

Northern Westchester County DRAFT Wireless Telecommunications Infrastructure Master Plan

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:

- 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

76%

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

85%

of photos taken in 2017 were captured on a smartphone

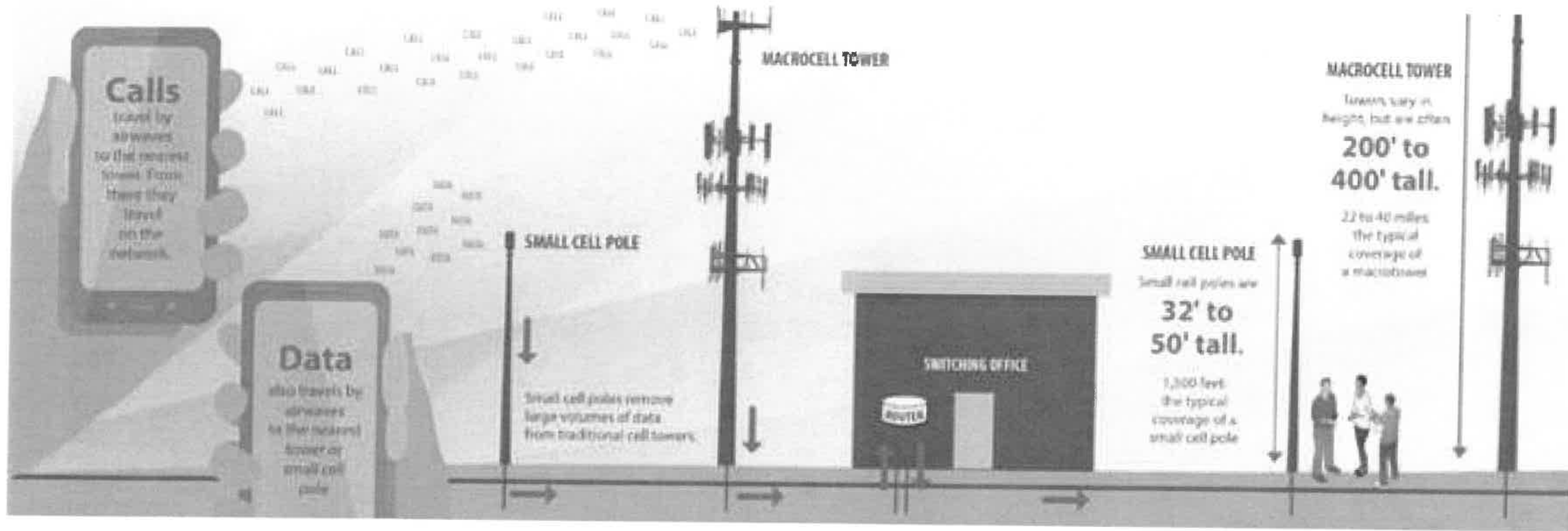
330%

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

31B

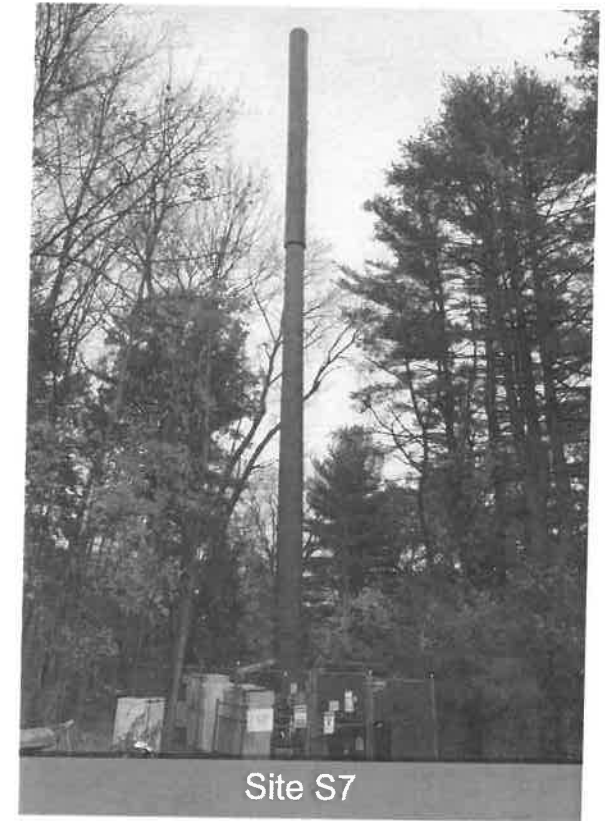
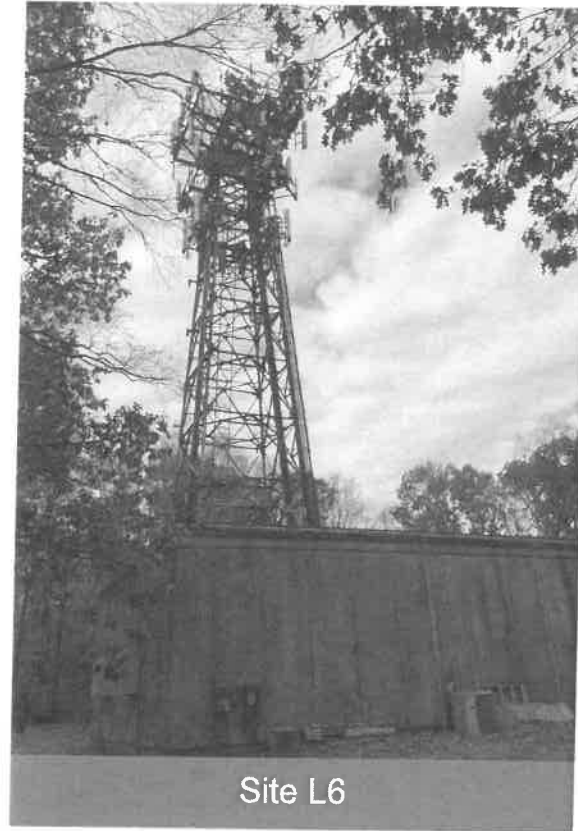
connected devices predicted by 2023.

Source: CTIA Wireless Quick Facts, 2019, 2020



Wireless Network Planning/Mapping

MACRO AND SMALL WIRELESS FACILITIES FOR SEAMLESS CONNECTIVITY



Lewisboro Macro Tower Sites



Lewisboro Base Station Sites



Site S4

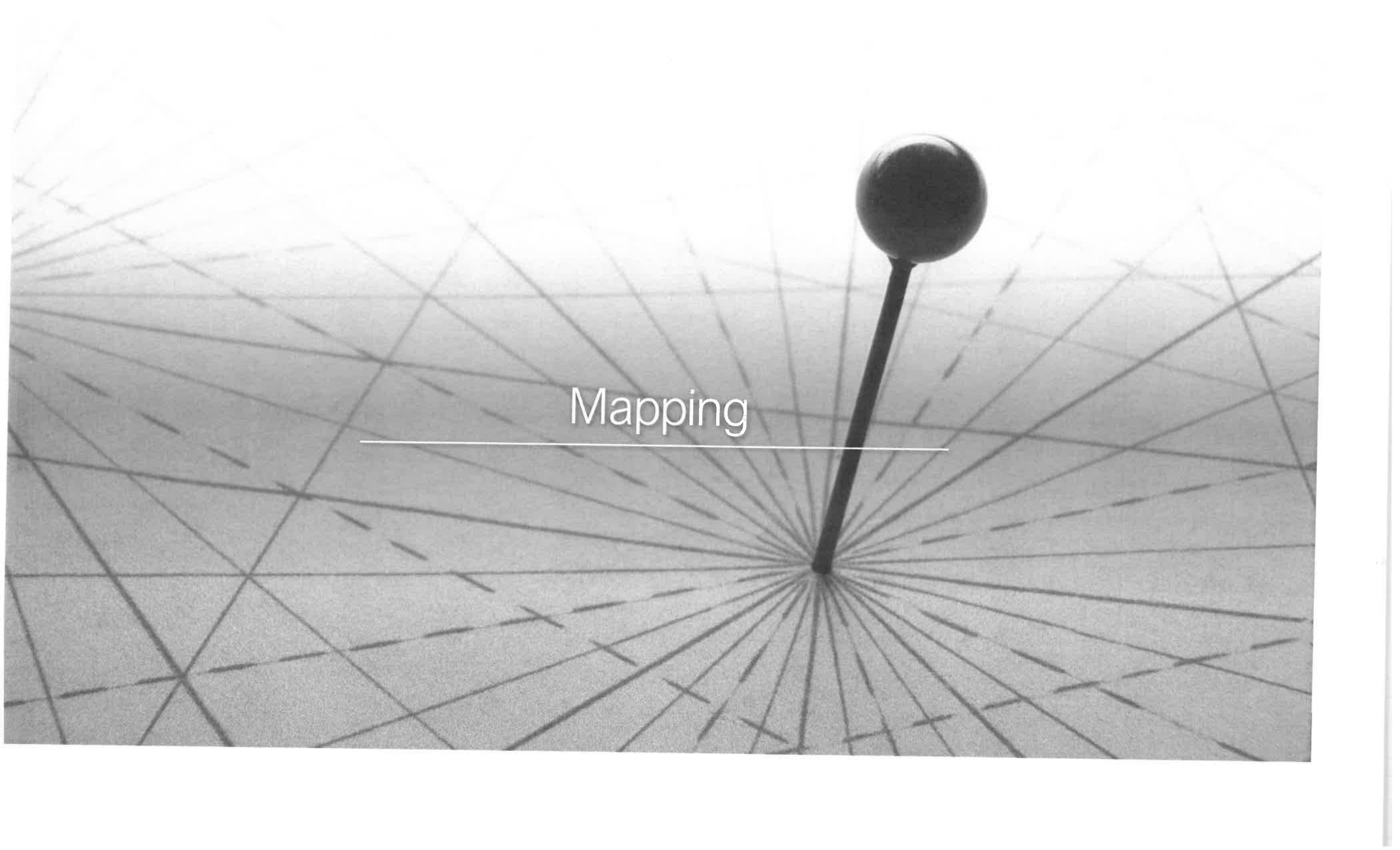


Site S5



Other

Small Wireless Facility Sites

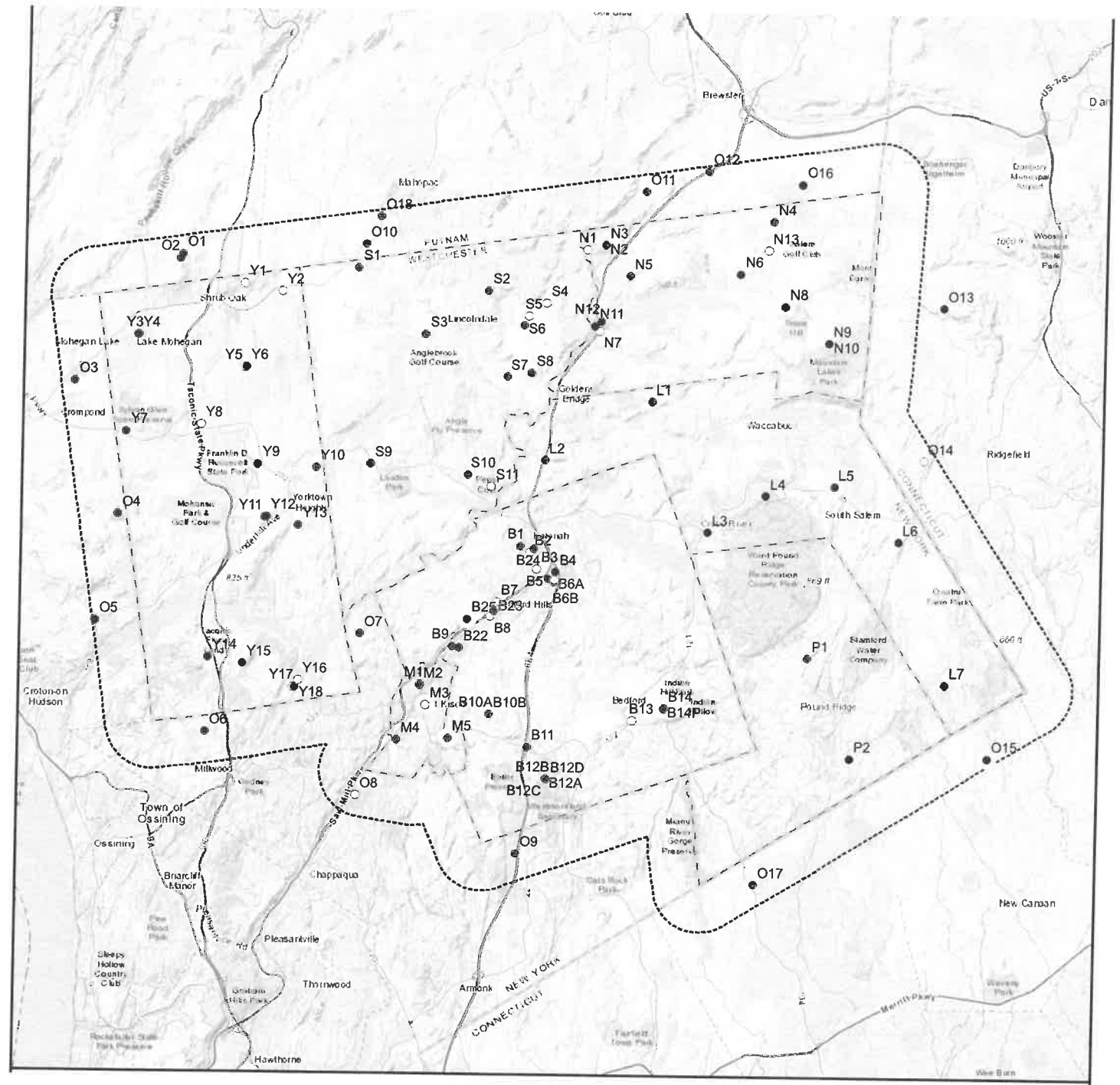


Mapping

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

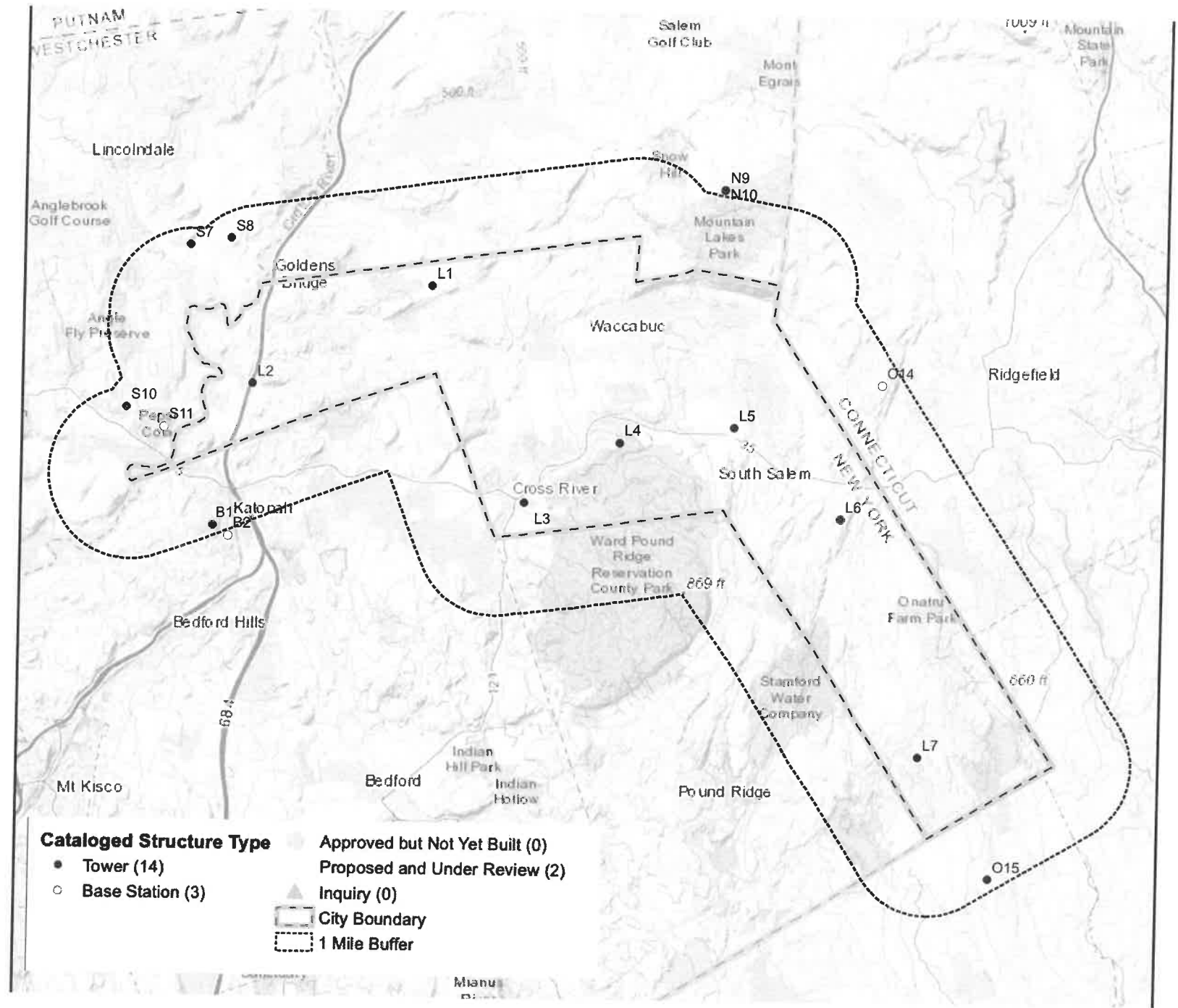
Towers in one-mile perimeter (7)

