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

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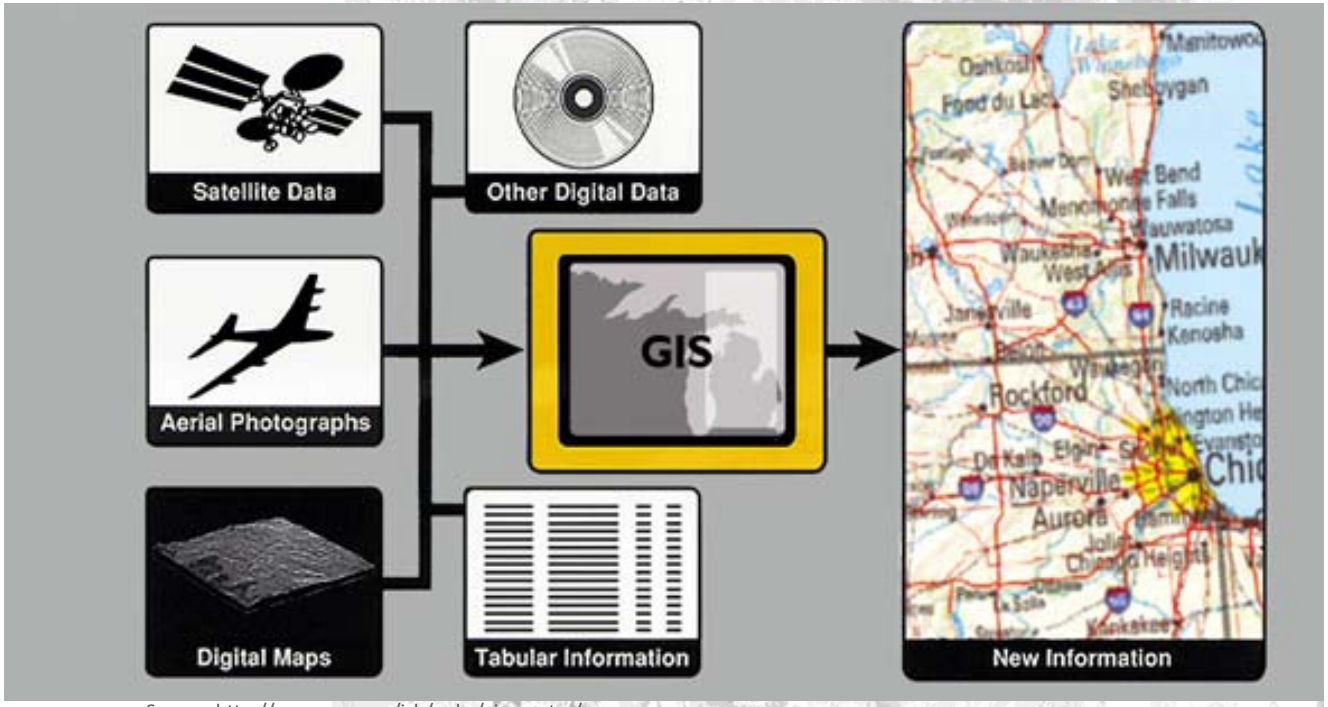
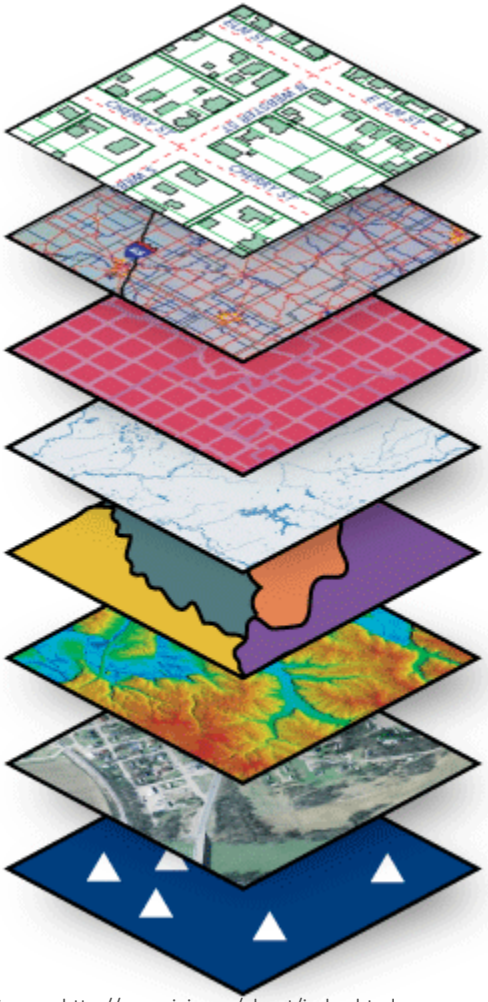
Introduction to Geographic Information System (GIS)

