

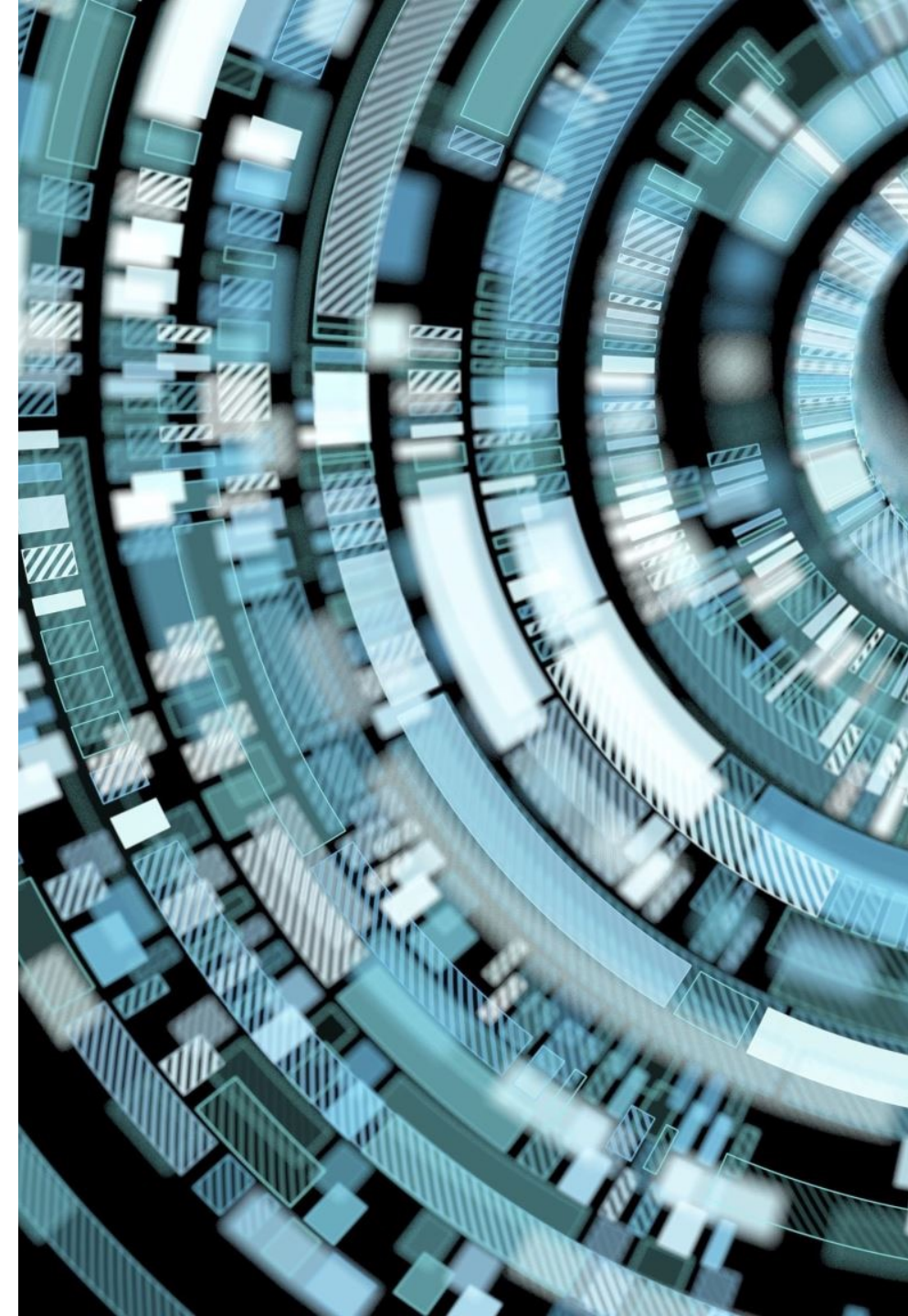
# Northern Westchester County DRAFT Wireless Telecommunications Infrastructure Master Plan

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## **Town of Lewisboro**

July 26, 2021

**CityScape**  
CONSULTANTS, INC.



# Northern Westchester County Wireless Tasks and Deliverables

Preliminary Research



Project Initiation Meeting



Infrastructure Assessments



Inventory Catalog



Engineering Mapping Analysis



Regulatory Review and Regulations

Potential Use of Public Property

Draft and Final Master Plan

# Wireless Telecommunications History



1G



2G & 3G



4G & 5G Enabled

- 1G service provided voice calls only.
- 2G service included voice, texting and data.
- 3G service offered in early 2000's improved data speeds (Providers retiring 1-3G CDMA in 2022).
- iPhone in 2007 offers thousands of applications and introduces smart phone technology.
- 4G service on AWS and LTE began around 2010 and increased data speeds; included new 700 and 2100 MHz frequencies (smaller handsets, Internet access, longer battery life).
- 5G service increases wireless bandwidth for faster transfer of data, Internet of Things (IoT).

# Quick Facts:

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- Over 49% of U.S. households have “cut the cord” and are wireless only
- 80% of an estimated 240 million 9-1-1 calls are made from wireless devices
- 45 million Americans use mobile phones as their primary Internet access device
- 2.4 million students connected
- Smart houses, smart cars, smart industry
- More use of data intensive applications such as Facetime, Internet, Streaming Music and HD Movies, Social Media, etc

The number 76% is displayed in a large, stylized font. The digits are composed of overlapping teal and lime green shapes. The percentage sign is a simple teal outline.

of travelers say a  
mobile phone is the most  
important trip accessory.

The number 85% is displayed in a large, stylized font. The digits are composed of overlapping teal and lime green shapes. The percentage sign is a simple teal outline.

of photos taken in 2017 were  
captured on a smartphone

The number 330% is displayed in a large, stylized font. The digits are composed of overlapping teal and lime green shapes. The percentage sign is a simple teal outline.

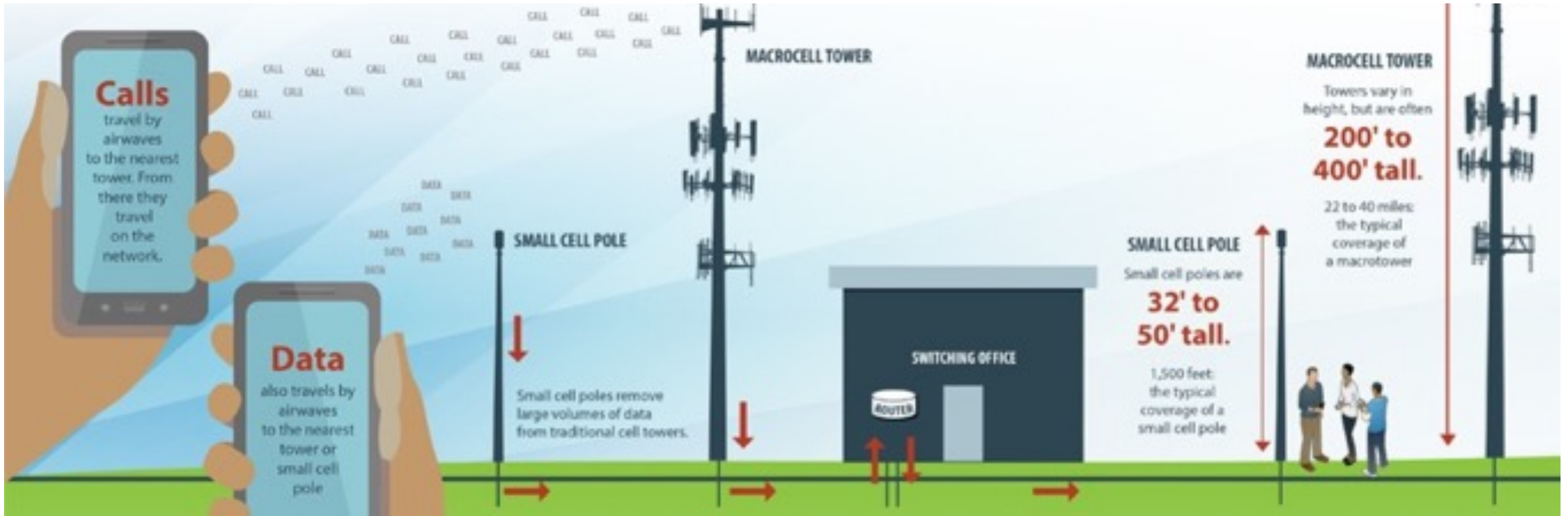
growth in health & fitness apps  
over the last three years.

The number 31B is displayed in a large, stylized font. The digits are composed of overlapping teal and purple shapes. The 'B' is a solid purple outline.

connected devices  
predicted by 2023.

Source: CTIA Wireless Quick Facts, 2019, 2020





# Wireless Network Planning/Mapping

MACRO AND SMALL WIRELESS FACILITIES FOR SEAMLESS CONNECTIVITY



Site L4



Site L6



Site S7

# Lewisboro Macro Tower Sites





Site Y2



Site B2



Site O14

# Lewisboro Base Station Sites



# Small Wireless Facility Sites



A black pushpin is stuck into a blue map grid. The grid consists of a network of thin, dark blue lines forming a complex, interconnected pattern. The pushpin's sharp point is visible, piercing the grid. The word "Mapping" is written in white, sans-serif font, centered horizontally and partially overlaid by a thin white horizontal line.

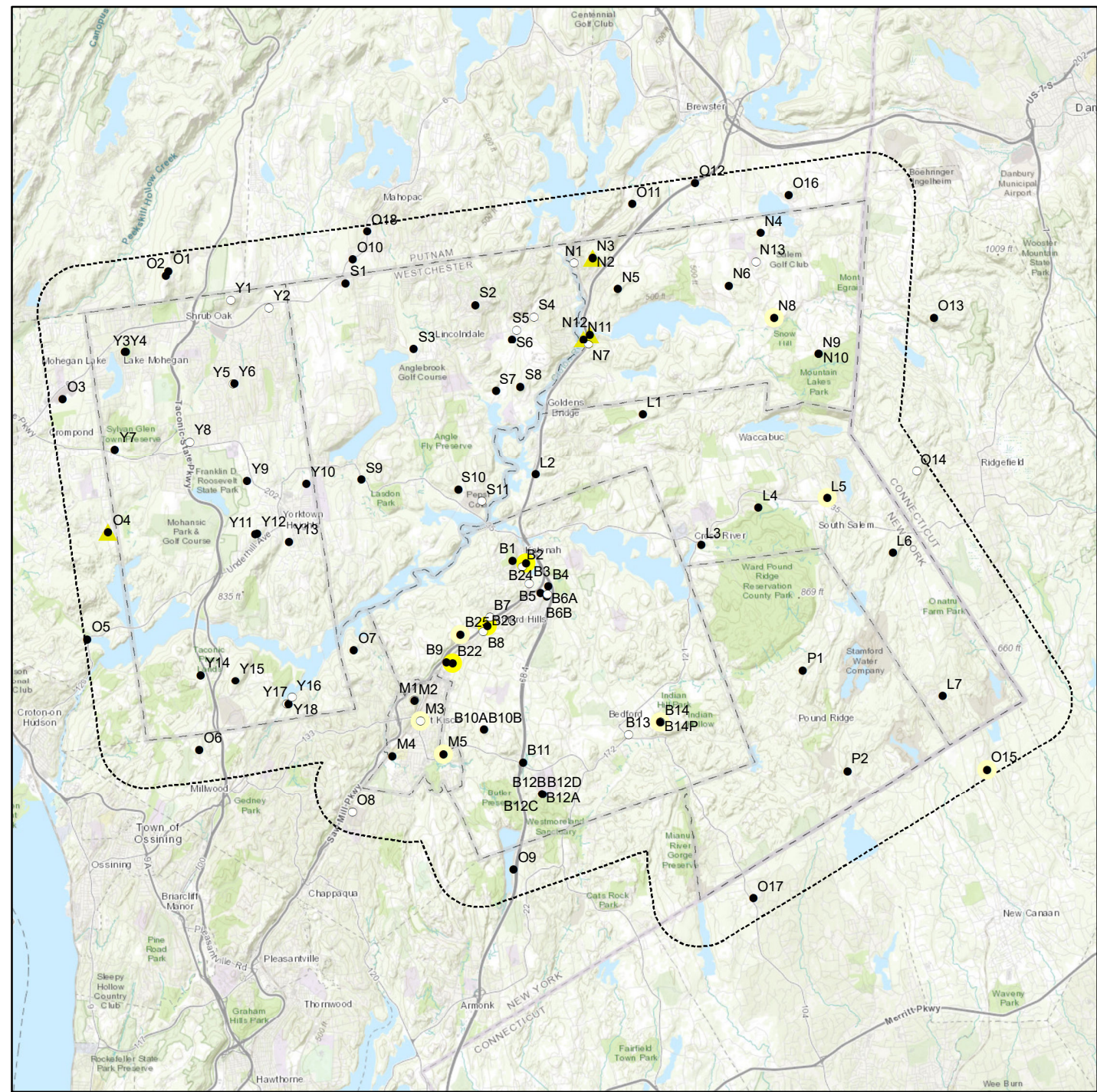
Mapping



# Northern Westchester County Inventory

- Town of Bedford: 21
- Town of Lewisboro: 7
- Town/Village of Mount Kisco: 5
- Town of North Salem: 13
- Town of Pound Ridge: 2
- Town of Somers: 11
- Town of Yorktown: 18
- One-Mile Perimeter: 18

## (95) Total Wireless Facilities





# Inventory by Structure Type

## Towers in Lewisboro (7)

- 6 Existing
- 1 Proposed and under review

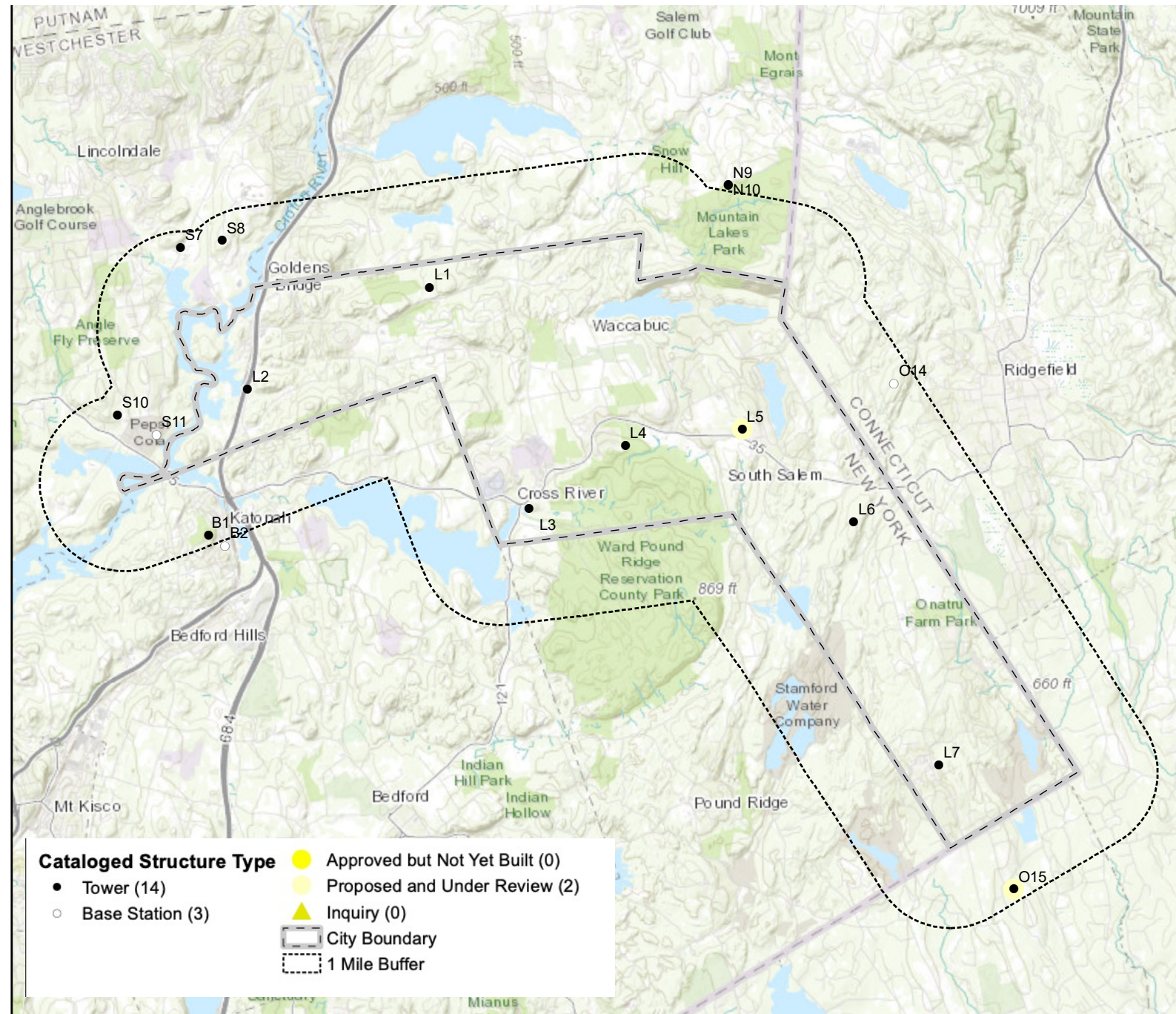
## Towers in one-mile perimeter (7)

- 6 Existing
- 1 Proposed and under review

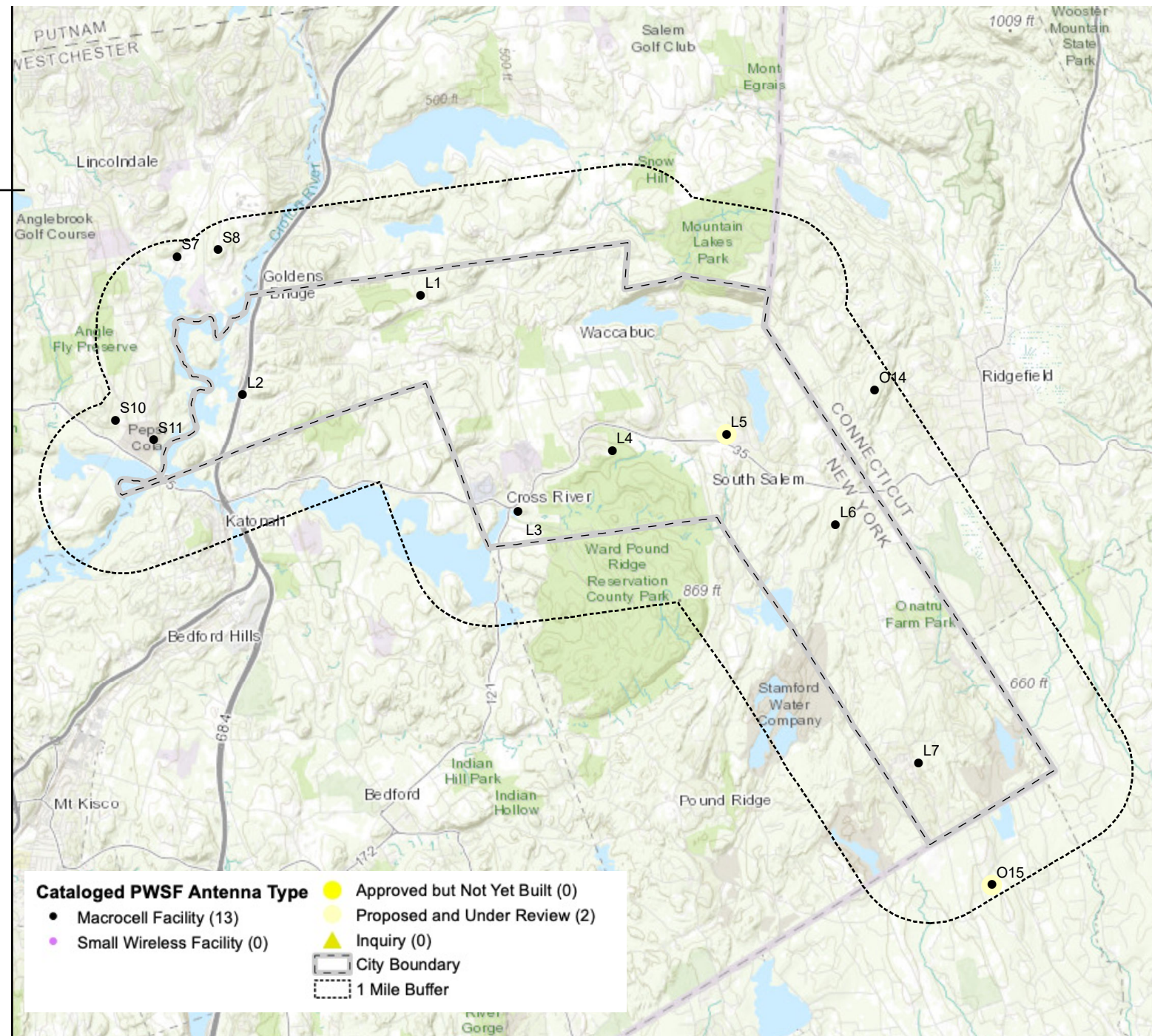
## Base Stations in one-mile perimeter (3)