- 6 Existing
- 1 Proposed and under review

Base Stations in one-mile perimeter (3)

- 3 Existing

17 PWSF Sites In Study Area



Inventory by PWSF Antenna Type

Macro facilities in Lewisboro (7)

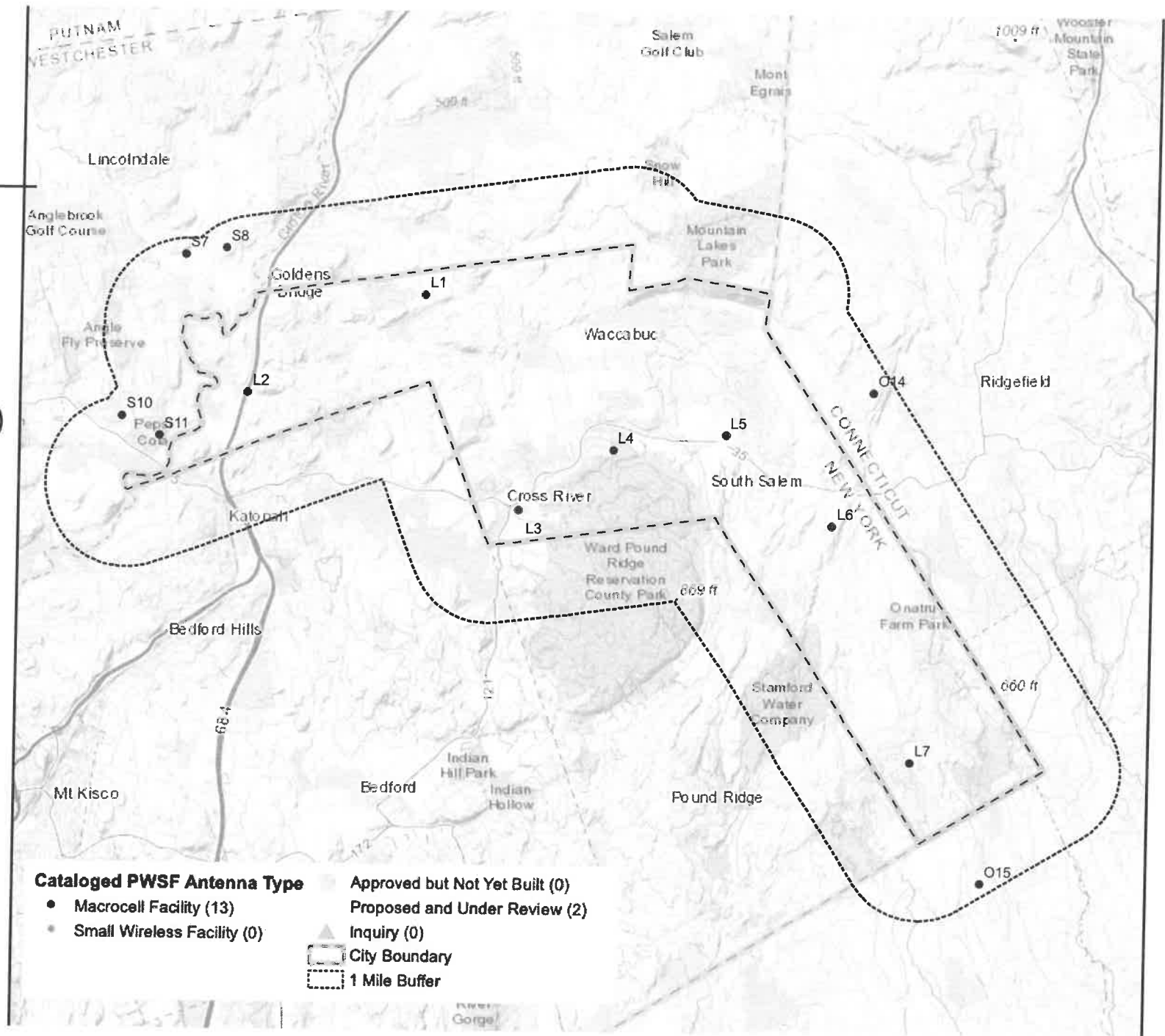
- 6 Existing
- 1 Proposed and Under Review

Macro facilities in one-mile perimeter (6)

- 5 Existing
- 1 Proposed and Under Review

Small Wireless Facilities (0)

13 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

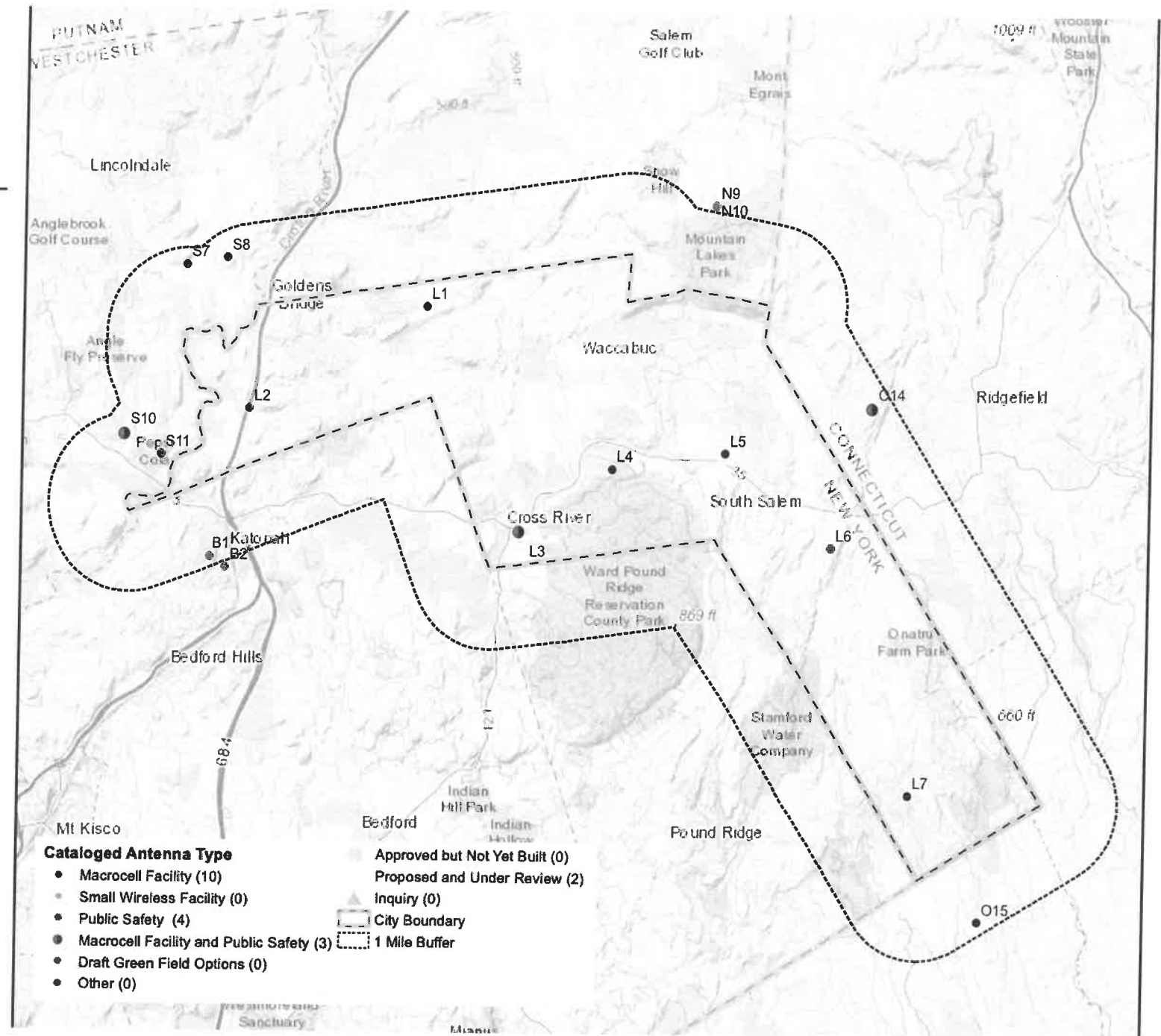
Small wireless facilities (0)

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)

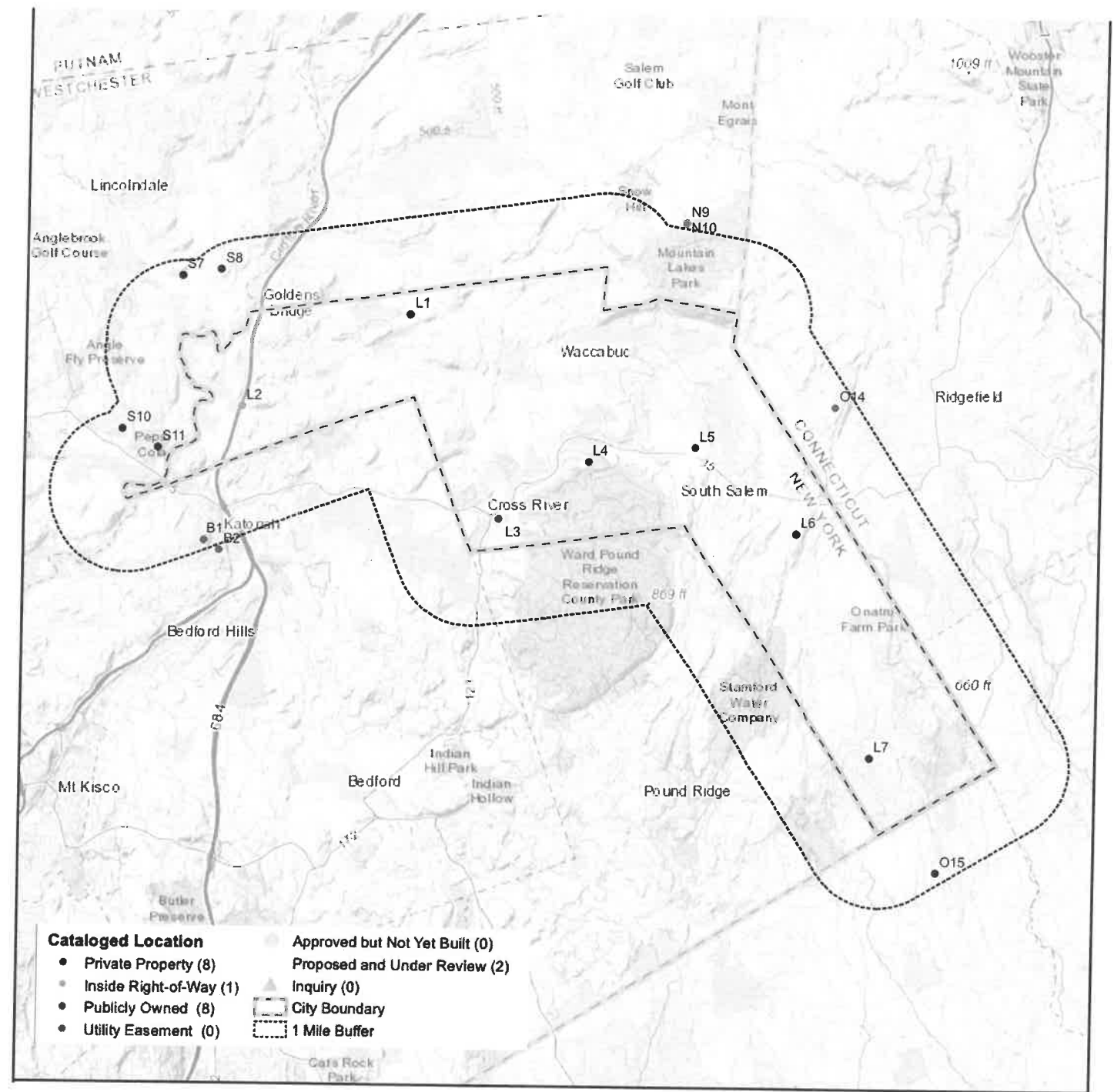
- 1 Existing in Lewisboro

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

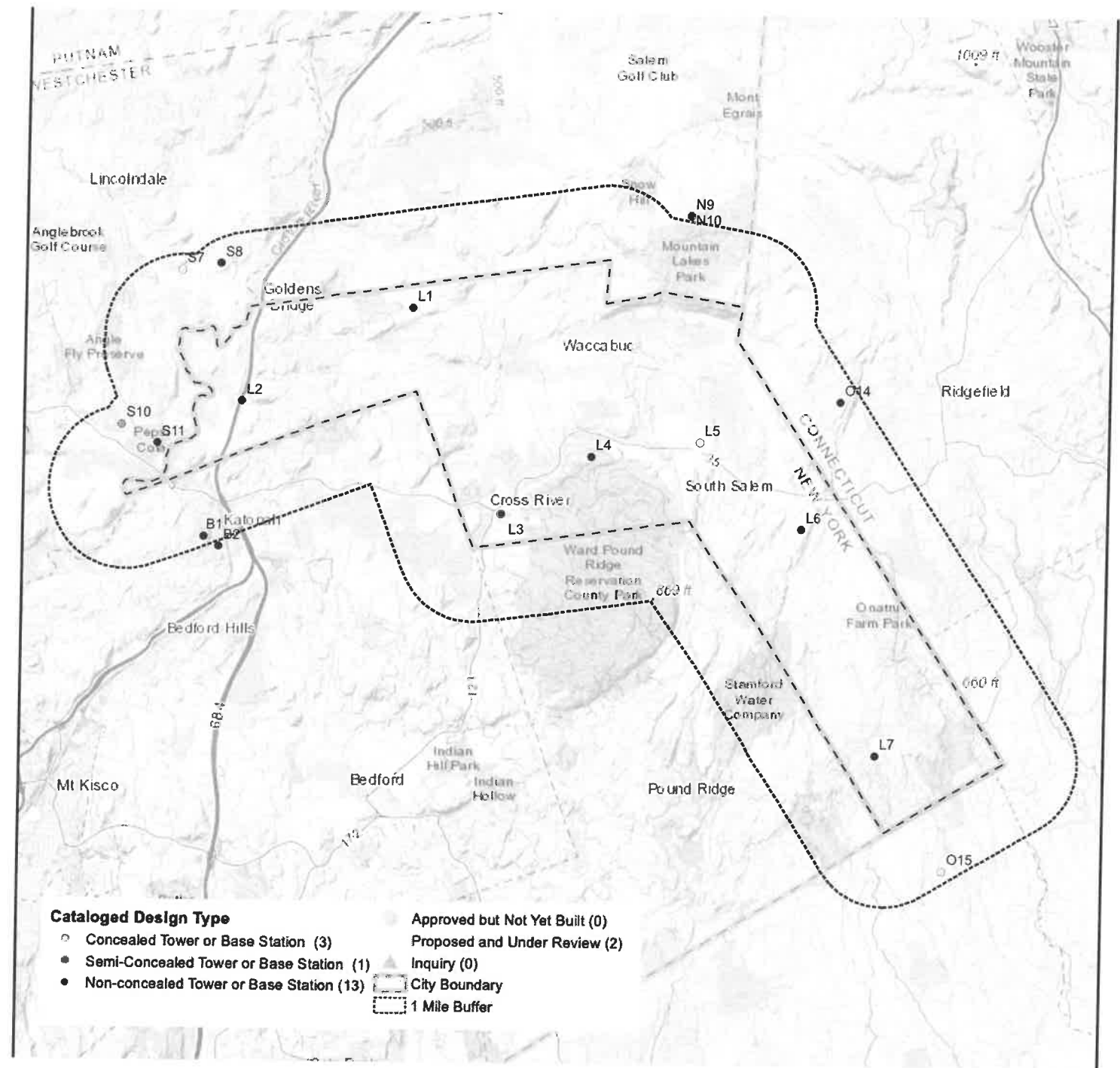
Non-Concealed in Lewisboro (6)

