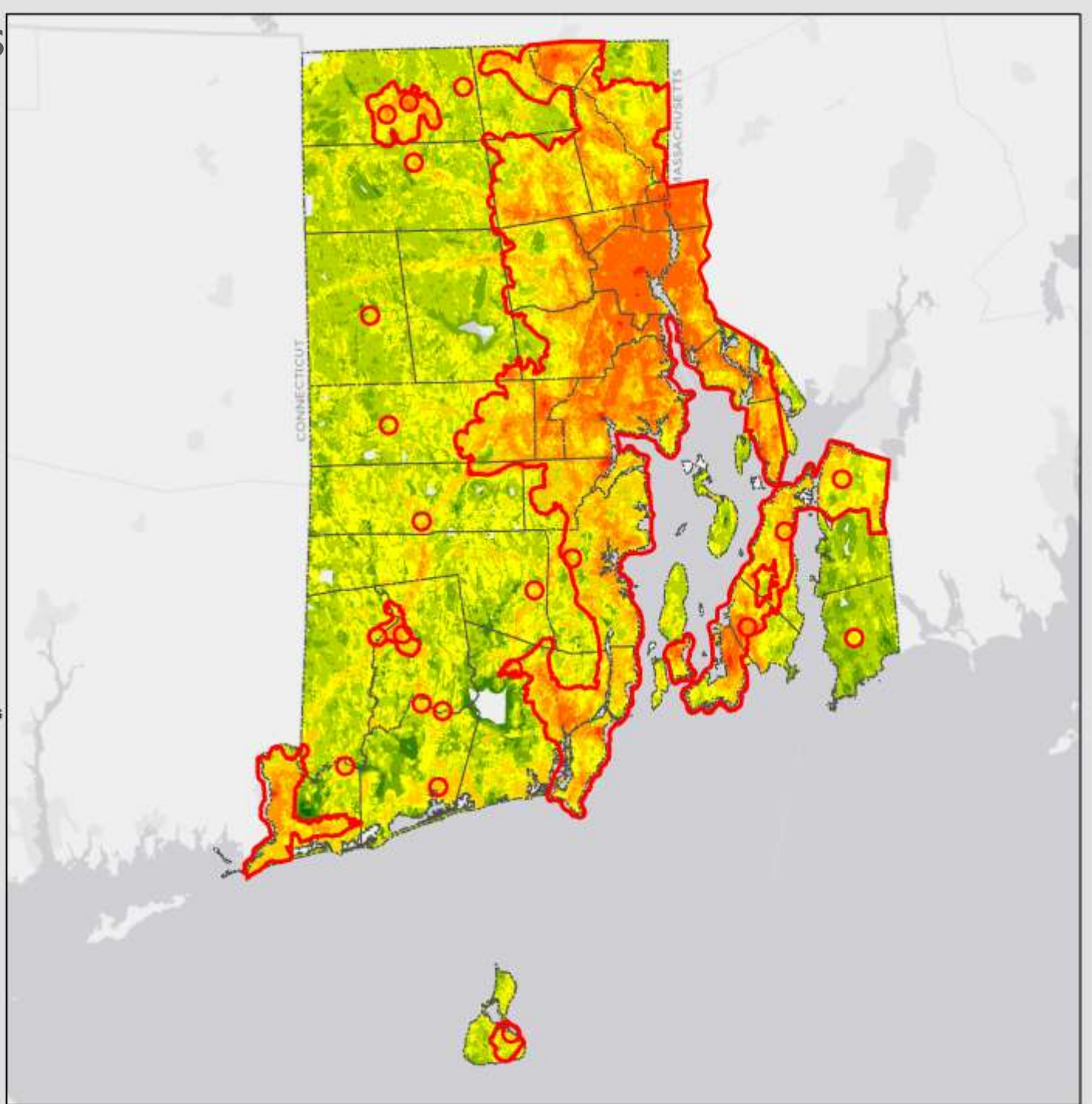
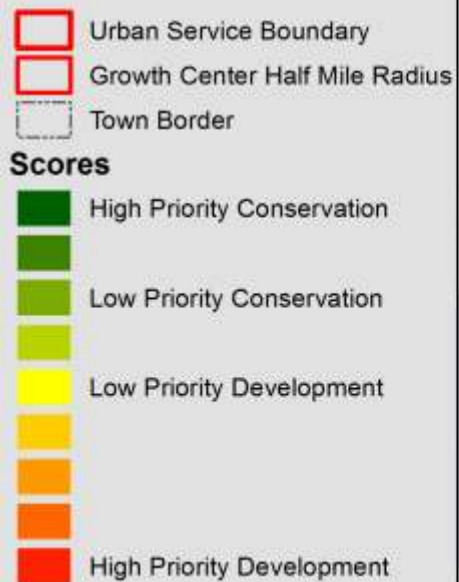
Overview of Overlay Analysis Tool in ArcGIS