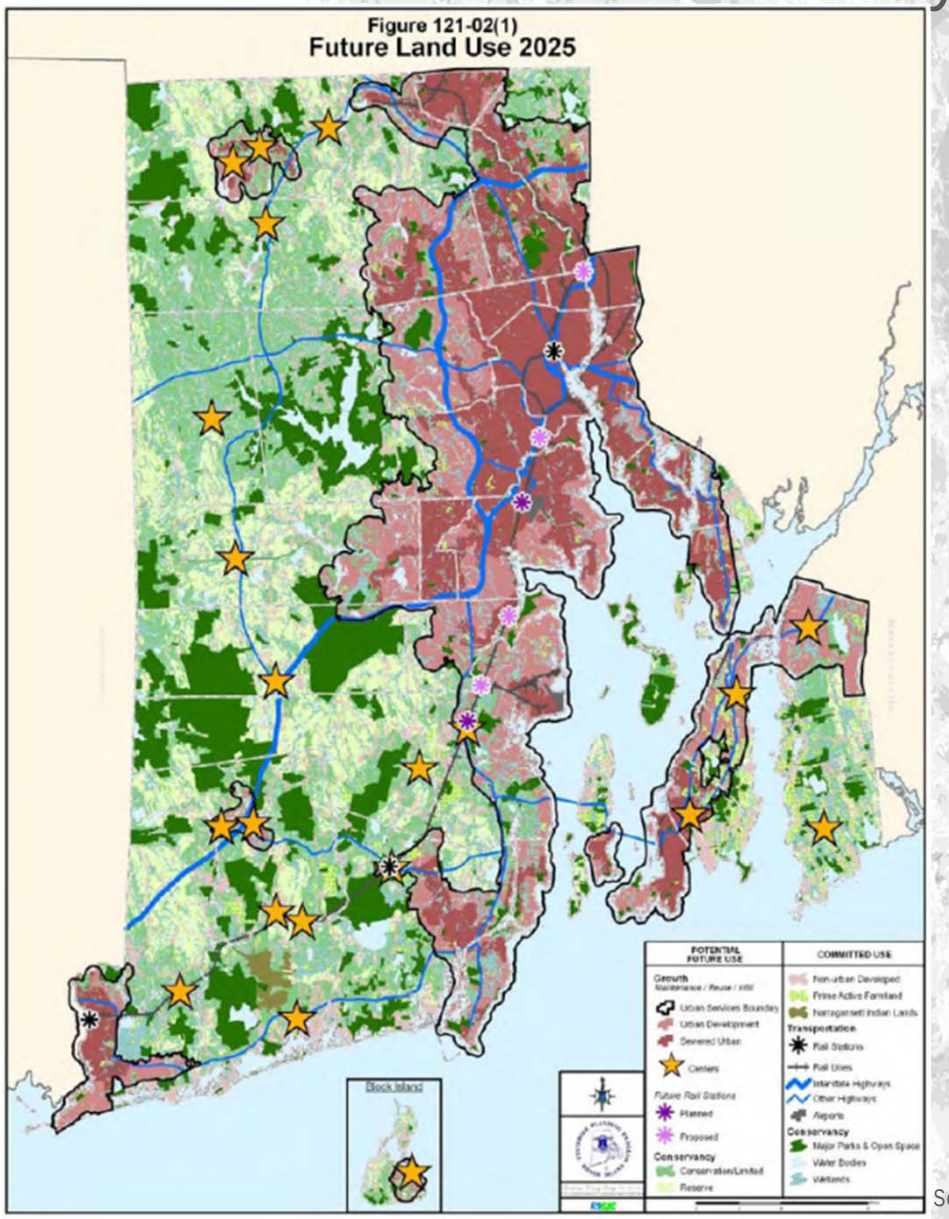


Source: http://egsc.usgs.gov/isb/pubs/gis_poster/



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

Land Use 2025 and Our Study



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

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

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

NORTH

Main Street Districts & Growth Centers 101

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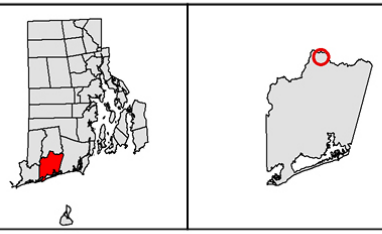
Initial Survey of Data

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

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

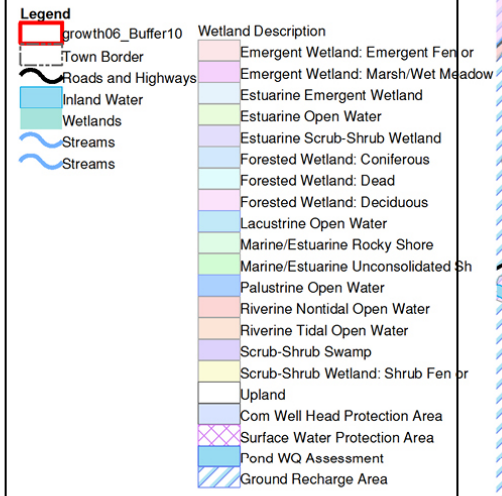
NORTH

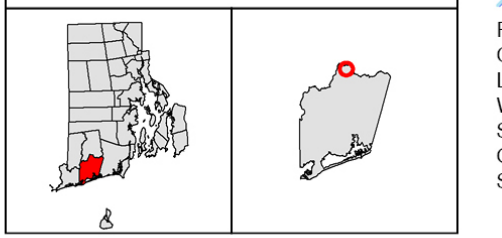
Initial Survey of Data

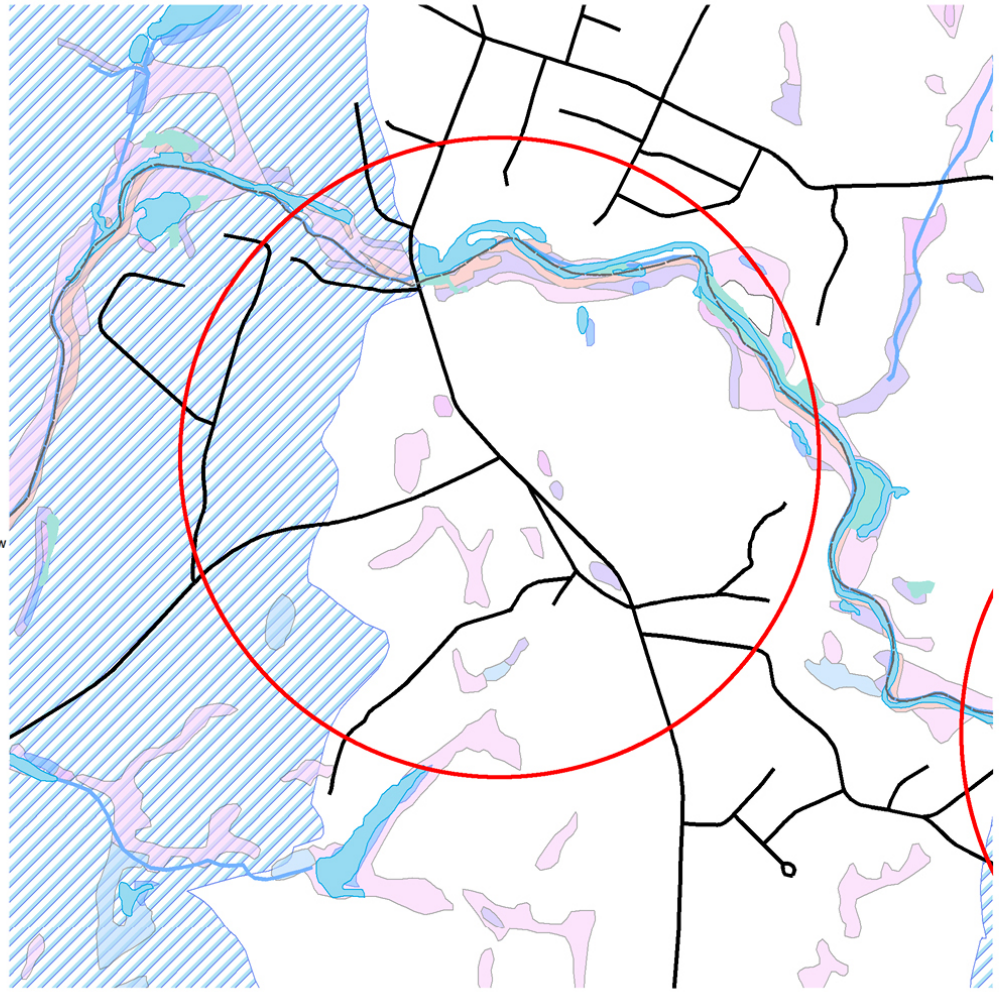
Carolina
Charlestown RI

Criteria Considered:

