New England
Radio Consultants, LLC

TOWN OF WESTON
CONNECTICUT

Town-Wide Communications Infrastructure and Subscriber Refresh

MARCH 1, 2022

NEW ENGLAND RADIO CONSULTANTS LLC

CENTER OSSIPEE, NH

Executive Summary

New England Radio Consultants LLC (NERC) was asked to analyze the Town of Weston's public safety dispatch radio systems for Police, Fire, EMS, Public Works and Board of Education. NERC analyzed the Town's current communication systems to determine if it is the best solution or what alternate solutions might better serve the Town's needs.

NERC conducted a needs-based analysis of all known departments that utilize Town radios for their daily operations. Surveys were distributed through the office of Larry Roberts , Communication Director. These surveys provided NERC with insight into the Town's communication systems in preparation for this report.

The Town of Weston now operates an aging five site UHF communications infrastructure for its public safety communications systems. During the analysis of written responses and subsequent interviews, the Police Department stated they were happy with the coverage of their present communication system. The Fire Department and EMS stated that their systems did not experience the coverage of the Police Department. Both entities would like to see improved coverage and interoperability.

Most systems within the Towns communications infrastructure have been discontinued for some time. It is now in dire need of replacement. Supply chain bottlenecks around the world have caused record shortages of many products that public safety users are used to having readily available. Replacement parts and assemblies are in little supply or virtually unobtainable. Communications equipment manufacturers are using what little parts that are available to produce limited amounts of new products. This situation will likely get worse before it gets better. The Town would be wise to research and pursue the purchase of a new communications infrastructure before a catastrophic failure requires the Town to purchase "Band Aid" solutions that wastes taxpayer money.

Based on this report's findings, there are a few options available that can improve upgraded communications to a state-of-the-art system that best serves its constituents and the public safety user community. All scenarios employ APCO P25 needs based system standards. The P25 standard provides a reasonable expectation that public safety radio transmissions will be delivered on the first radio transmission. The information included in this report provides the Town with the technical research and a Rough Order of Magnitude (ROM) pricing for each option proposed.

Scenario 1 Upgrade Existing Five Site System to P25

Scenario 1 offers improved overall P25 coverage while allowing the Town to maintain its communications autonomy. This Scenario provides a P25 refresh of the Town owned Fixed Network Equipment (FNE) now used by the Town's public safety community. This scenario refreshes the present police digital system with new state of the art P25 FNE. The present analog Fire Department and Public Works systems FNE would also be upgraded to P25 digital in lieu of conventional analog. P25 offers superior coverage as compared to an analog communications system.

Five Site – Town Owned System

Site
Site #1: Norfield Road
Site #2: Landfill, Godfrey Road
Site #3: Station 2, Lyons Plain Road
Site #4: Meadow Ridge (RX only)
Site #5: Bayberry Lane (RX only)

System ROM $2,600,000 to $3,100,000 Includes FNE, 2 dispatch consoles, 205 subscriber units and 40 Unication G5 pagers.

Section 10 of this report outlines the pros and cons of all systems reviewed in this report.

Scenario 2 State CLMRN System

The Connecticut Land Mobile Radio Network (CLMRN) has been offered to the Town as an option for public safety communications. The CLMRN offers the Town an alternative to its present system.

Migrating public safety entities to the CLMRN will provide a hardened standards-based P25 communications system for Weston's first responders. With proper planning, migration to the CLMRN will be seamless. By upgrading to the CLMRN, the Police and Fire Departments would benefit from seamless interoperability and wide-area communications coverage.

Two additional sites on the CLMRN would be added to provide needed coverage for the Fire Department and EMS services. These sites would replace the UHF equipment at the Landfill and Norfield Road. This equipment would be the Towns responsibility to purchase, install and maintain. These additional sites will provide a public safety standard Delivered Voice Quality 3.4 (DAQ 3.4) for ≥95% of the Town area using a tri-band portable on hip at street level with a shoulder-mounted speaker microphone.

The tri-band portable used in pricing and coverage calculations for this scenario is for reference only. The tri-band model is not used to imply which radio is necessary for each stakeholder agency. Exact model and features of radios must be determined upon further stakeholder input and available project funding.