Analysis Breakdown: Infrastructure

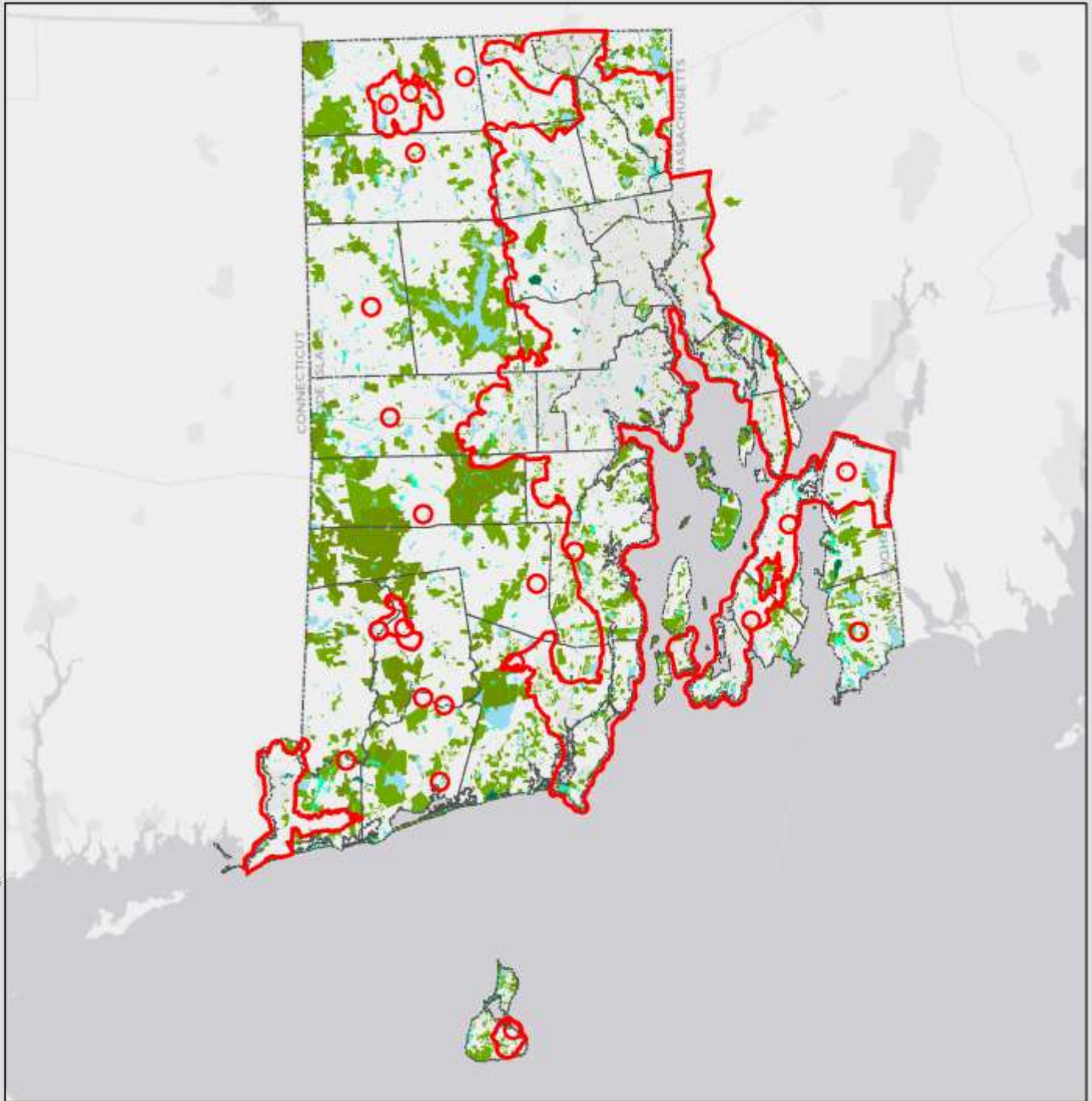


Initial Results