5. Protect and enhance critical environmental resources







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

Hydrological Considerations

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

NORTH

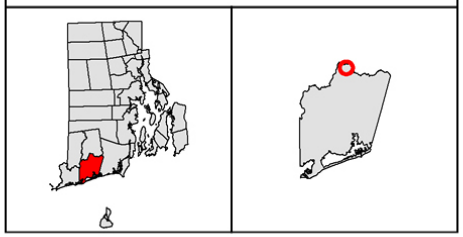
Initial Survey of Data

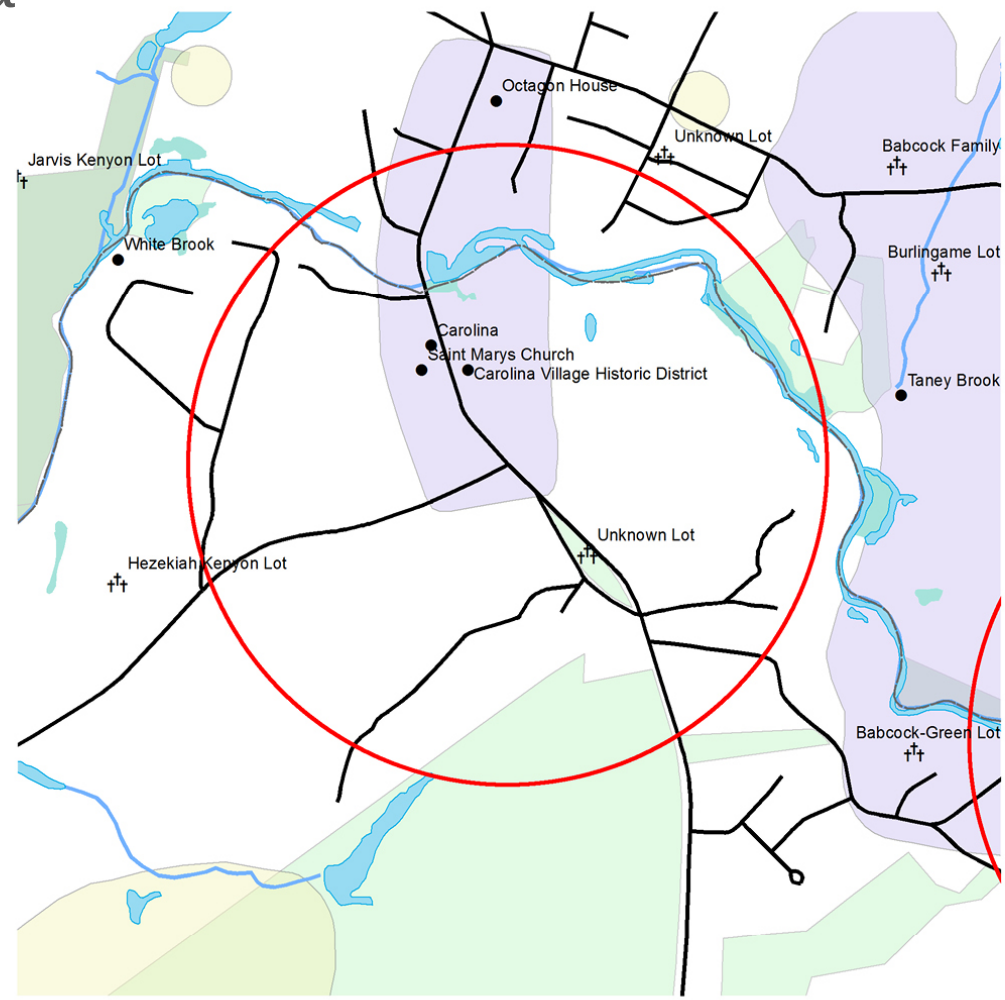
Carolina
Charlestown RI

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 Cemetaries
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

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

NORTH

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Overview of Methodology

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

A Geographic Approach

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

RIGIS

SURVEY OF DATA AVAILABLE

Steps to prepare for the overlay analysis

LU 2025

GOALS AND CRITERIA

METRICS

LIST OF GIS DATA TO ANALYZE

G.P.C.

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

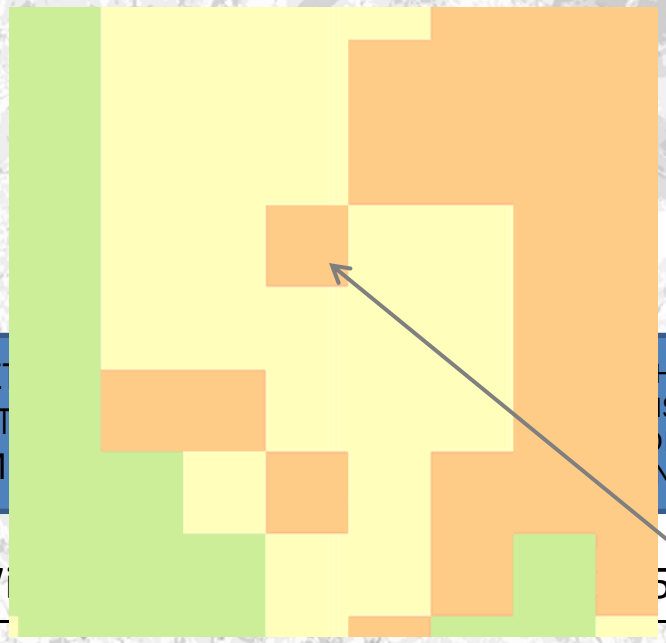
Determining Goals and Metrics

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**	
• *The preferred locations for growth centers are areas with existing* infrastructure *and public services.* • *Infill projects, reuse of brownfields sites, and conversion of underutilized structures have priority over greenfield sites.*	*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.* • *Focus growth within the urban services boundary and in centers of different sizes and types; support traditional centers instead of new development.* • *Support regional and watershed-wide planning to coordinate policy development and promote cooperative implementation of plans, programs, and projects affecting more than one community.* Policies: *(LUP-1,2,9,12,21,33,34,41,42,43)*	(+) Proximity to public facilities / services (+) Proximity of underutilized structures (+) Existing density of center (-) Groundwater Considerations (-) Capacity to build on soil Criteria for future analysis: •Brown and Greyfield sites •Job Density
Encourage growth in appropriately scaled centers		
• *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).*		
Protect and enhance critical environmental resources	**The Greenspace System**	
• *The center avoids converting working lands, such as prime farmland and forestland, into development.* • *The center protects the local watershed and/or does not negatively impact critical and/or resource areas*	• *Permanently protect critical natural resources.* • *Provide a diverse, well-balanced system of public outdoor recreation facilities.* • *Ensure that shoreline areas compose a significant portion of the Greenspace system.* Policies: *(LUP-3,10,11,13,14,15,17,18,19)*	(-) 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

Determining Goals and Metrics

Growth Planning Council: 2002	**Land Use 2025: 2006***	
GOALS / Objectives	**GOALS / Objectives**	**Measureable Criteria**
Promote community design that creates a sense of place • *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.* **Create a range of housing opportunities and choices** • *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.* **Include mixed land uses** • *Centers include a mix of housing, significant employment opportunities, schools, commercial and industrial uses, and civic/public spaces and buildings.*	**Community Design** *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.* • *Give a majority of the State's residents the opportunity to live in traditional neighborhoods, near growth centers.* • *Preserve and enhance special districts and special places, supporting particular uses and resources.* • *Provide a diverse, affordable housing stock.* • *Increase energy efficiency through building design and location.* *Policies: (LUP-4,7,16,20,22,23,24,25)*	(+) Walkability of Center (+) Mixed Use Center (+) Civic building, uses or spaces (+) Amount of developable land (-) Areas of cultural or ecological importance
Scale new infrastructure to support compact growth • *Planned infrastructure is sized to support designated compact growth, not a sprawl development pattern.* **Provide a variety of transportation choices** • *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.*	**Infrastructure** • *Maintain fully functional water and sewer systems; focus development to maximize the investment and capacity of these community assets.* • *Protect drinking water supply resources.* • *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.* Policies: *(LUP-6,8,28,29,30,31,32,35,36,37,38,39,40)*	(+) Proximity to existing sewer (+) Proximity to public water (+) Proximity to public transit (+) Proximity to major roadway Criteria for future analysis: (+) Availability of well water