Two Additional Sites on the State CLMRN

Site	Mounting Structure Height
Site #1: Norfield Road	190’ Monopole
Site #2: Godfrey Road (landfill)	190’ Monopole

System ROM $3,6500,000 to $4,375,000

Includes 2 dispatch consoles, 2 CLMRN RF sites, 205 subscriber units and 70 Unication G5 pagers. (Does not reflect a bulk State subscriber discount).

Section 10 of this report outlines the pros and cons of all systems reviewed in this report.

Scenario 3 Board of Education

The Board of Education (BOE) communication system is a matured system that would benefit from a refresh. Except for the high school, this system provides acceptable communications within buildings of the BOE campus. When upgraded, attention should be given to the antenna system. The system would benefit from lower gain antennas that would concentrate the RF energy locally rather that at the horizon. Existing subscriber radios would not need to be replaced.

System ROM $ 135,000 to $190,000 Includes four DMR format repeaters. No subscriber replacement is necessary

Conclusion

Research included in this report provides the Town's public safety communications users the information needed to make a well-informed decision for the Town's constituents and first responder community. Scenario 1 addresses current and future user community public safety communications needs while maintaining the Towns communications autonomy.

Although not considered public safety, the Weston Public Works Department is bundled with the Town's public safety users because of their interaction with public safety departments during inclement weather.

Fixed life cycle costs for Town purchased FNE equipment needed to operate on either system must be well defined. These recurring yearly costs should be added as a line item to the Town's yearly communications maintenance budget.

The present Tait equipment offered by Marcus communications does not have a well-defined Life Cycle program.

Estimated ROM pricing includes two replacement communication consoles at the Weston Communications Center. The number of subscriber units used in the preparation of this report was provided by each department in the Needs Analysis Survey as well as Larry Roberts. These quantities are tabulated in Section 12.1 of this report. ROM estimates in this report are provided as the maximum cost for total project implementation. Pricing does not reflect any civil work the Town might perform in house, bulk State contract pricing, seasonal discounts, or manufacturers incentives. Motorola estimates are based on the State of Connecticut Master Contract # 99ITZ0001MA and # A-99-001. Currently, Marcus communications does not have a State of Connecticut Master Contract in place.

1 Introduction 3
2 Methodology 4
3 Document Review and Site Visits 5
4 Existing Weston Land Mobile Communication Systems Description 6
4.1.1 Weston Communications Center Dispatch Consoles 6
4.2 Police 6
4.3 Fire 7
4.3.1 Fire Department Pagers 7
4.4 EMS 7
4.4.1 EMS Pagers 7
4.5 Public Works 7
4.6 Board of Education 8
5 Existing RF Sites 9
5.1 Weston Communications Center, Norfield Road 9
5.1.1 Board of Education (BOE) 10
5.2 Transfer Station 10
5.3 Meadow Ridge Site 10
5.4 Lyons Plain Fire House 11
5.5 Bayberry Lane 11
5.6 Site/RF Locations Matrix 12
5.7 Connectivity By Location Matrix 12
6 Radio System Coverage 13
6.1 Self-Assessment 13
6.2 Field Propagation Test Results 13
6.2.1 Areas Tested With Results 14
6.2.2 Areas Tested Map 15
7 Interoperability 16
7.1 Current Interoperability 17
7.2 Desired Interoperability 18