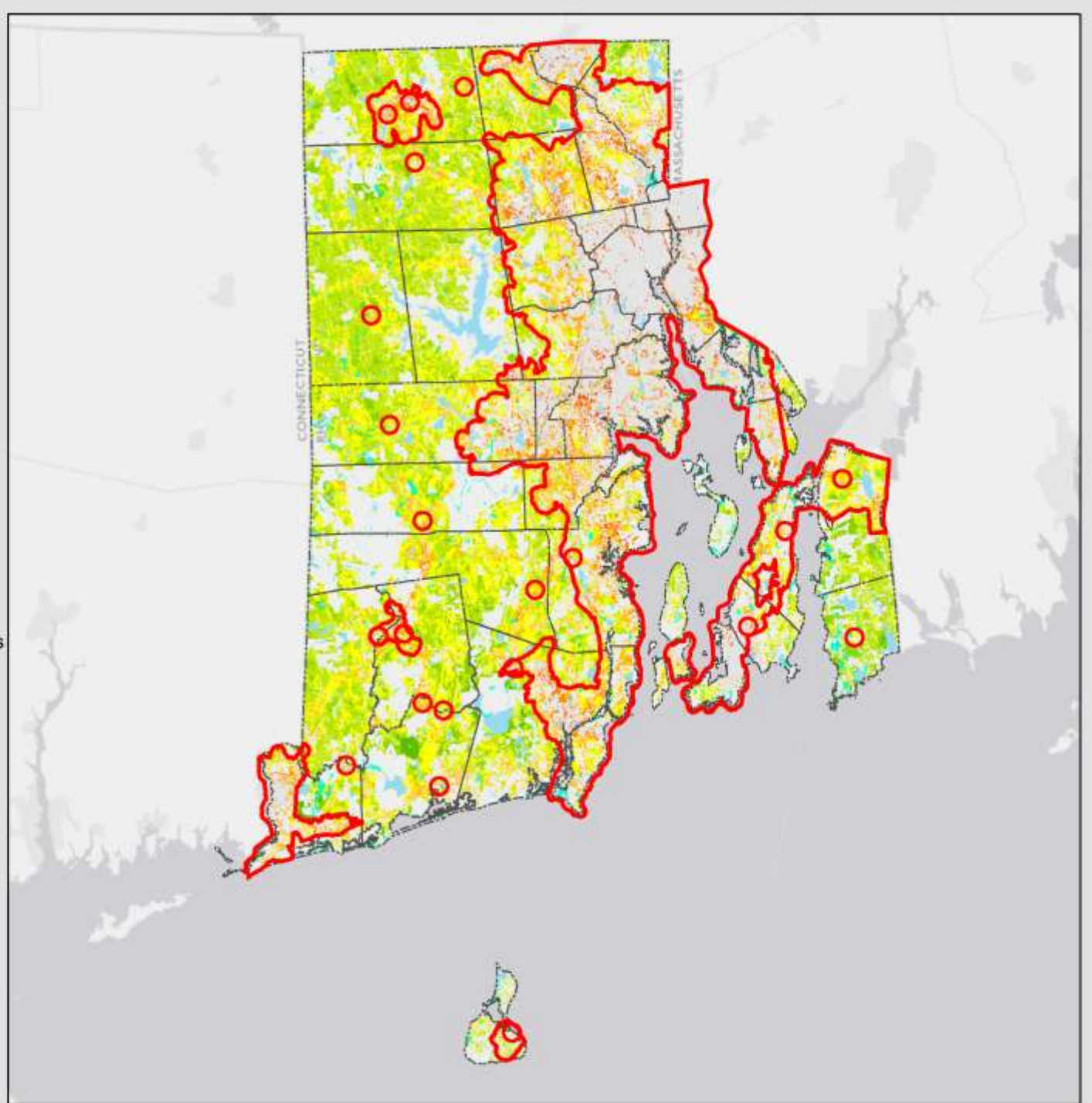
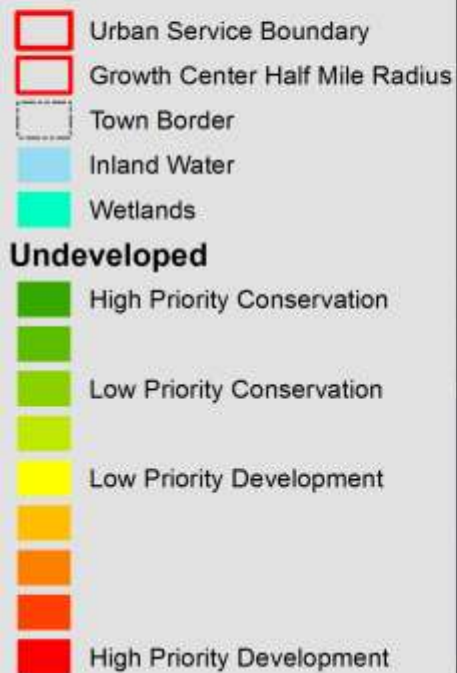