Overview of Overlay Analysis Tool in ArcGIS



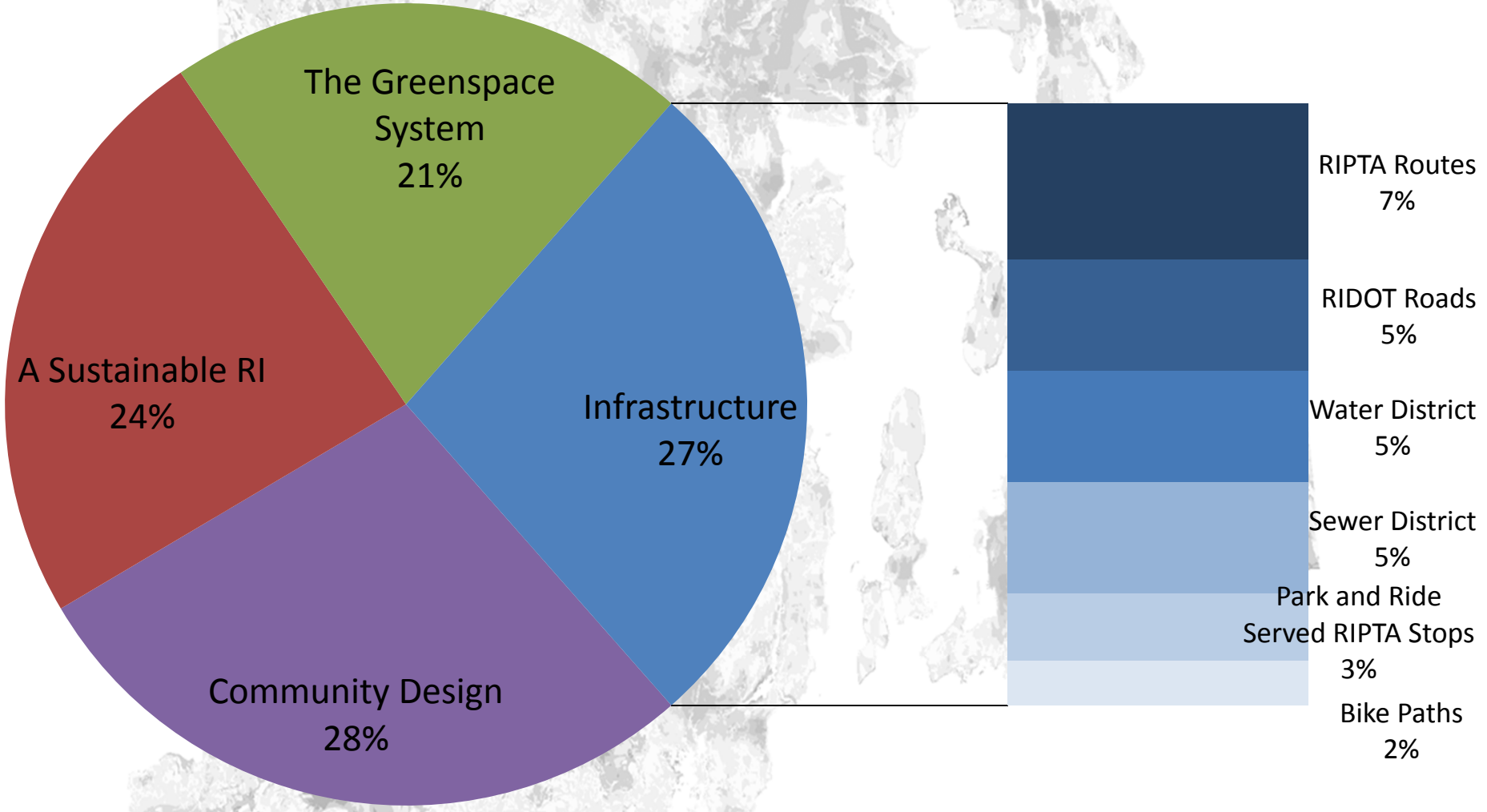
ANALYSIS

GIS DATA → DE… -AT… M… → …H CRITERIA …SIDERED A …F WHOLE …NALYSIS → RANGE OF SCORES → SUITABILITY MAP

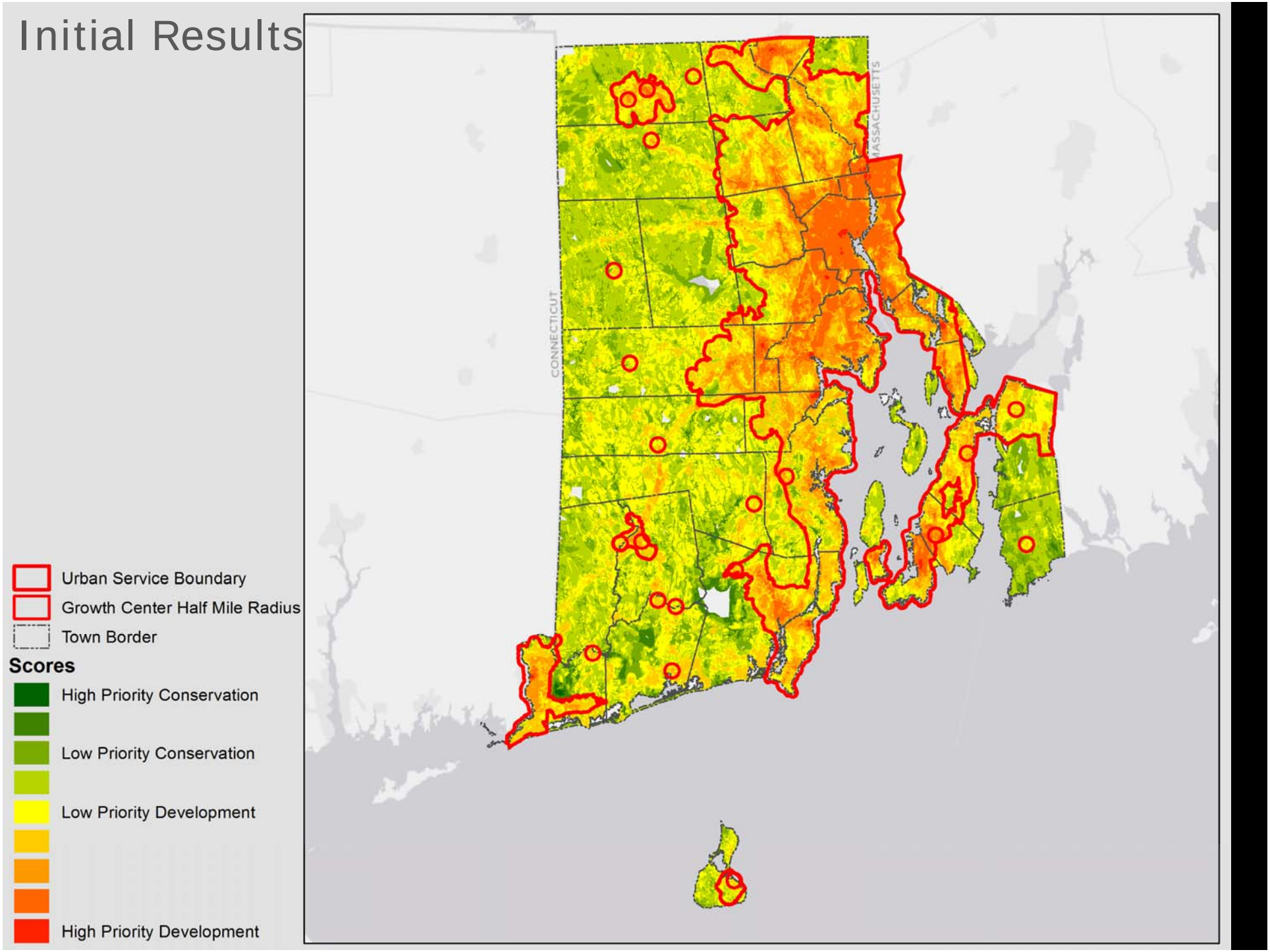
Roads	Wi…		…5%	0.5
RIPTA Routes	With in 1000’	10	7%	0.7
Scenic Area	With in area	-5	4%	-0.2
Groundwater Recharge Areas	With in area	-5	5%	-0.25
				0.75