- 6 Existing

Non-Concealed in one-mile perimeter (7)

- 7 Existing

17 PWSF Sites In Study Area



Simulated Propagation Coverage Maps

- 1 Simulated coverage and capacity mapping from existing PWSF sites to identify gaps in network service areas
- 2 Simulated coverage and capacity mapping from potential PWSF sites to identify gaps in network service areas
- 3 Evaluation for future network capacity

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



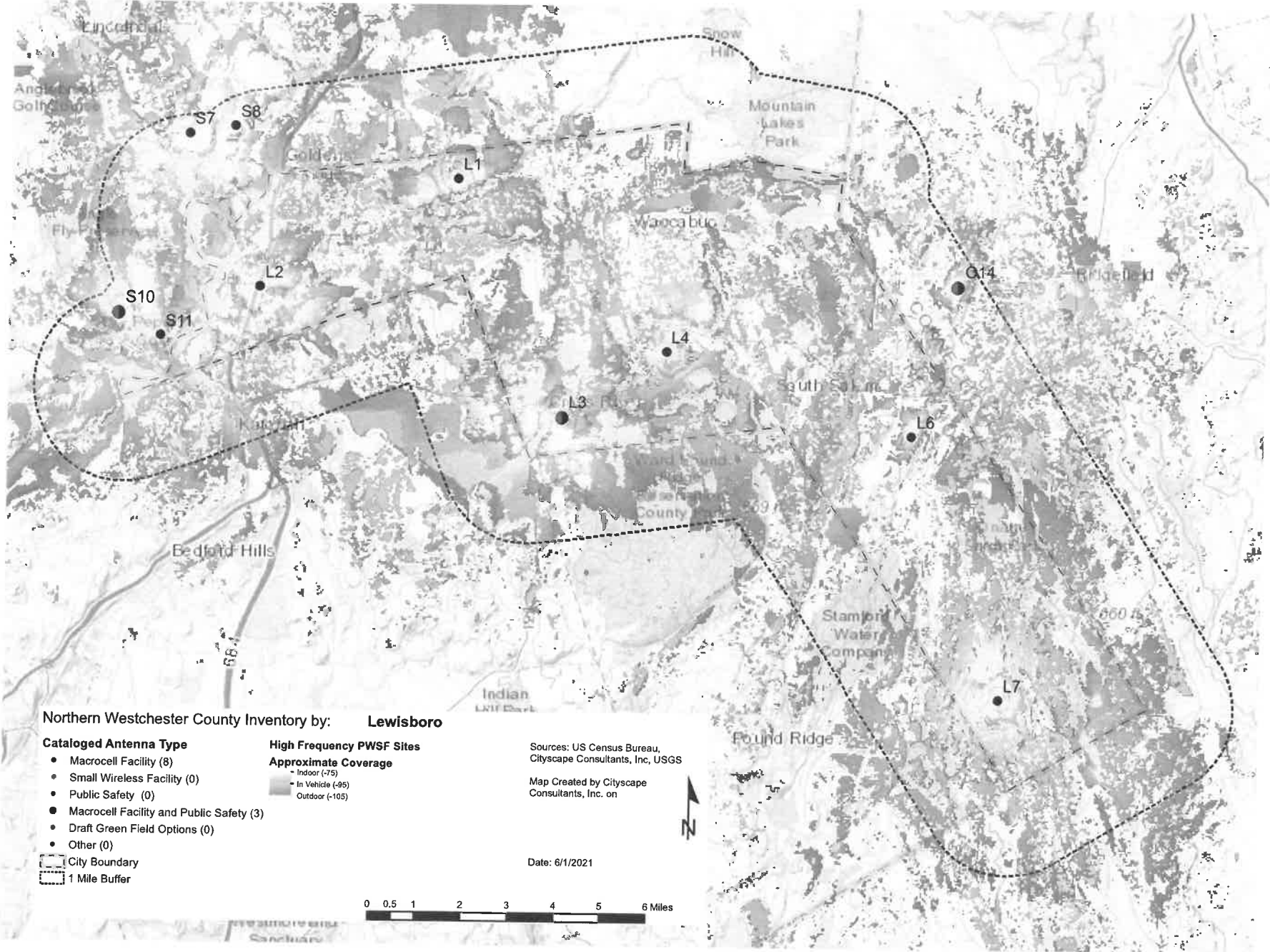
Coverage Map

Lewisboro Study Area

Site Numbers in Study Area

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

11 Sites in Study Area



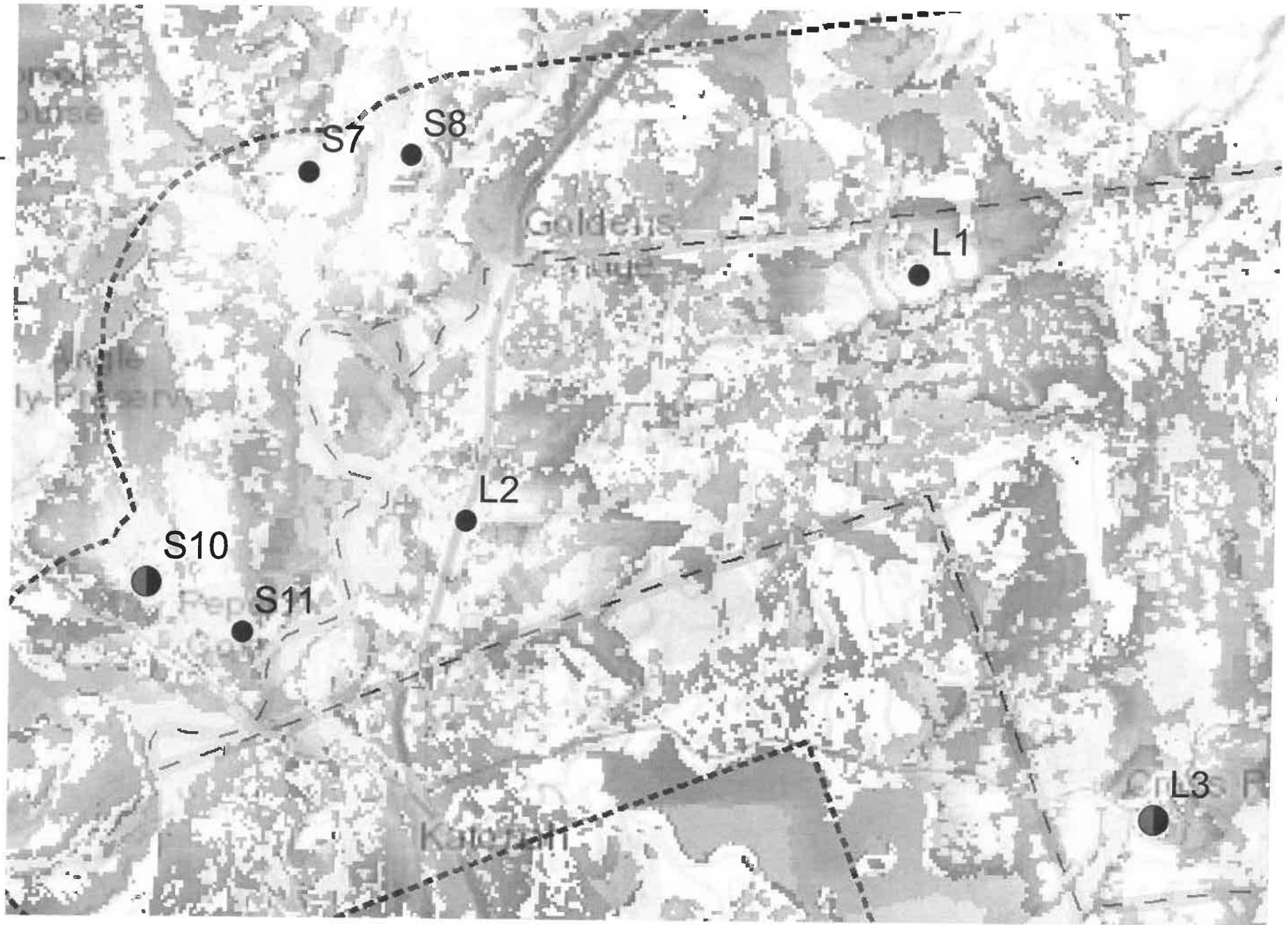
Coverage Map For All PWSF Sites

→ 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.