Areas Not Suited For Development

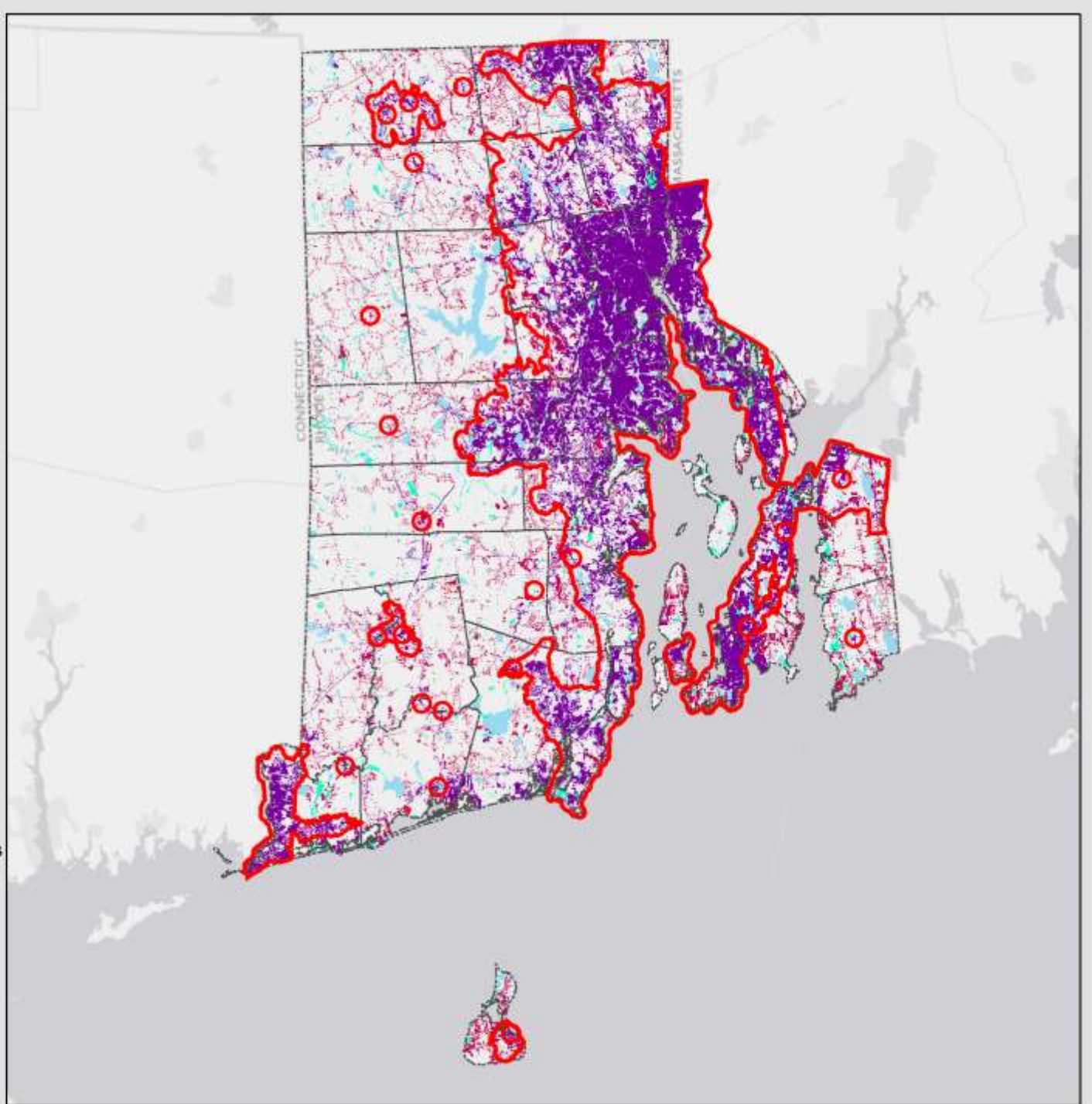
- Urban Service Boundary
- Growth Center Half Mile Radius
- Town Border
- Inland Water
- Wetlands
- Local Conservation
- State Conservation
- Soils with Significant Restraints