= A single cell of the map

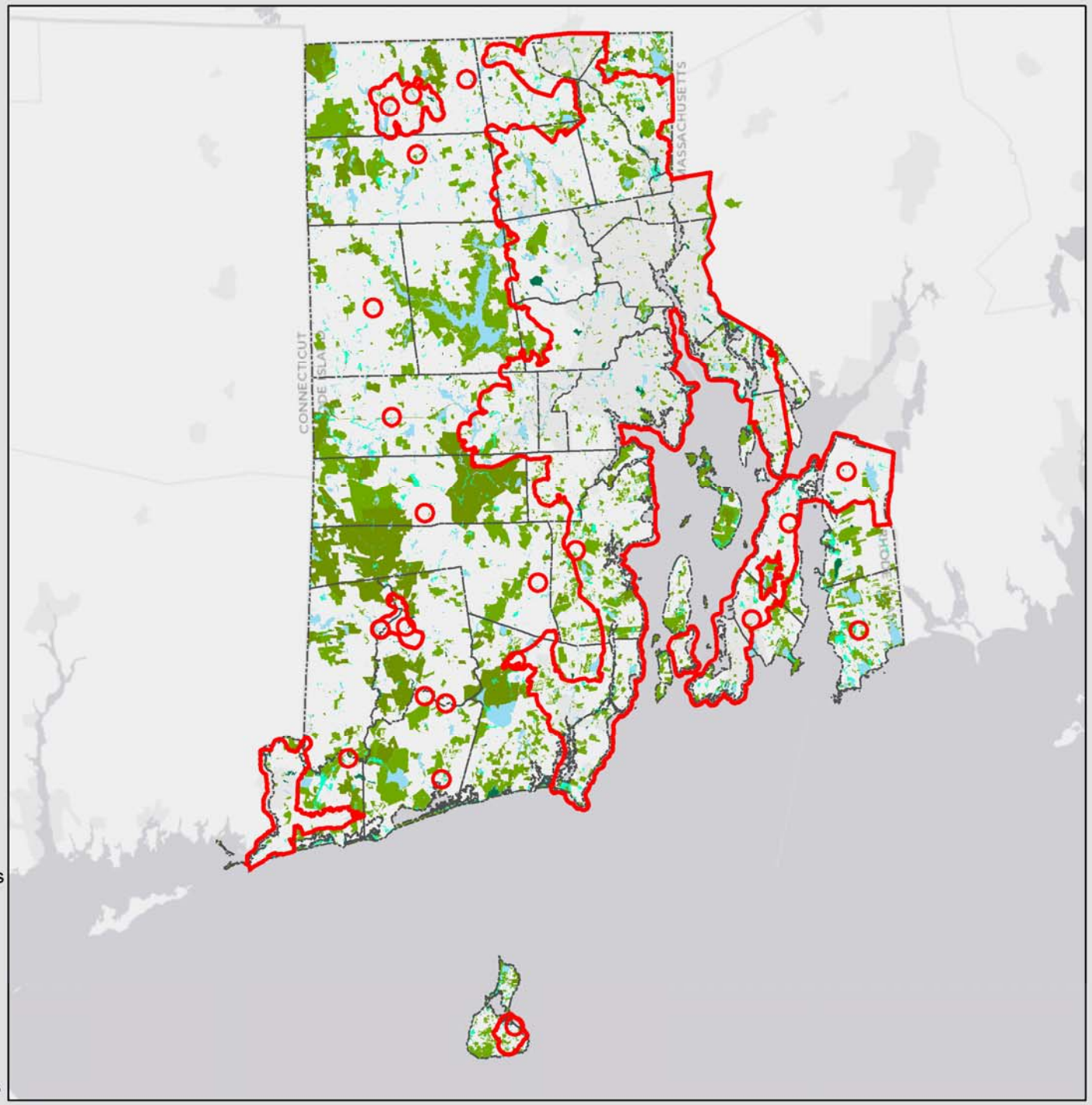
Analysis Breakdown: Infrastructure



Initial Results

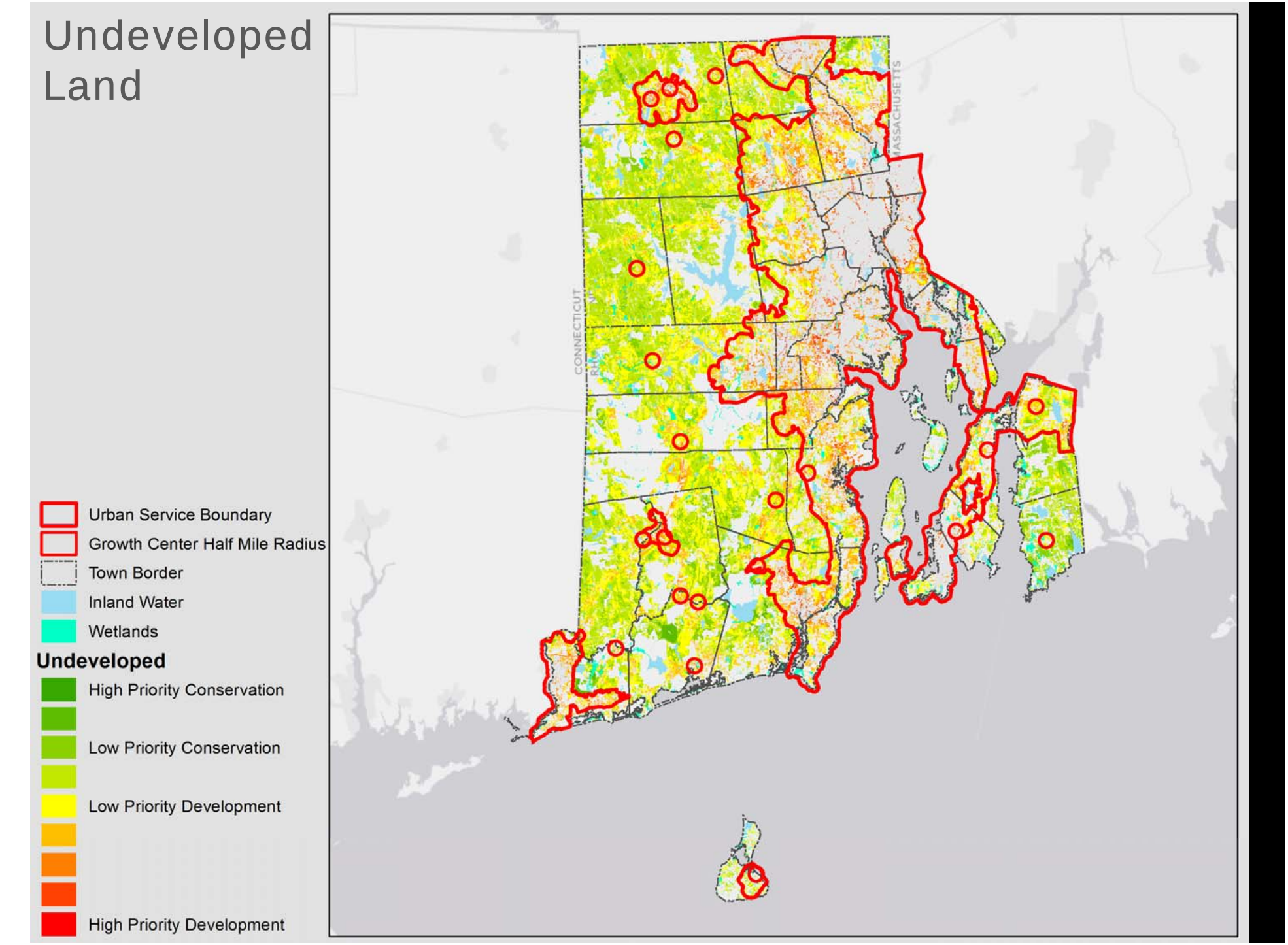


Areas Not Suited For Development

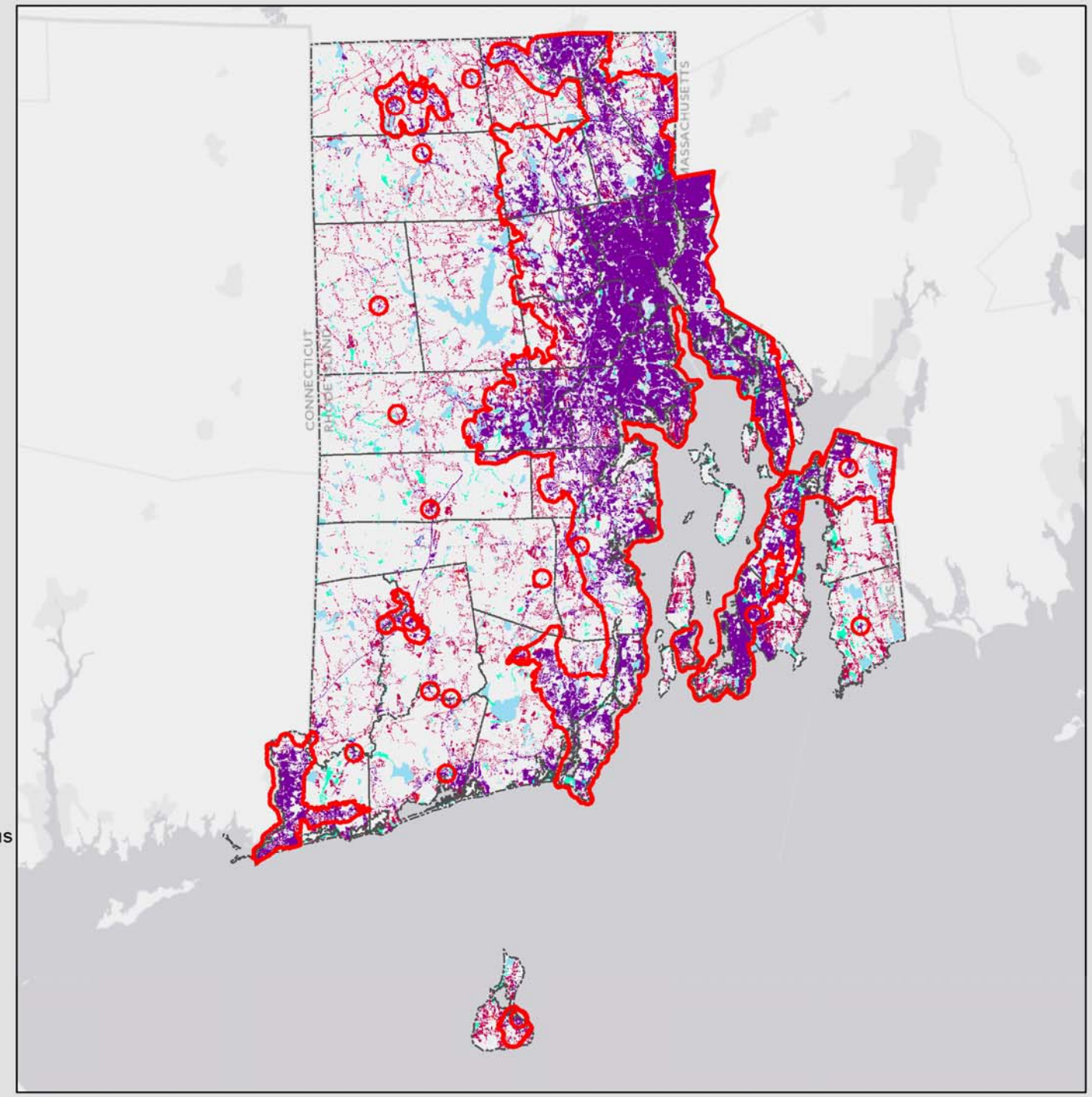


- Urban Service Boundary
- Growth Center Half Mile Radius