- 3 Existing

## 17 PWSF Sites In Study Area









# Inventory by All Antenna Type

## Macro facilities in Lewisboro (6)

- 5 Existing
- 1 Proposed and under review

## Macro facilities in one-mile perimeter (4)

- 3 Existing
- 1 Proposed and under review

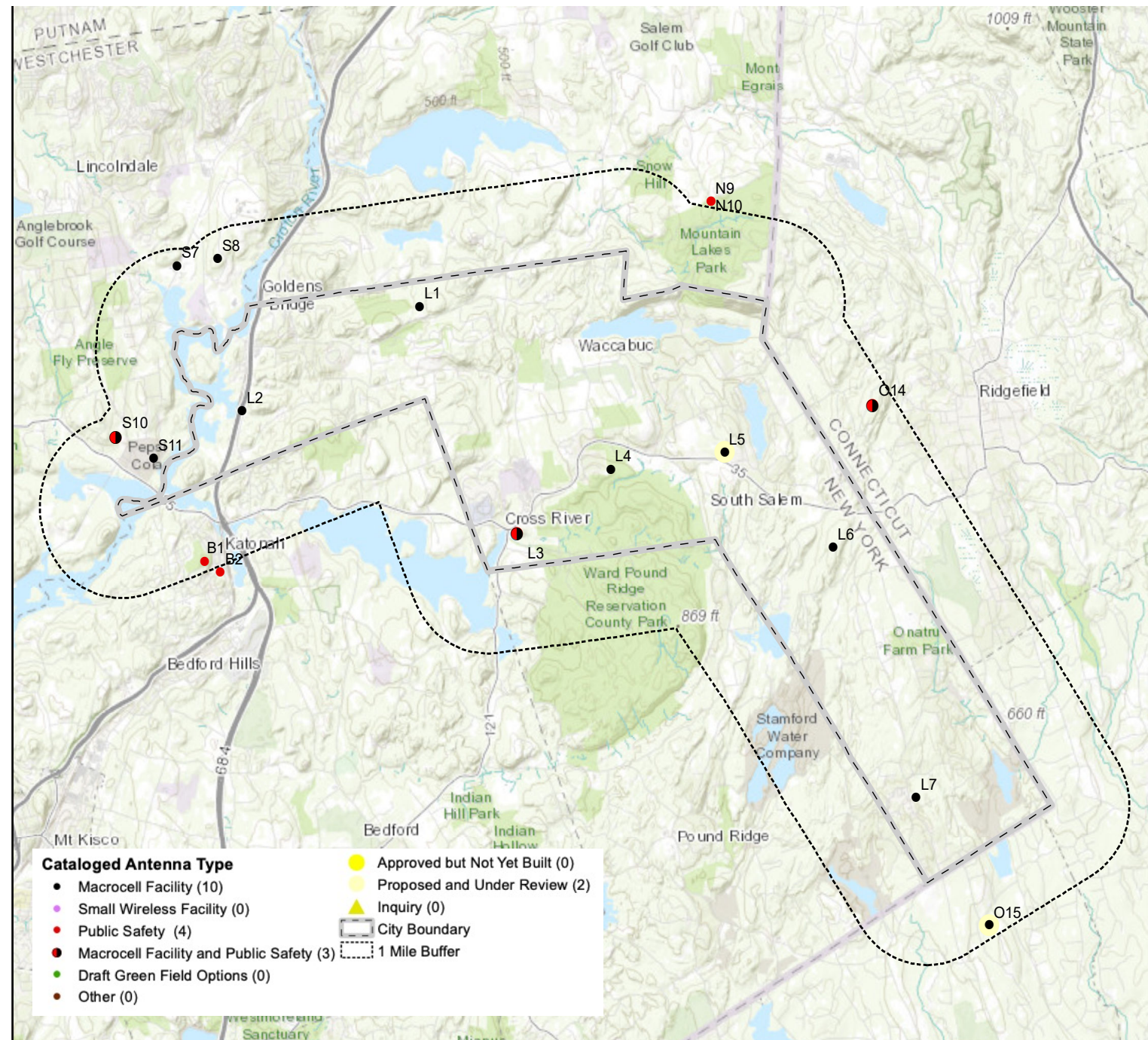
## Small wireless facilities (0)

## Public safety in one-mile perimeter (4)

## Public safety and macro (3)

- Lewisboro – 1 existing
- One-mile perimeter – 2 existing

## 17 PWSF Sites In Study Area





# Inventory by Location

## Private property (8)

- 3 Existing in Lewisboro
- 4 Existing in one-mile perimeter
- 1 Proposed and under review in one-mile perimeter

## Inside Rights-of-Way (1)

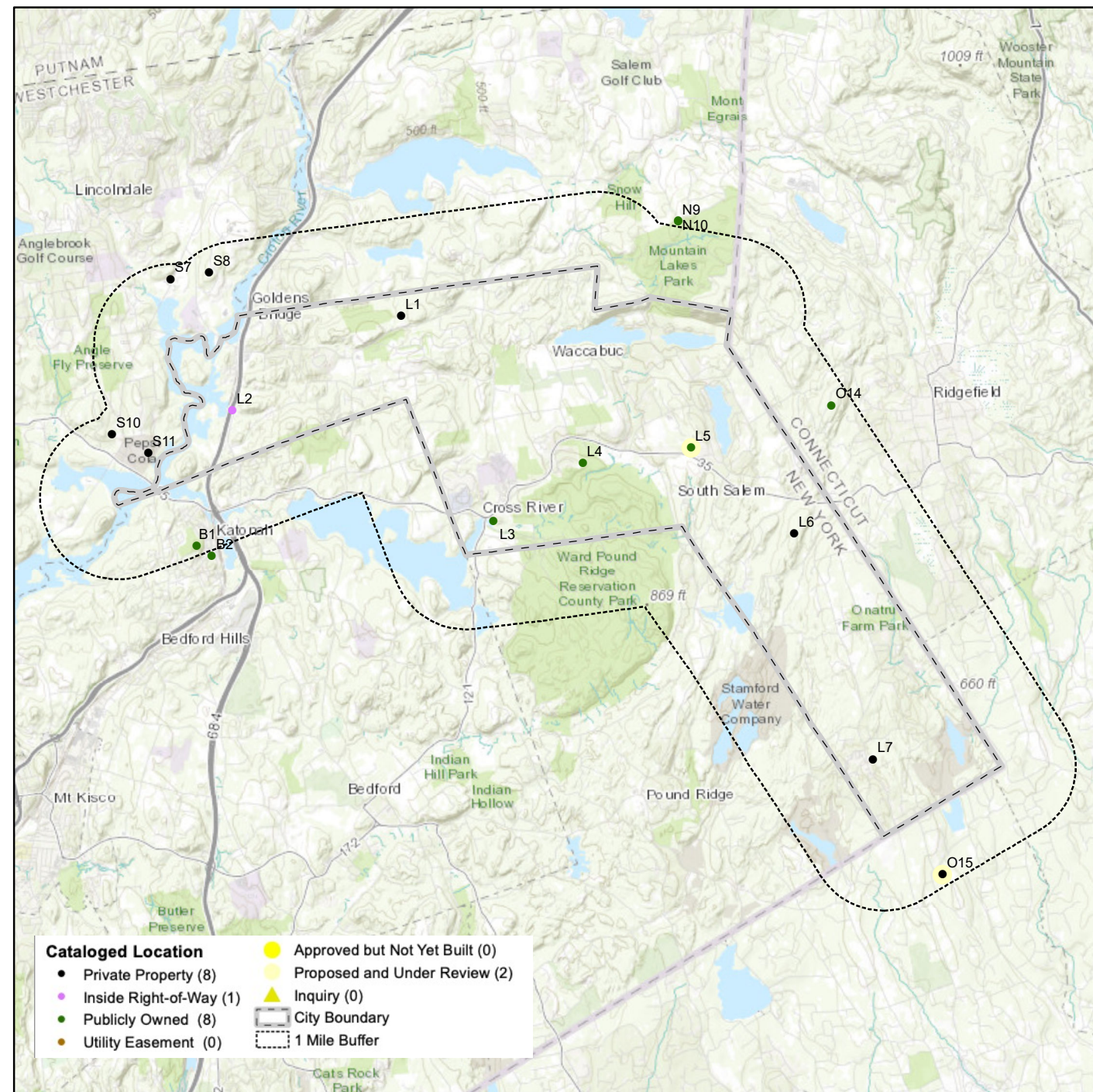
- 1 Existing in Lewisboro

## Public Property (8)

- 2 Existing in Lewisboro
- 1 Proposed and under review in Lewisboro
- 5 existing in one-mile perimeter

## Utility Easement (0)

### 17 PWSF Sites In Study Area





# Inventory by Design Type

## Concealed in Lewisboro (1)

- 1 Proposed and under review

## Concealed in one-mile perimeter (2)

- 1 Existing
- 1 Proposed and under review

## Semi-Concealed in one-mile perimeter (1)

- 1 Existing

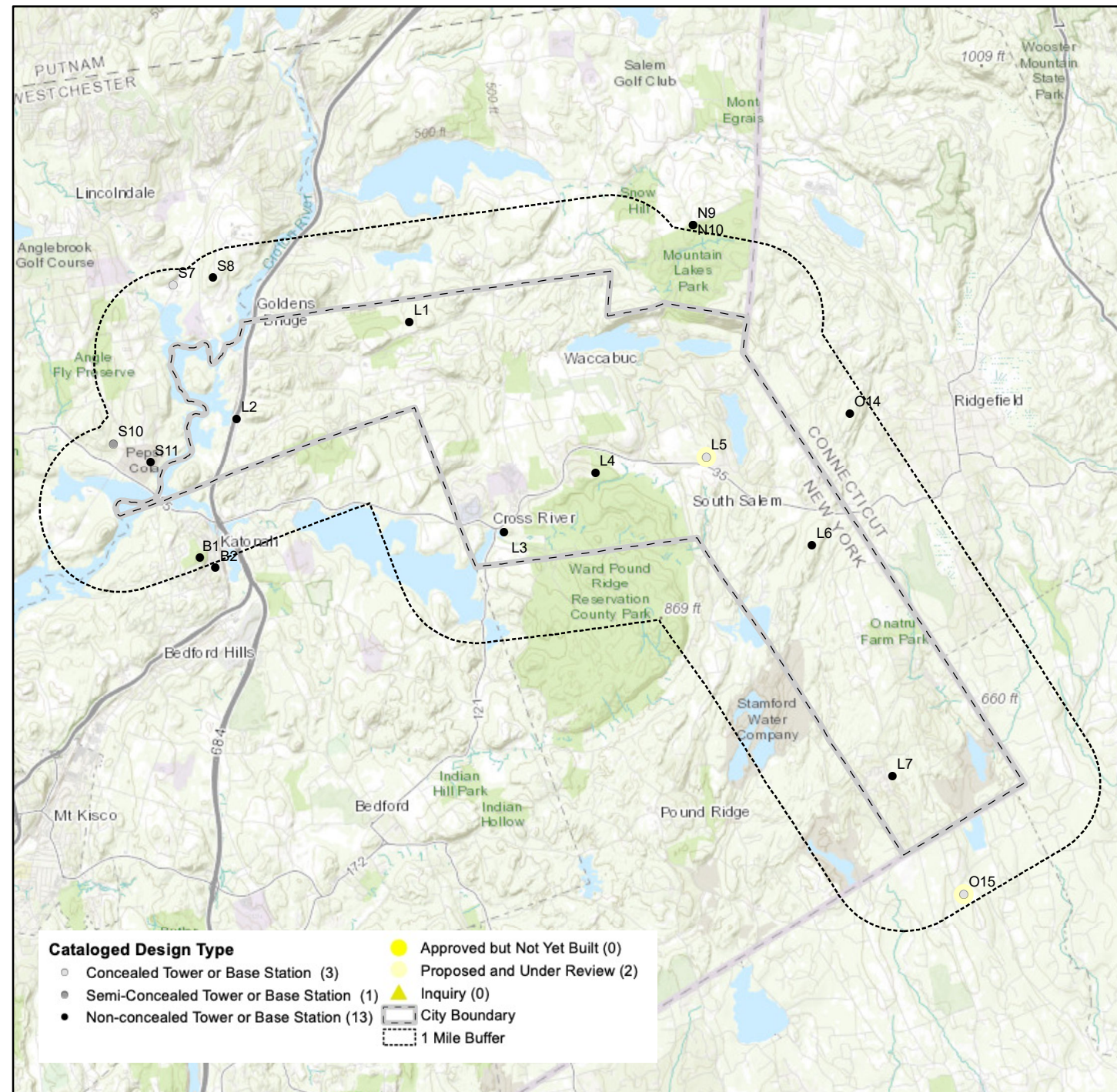
## Non-Concealed in Lewisboro (6)

- 6 Existing

## Non-Concealed in one-mile perimeter (7)

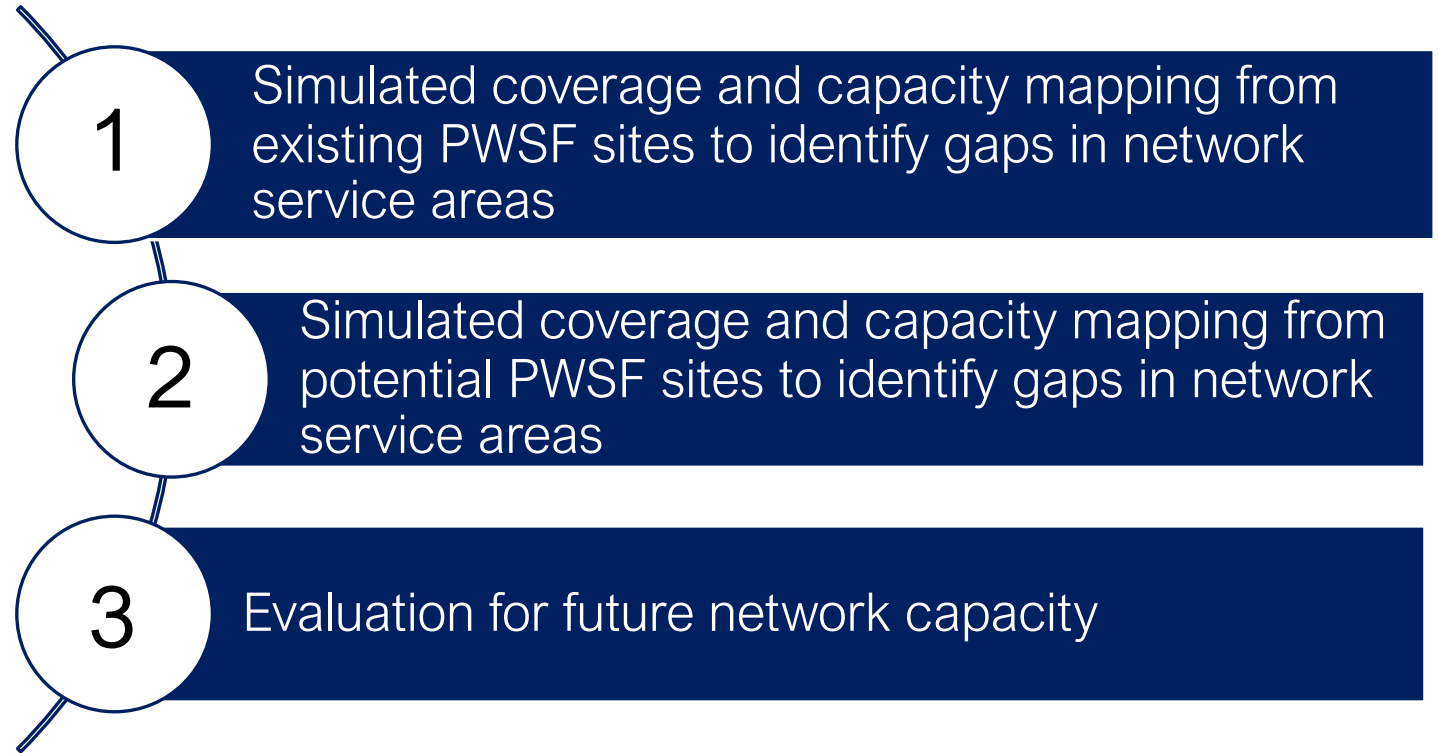
- 7 Existing

## 17 PWSF Sites In Study Area





# Simulated Propagation Coverage Maps





# Coverage Map For A Single Provider

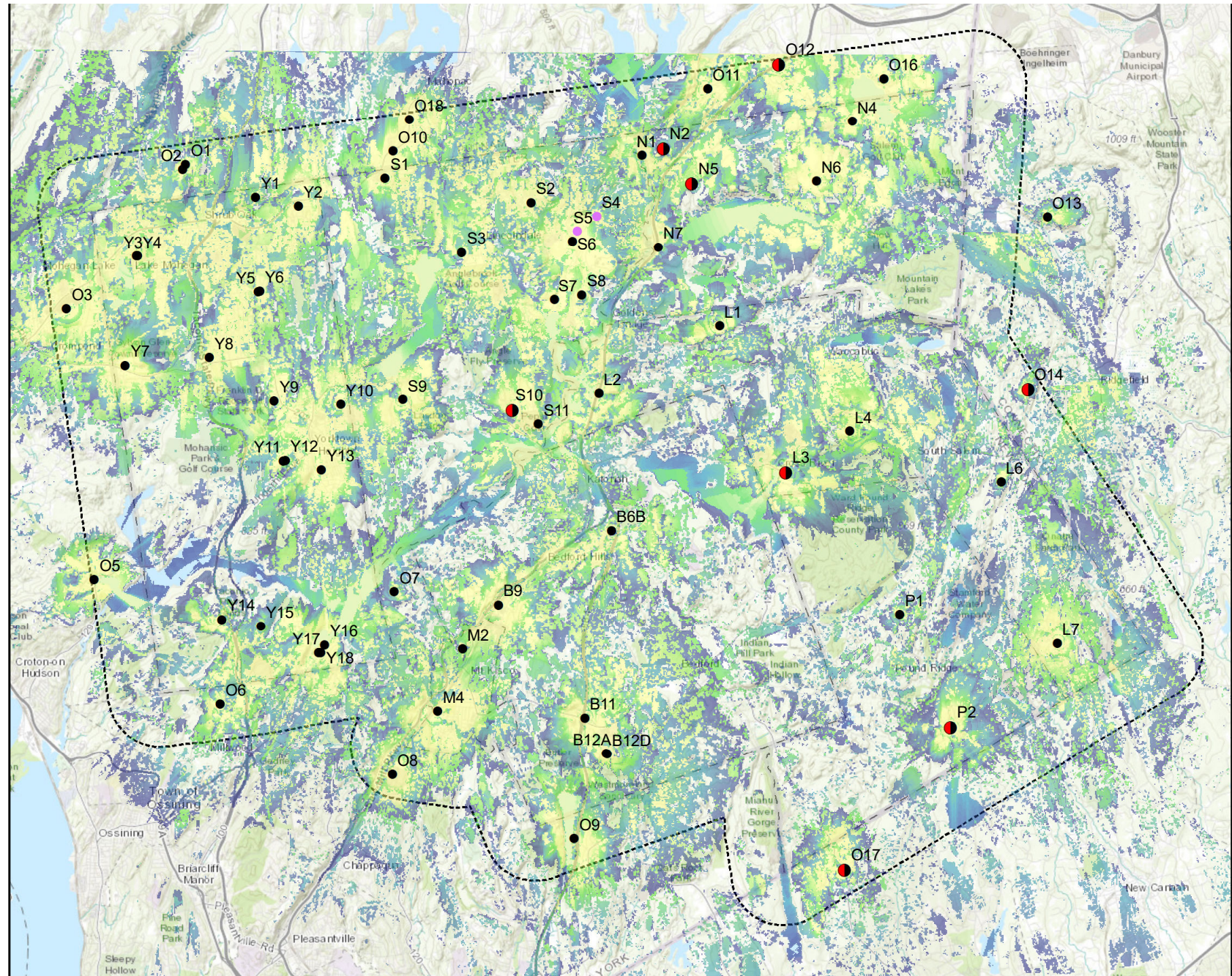
- High frequency coverage map
- Assumes same provider at each site
- Level of propagation signal strength is shown through the gradation of colors from yellow to blue or no color