Undeveloped Land

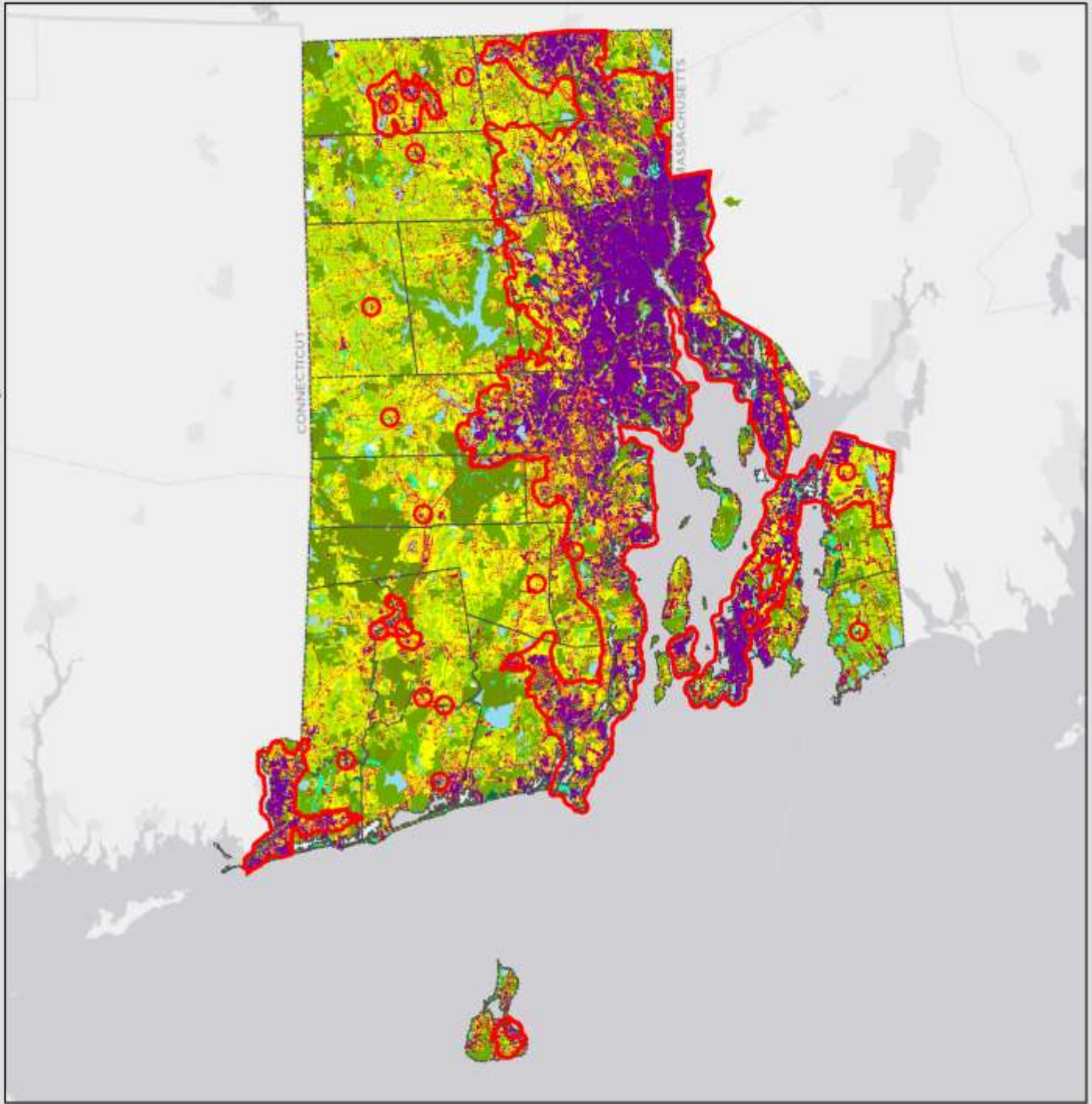


Developed Land





Composite Map

- Urban Service Boundary
 - Growth Center Half Mile Radius
 - Town Border
 - Inland Water
 - Wetlands
 - Local Conservation
 - State Conservation
 - Soils with Significant Restraints
- Undeveloped**
- High Priority Conservation
 - Low Priority Conservation
 - Low Priority Development
 - High Priority Development
- Developed**
- Low Priority Development
 - Medium Priority Development
 - High Priority Development