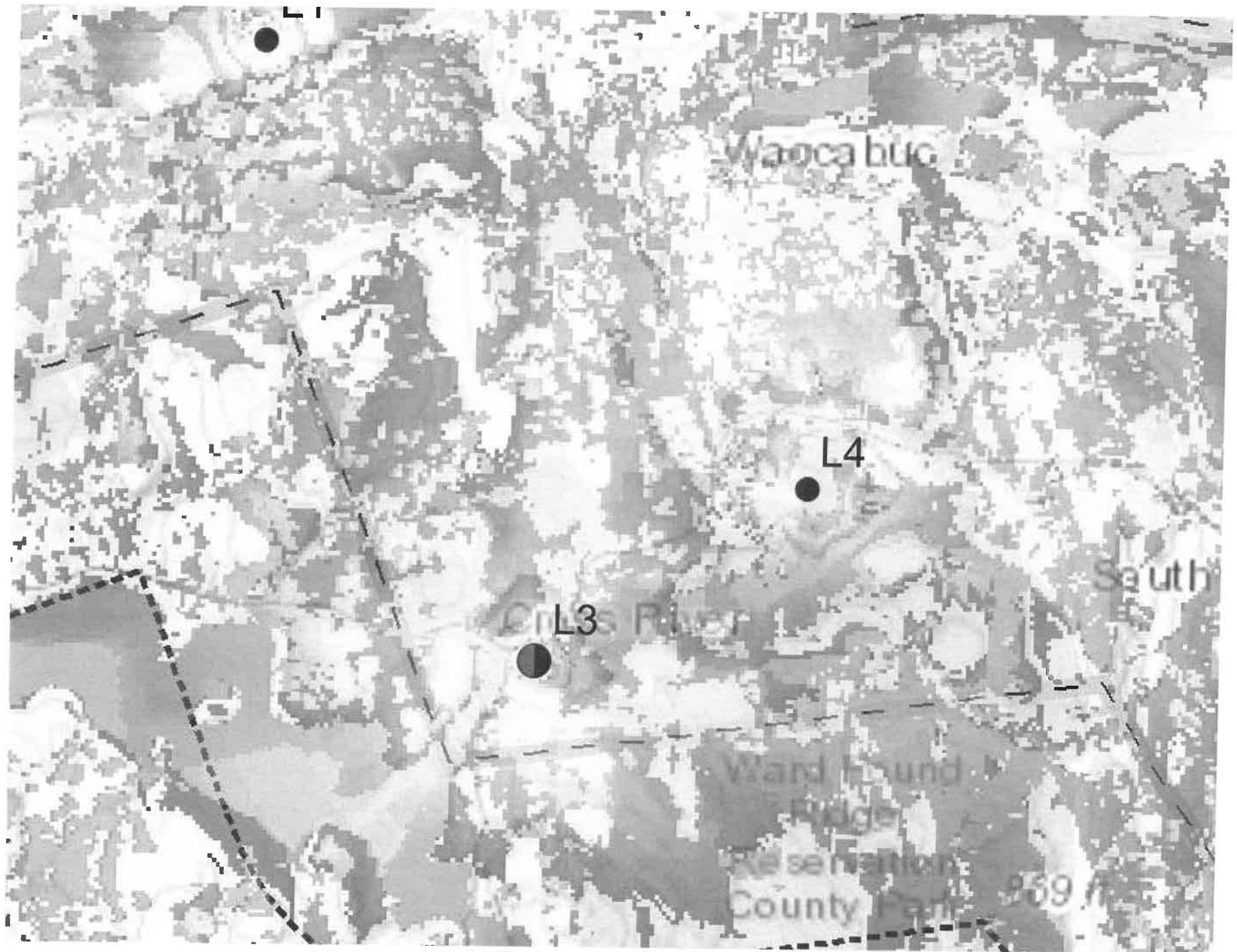
Coverage Map For All PWSF Sites

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



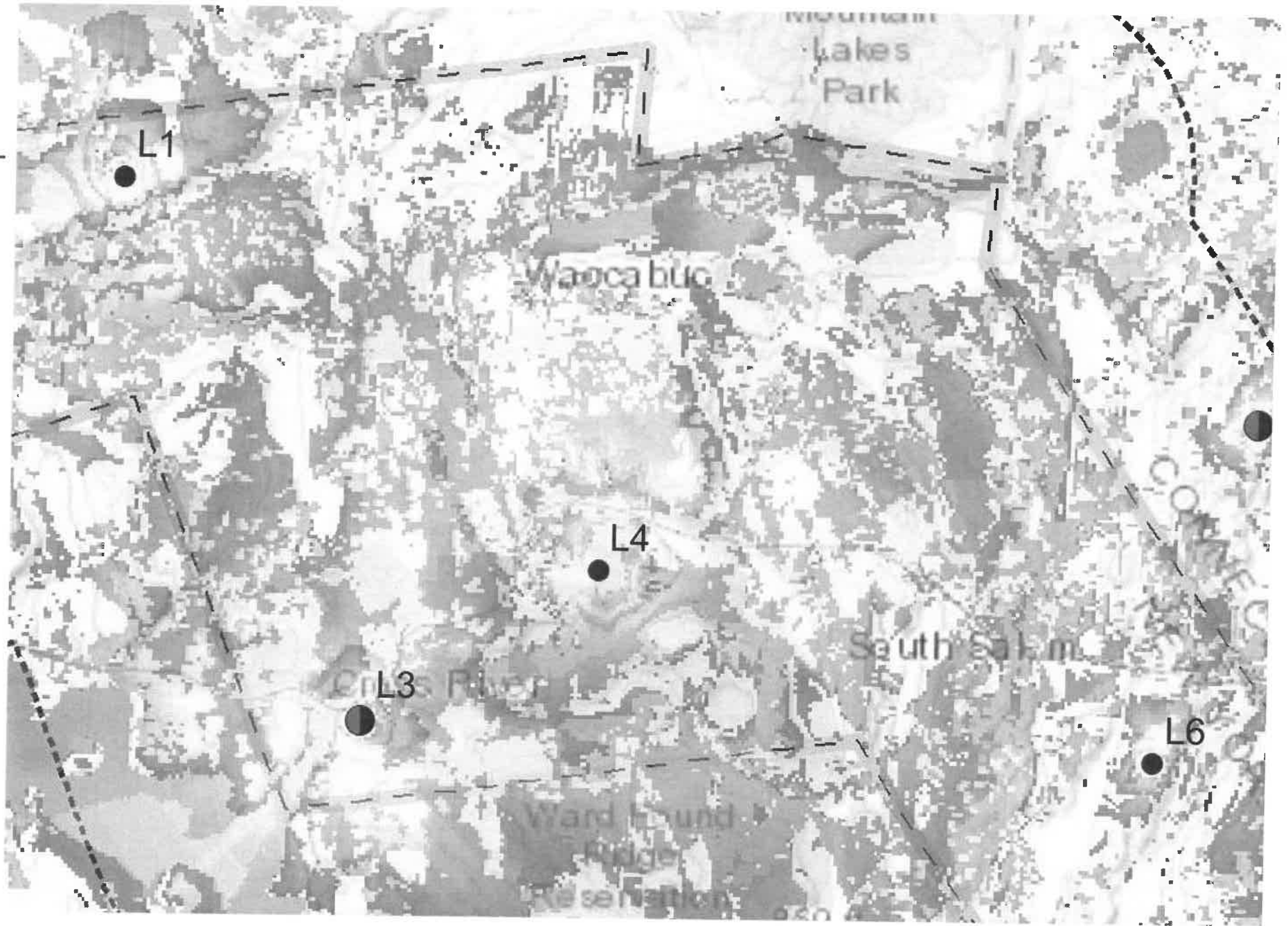
Coverage Map For All PWSF Sites

→ L3 gaps in handoff to
L4 and to L1



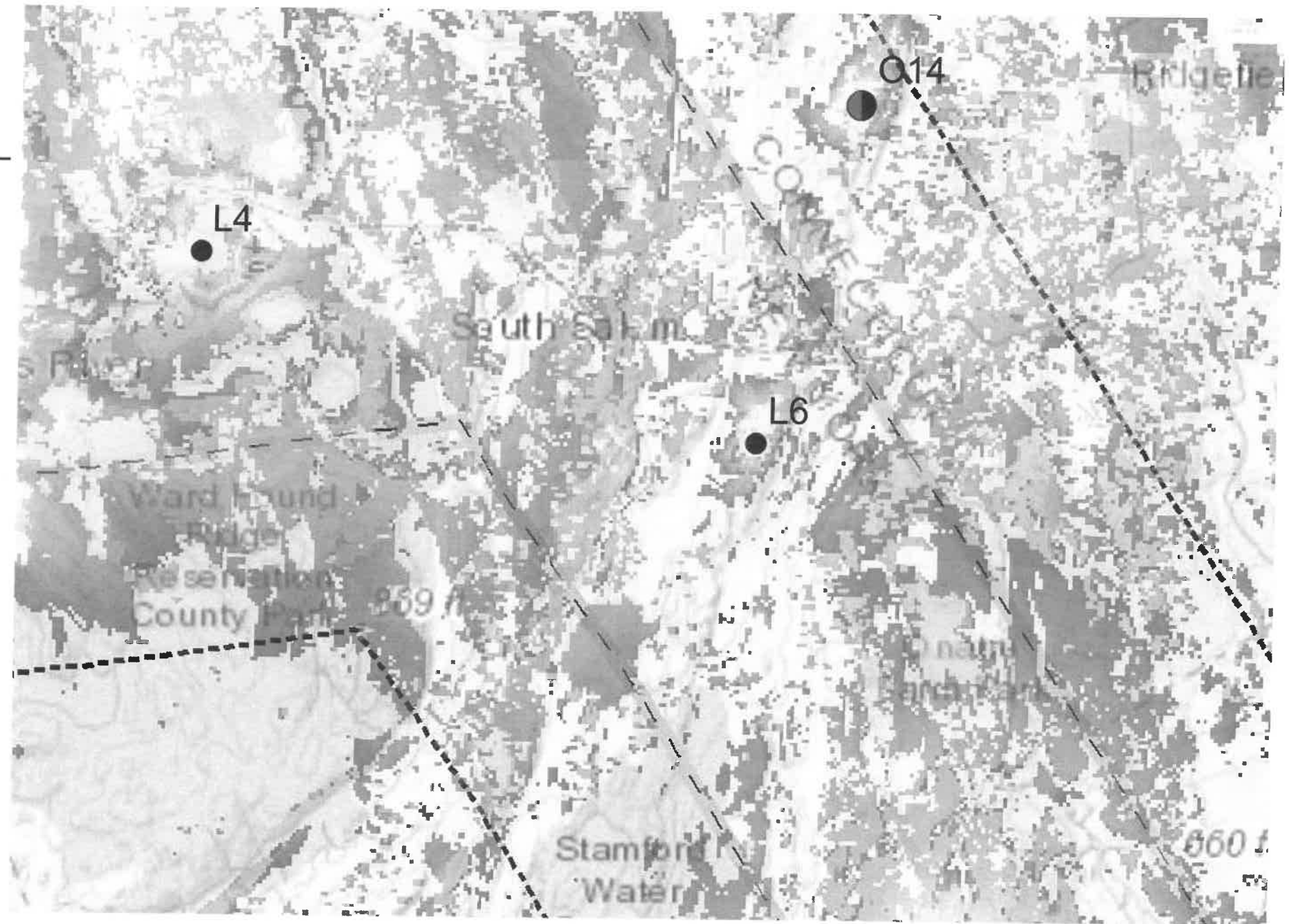
Coverage Map For All PWSF Sites

→ L4 gaps in handoff to
L3, L1 and L6



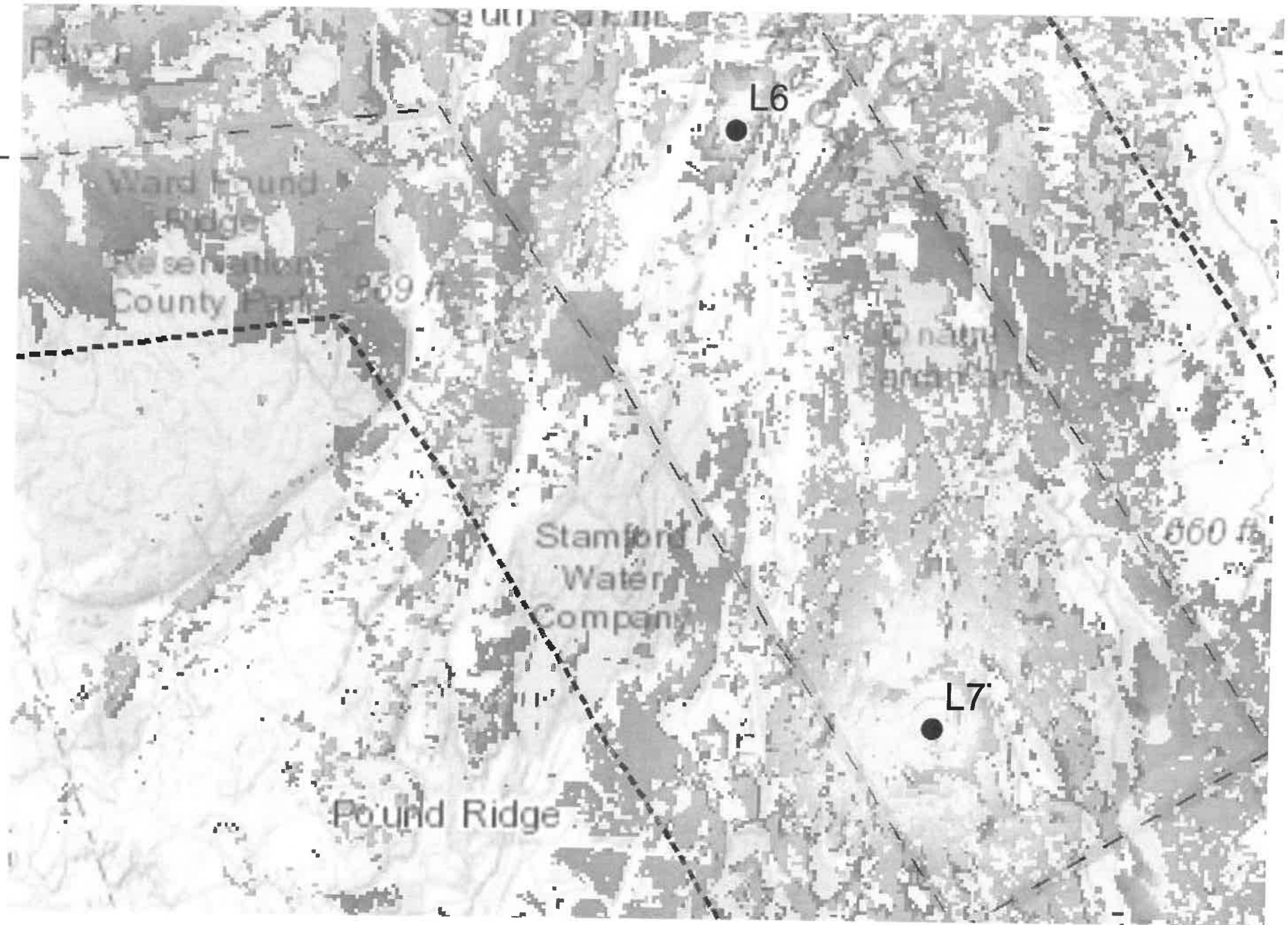
Coverage Map For All PWSF Sites

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



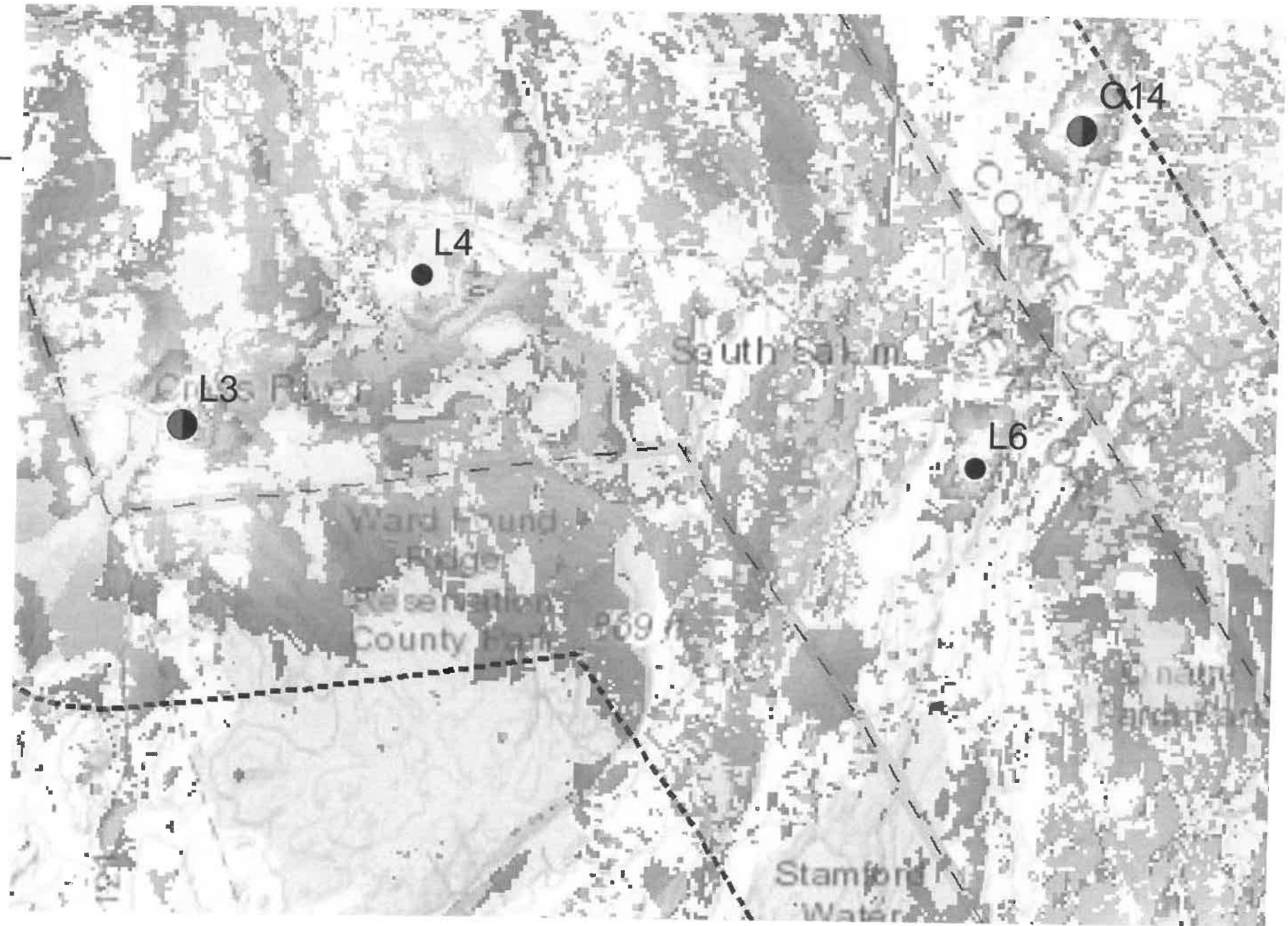
Coverage Map For All PWSF Sites

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



Coverage Map For All PWSF Sites

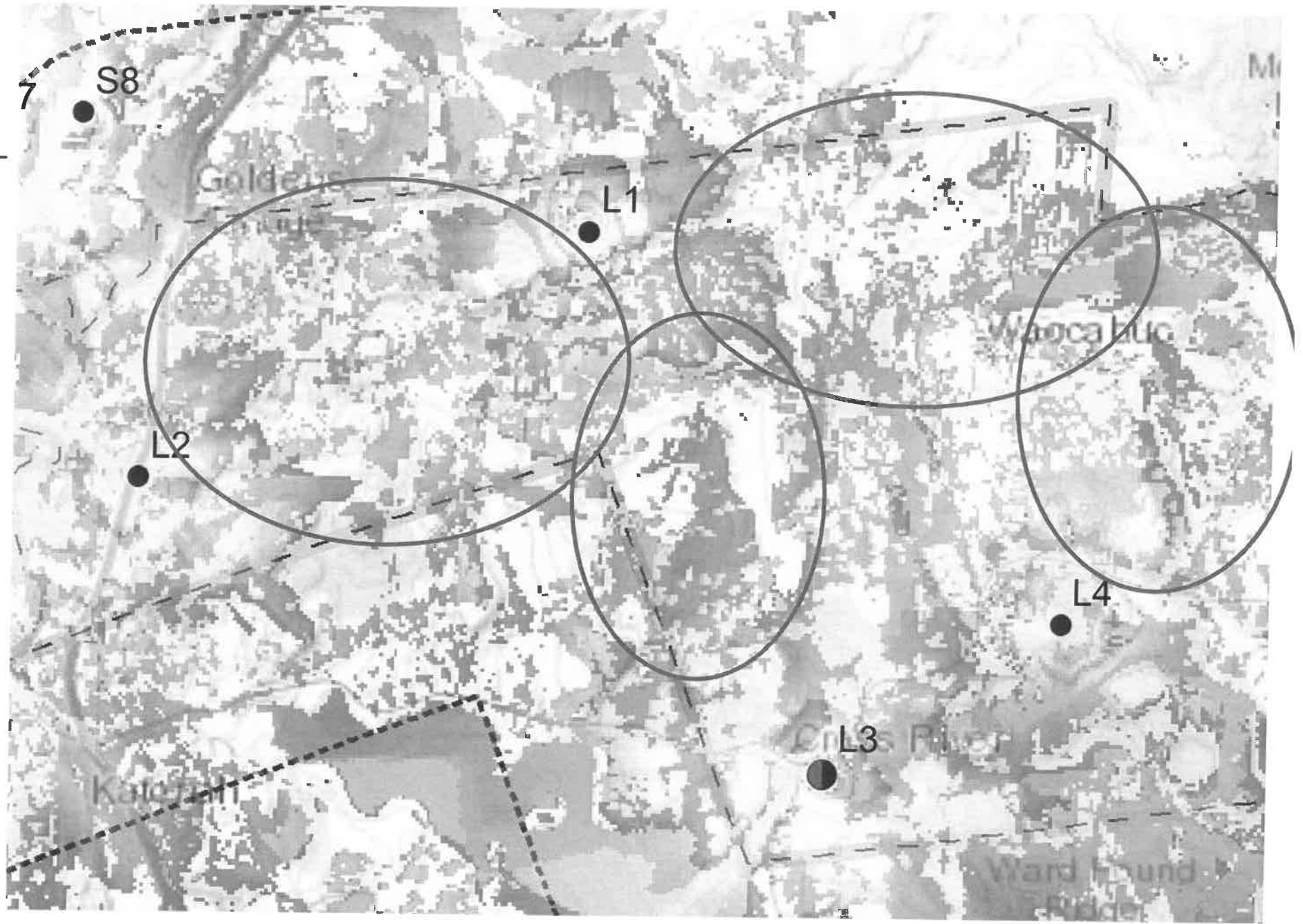
→ L3- L6 only provides
minimal coverages
along Rt 35 (Cross
River Rd)