→ **Yellow** – superior; strong enough to operate within most buildings

→ **Green** – average; strong enough to operate in vehicle but not inside most buildings

→ **Blue** – acceptable; strong enough to operate outside but not in most vehicles or buildings

→ **No color** – poor; no service or dropped calls; gaps where new sites will be needed





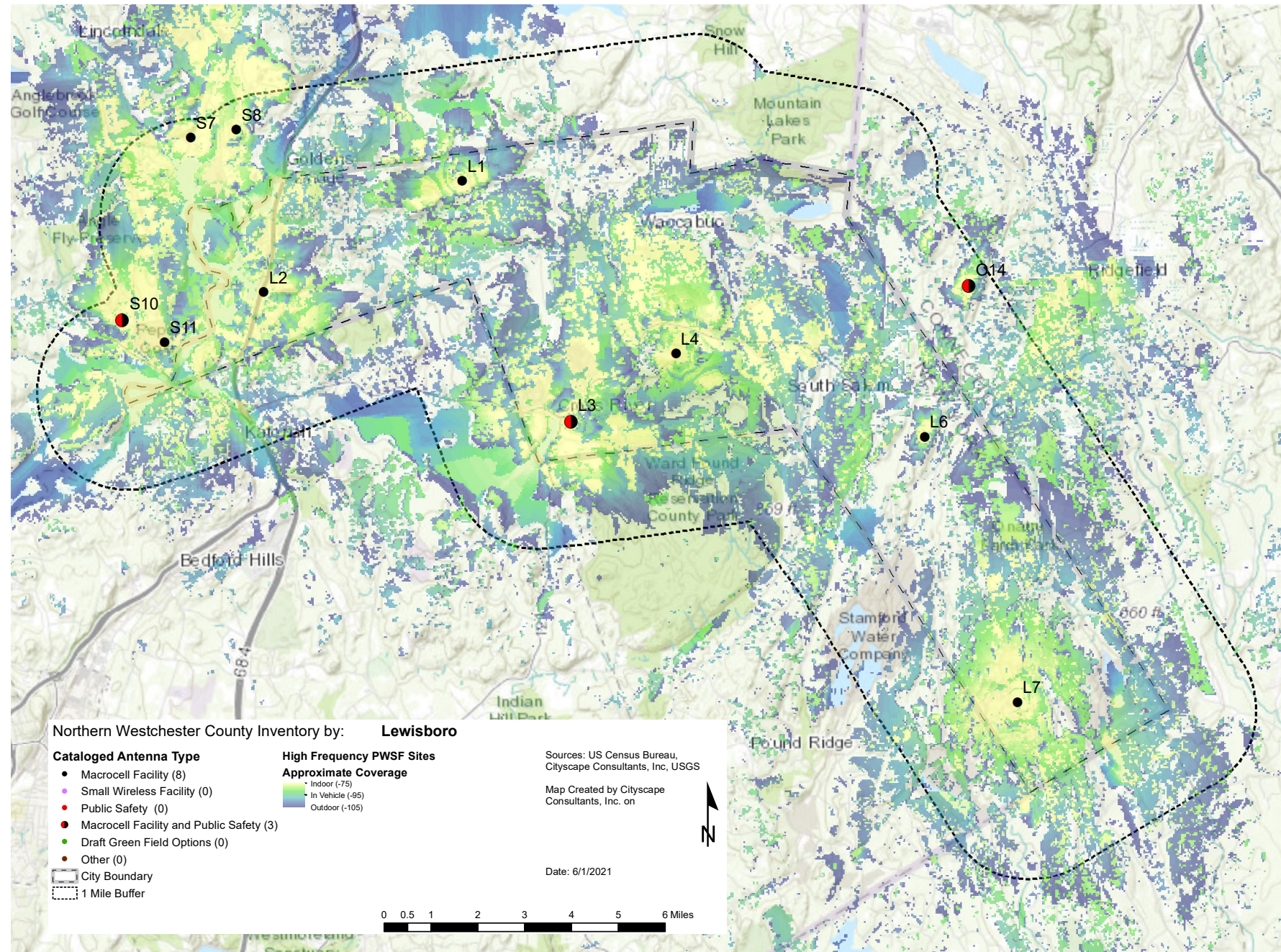
# Coverage Map

## Lewisboro Study Area

### Site Numbers in Study Area

- L1
- L2
- L3
- L4
- L6
- L7
- S7
- S8
- S10
- S11
- O14

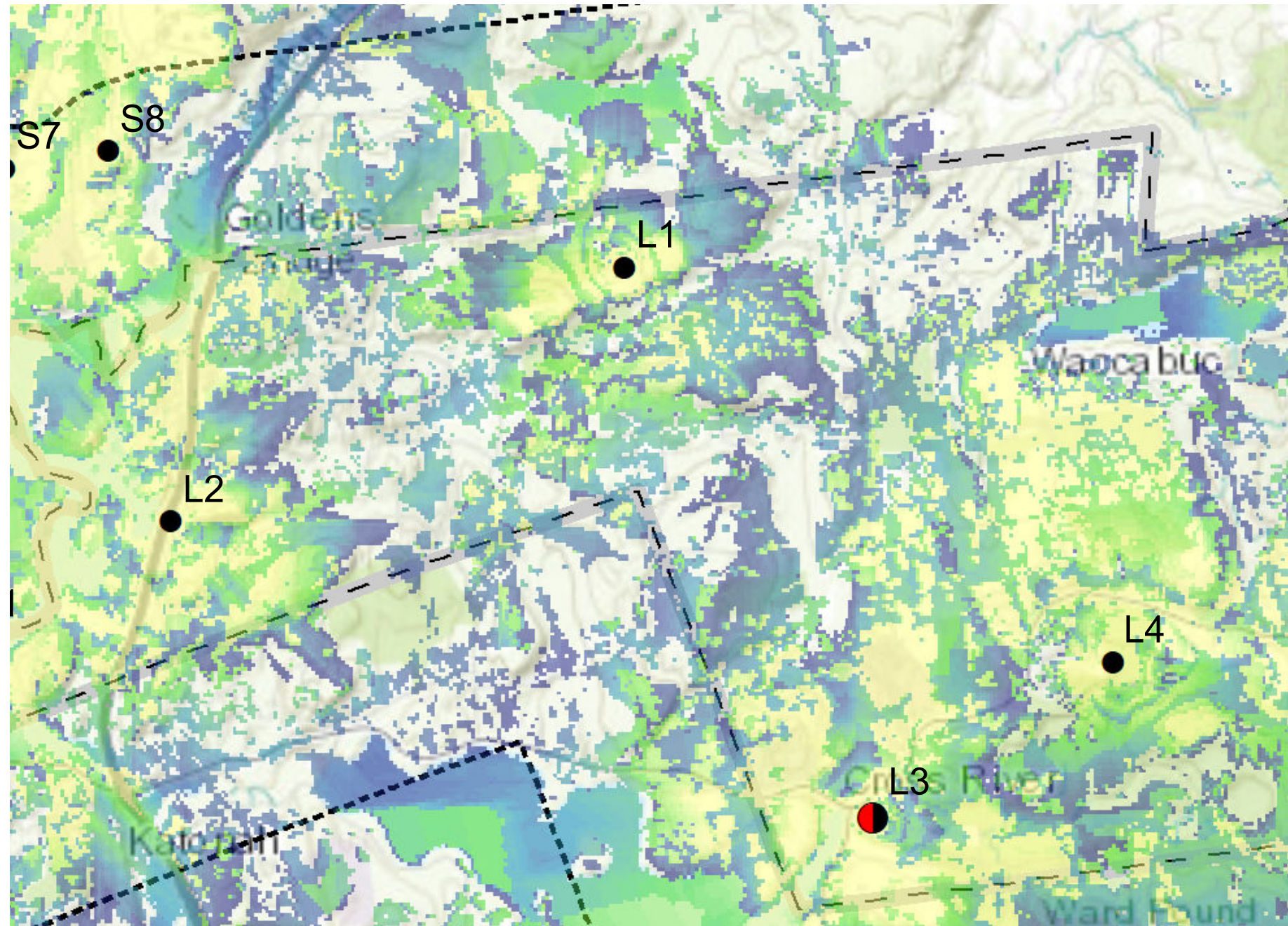
### 11 Sites in Study Area





# Coverage Map For All PWSF Sites

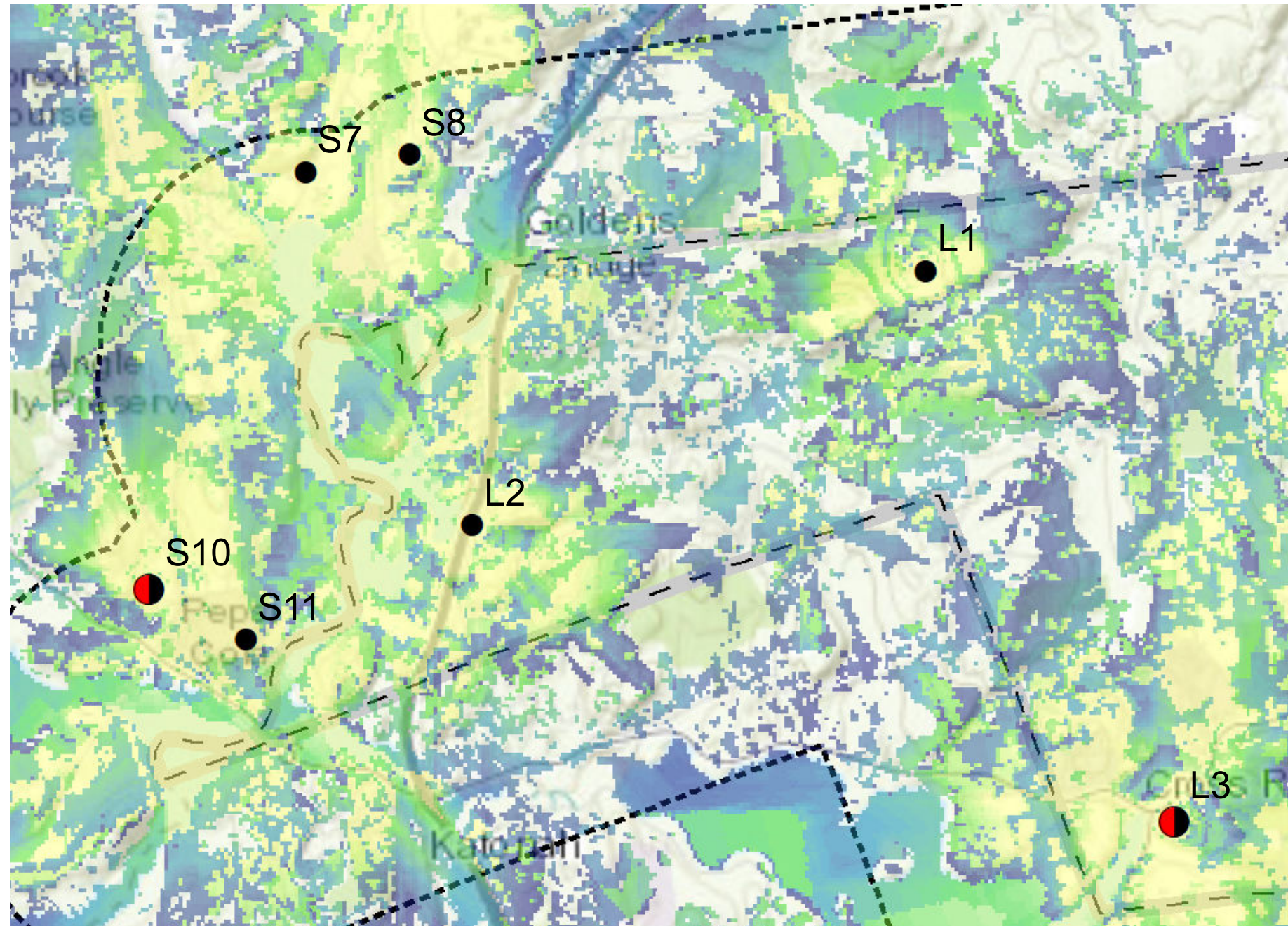
→ L1 is at the Northern town line with poor handoff to S8, L2, L3 and L4. Many gaps in services in and around this area.





# Coverage Map For All PWSF Sites

→ L2 is parallel to I-684  
with good handoff to  
sites in Somers but  
not to other  
Lewisboro sites

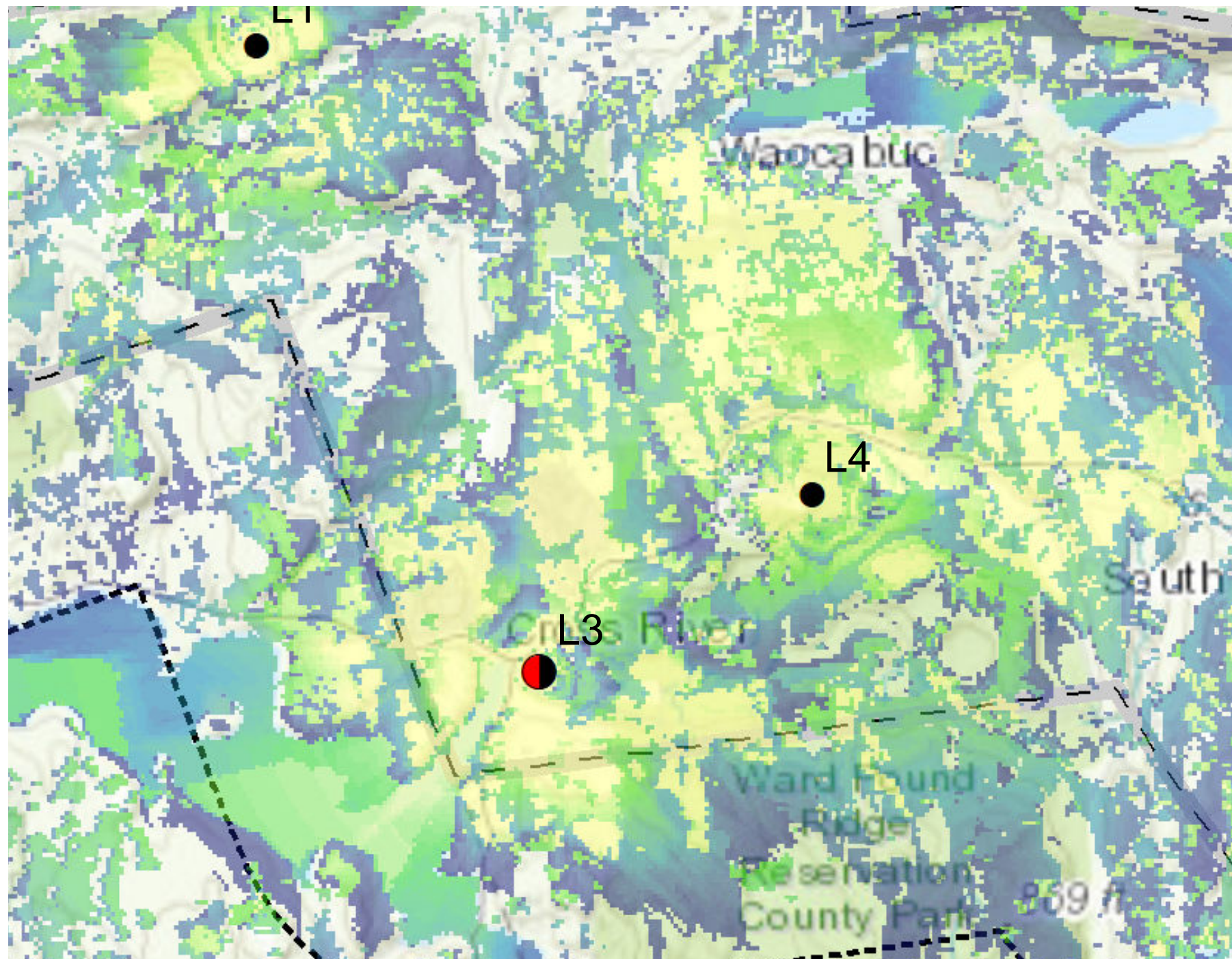




# Coverage Map For All PWSF Sites

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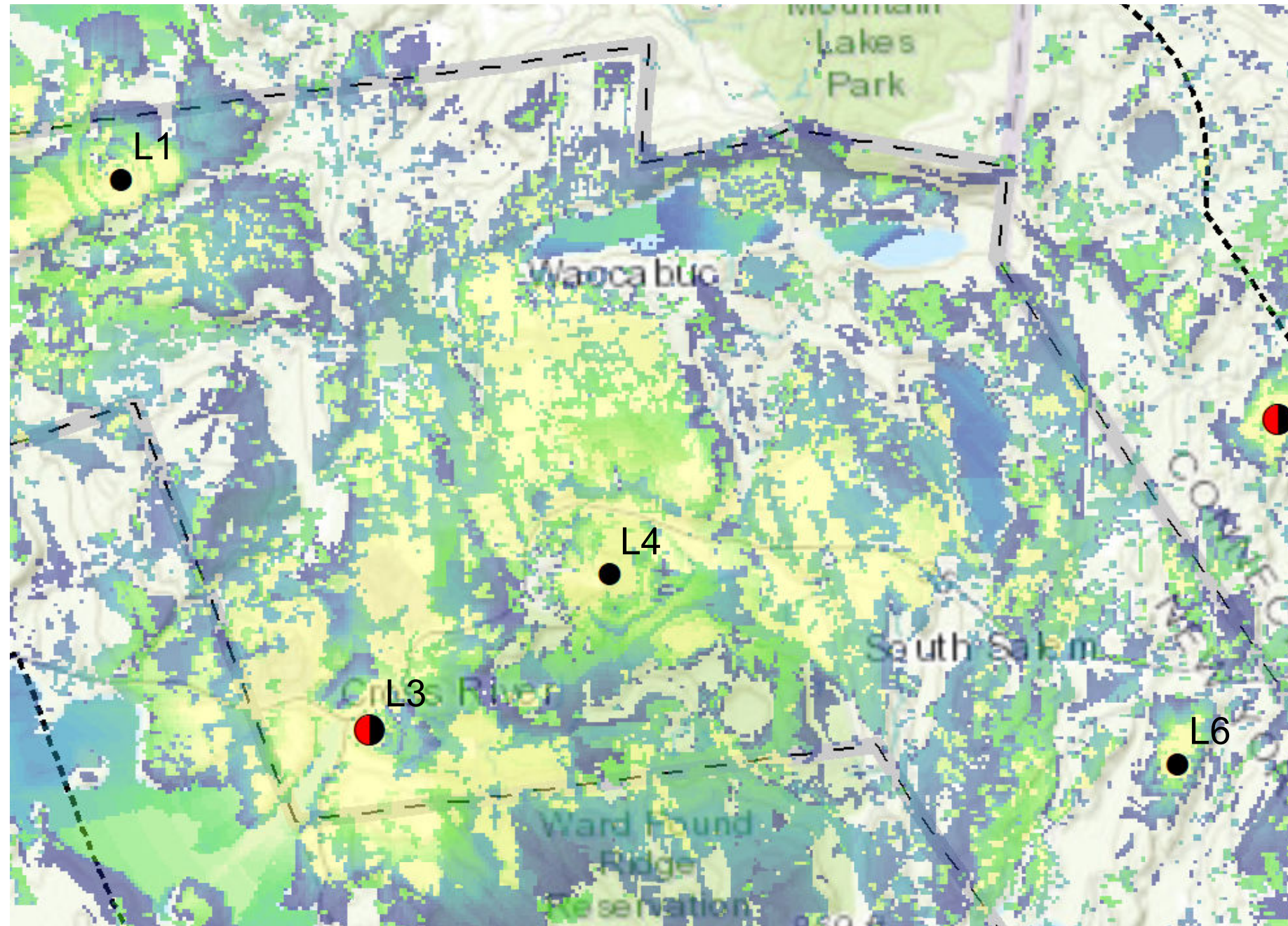
→ L3 gaps in handoff to  
L4 and to L1