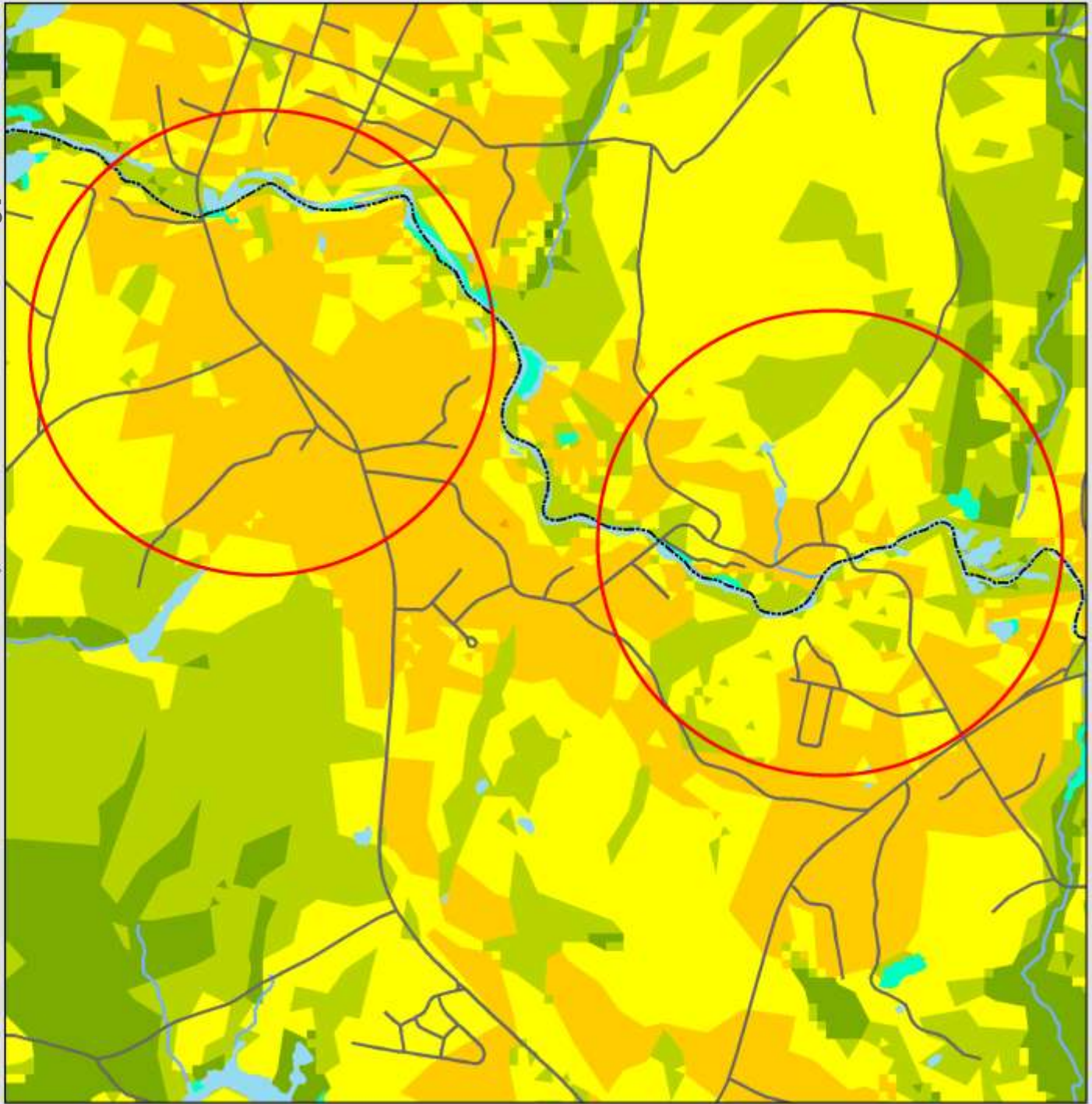
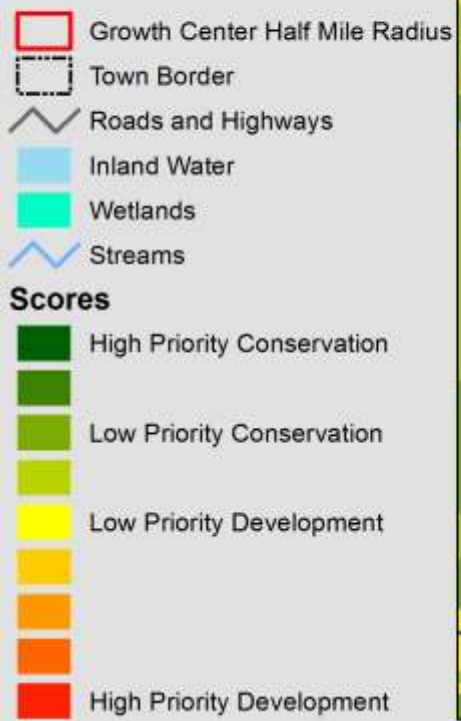
Carolina and Shannock, RI