- Town Border
- Inland Water
- Wetlands
- Local Conservation
- State Conservation
- Soils with Significant Restraints

Undeveloped Land



Developed Land

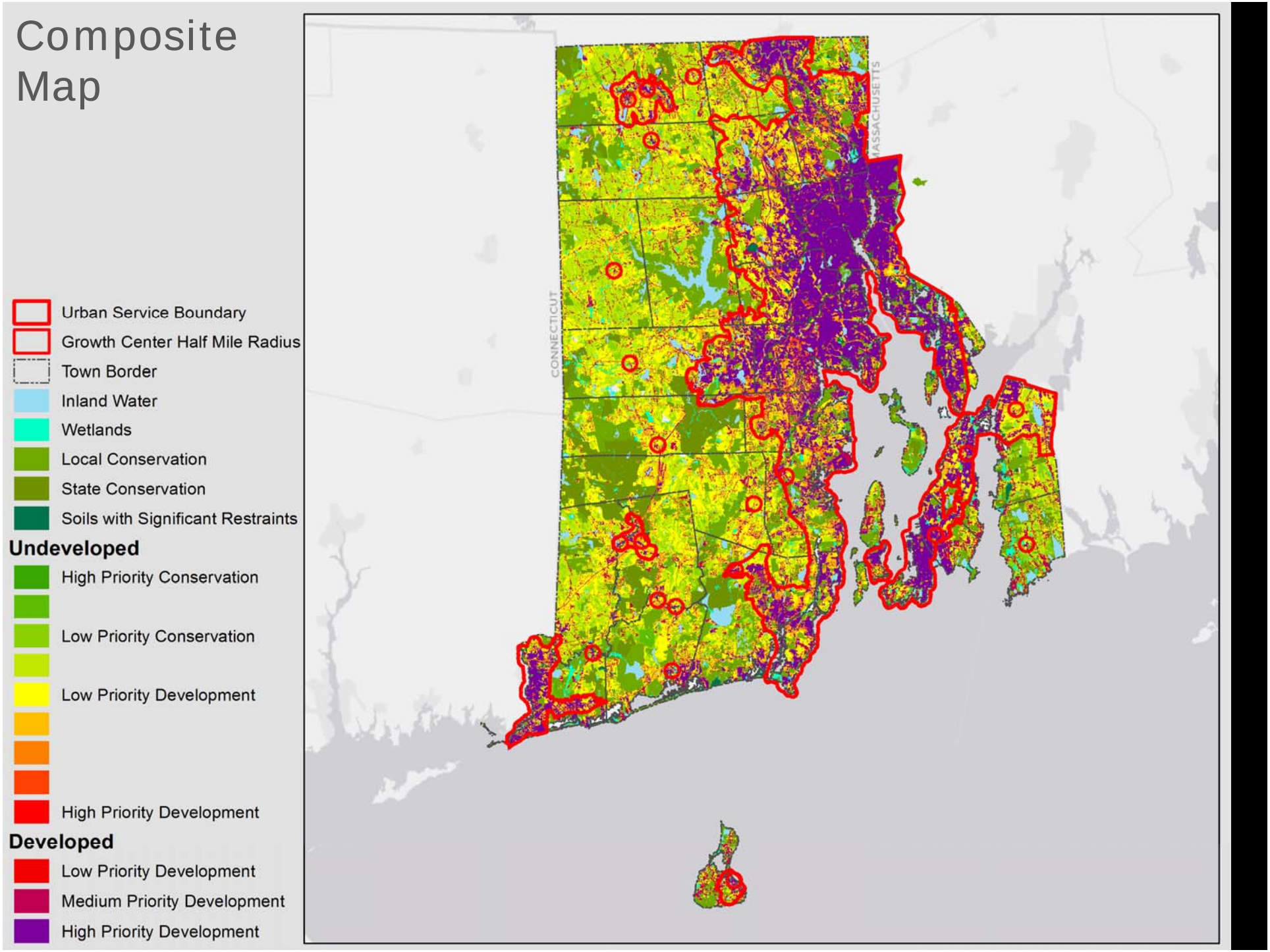


Urban Service Boundary
Growth Center Half Mile Radius
Town Border
Inland Water
Wetlands