# Coverage Map For All PWSF Sites

→ L4 gaps in handoff to  
L3, L1 and L6

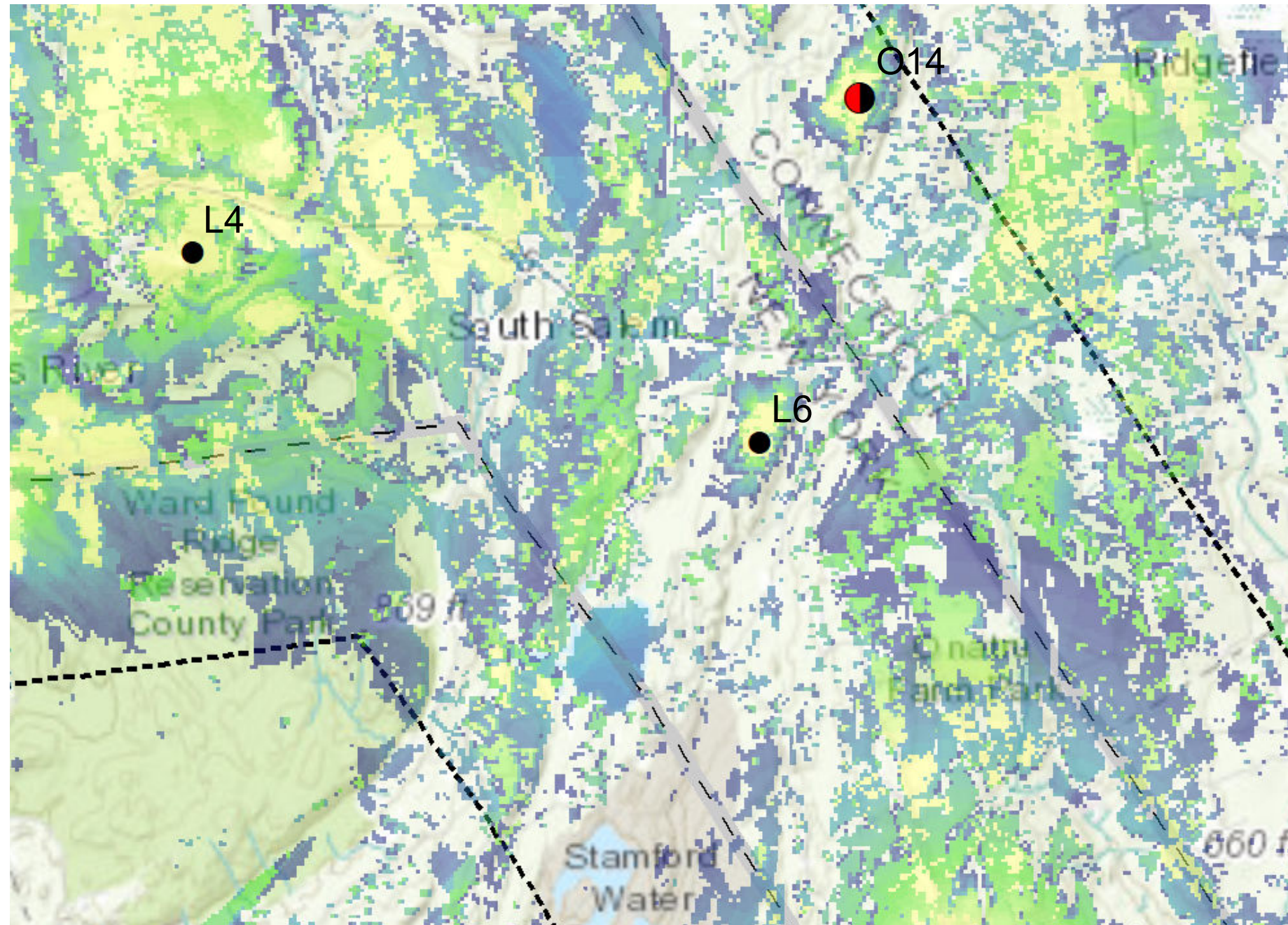




# Coverage Map For All PWSF Sites

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→ L6 has a small coverage area; the assumption is the coverage in the valley is perhaps due to the beam tilt of the antennas

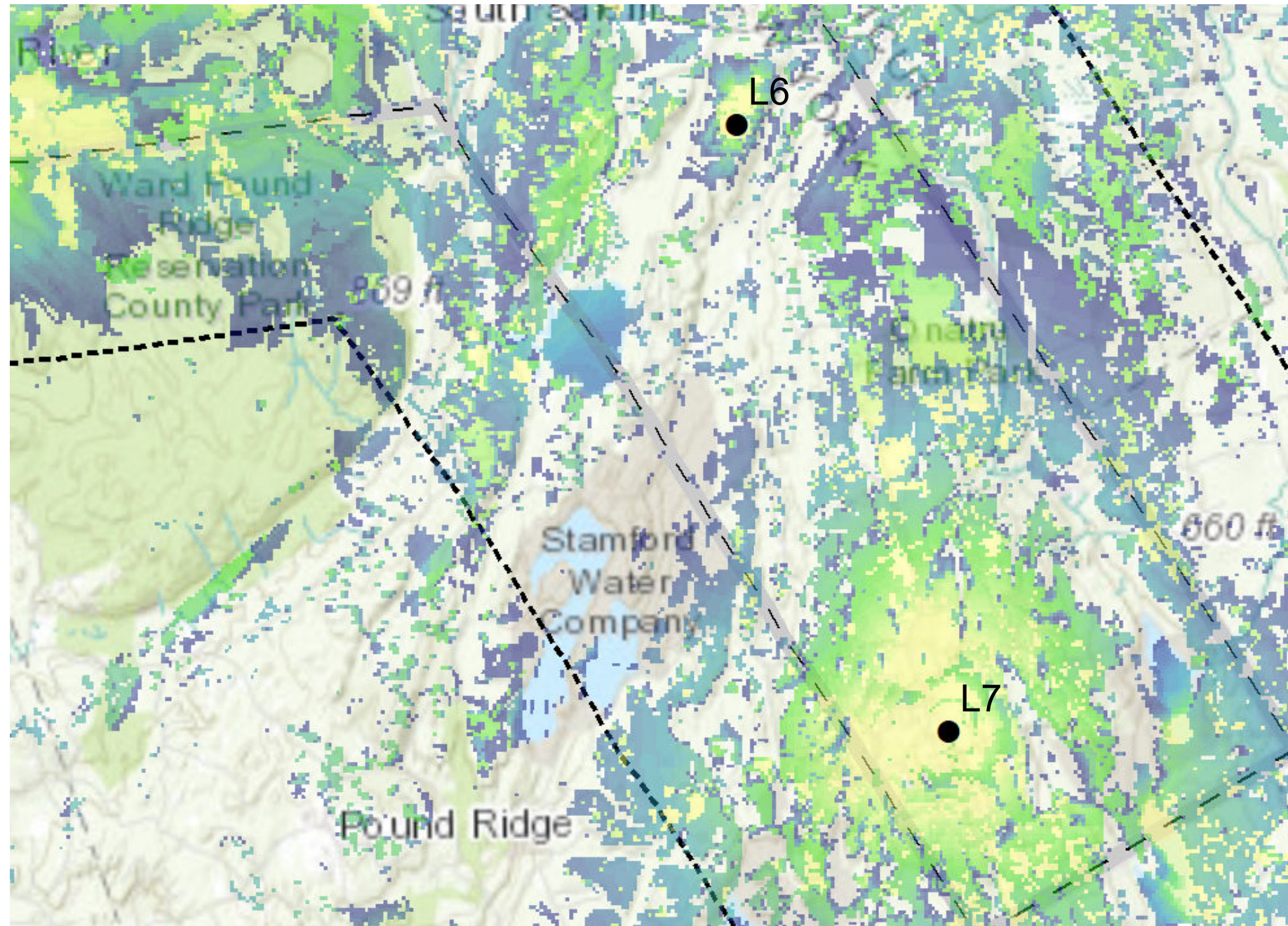




# Coverage Map For All PWSF Sites

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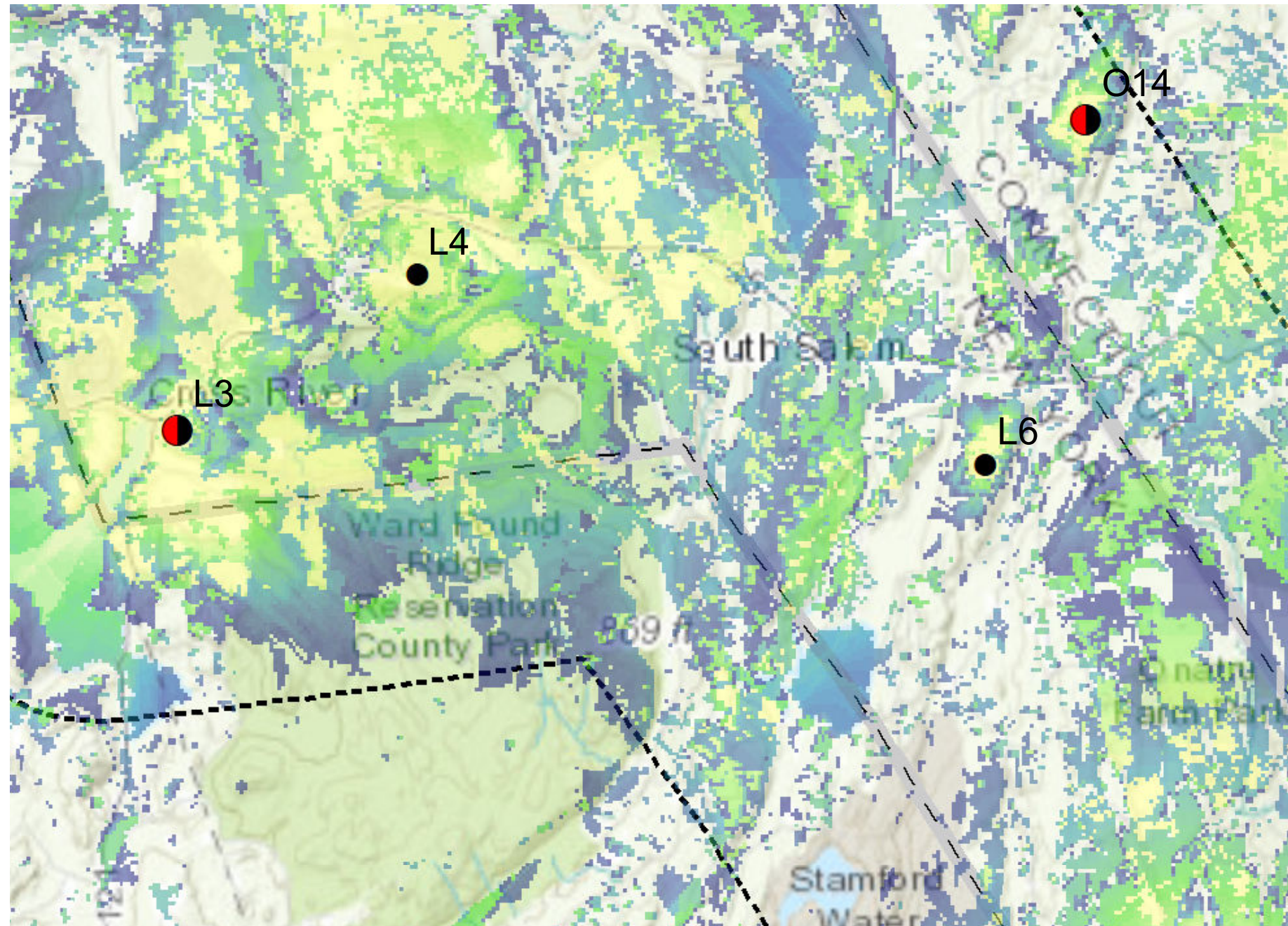
→ L7 provides good coverage to the southwest corner of Town but significant gaps in handoff to L6





# Coverage Map For All PWSF Sites

→ L3- L6 only provides  
minimal coverages  
along Rt 35 (Cross  
River Rd)

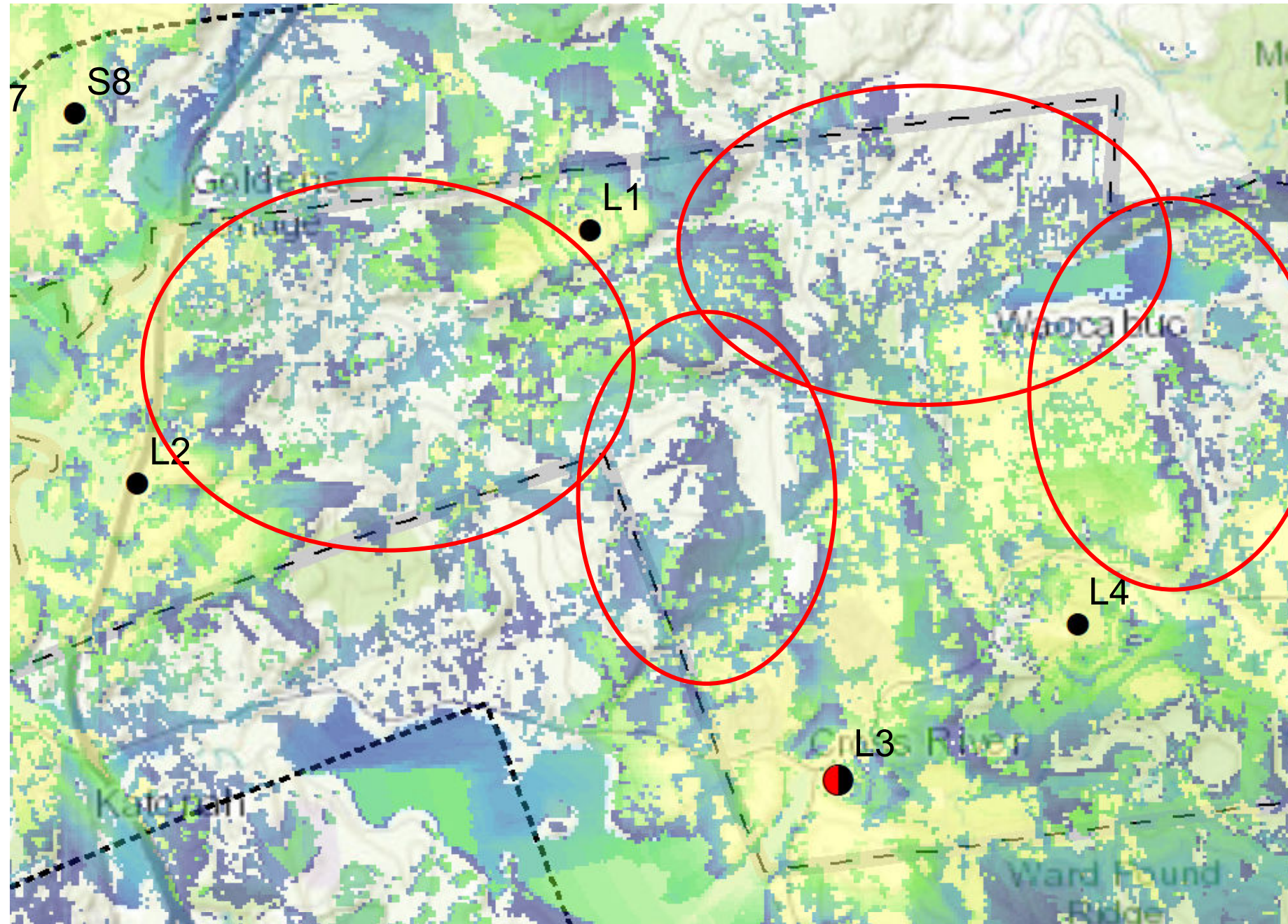




# Coverage Map For All PWSF Sites

## North Side of Town Summery

- Many gaps in coverages throughout the Town as indicated with areas with no color
- New sites are needed to improve network connectivity between sites