Coverage Map For All PWSF Sites

North Side of Town Summery

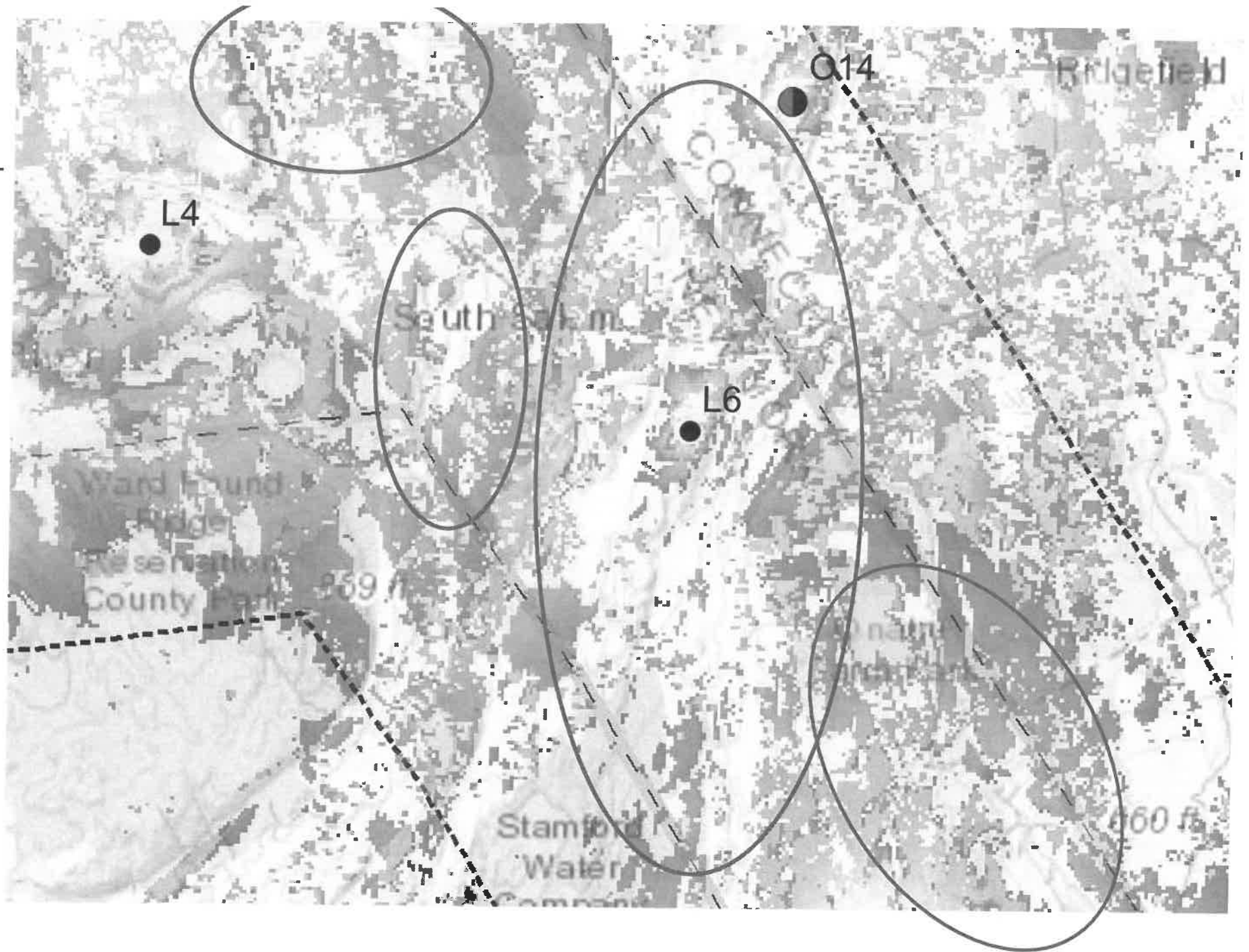
- Many gaps in coverages throughout the Town as indicated with areas with no color
- New sites are needed to improve network connectivity between sites



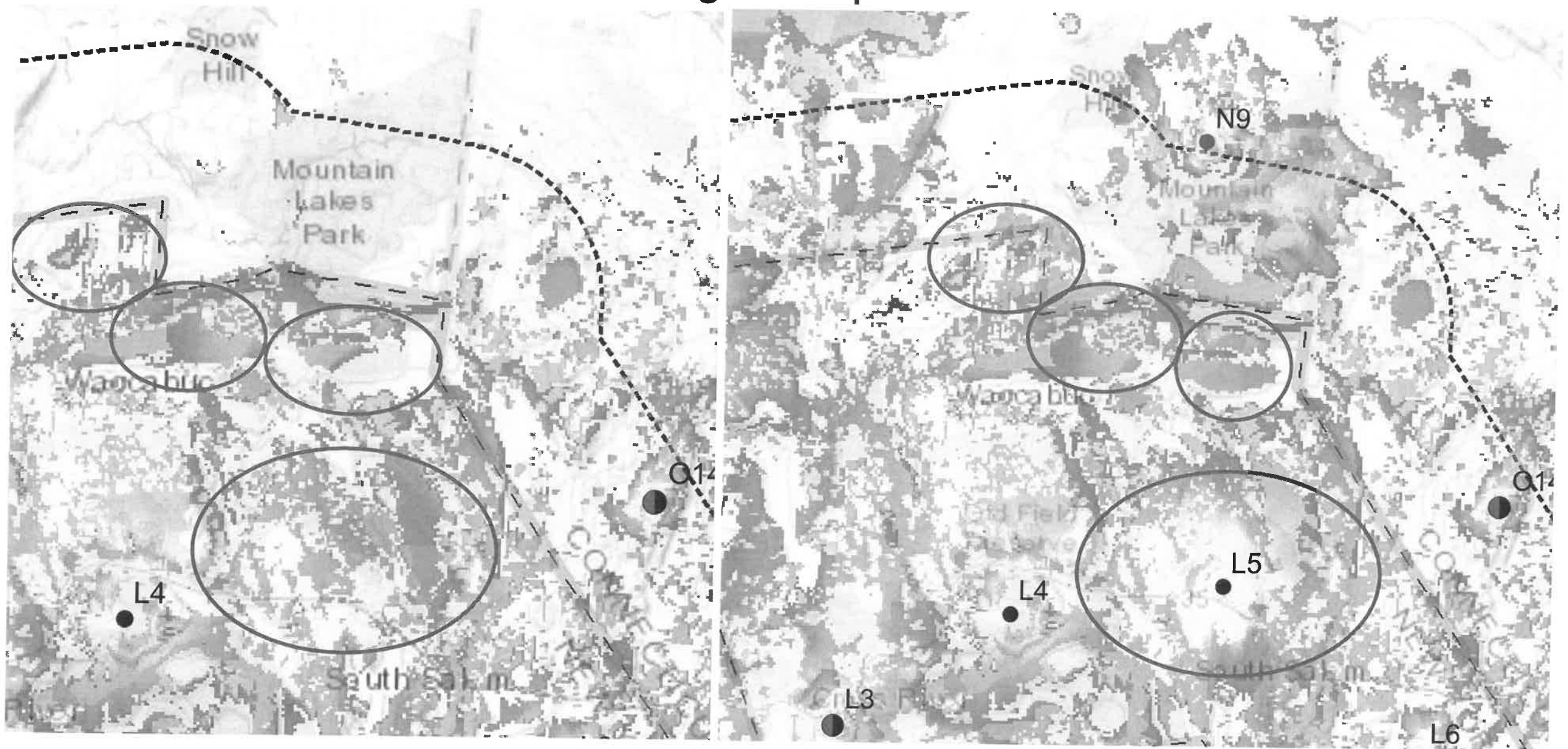
Coverage Map For All PWSF Sites

South Side of Town Summary

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

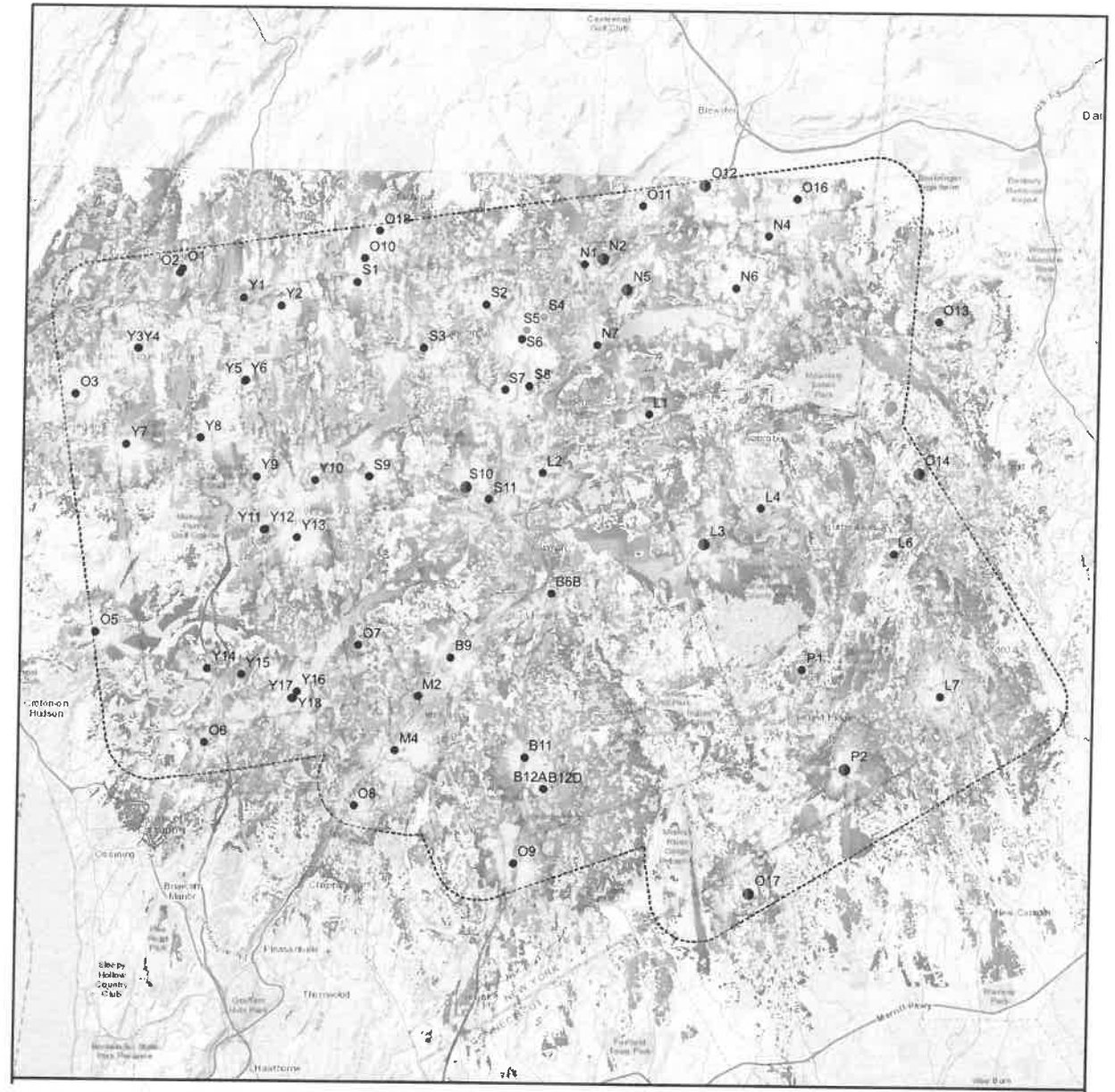
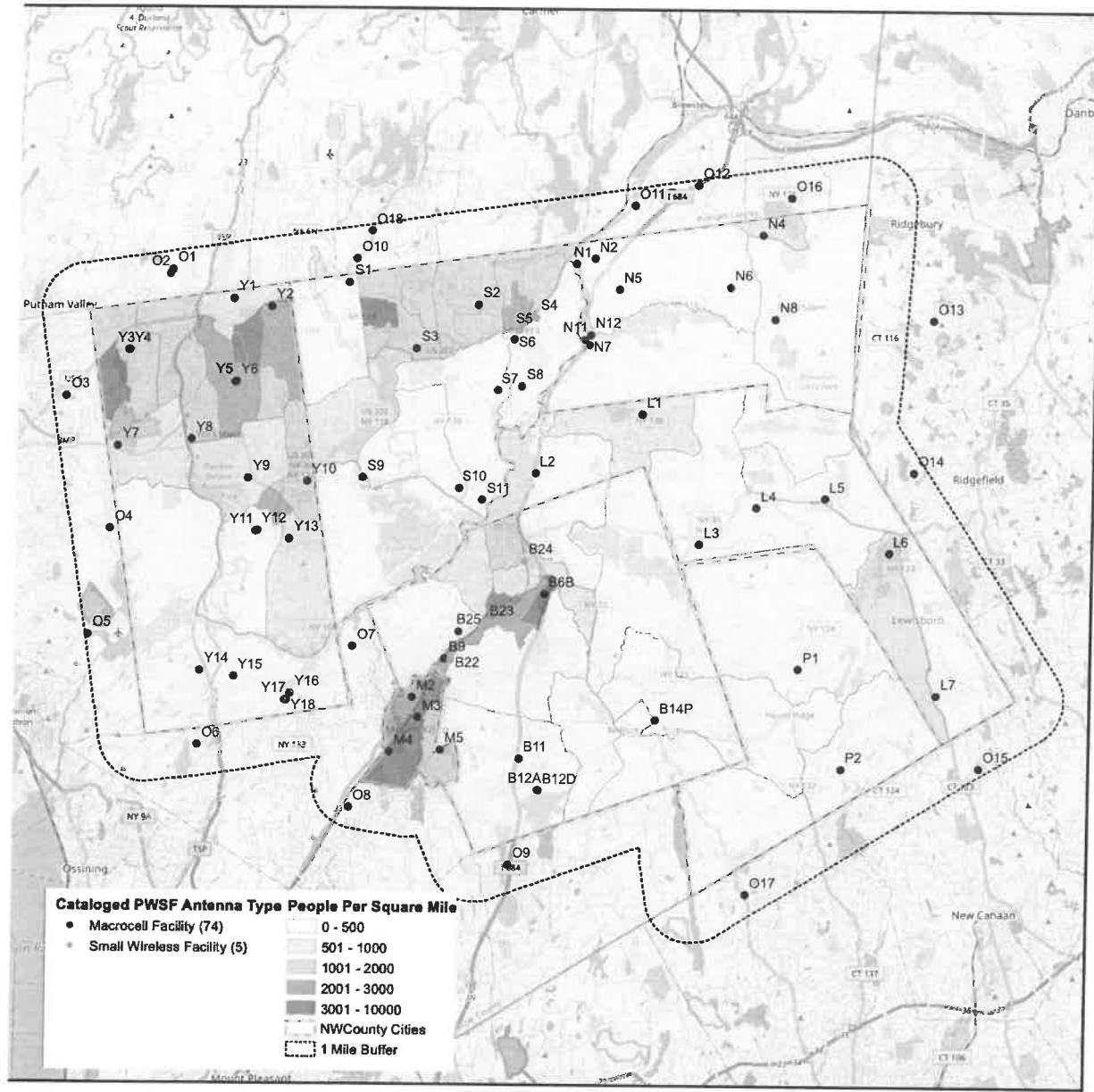