-  Growth Center Half Mile Radius
-  Town Border

Carolina and Shannock, RI

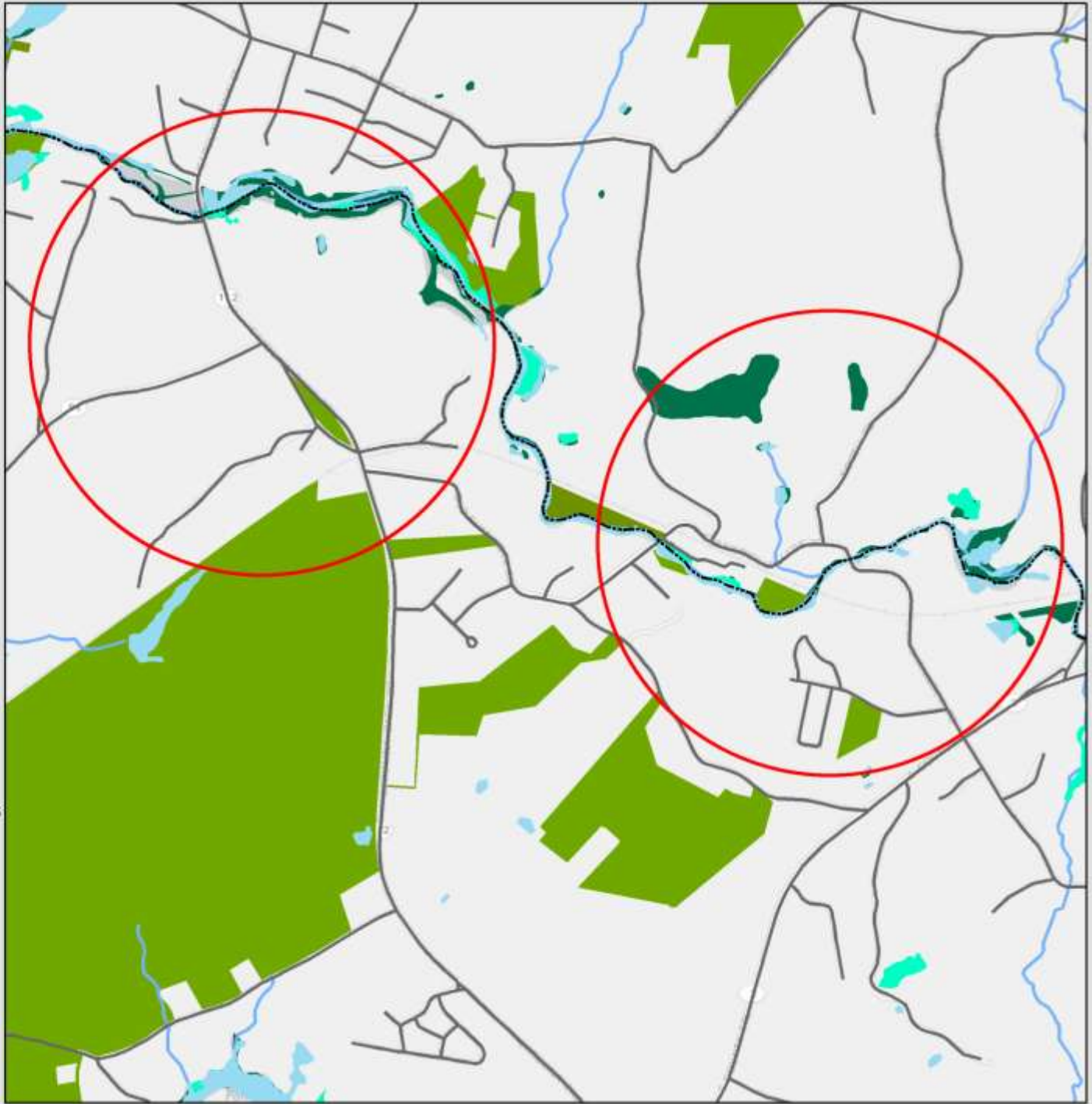
Initial Results



Carolina and Shannock, RI

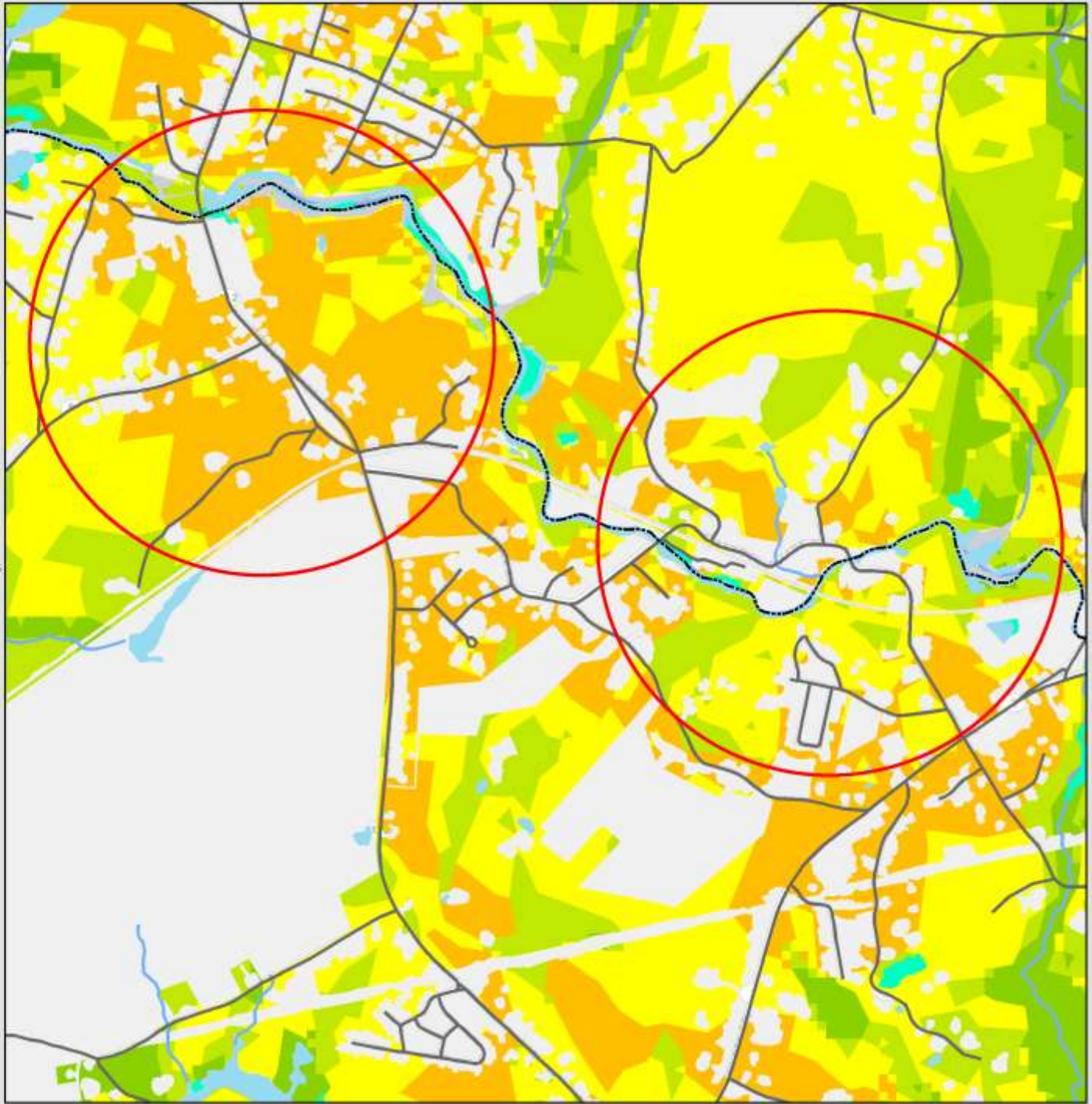
Areas Not Suited For Development

-  Growth Center Half Mile Radius
-  Town Border
-  Roads and Highways
-  Inland Water
-  Wetlands
-  Streams
-  Local Conservation
-  State Conservation
-  Soils with Significant Restraints



Carolina and Shannock, RI

Undeveloped



Carolina and Shannock, RI




















Developed

-  Growth Center Half Mile Radius
-  Town Border
-  Roads and Highways
-  Inland Water
-  Wetlands
-  Streams
- Developed**
 -  Low Priority Development
 -  Medium Priority Development
 -  High Priority Development



Carolina and Shannock, RI

Composite Map

-  Growth Center Half Mile Radius
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- Developed**
-  Low Priority Development
 -  Medium Priority Development
 -  High Priority Development



Thank you!

This study was funded by the *RWU Foundation to Promote Scholarship and Teaching* grant.

Additional Questions email:
eadams@rwu.edu or
bboisvert976@g.rwu.edu