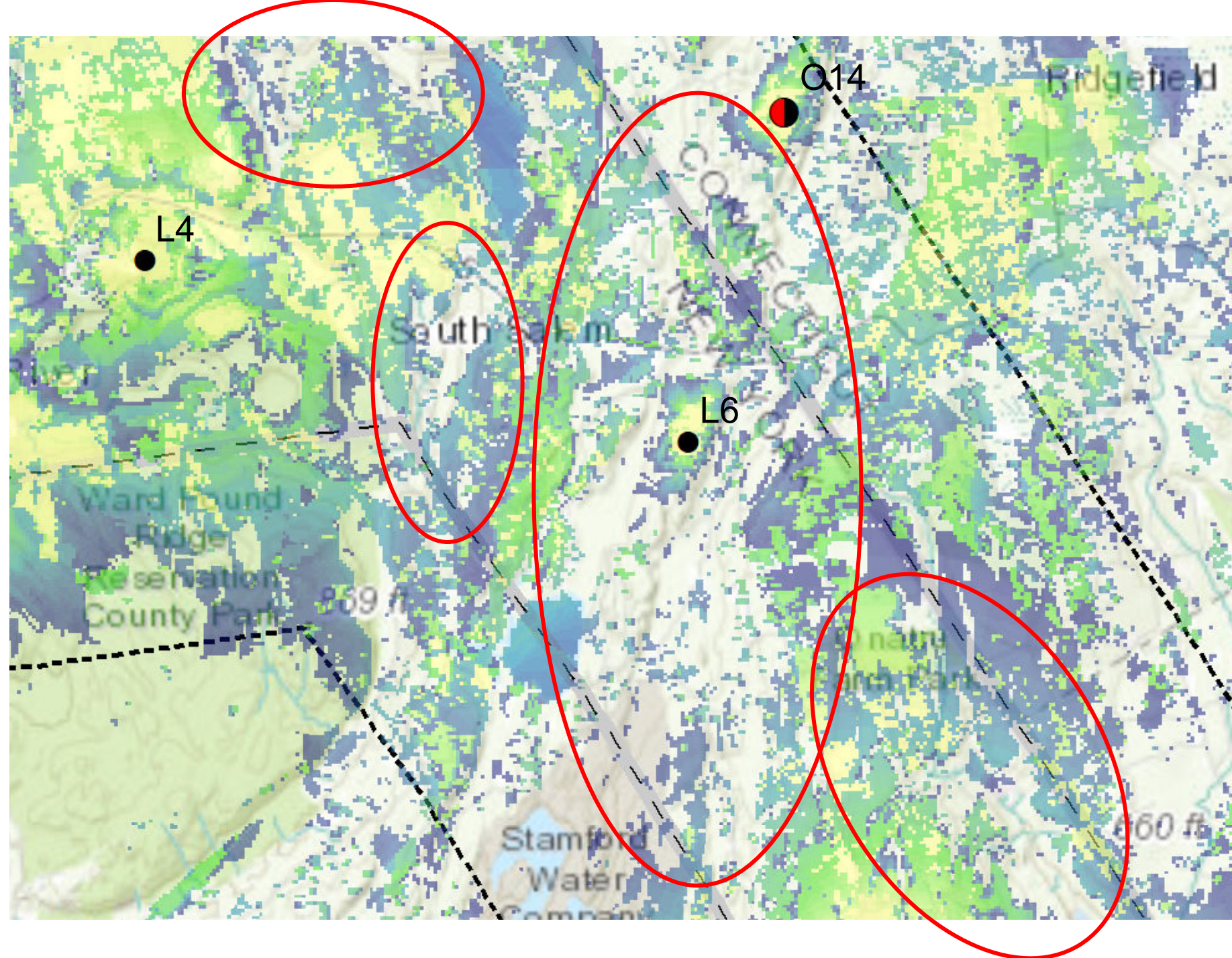




# Coverage Map For All PWSF Sites

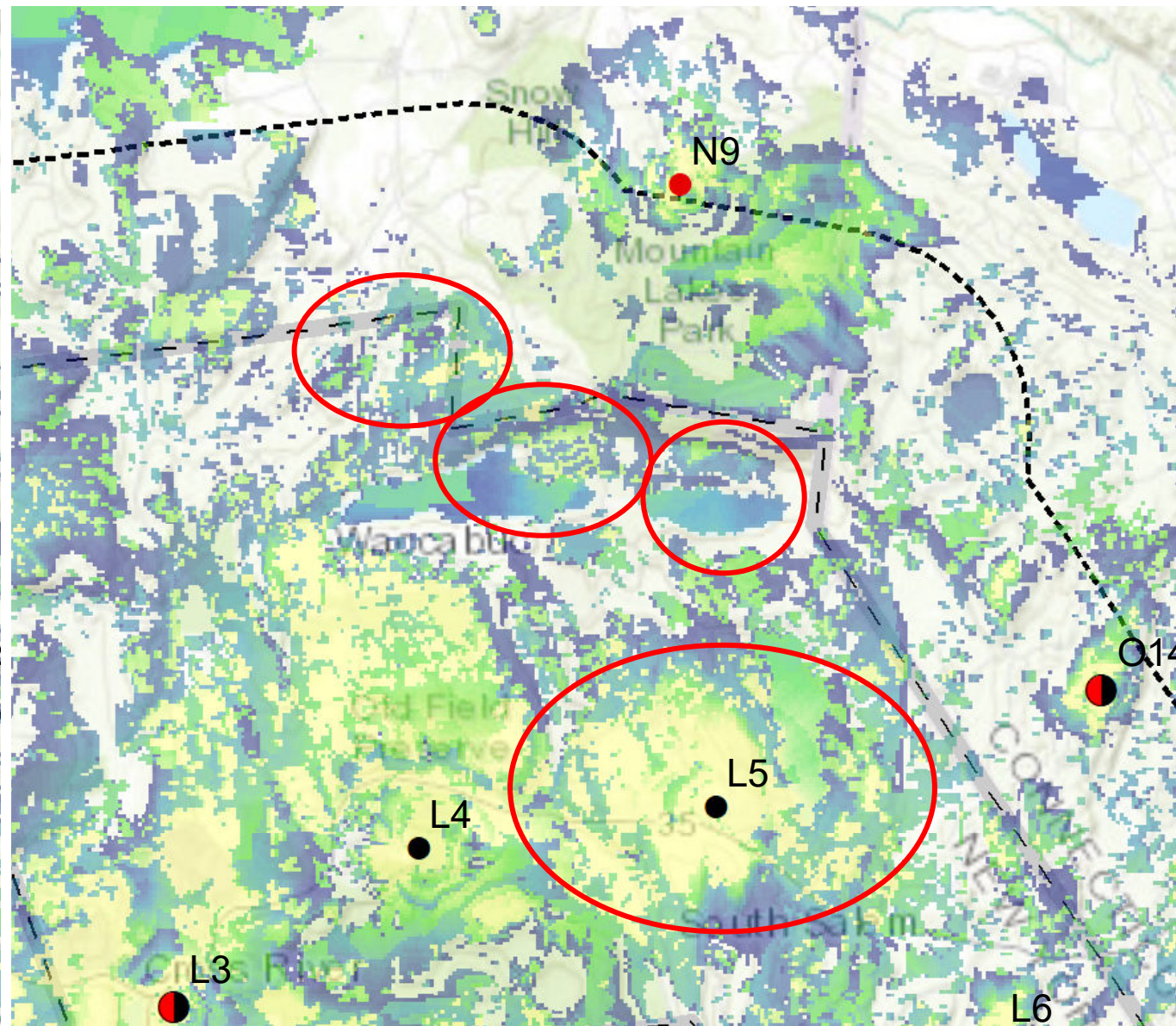
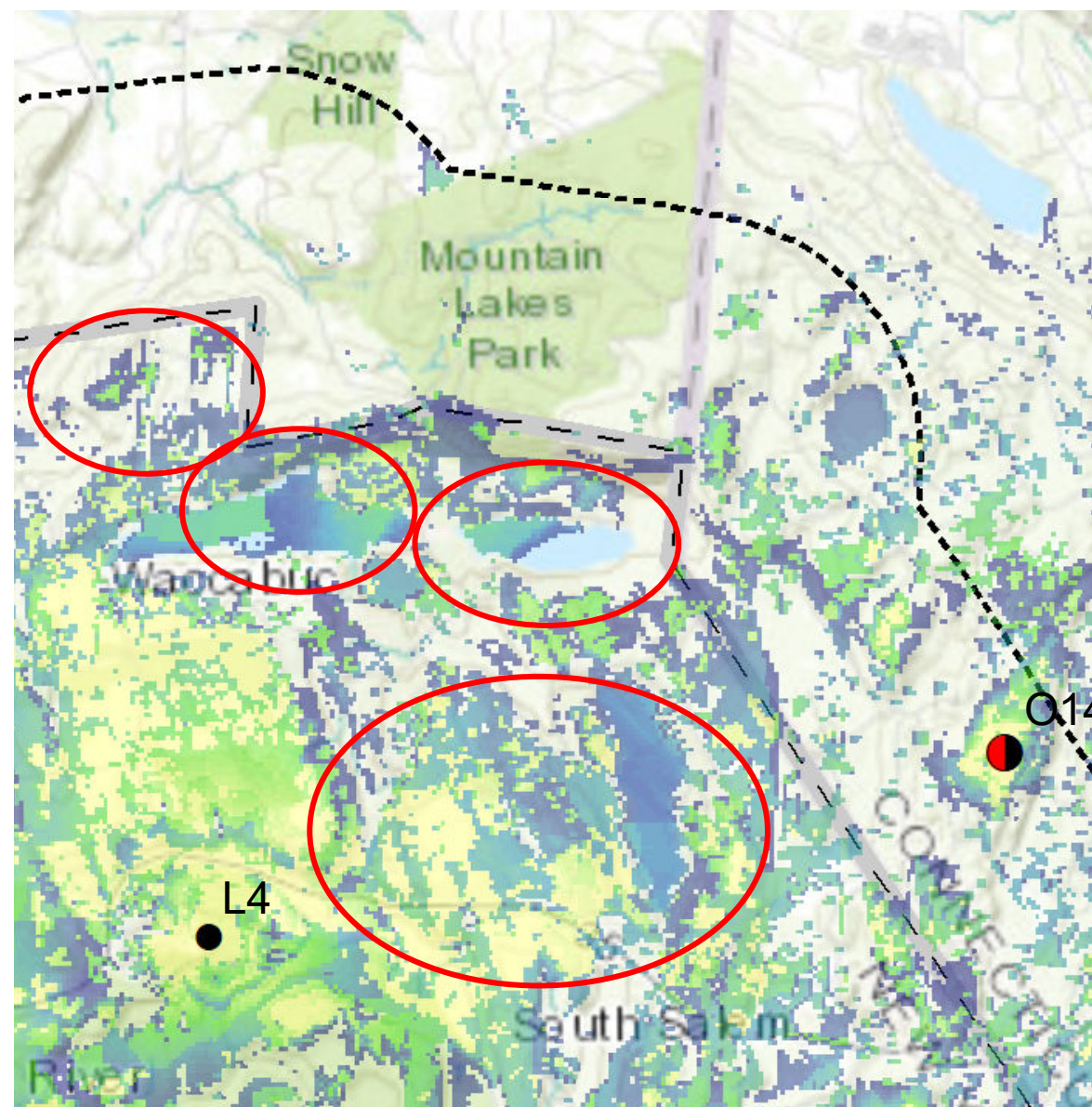
## South Side of Town Summery

- Many gaps in coverages throughout the Town as indicated with areas with no color
- New sites are needed to improve network connectivity between sites





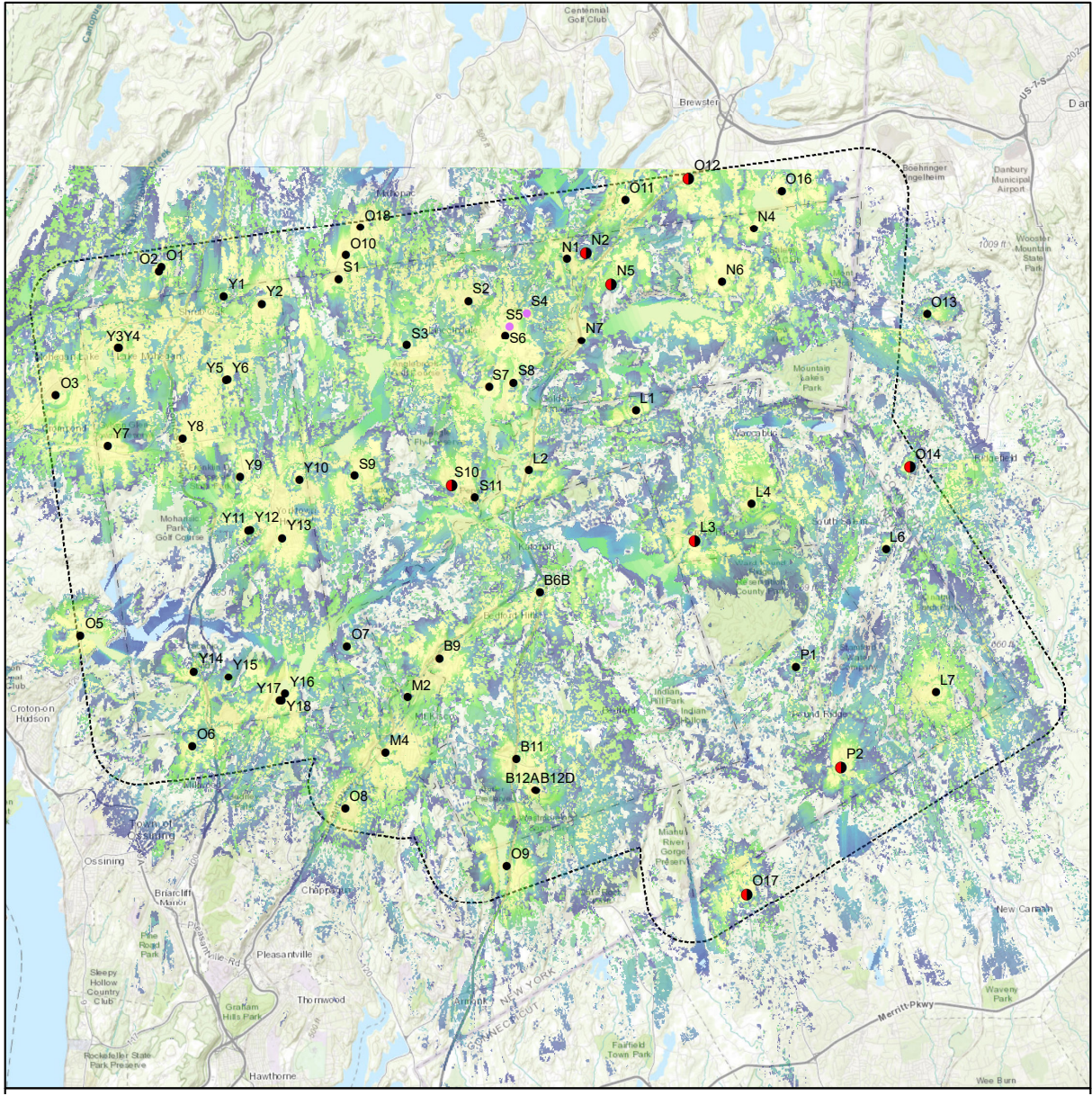
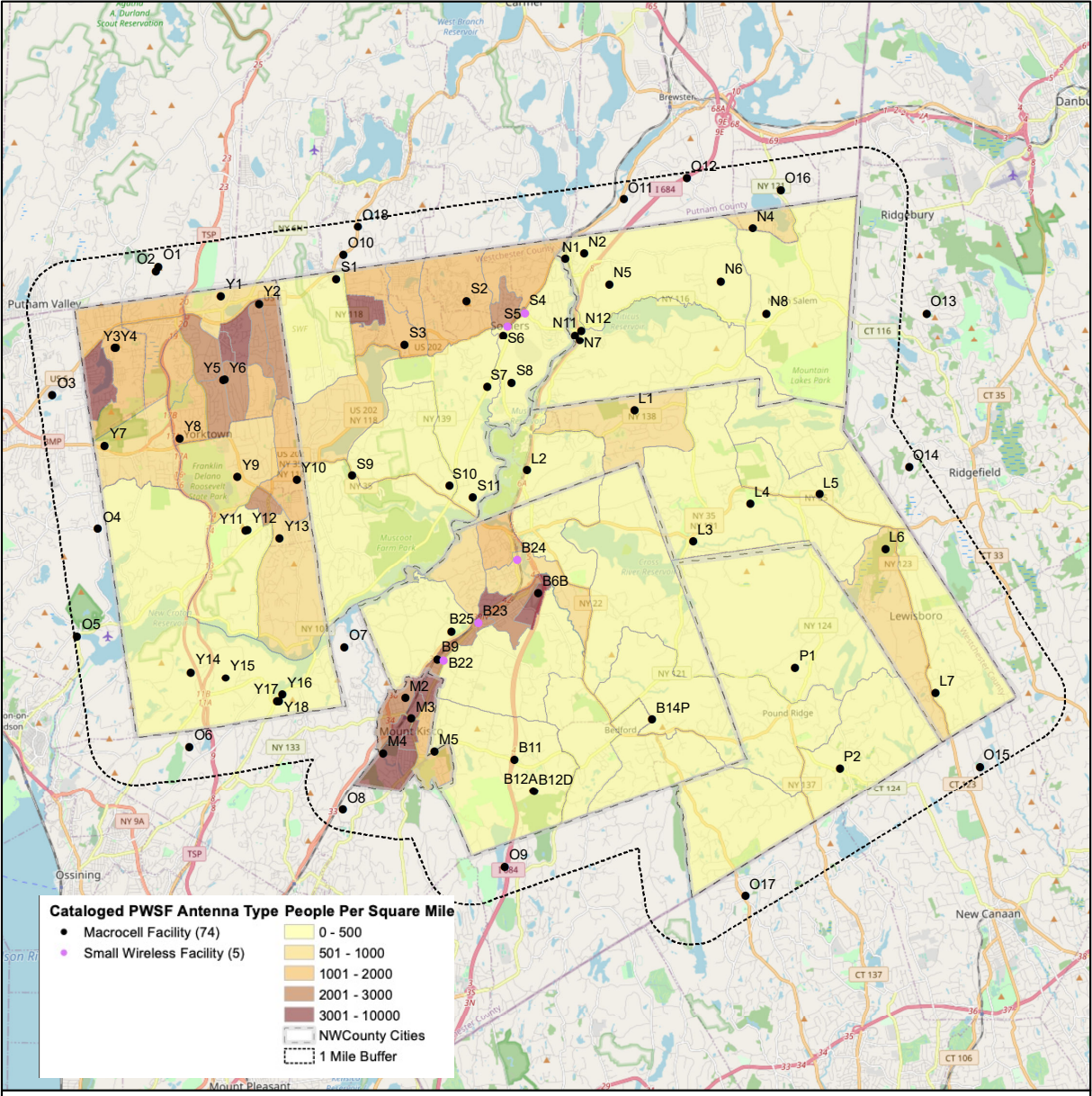
# Coverage Comparisons



- If personal wireless is added to site N9 there is nominal improvements for the Town
- Adding L5 will provide better handoff to L4 and improve coverage along Rt 35 and eastward