Coverage Comparisons



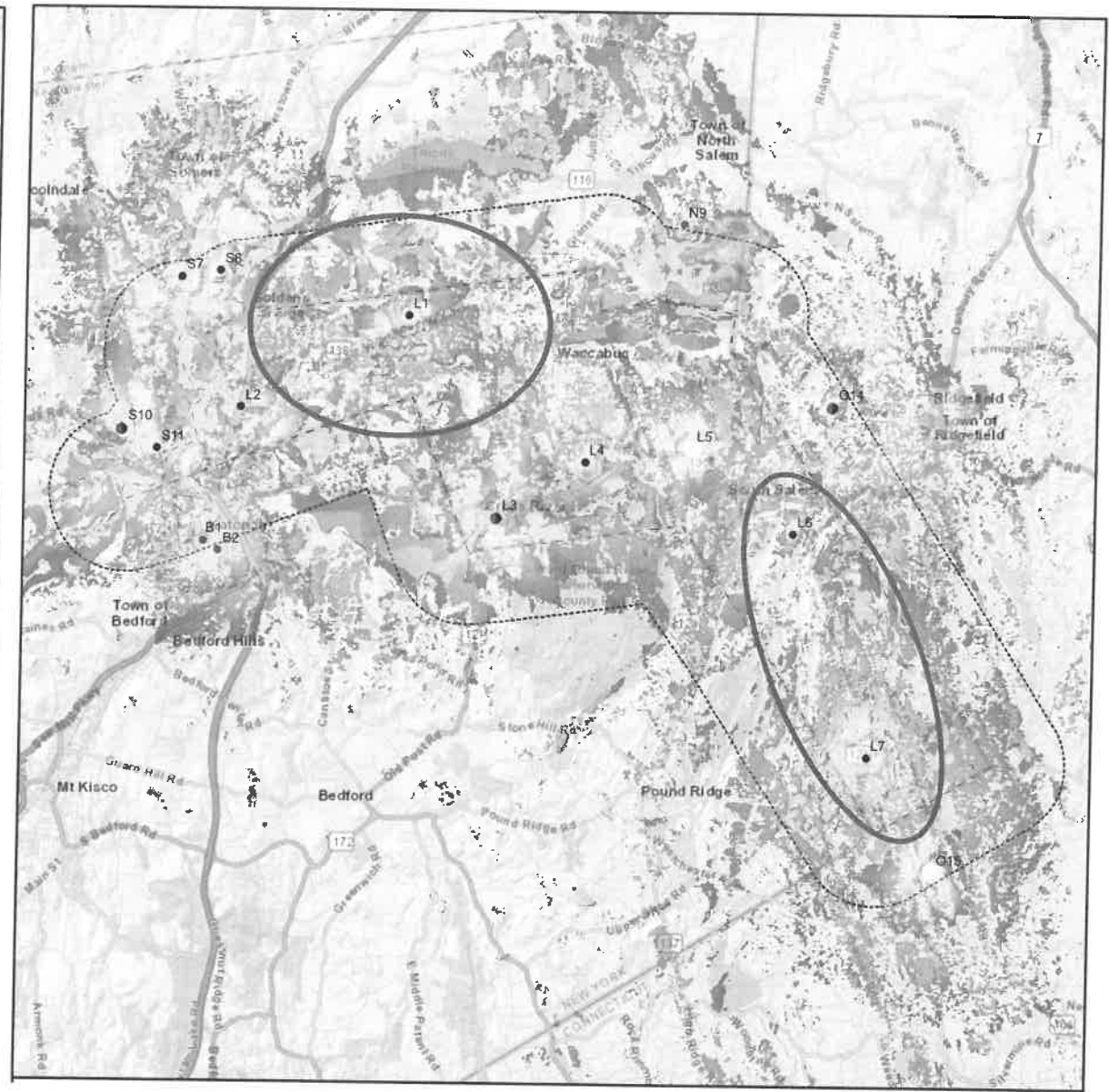
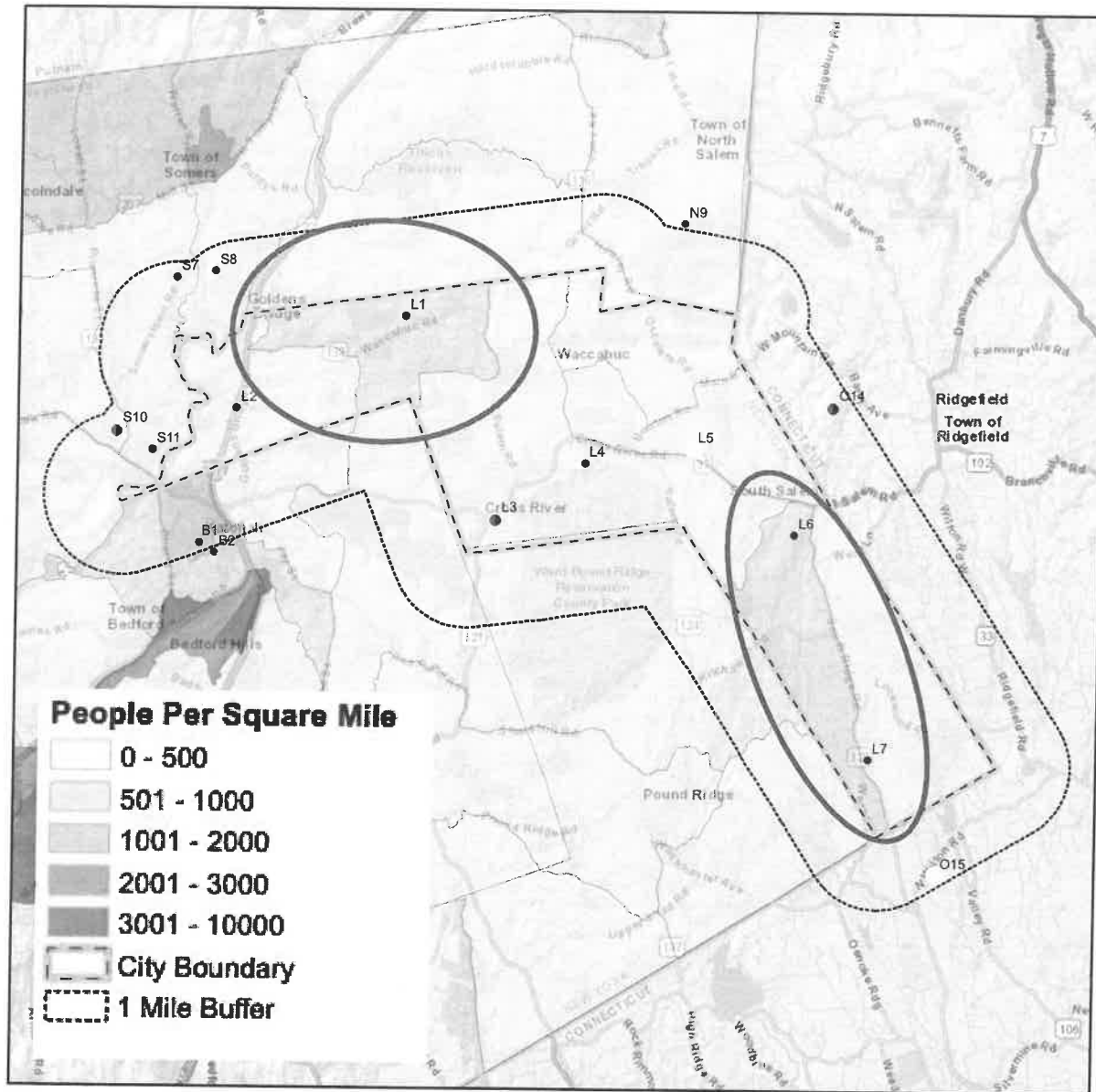
- If personal wireless is added to site **N9** there is nominal improvements for the Town
- Adding **L5** will provide better handoff to **L4** and improve coverage along Rt 35 and eastward

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

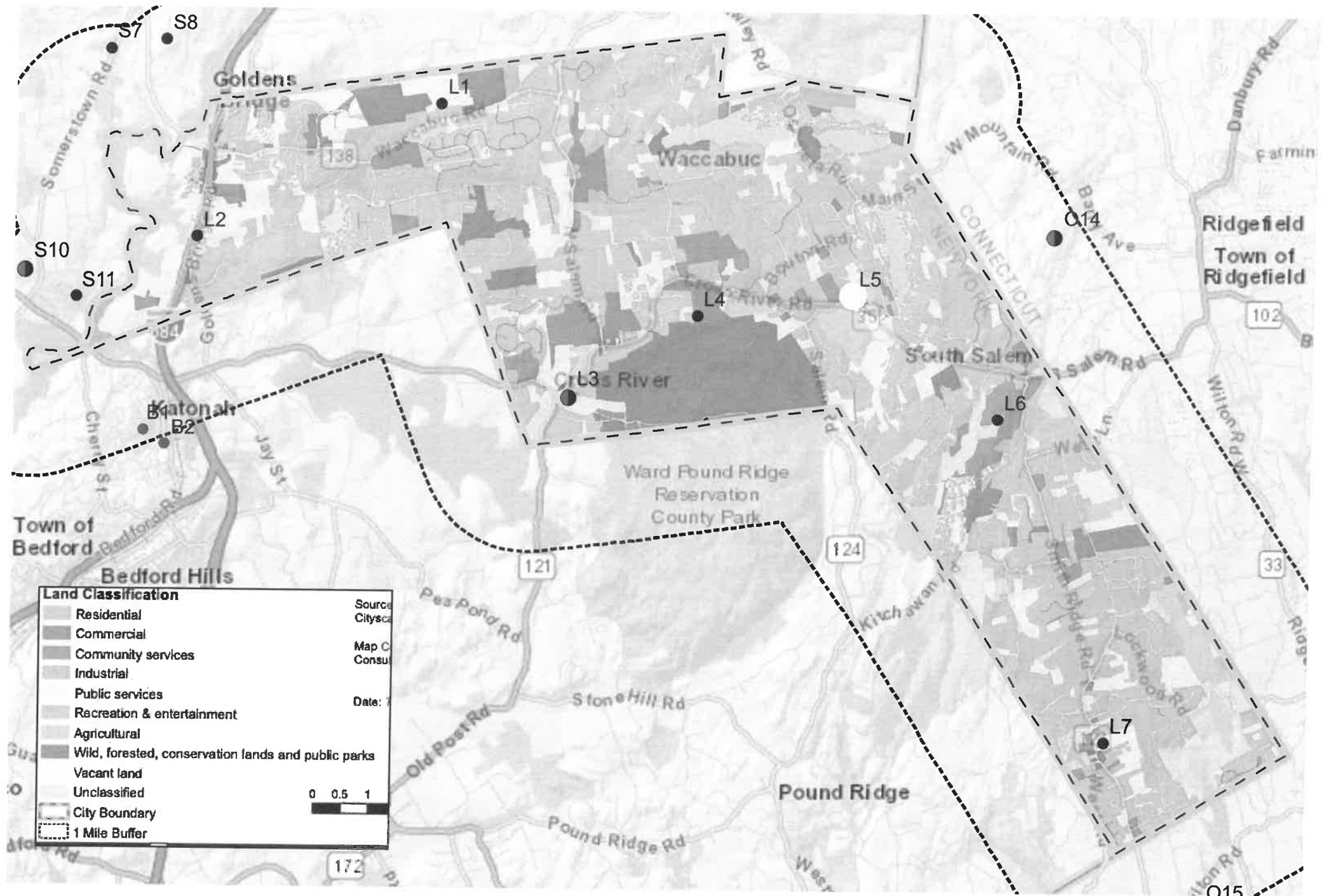
Coverage Gap Analysis Land Classification

Lewisboro largely
residential with
4,610 parcels

Vacant land - 775
parcels (Site L1)

Small pockets of
commercial areas
with 58 parcels

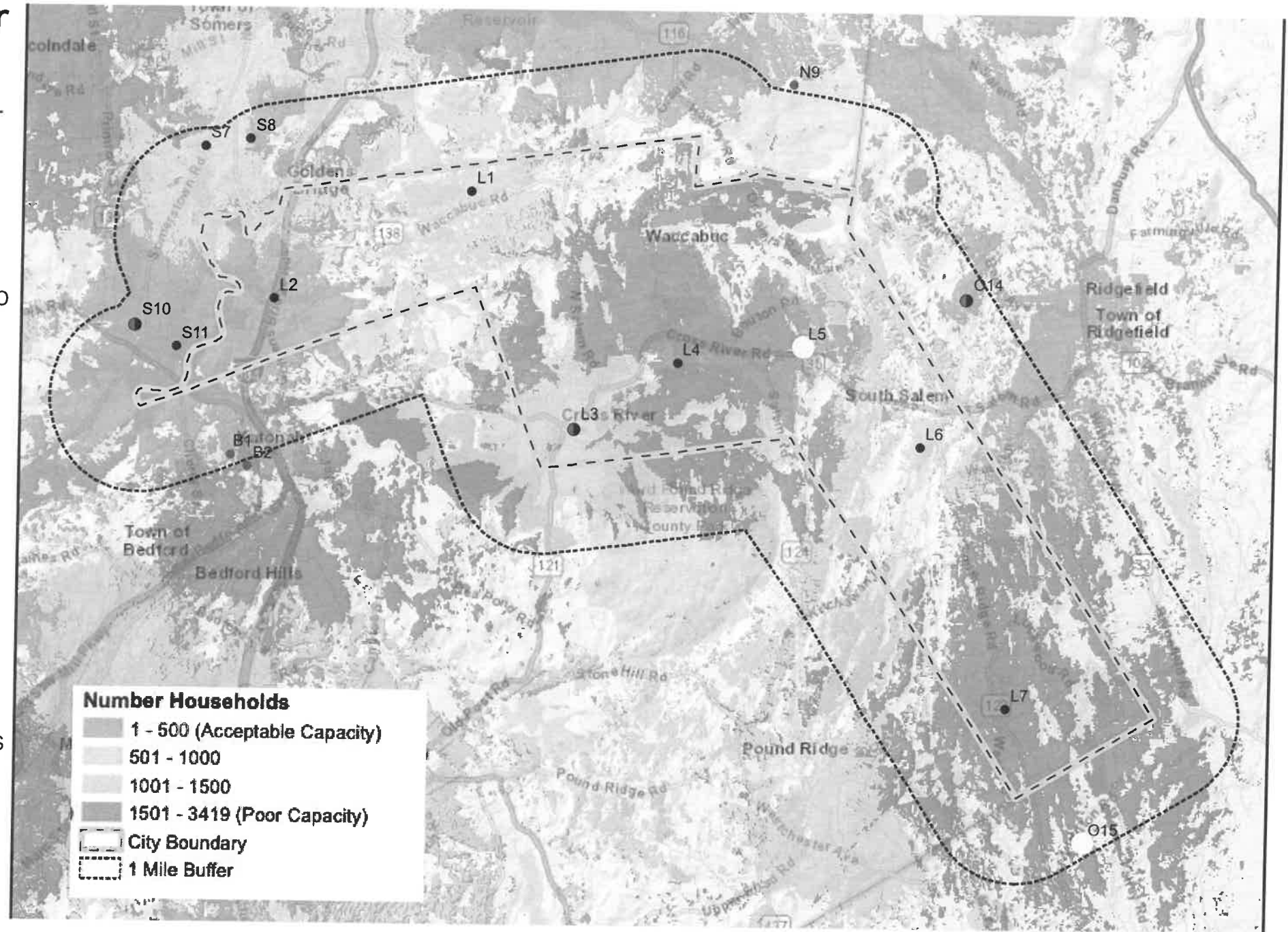
Community
Services - 204
parcels



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

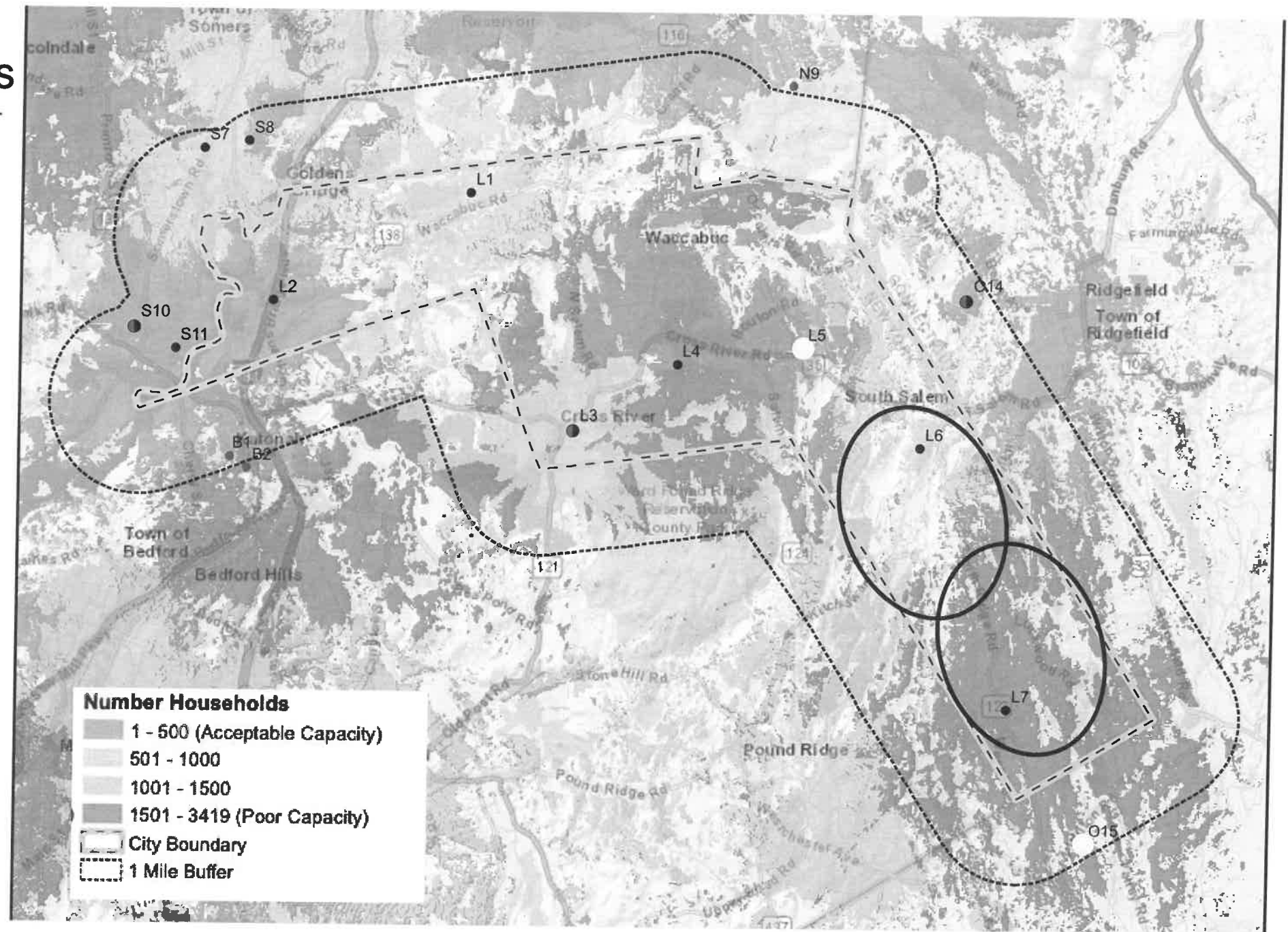
- **Green** – good; ratio of number of sites supporting subscriber base
- **Orange** – average; ratio of number of sites to subscriber base is problematic
- **Red** – poor; ratio of number of sites to subscriber base is poor
- No color** – none; PWSF sites are needed in most of these areas