Developed

Low Priority Development
Medium Priority Development
High Priority Development

Composite Map



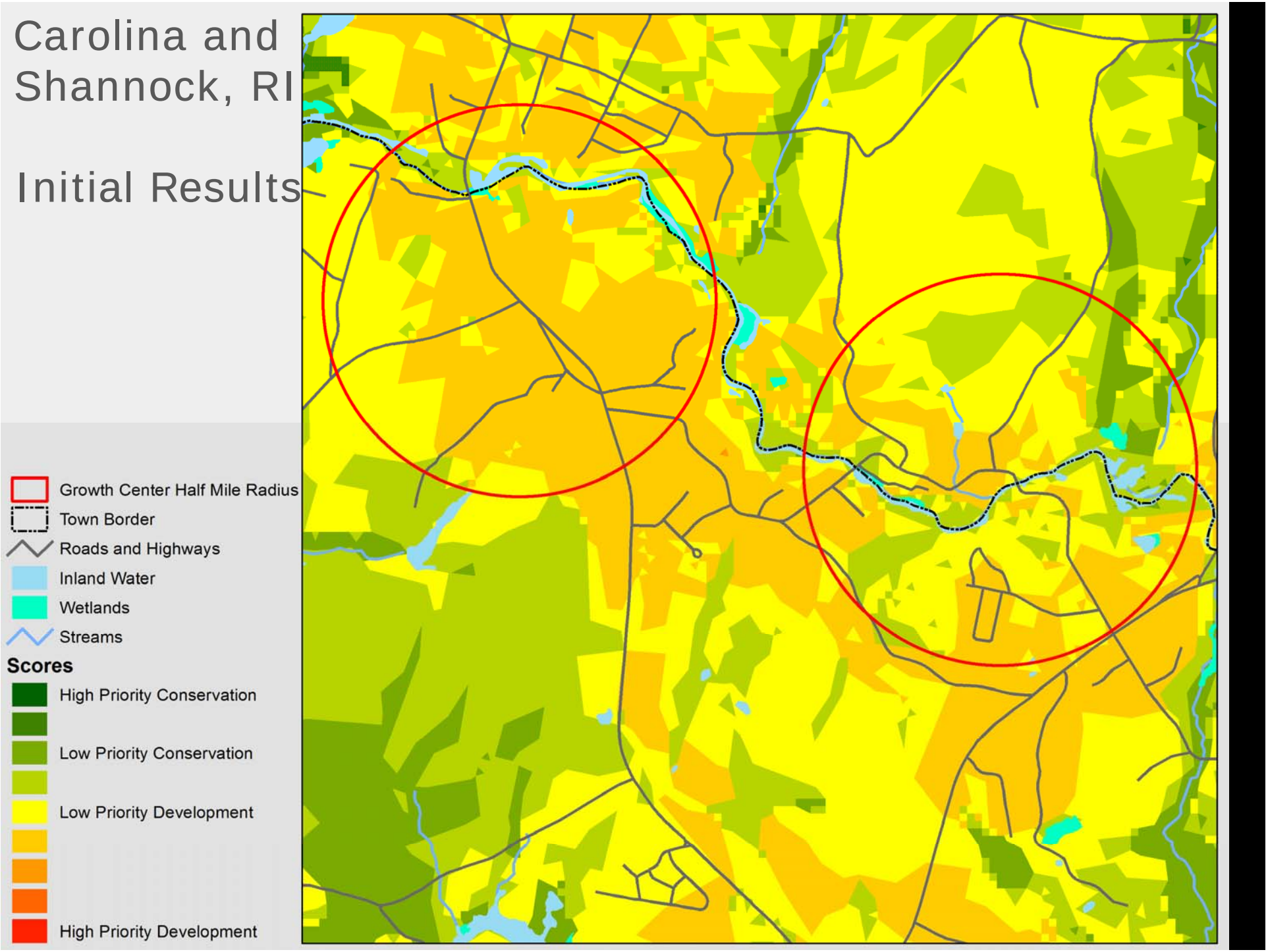
Carolina and Shannock, RI

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
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- Local Conservation
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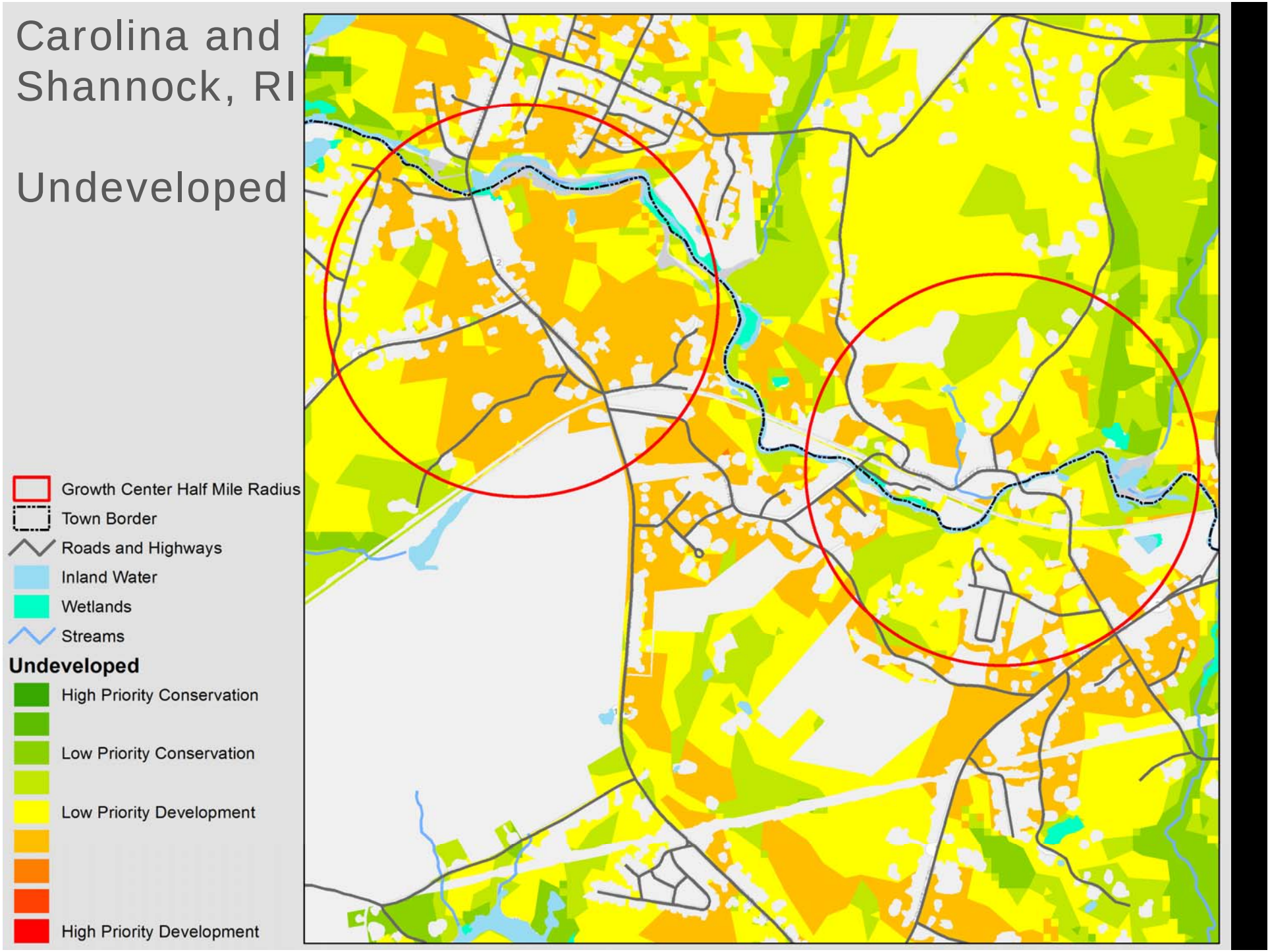
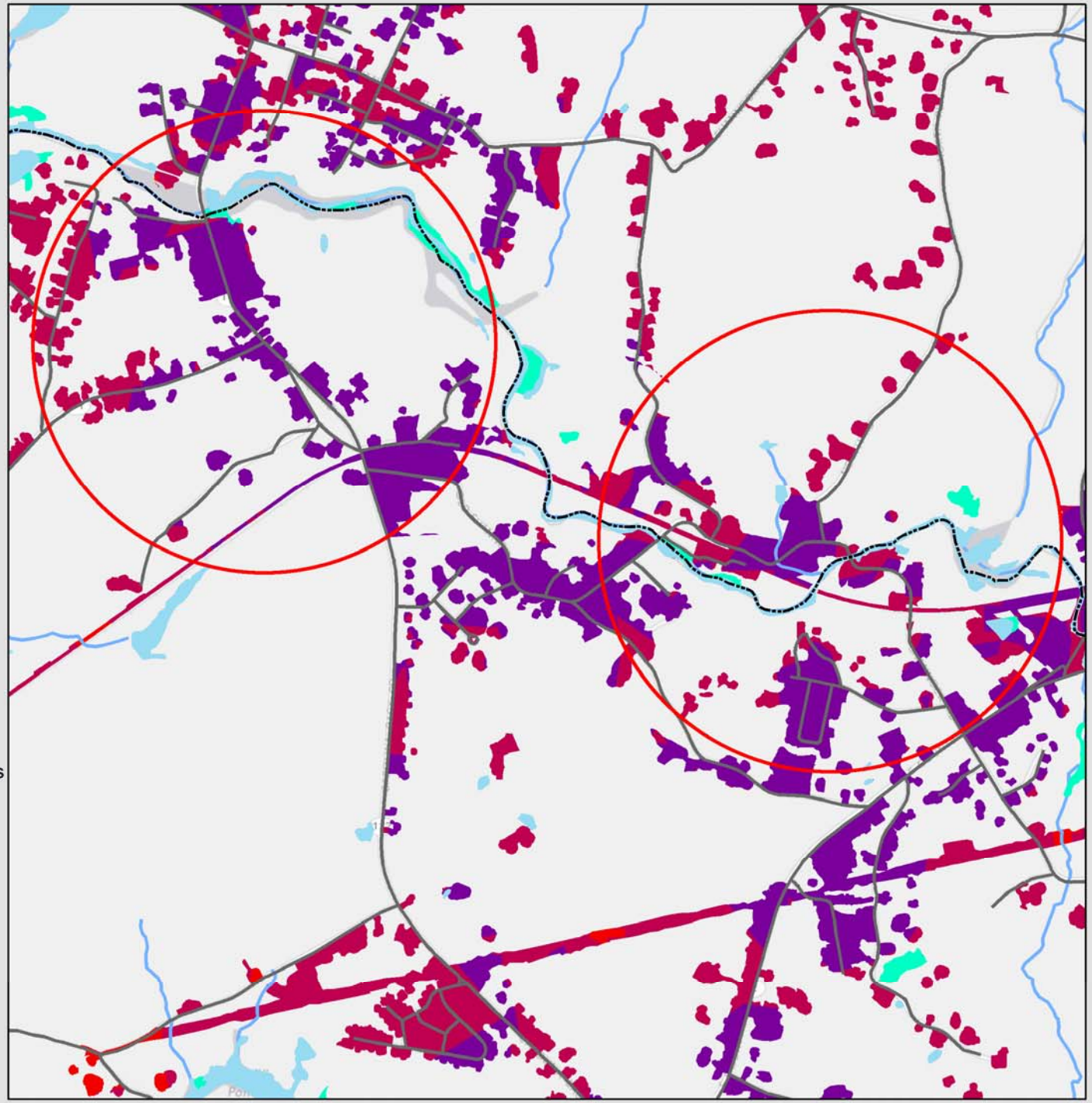
Carolina and Shannock, RI