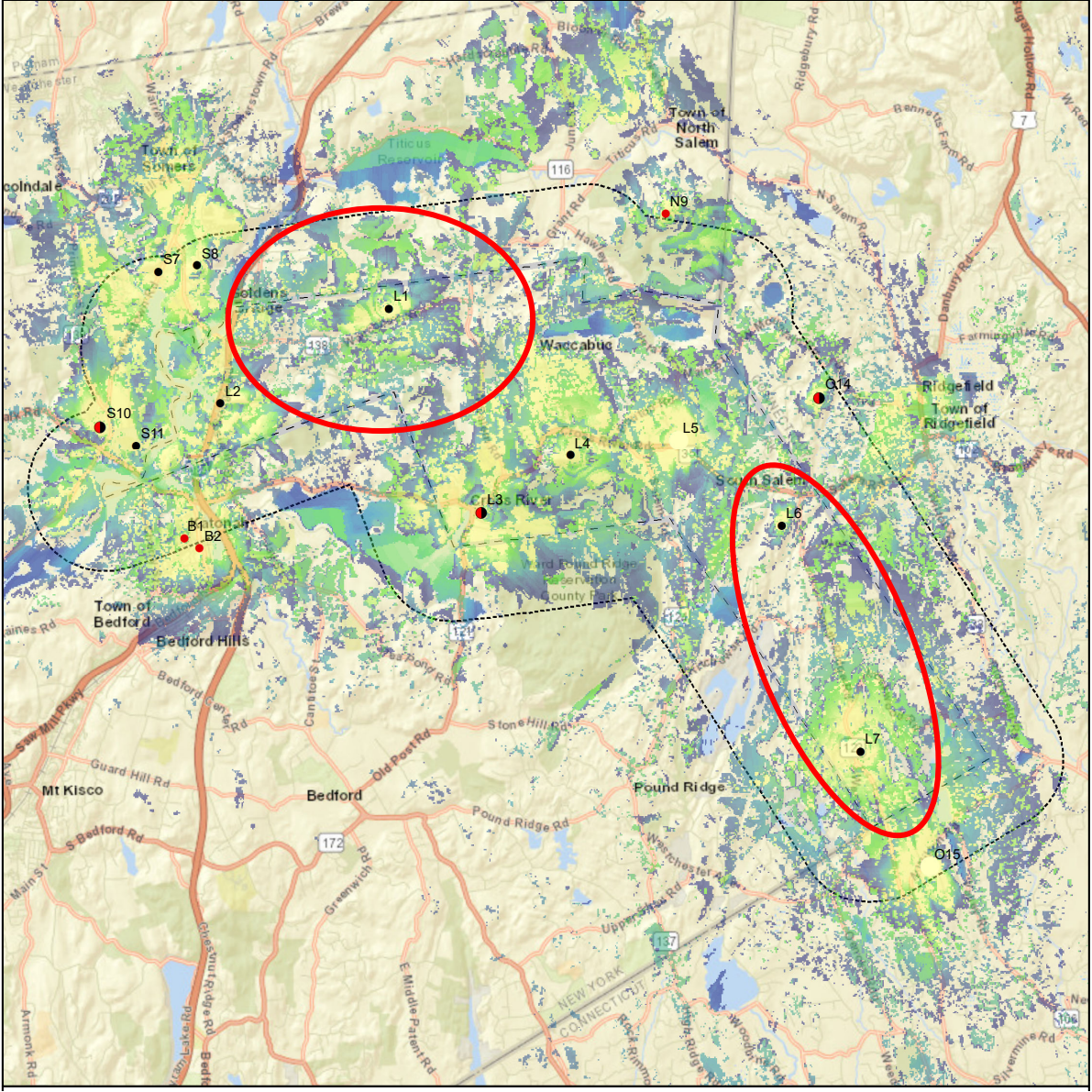
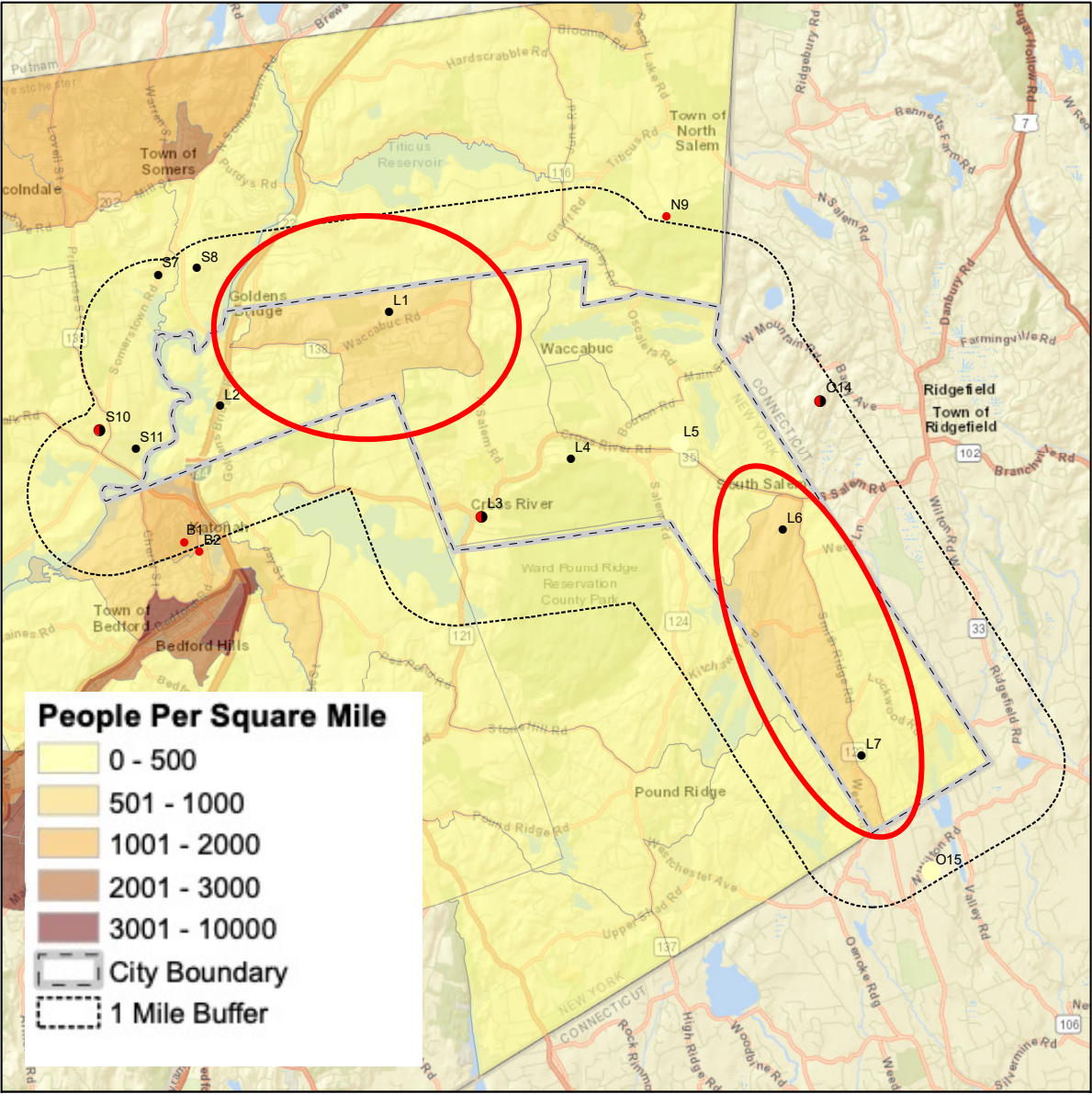
# Coverage Gaps in County Compared to People Per Square Mile



More PWSF's In Higher Density Areas and Along Major Traffic Corridors



# Coverage Gaps in Lewisboro Compared to People Per Square Mile

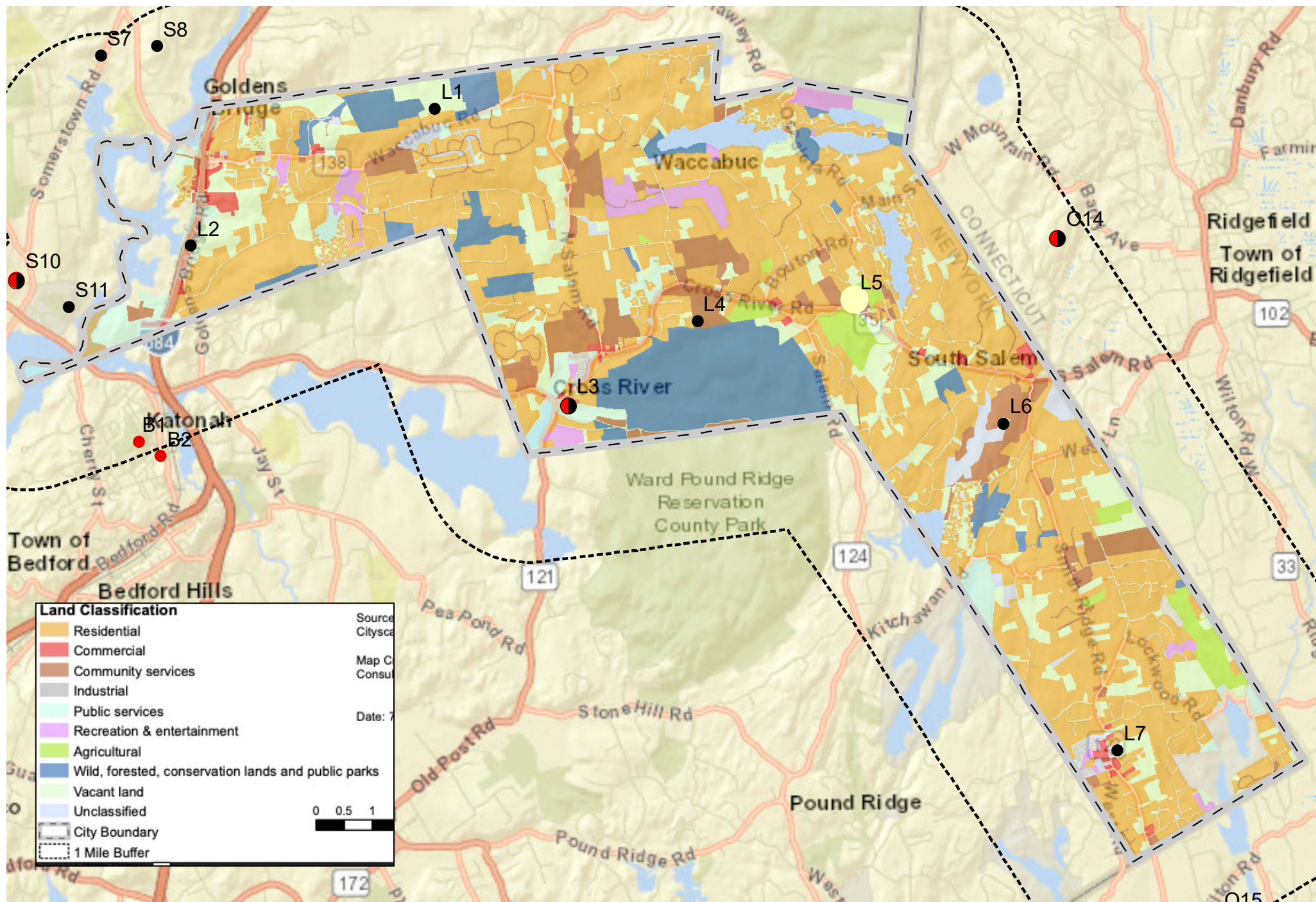


More PWSF's Are Needed In Higher Density Areas (L1, L6, L7) , Along Major Traffic Corridors And In Gaps



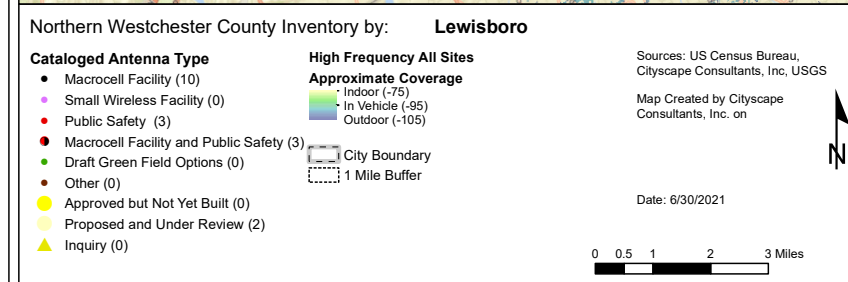
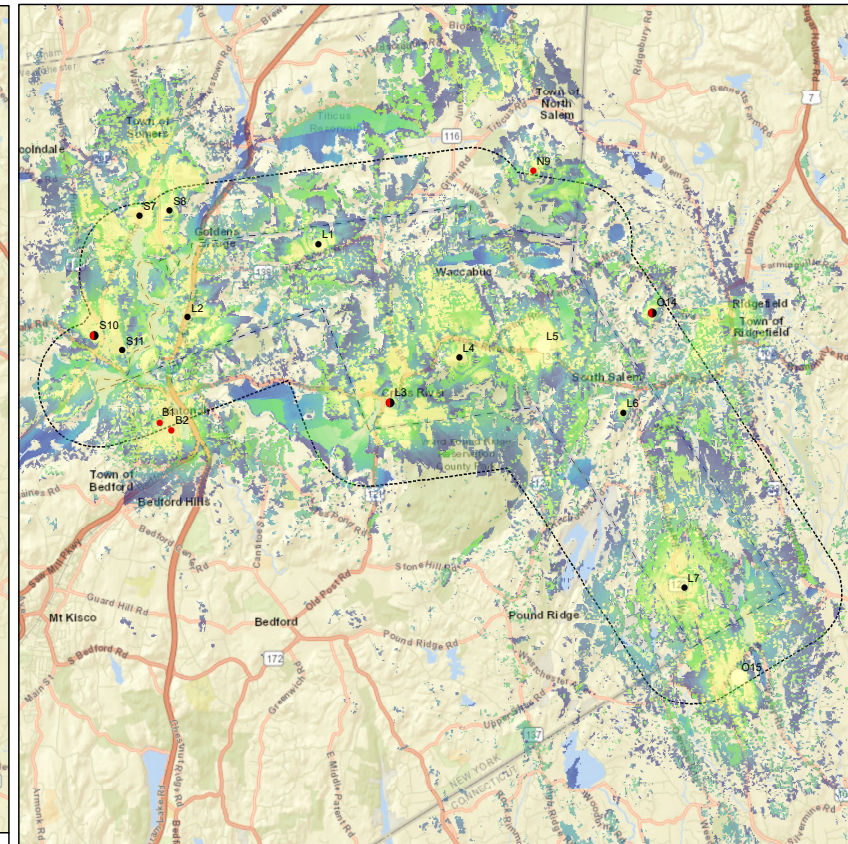
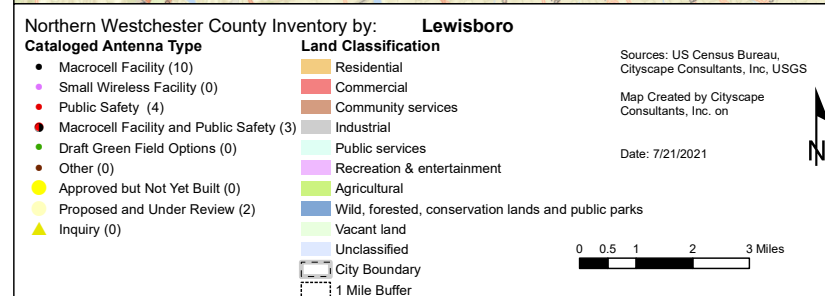
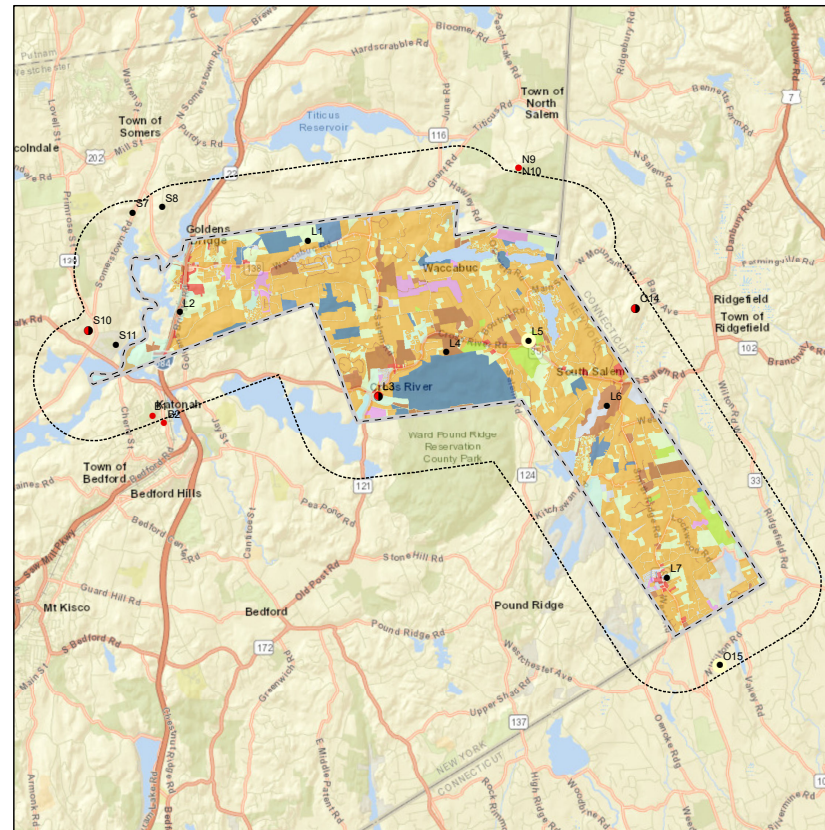
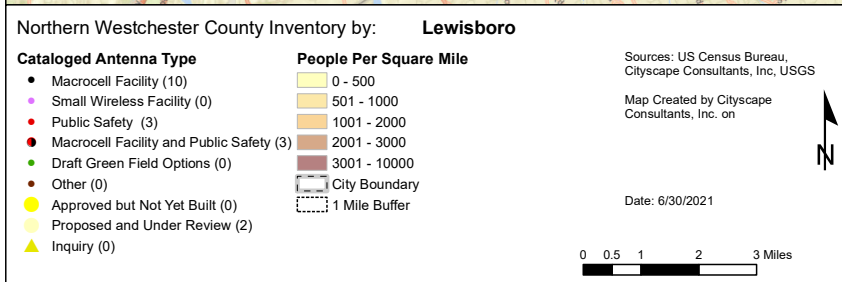
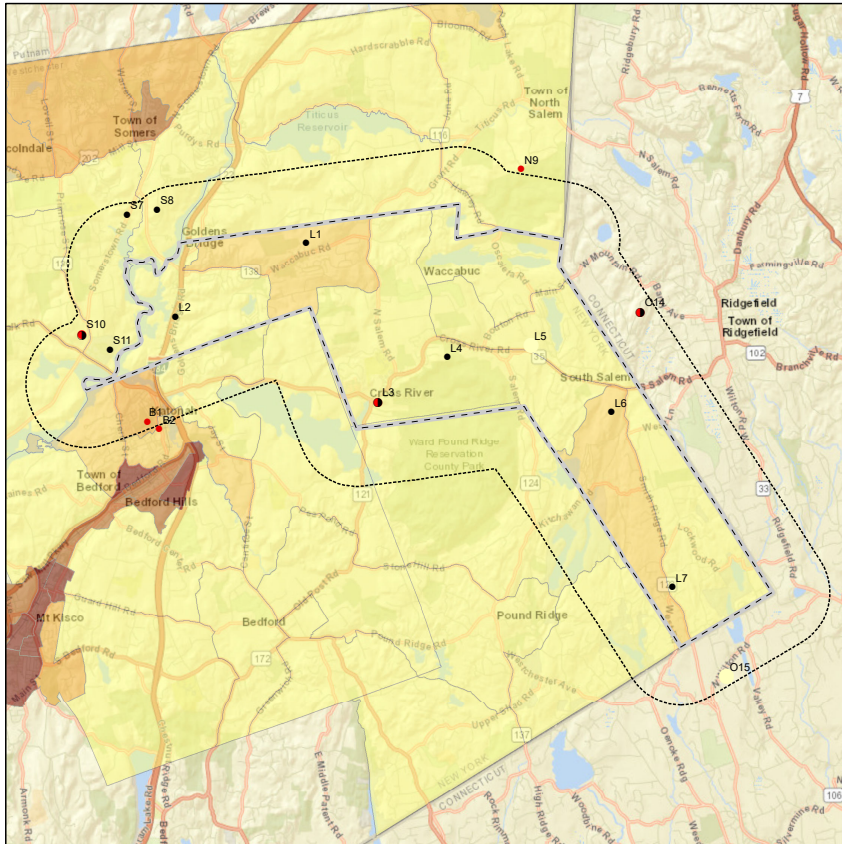
# Coverage Gap Analysis Land Classification