Network Capacity

All Existing PWSF Sites

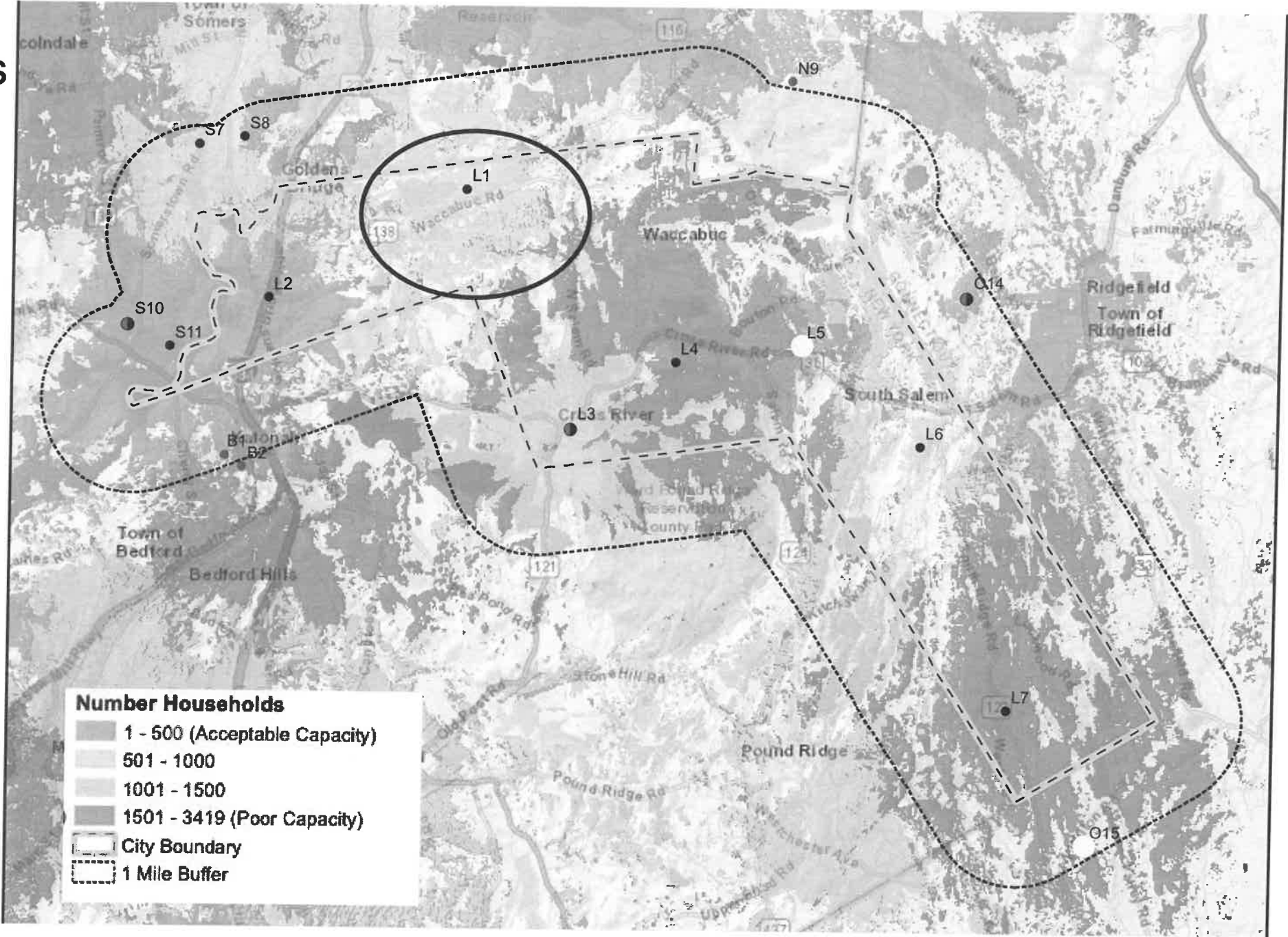
→ L6 and L7 the areas that show no coloration is because there isn't any coverage in this area therefore it doesn't show capacity issue, however this is a higher density residential area and new sites will be necessary for these gaps



Network Capacity

All Existing PWSF Sites

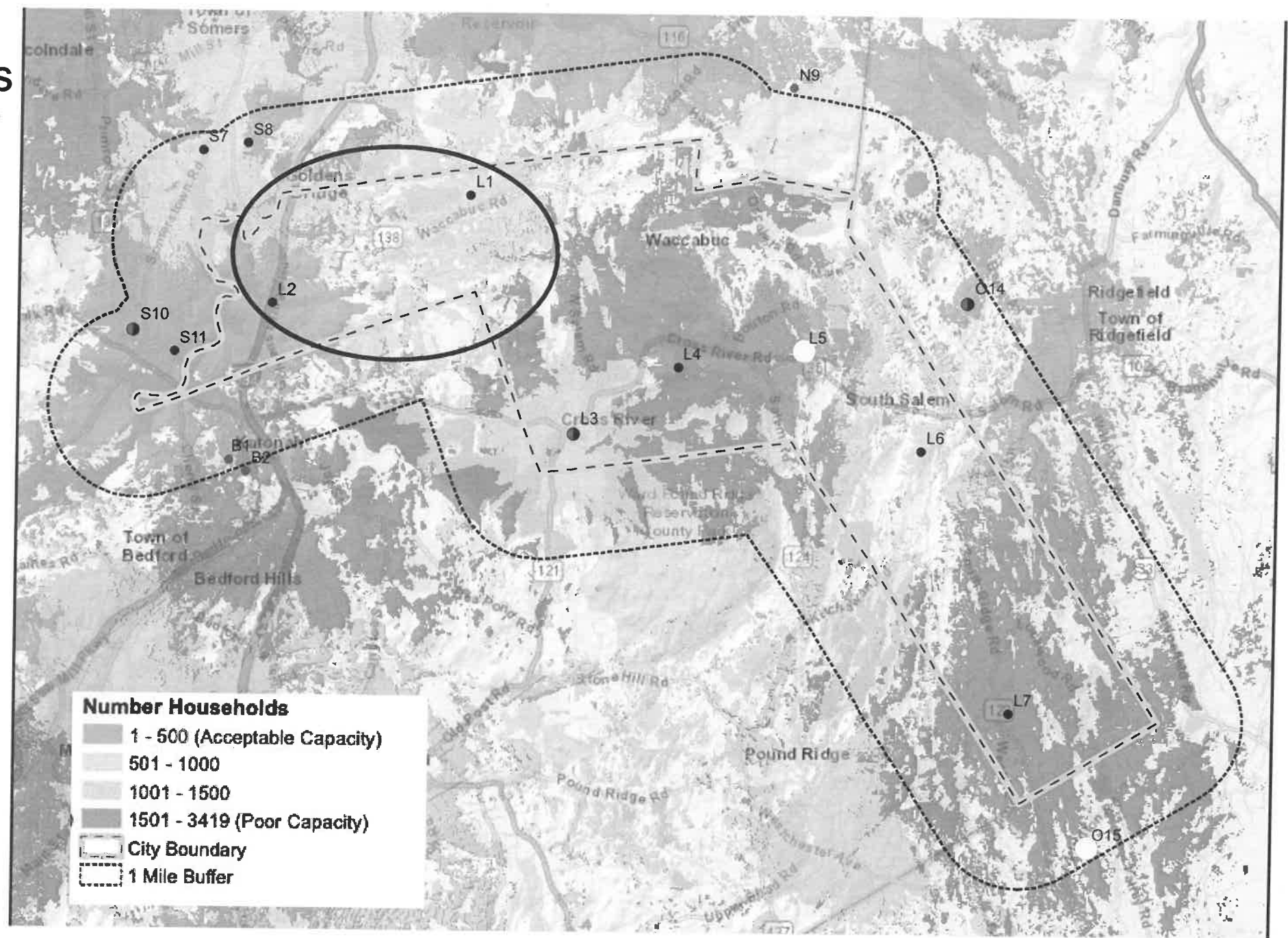
→ L1 Vacant and public property in low priority area



Network Capacity

All Existing PWSF Sites

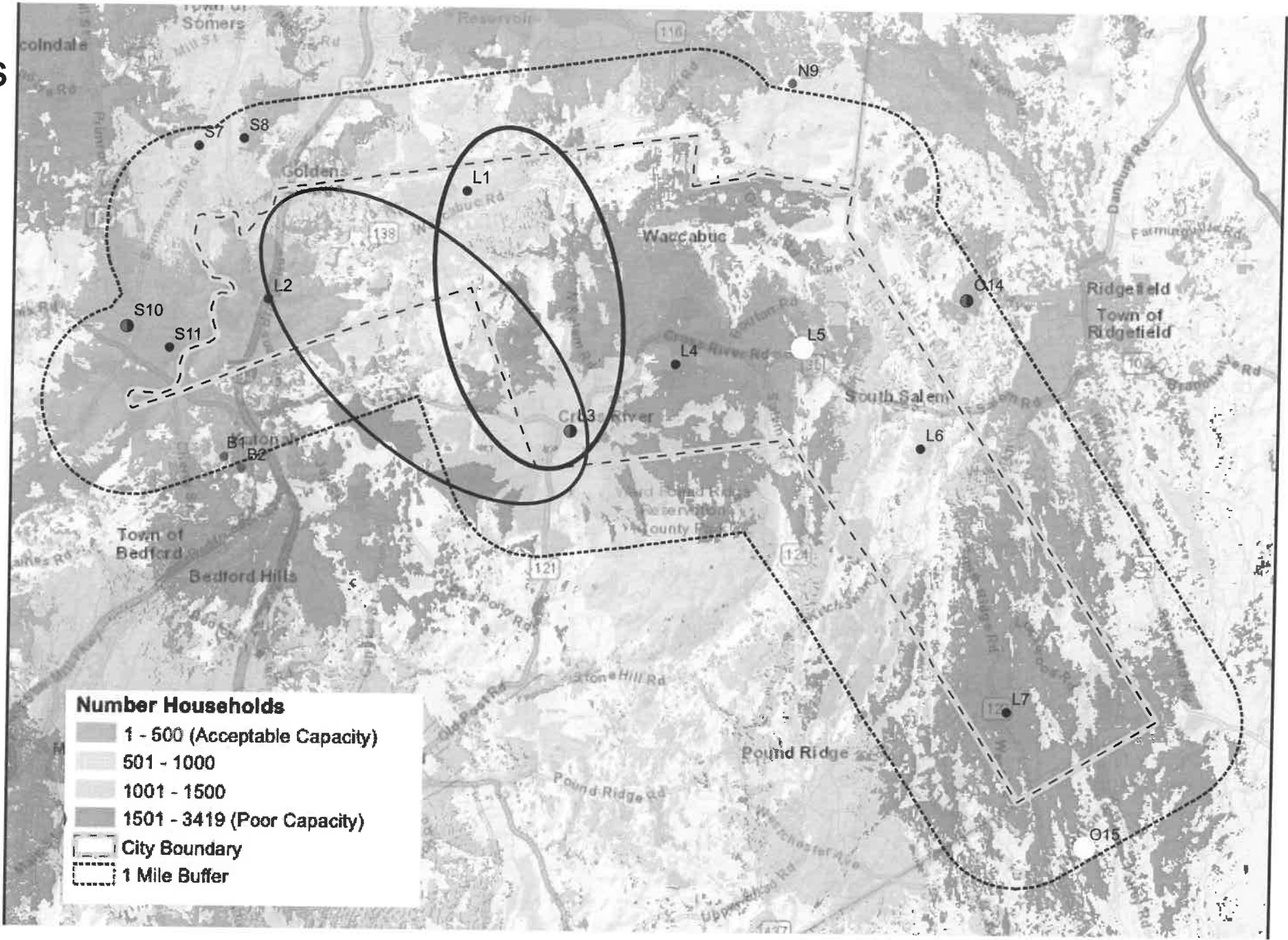
→ L2 site needed between L1 and L2 to add coverage and improve handoff between sites



Network Capacity

All Existing PWSF Sites

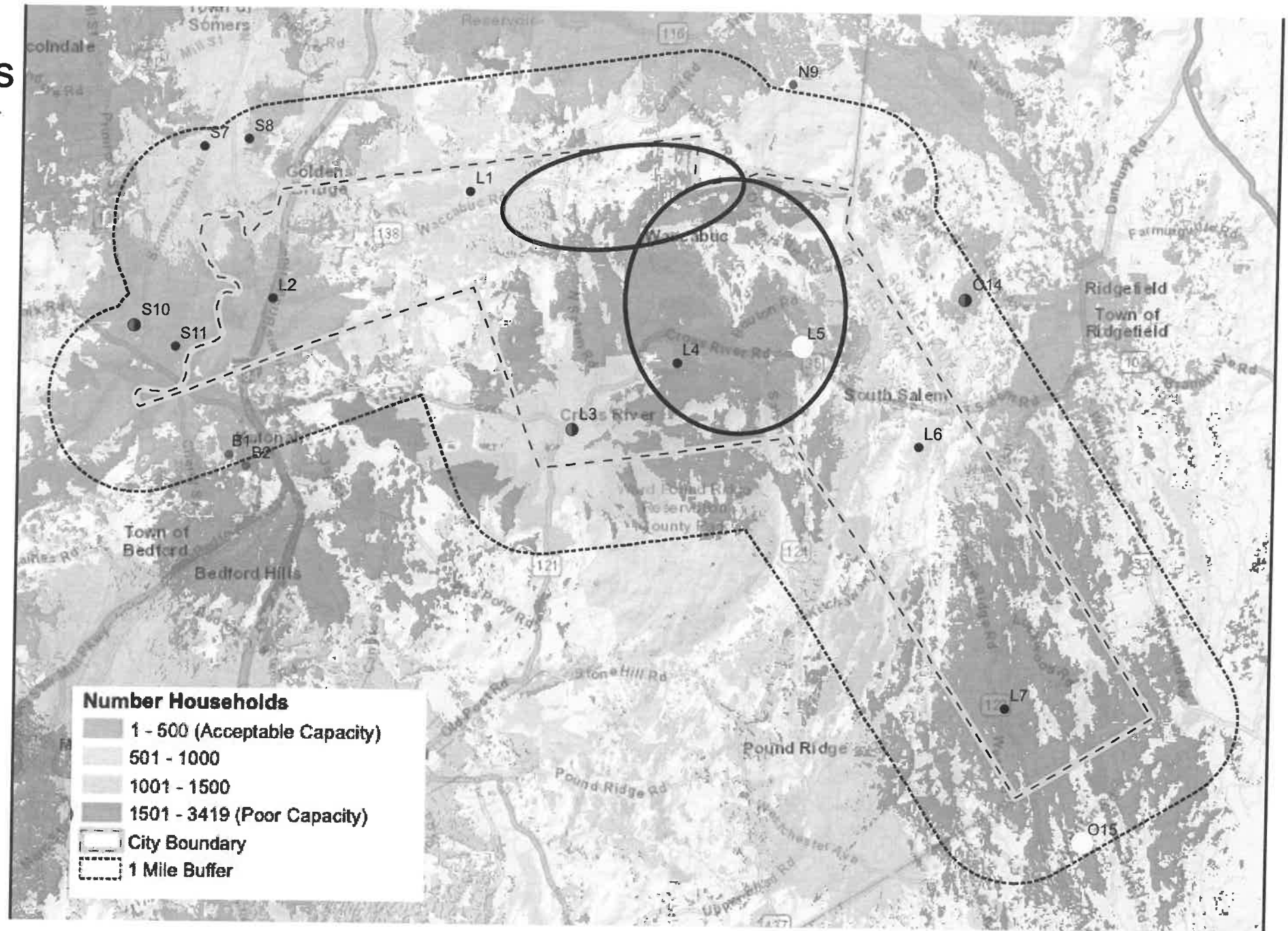
→ L3 sites needed between L3 and L1 and L2 to help capacity issues, add coverage and improve handoff between sites