8 Interviews 19
8.1 Departments and Personnel Interviewed 20
8.2 Interview Highlights 21
8.2.1 Police Department 21
8.2.2 Fire / EMS 21
8.2.3 Public Works 21
8.2.4 Board of Education (BOE) 21
8.2.5 State of Connecticut 22
9 FCC Licenses 23
10 Communication Systems Comparison Matrix 24
10.1 Present Communications System Matrix (Police) 24
10.2 Update Current Infrastructure to APCO P25 Matrix (Fire / EMS) 25
10.3 State P25 Trunked System Matrix (CLMRN) 26
11 Coverage Maps 27
11.1 Marcus Communications Coverage Maps 28
11.1.1 Present P25 Police System UHF Talk-Out to Portable Light Residential Building 28
11.1.2 Present P25 Police System UHF Talk-out on Street 29
11.1.3 Weston PD – P25 Talk-in UHF Talk-out to Light Residential Building 30
11.1.4 Weston PD – P25 Talk-In on Street 31
11.2 Motorola Coverage Maps Weston UHF 32
11.2.1 Maps Matrix 32
11.2.2 Present P25 Police System UHF Talk-out 33
11.2.3 Present P25 Police System UHF Talk-out 34
11.2.4 Weston Fire – UHF Talk-out 35
11.2.5 Weston Fire – P25 Talk-out 36
11.2.6 Weston EMS – P25 Talk-Out 37
11.2.7 Weston EMS – P25 Talk-out 38
11.2.8 Weston PD – P25 Talk-in UHF Talk-out 39
11.2.9 Weston PD – P25 Talk-In 40
11.2.10 Weston Fire / EMS – P25 Talk In 41
11.2.11 Weston Fire / EMS – P25 Talk In 42

11.3 State System Coverage Maps (CLMRN) 43
11.3.1 CLMRN P25 Coverage Lite Residential Building 44
11.3.2 CLMRN P25 Coverage Lite Building 46
12 Appendix 47
12.1 Radio Inventory 48
12.2 User Survey Questionnaire 49
12.3 User Questionnaire Tabulated Results 81
12.4 Definitions 100

1 Introduction

The Town of Weston tasked New England Radio Consultants LLC (NERC) to evaluate its current communications system users' needs. This report outlines these needs and addresses communications upgrade proposals the Town should consider for improving its first responder communications requirements. It will provide Weston with research information to help determine which proposal would be in its best interest.

As part of this report's preparation, NERC distributed a questionnaire to determine the present communication system's overall ability to meet these needs. Questionnaires were distributed through the office of Communications Director Larry Roberts.

Tasks performed by NERC included:

- Site visits to determine site conditions and readiness of existing communications infrastructure.
- Site visits also confirmed the accuracy of information submitted by participating departments.
- Querying participants on system requirements.
- Querying participants as to their daily needs for interoperability between other Town agencies, outside agencies, non-Weston first responder and mutual aid partners.

Interviewed departments included:

- Weston Police Department
- Weston Volunteer Fire Department
- Weston EMS
- Weston Board of Education

This report is broken into twelve sections. Included in this analysis is the methodology used to obtain pertinent information. The report outlines interviews performed and recommendations as to how each proposal addresses the Town's first responder needs.

2 Methodology

New England Radio Consultants distributed identical in-depth questionnaires to communications system department heads. The department heads included:

- John Pokorny — Weston Volunteer Fire Department, Chief
- Michael Schlechter — Weston EMS, Chief
- Ed Henion — Weston Police Department, Chief
- Patrick Daubert — Weston Police Department, Sargent
- John Conte — Weston Public Works Director
- Robert Hudak — Weston Board of Education, Lead Security Specialist

This questionnaire queried the managers addressing four specific categories.

- Infrastructure
- Dispatch Services
- Interoperability
- Subscribers

Questionnaires were used as a starting point for this report. These surveys provided the basis for questions asked during in-person and phone interviews with major stakeholders and vendors.

Vendors interviewed:

- State of Connecticut CTS Unit — Middletown, Ct
- NorcomCT — Naugatuck, Ct
- Marcus Communications — Manchester, Ct

3 Document Review and Site Visits

Distributed questionnaires were compiled and analyzed as a basis for this report. Onsite infrastructure inspections and interviews were conducted with key personnel to confirm completeness and accuracy. Field tests to confirm present system coverages were conducted with Larry Roberts, Director of Communications. Several site visits were conducted throughout Weston to evaluate present and possible future communication site locations.

As part of this evaluation, considerable time was spent researching ways to provide communications within buildings deemed critical coverage structures throughout Weston.

4 Existing Weston Land Mobile Communication Systems Description

All sites are connected using microwave, leased lines or cable modems.