- Lewisboro largely residential with 4,610 parcels
- Vacant land - 775 parcels (Site L1)
- Small pockets of commercial areas with 58 parcels
- Community Services - 204 parcels





# Anticipated Gap Fill-in



First Tier Gap Fill In By Providers : Corridors, Higher Density Residential, Commercial, Community Services



# Network Capacity for a Single Provider

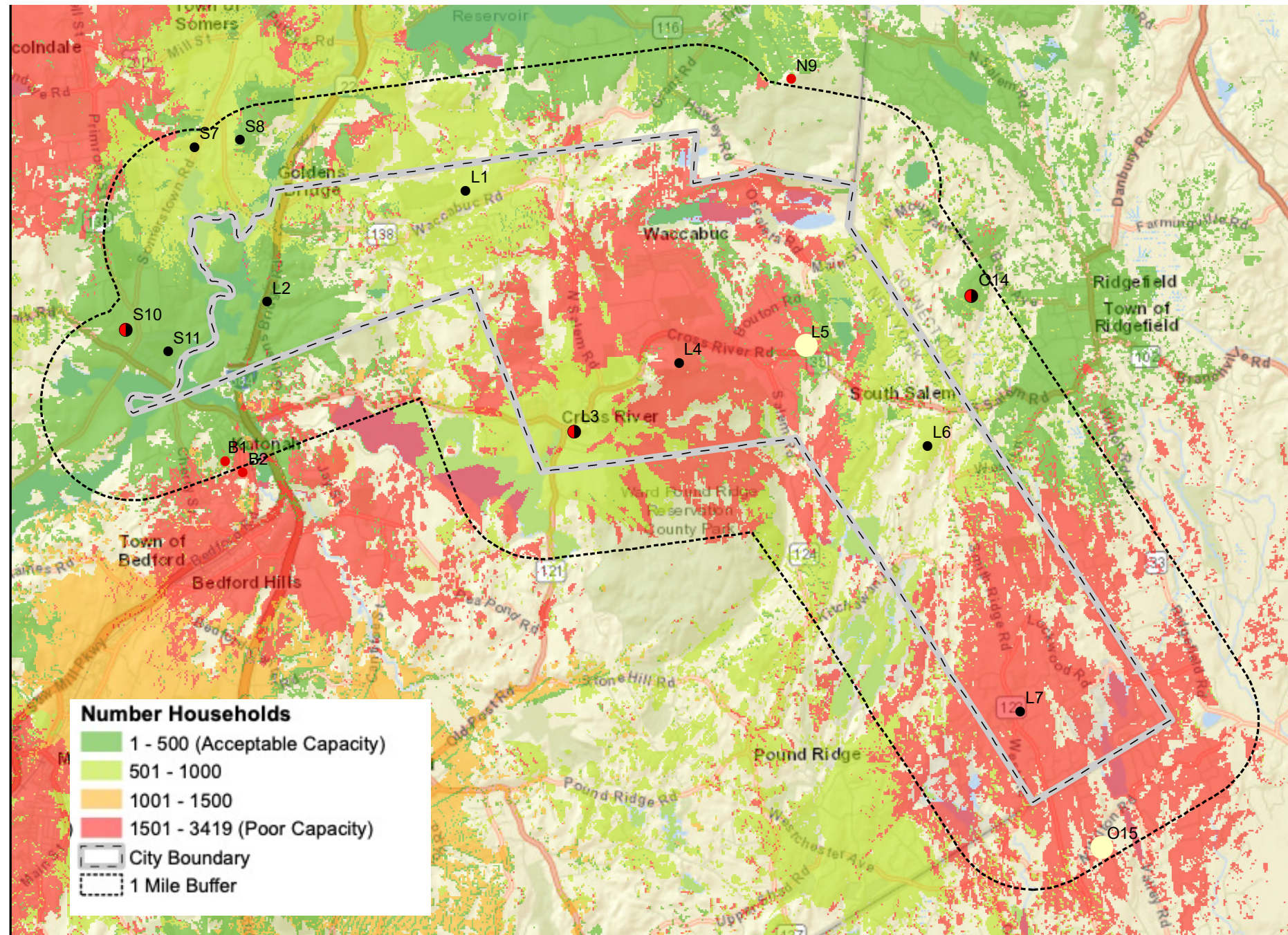
- Simulates areas with potential capacity problems
- Level of propagation signal strength is shown through the gradations of colors from green to red
- Areas with no coloration have no coverage so need for capacity does not show up

→ **Green** – good; ratio of number of sites supporting subscriber base

→ **Orange** – average; ratio of number of sites to subscriber base is problematic

→ **Red** – poor; ratio of number of sites to subscriber base is poor

→ **No color** – none; PWSF sites are needed in most of these areas

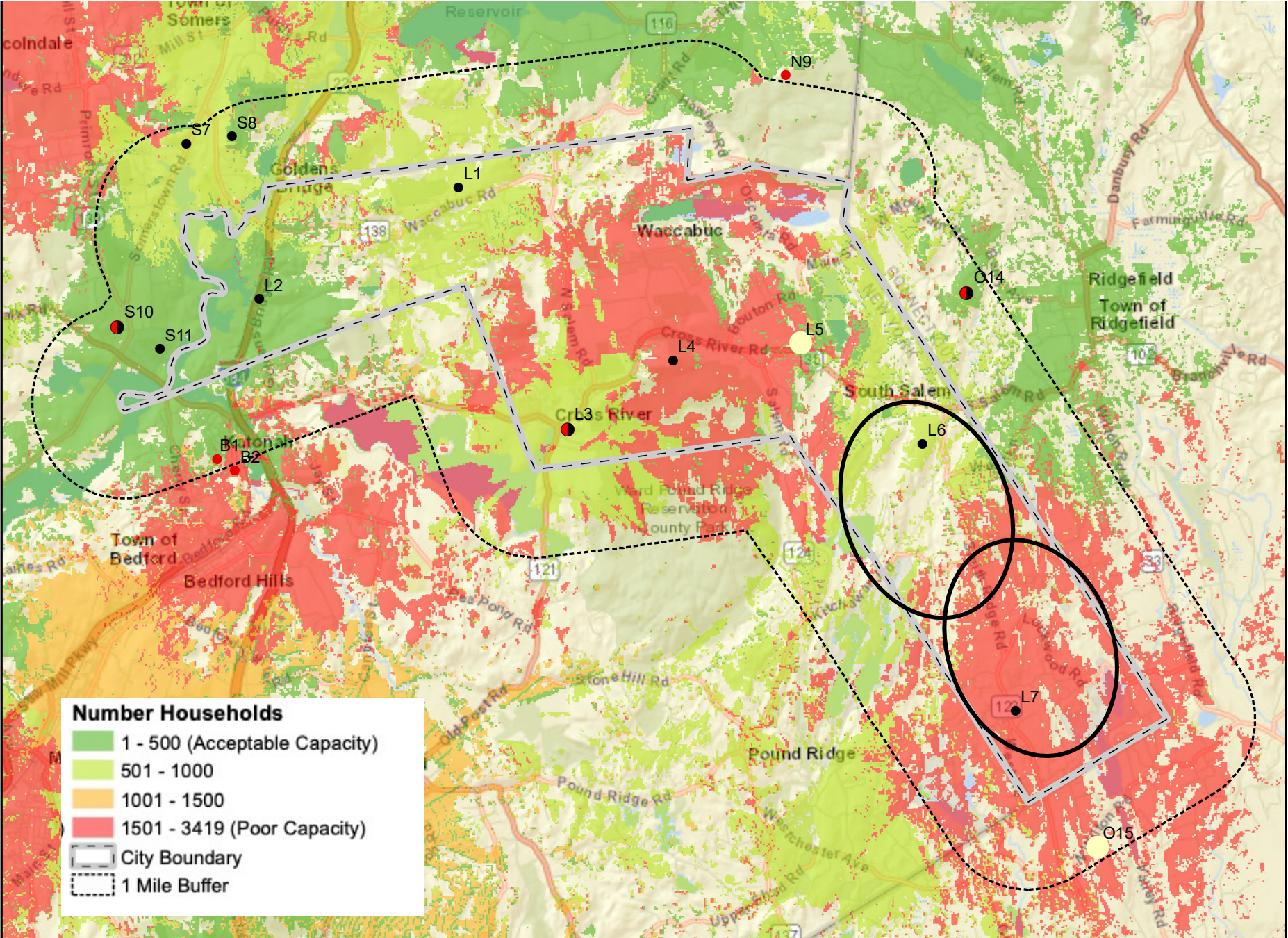




# Network Capacity

## All Existing PWSF Sites

→ L6 and L7 the areas that show no coloration is because there isn't any coverage in this area therefore it doesn't show capacity issue, however this is a higher density residential area and new sites will be necessary for these gaps

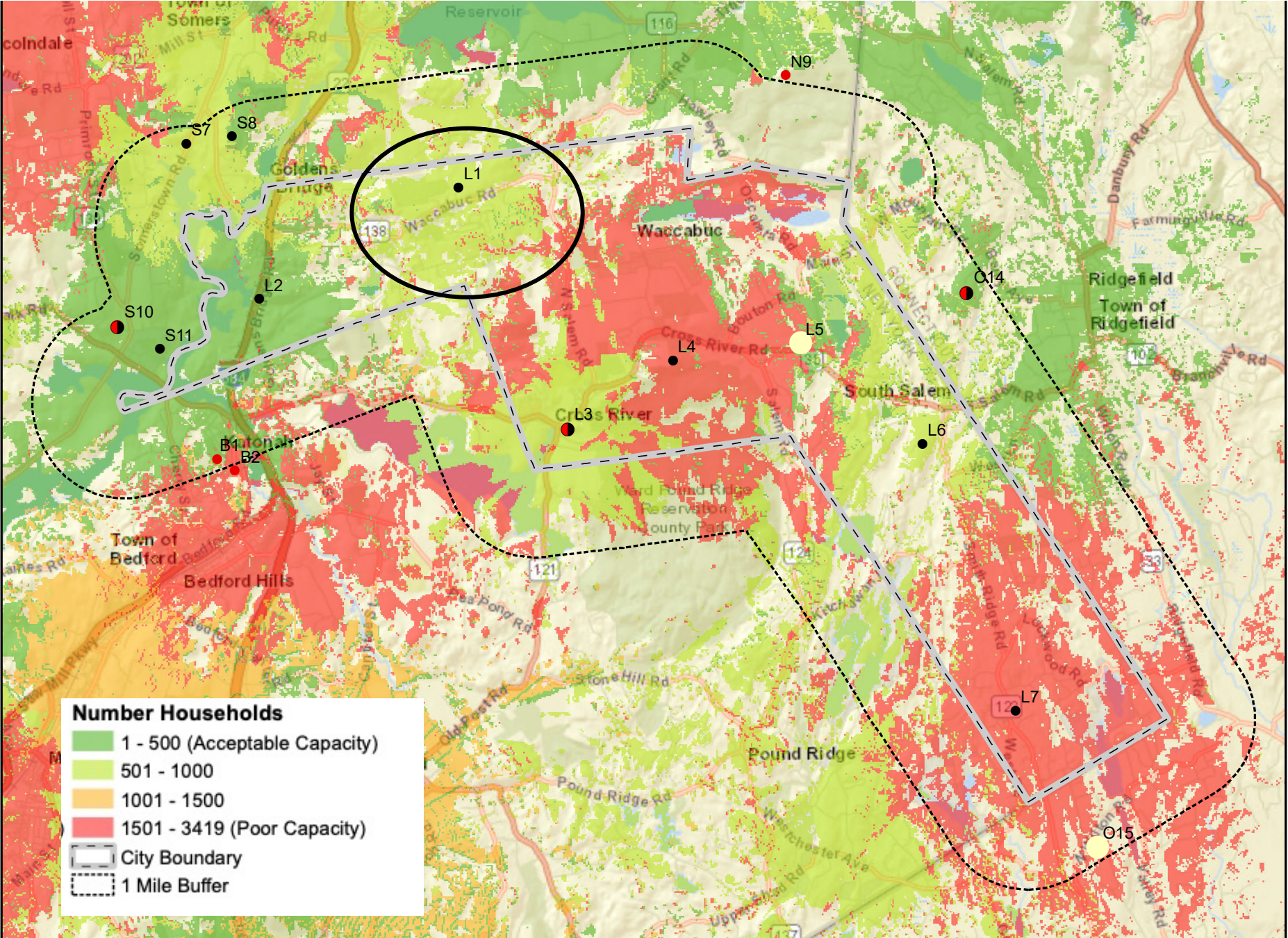




# Network Capacity

## All Existing PWSF Sites

→ L1 Vacant and public property in low priority area

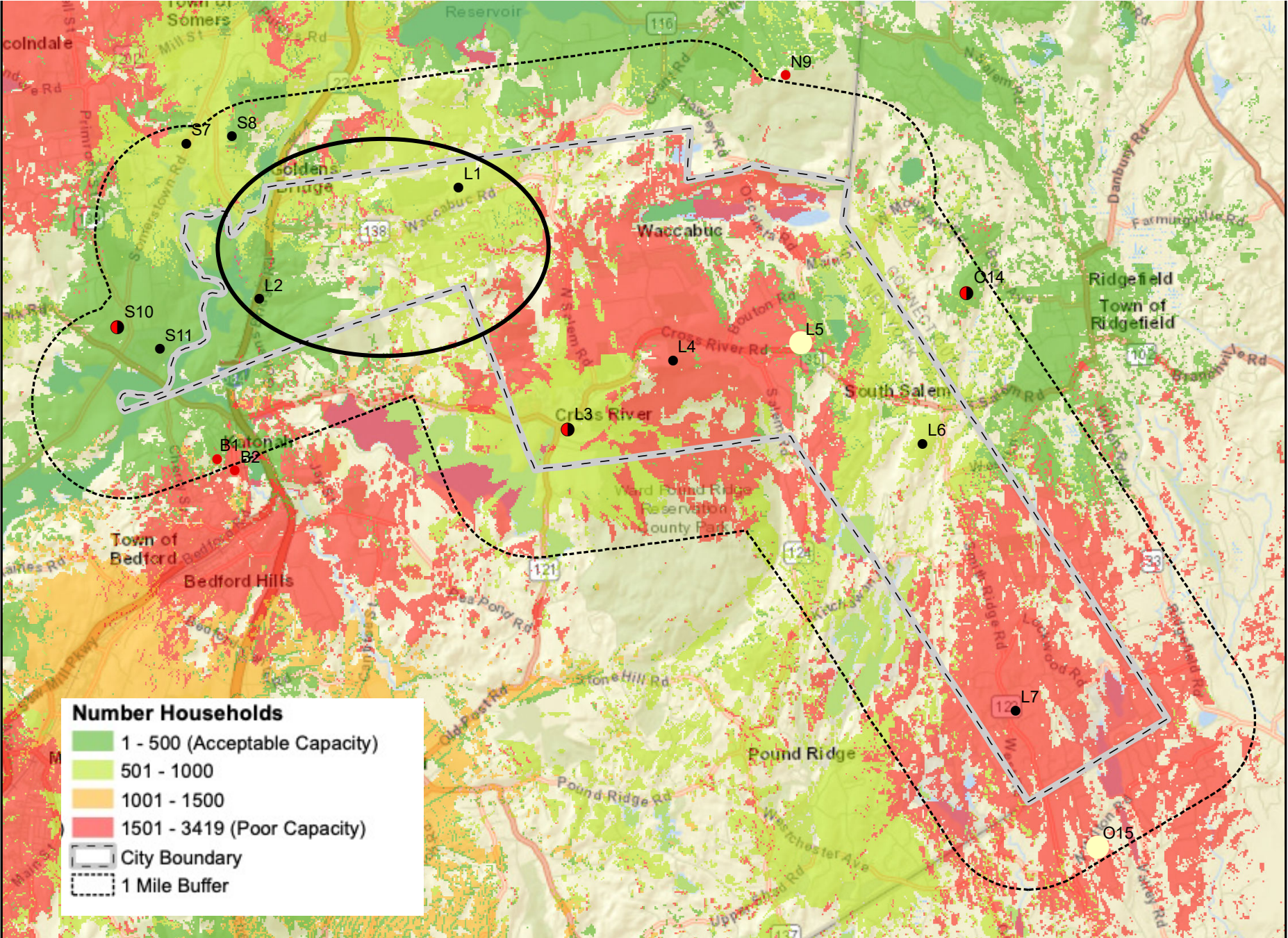




# Network Capacity

## All Existing PWSF Sites

→ L2 site needed  
between L1 and L2 to  
add coverage and  
improve handoff  
between sites

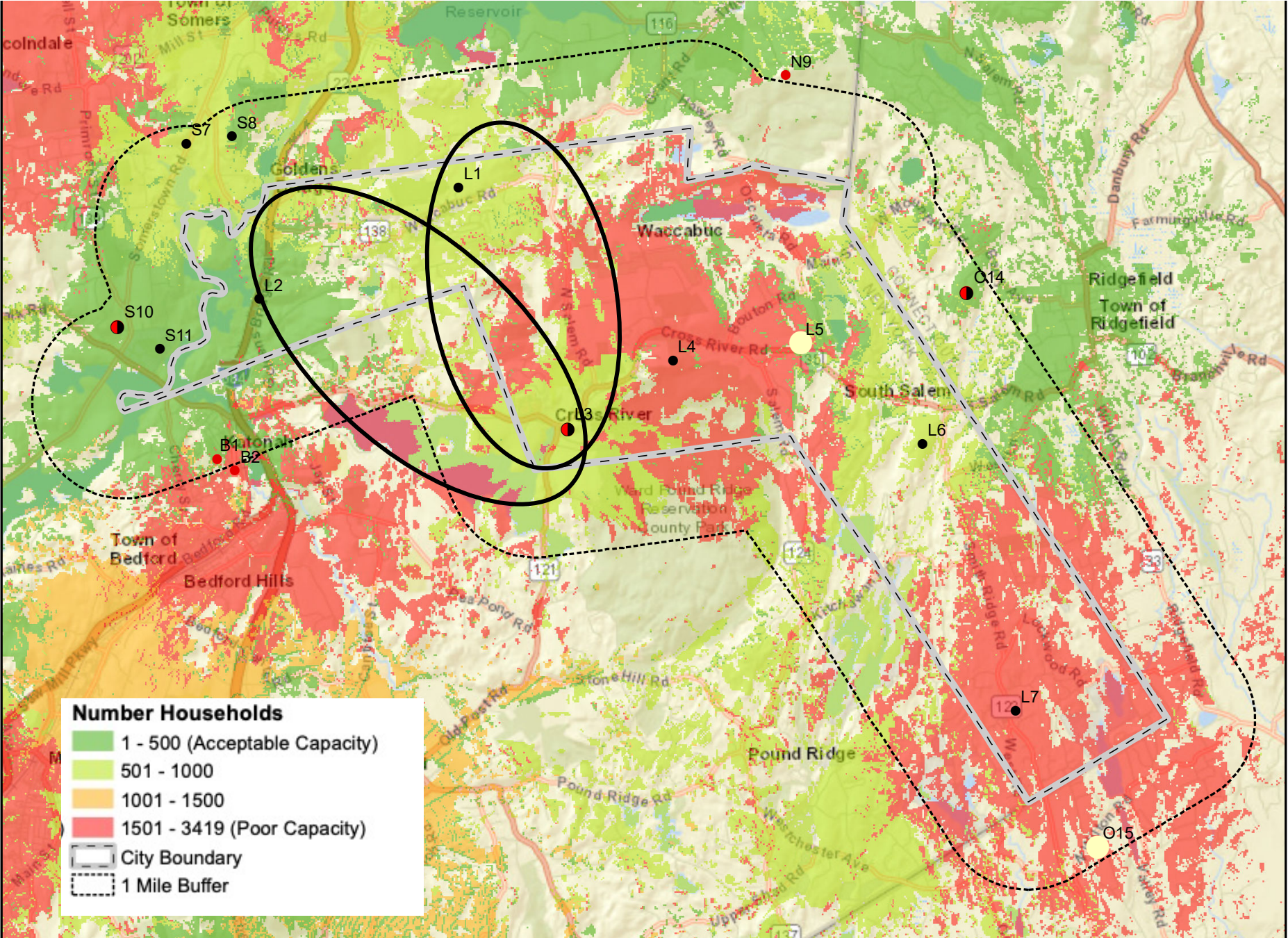




# Network Capacity

## All Existing PWSF Sites

→ L3 sites needed between L3 and L1 and L2 to help capacity issues, add coverage and improve handoff between sites