Network Capacity

All Existing PWSF Sites

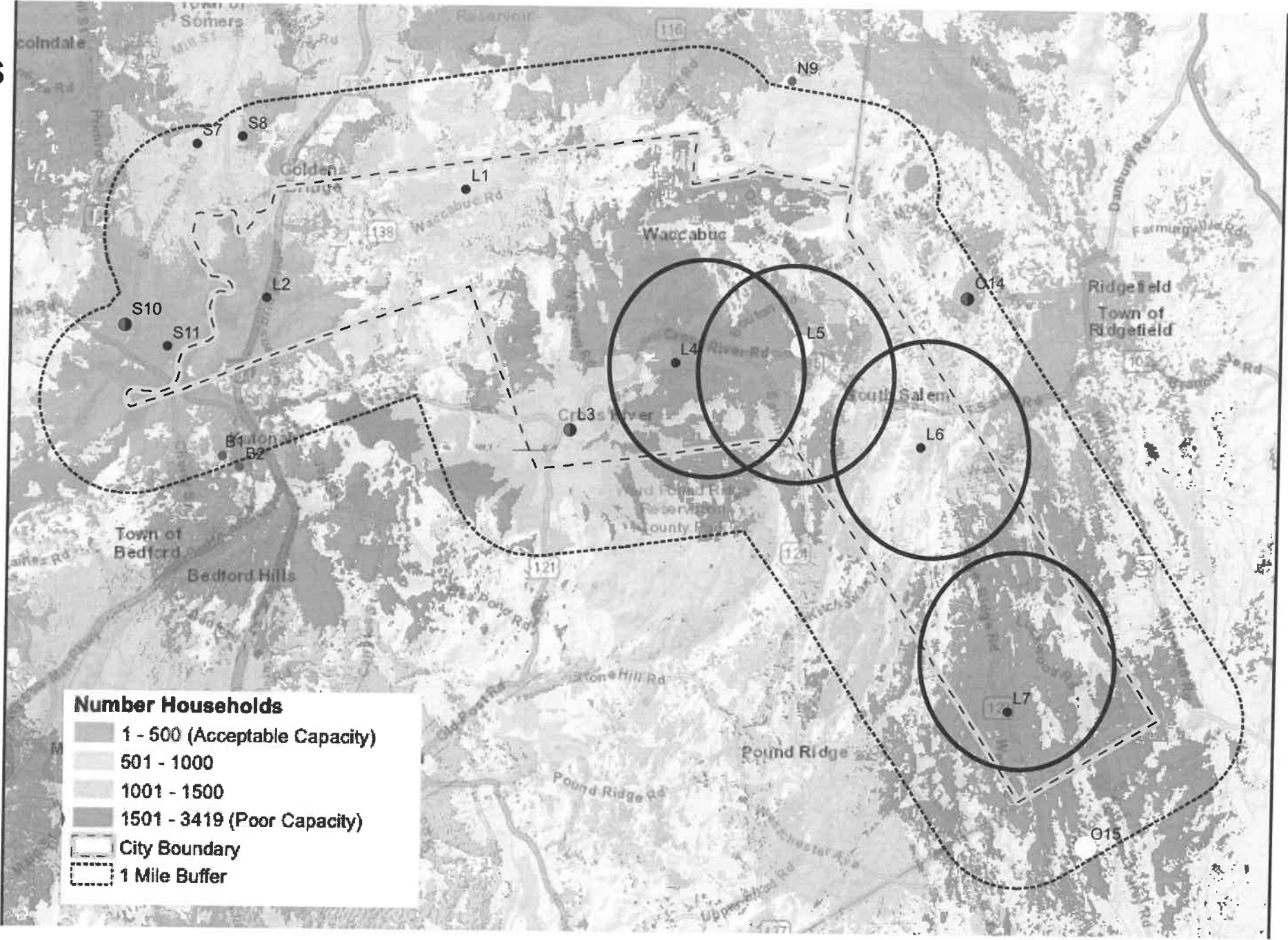
- **L4** additional sites needed north, south and east of **L4** because of the larger geographic area in need
- Additional sites will be needed east of **L1** and north of **L4** in addition to the potential **L5** site



Network Capacity

All Existing PWSF Sites

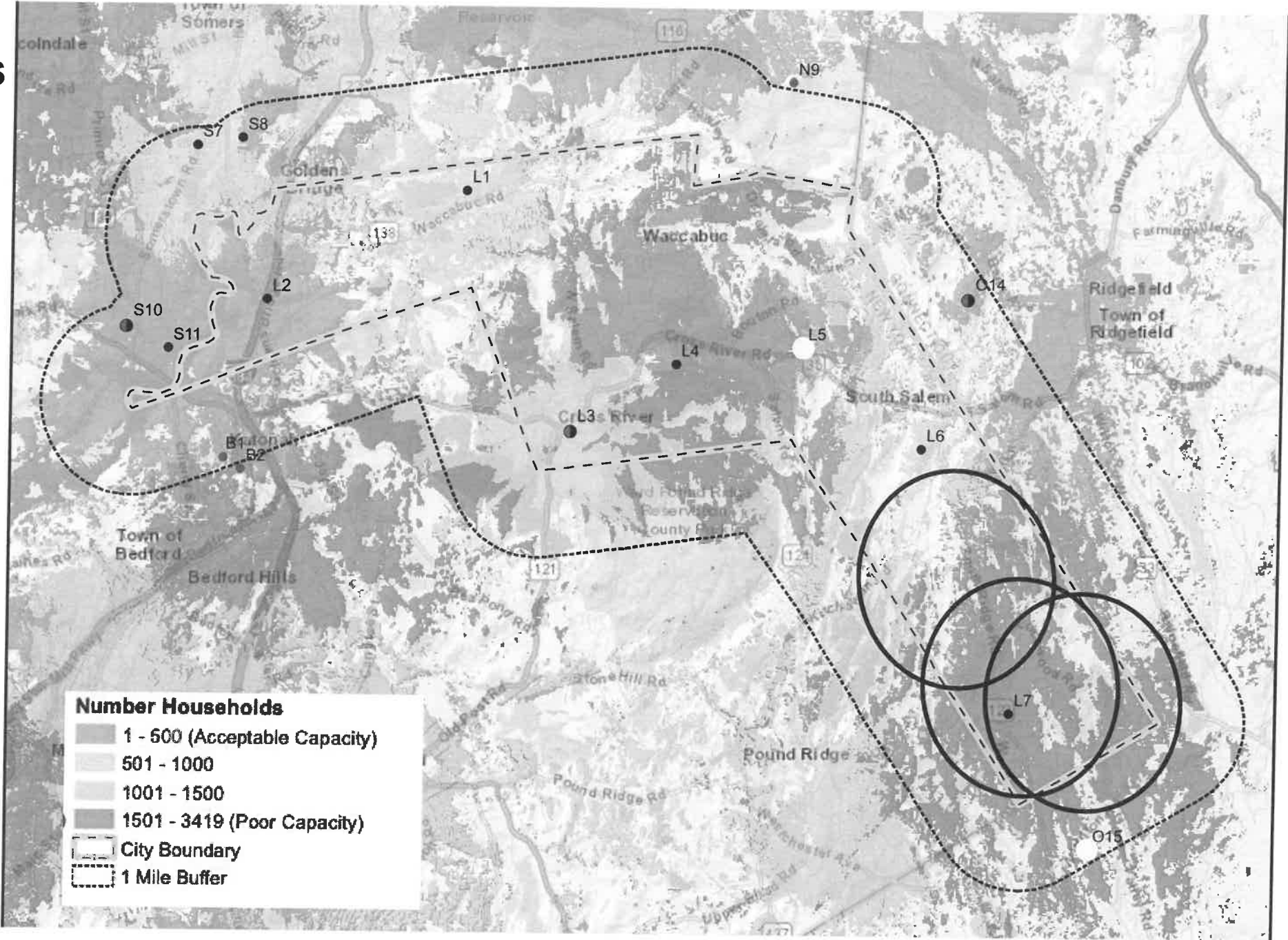
→ L6 gaps in network coverage area need to be filled in with new sites to alleviate capacity issues and add connectivity to L4, L7 and in the area of the potential L5



Network Capacity

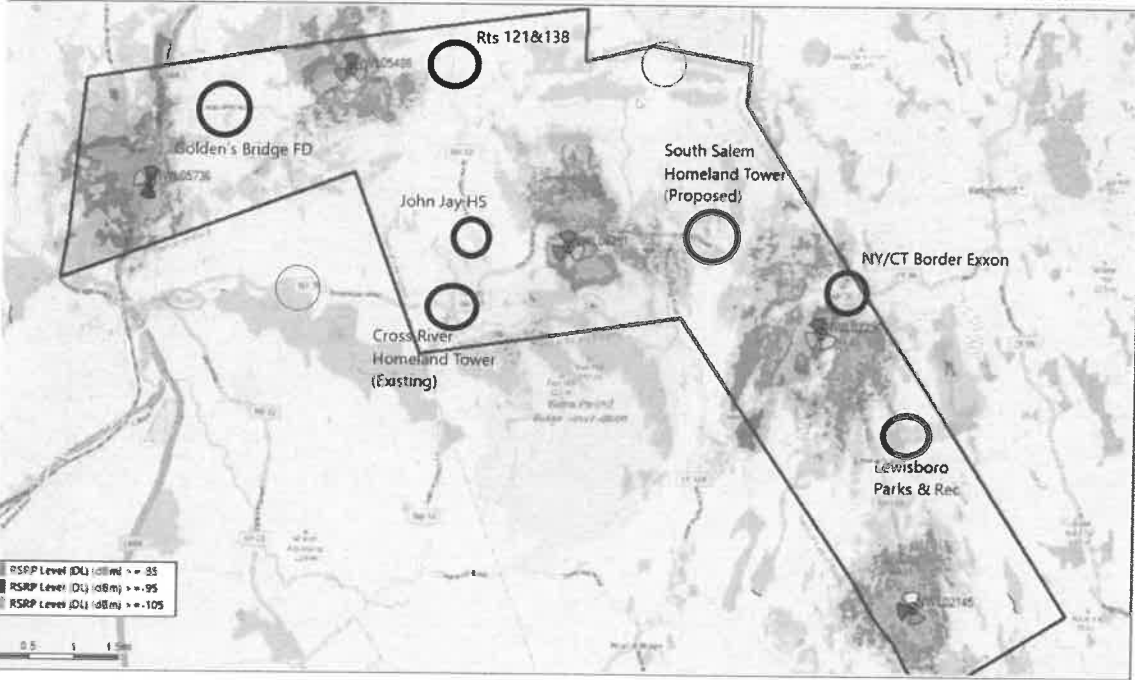
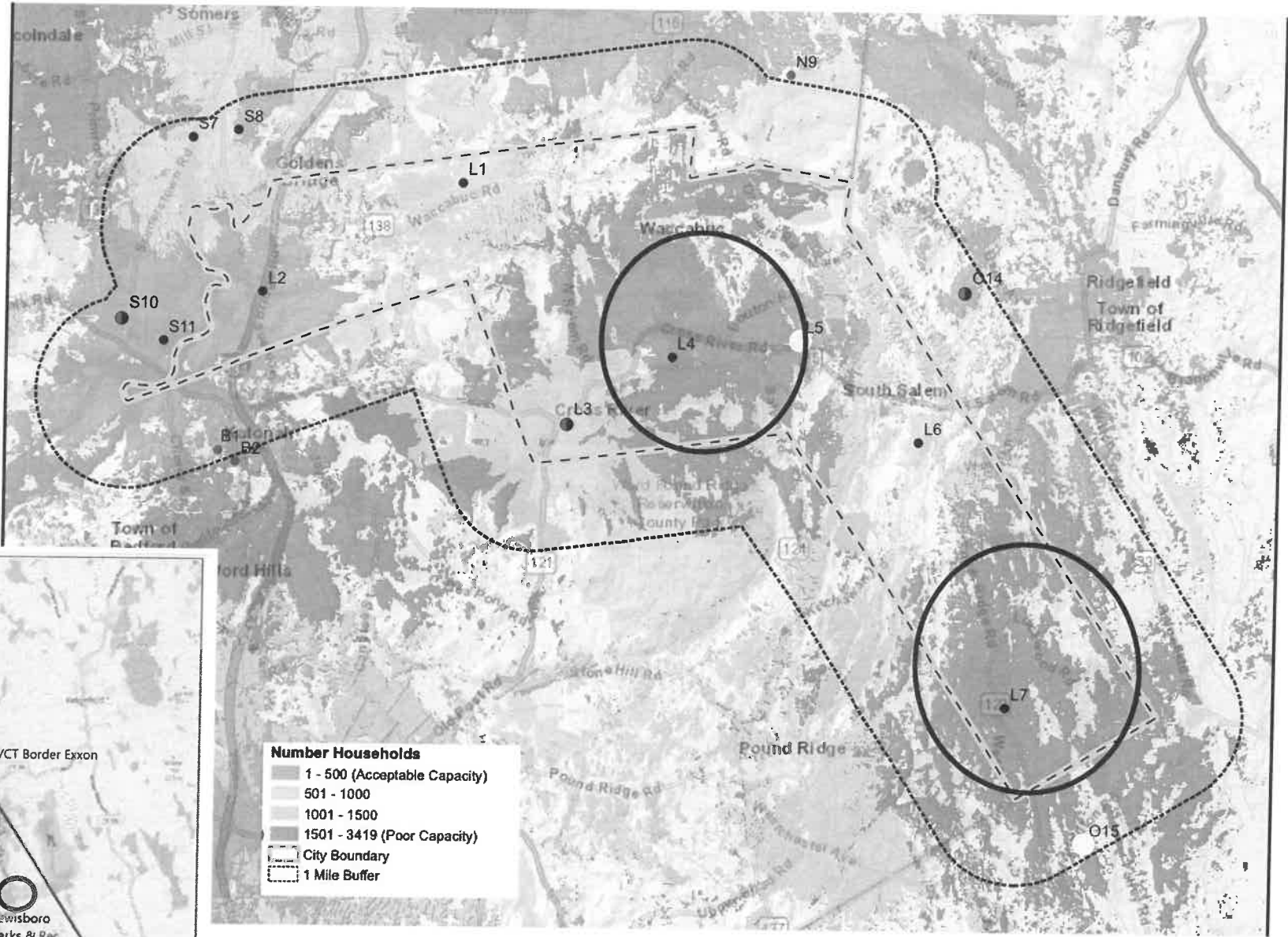
All Existing PWSF Sites

→ 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