Undeveloped



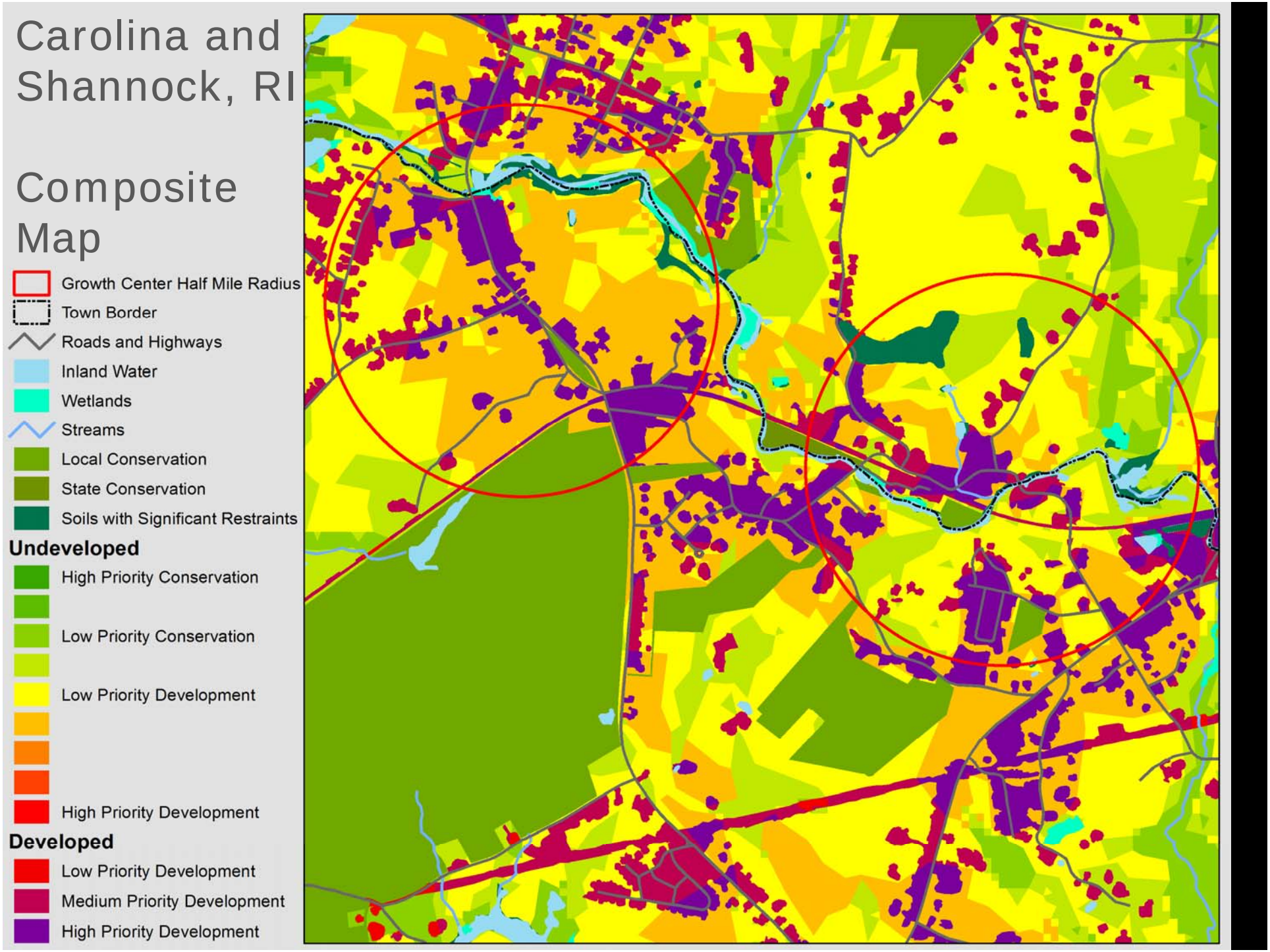
Carolina and Shannock, RI

Developed



Carolina and Shannock, RI

Composite Map



Thank you!

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Additional Questions email:
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