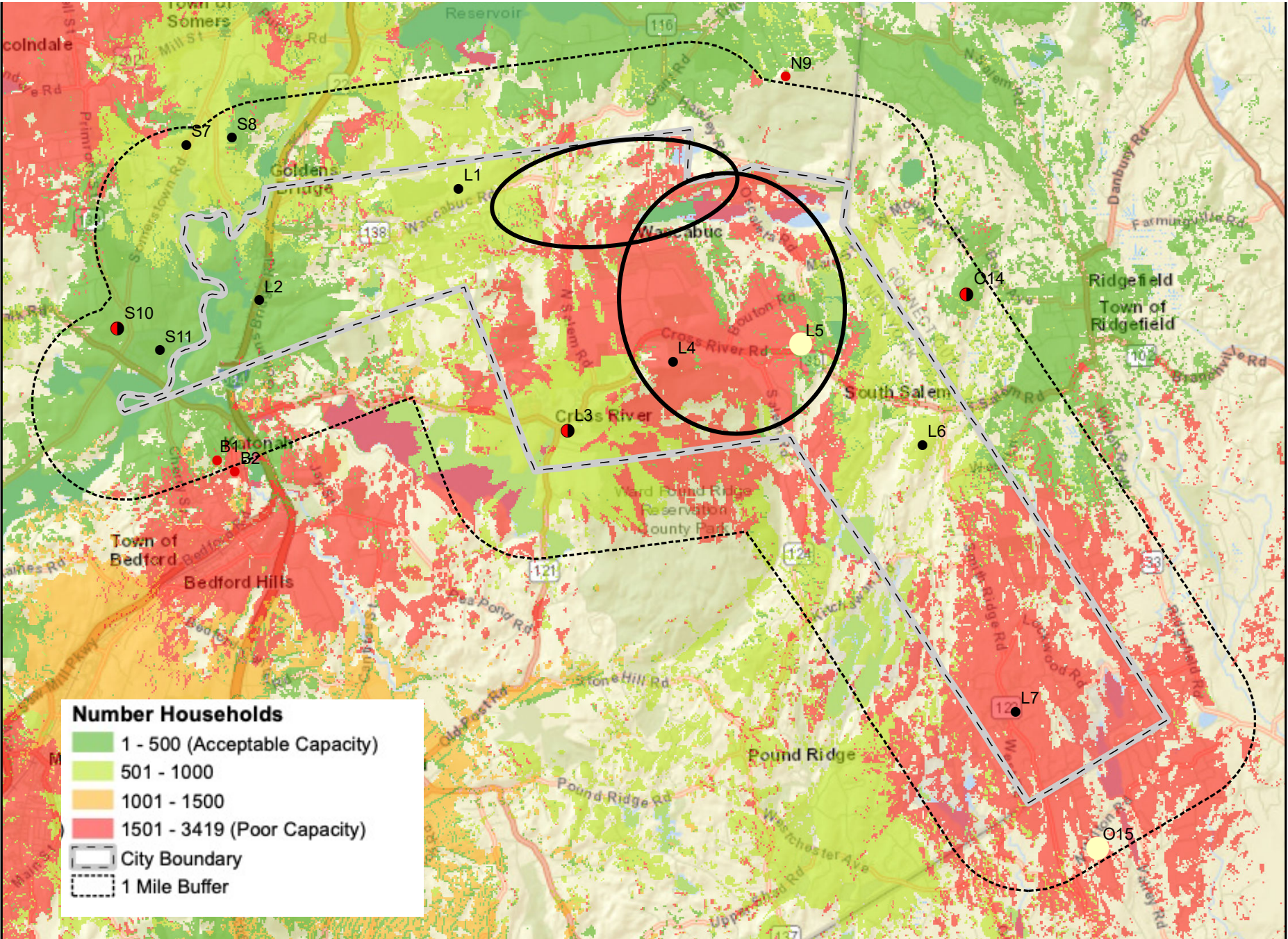




# Network Capacity

## All Existing PWSF Sites

- L4 additional sites needed north, south and east of L4 because of the larger geographic area in need
- Additional sites will be needed east of L1 and north of L4 in addition to the potential L5 site

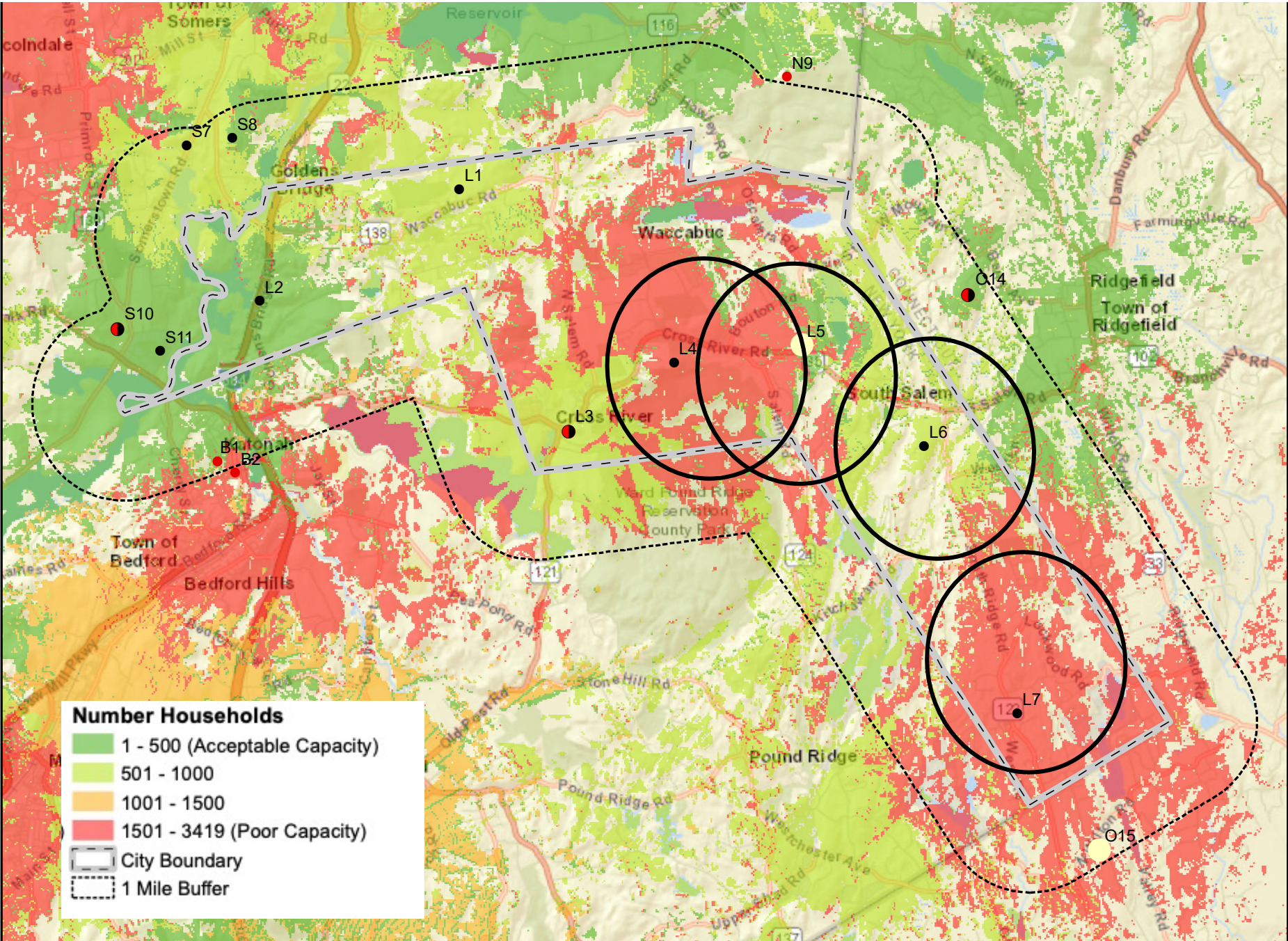




# Network Capacity

## All Existing PWSF Sites

→ L6 gaps in network coverage area need to be filled in with new sites to alleviate capacity issues and add connectivity to L4, L7 and in the area of the potential L5

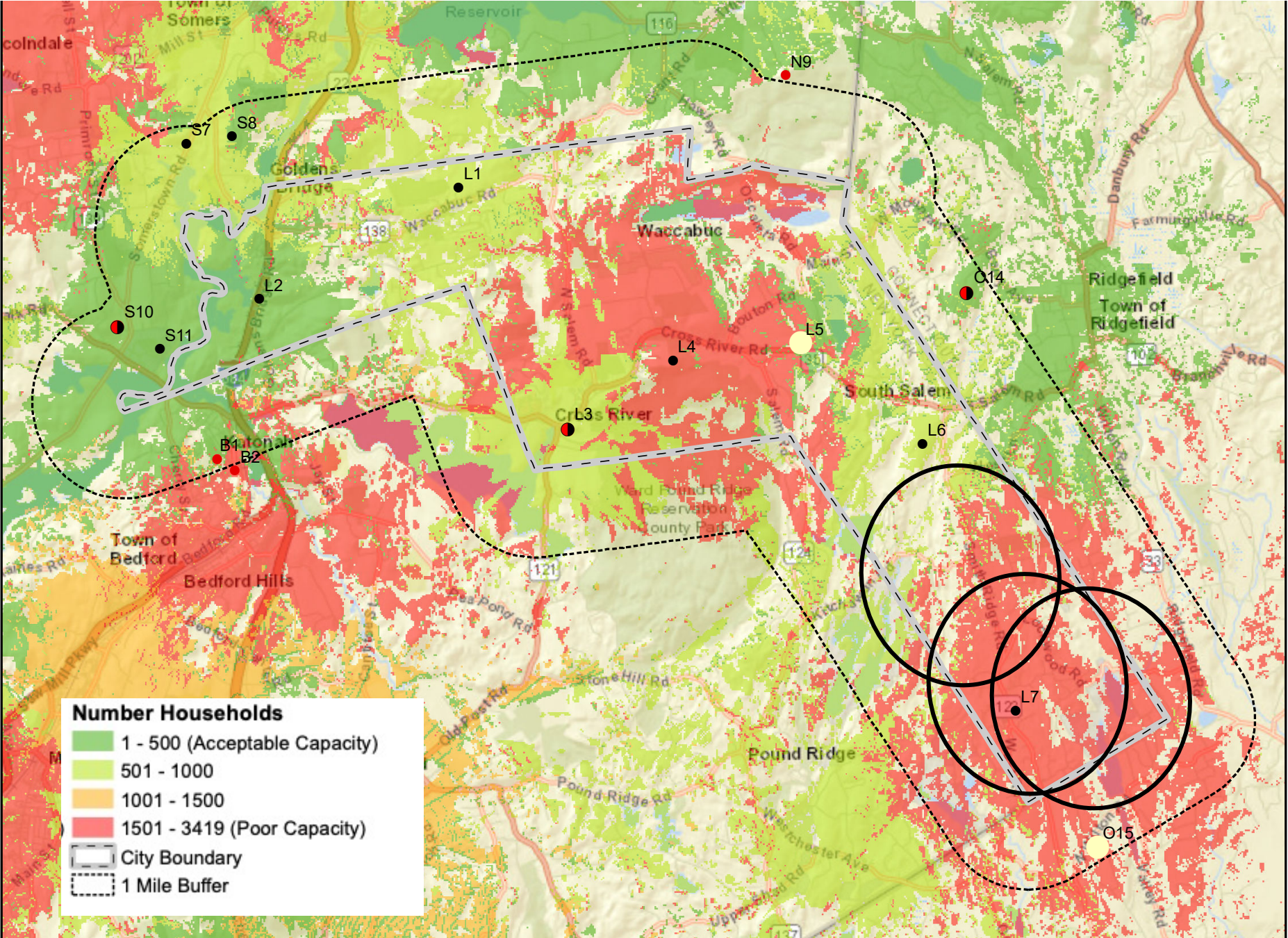




# Network Capacity

## All Existing PWSF Sites

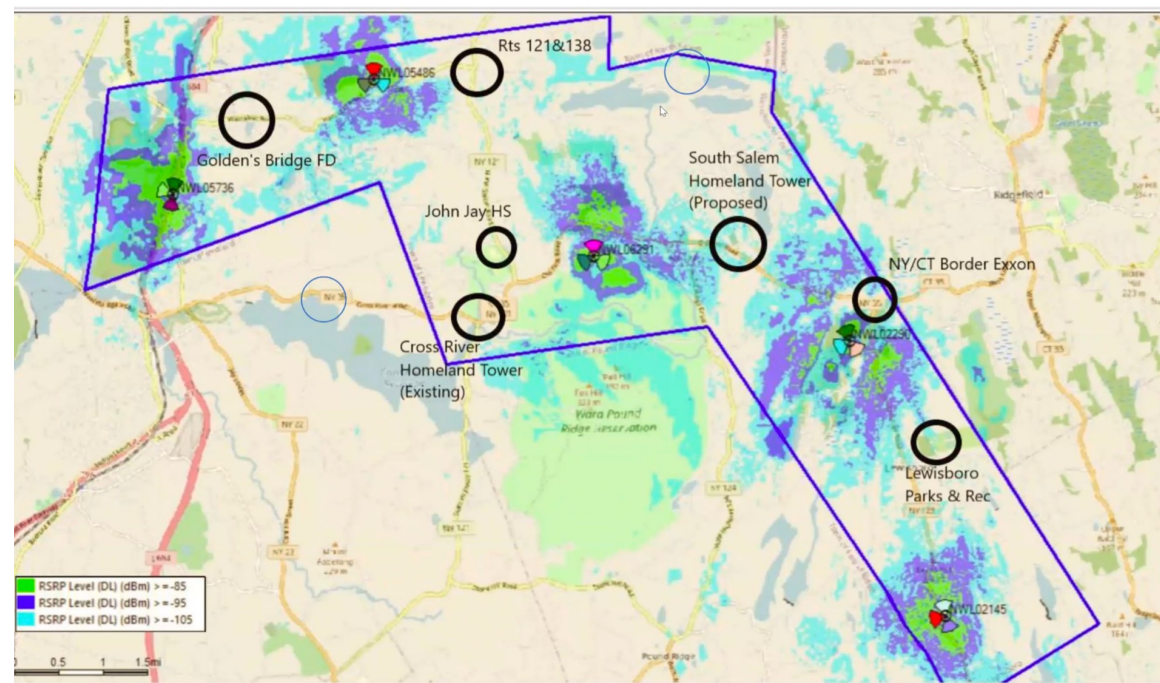
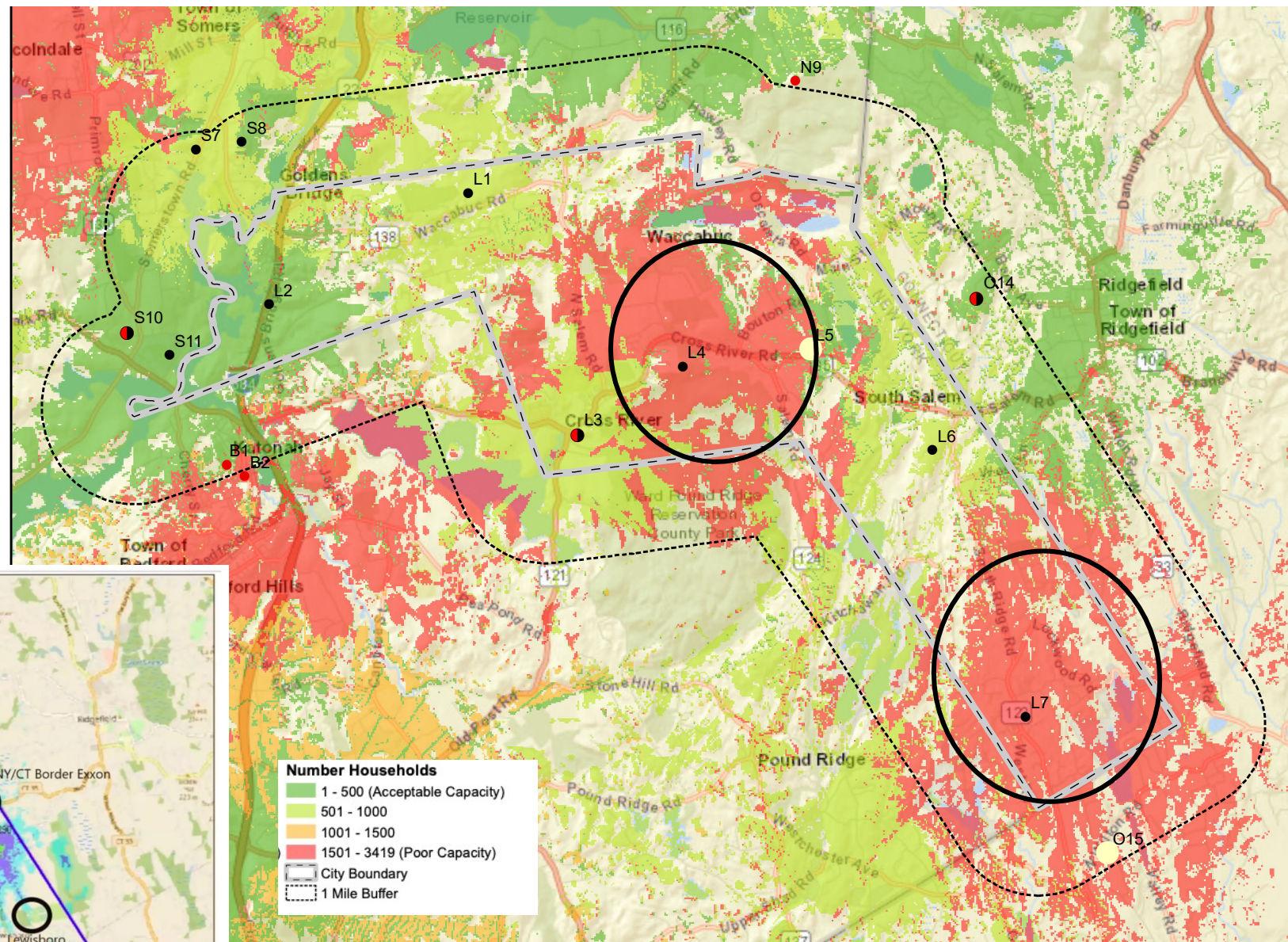
→ L7 additional sites needed surrounding this site due to the size of the geographic area it is serving





# Comparison Maps

- The below map was included in the minutes of the AAB dated September 2, 2020, and the circles in bold and light outline indicates the need for PWSF sites to increase coverage and capacity in those geographic areas
- Analysis indicates additional sites would likely be needed over the next 10 years in the vicinity of L4 and L7 to improve capacity issues in those areas





# Community Poll

Lewisboro Wireless Infrastructure  
Preference Poll