4.1.1 Weston Communications Center Dispatch Consoles

Dispatch services are provided by the Weston Communications Center (WCC), located at 52 Norfield Road. Two Motorola Gold Elite console positions provide a control point for town-wide dispatch services. These consoles have been discontinued, and parts are no longer available. These consoles operate on a Microsoft Windows XP platform. Microsoft discontinued support of its Windows XP operating system in April 2014. The computers used to operate these consoles are no longer produced. It is becoming increasingly harder to find refurbished replacements. These consoles are no longer suitable for Public Safety Mission Critical Communications.

Control stations are used to access discrete channels within the Police Department dispatch infrastructure. Some of these control stations are standard intermittent duty mobile radios with individual power supplies. This outdated approach to channel access is hardware intensive and inefficient.

The WCC is also the repository for a State owned “Stocks Box”. Stocks Boxes are regional resourced used as a rudimentary interface to connect disparate communications systems for interoperability.

The WCC is also the Town's NG911 Public Safety Answering Point (PSAP).

At present, system service is performed only when there is an emergency outage.

4.2 Police

The Weston Police Department Communications infrastructure is configured as a Tait digital five site UHF simulcast system. (Two TX/RX sites and three RX only sites). This system is P25 signaling compliant but lacks other important P25 requirements such as network redundancy.

The Police Department base stations are supported but are aging and assumed to need firmware upgrades. System monitoring is accomplished using a third-party system monitor as required by the P25 standard.

The Cisco Series 1900 switch used in the Police system at this site was discontinued as of January 2002. Support will end in January 2025.

The two Microwave stations used in this system are no longer supported. A failure of either unit would necessitate the replacement of both units.

At present, system service is performed only when there is an emergency outage.

4.3 Fire

The Weston Fire Department consists of two firehouses. The Fire Department communication system is a 2 site UHF Analog system. (Two TX/RX sites configured as main/backup and two RX only sites) This system is beyond end of life and no longer supported. Fire Department members experience interference when monitoring the dispatch frequency for situational awareness. This full-time co-channel interference originates in Long Island NY.

At present, system service is performed only when there is an emergency outage.

4.3.1 Fire Department Pagers

The Weston Volunteer Fire Department utilizes their UHF fire dispatch frequency for pager alerting of its members. Past purchasing practices would require the replacement of only 40 pagers if a P25 system is deployed.

4.4 EMS

The Weston EMS communications system is a 2 site UHF system. (One TX/RX site configured as main/backup and two RX only sites). Weston EMS utilizes the fire dispatch frequency for pager alerting of its members. The EMS system is beyond end of life and no longer supported.

The EMS antenna is not mounted at a height indicated on the FCC license. EMS members also experience interference when monitoring the dispatch frequency for situational awareness. This full-time co-channel interference originates in Long Island NY.

EMS and fire also share a single site digital base station located on the police monopole. This station and its associated Digital Interface Unit (DIU) is beyond end of life and no longer supported

EMS notifies it's members using portable radios.

At present, system service is performed only when there is an emergency outage.

4.4.1 EMS Pager

Weston EMS utilizes the Fire Department UHF fire dispatch frequency for pager alerting of EMS Chief.

4.5 Public Works

The Town of Weston Highway Department communication system operates using a two-site voted analog repeater (One TX and 2 RX only sites). This repeater is at end of life and no longer supported. The system is primarily a vehicular system.

At present, system service is performed only when there is an emergency outage.

4.6 Board of Education

The Board of Education (BOE) utilizes three discrete industrial class repeater stations located on the Norfield tower site. These repeaters provide communications within the school campus system located adjacent to the Police and Fire Departments. One channel is dedicated to bus communications with the remaining channels used for inter and intraschool communications. Over the years, the BOE system was expanded as needs arose. This system although seemingly operational, could benefit from a system upgrade.

The High School located at 135 School Road suffers from an intermittent noise level that has yet to be identified. A fourth DMR repeater was added at the High School to mitigate this noise and improve communications within the building. The antenna for this system is shared by all repeaters and is mounted above FCC licensed height. This antenna height, along with antenna gain, may be adding to the High School coverage issues because of RF overshoot of the transmitted signal.

An analog base station located at the Norfield tower is used to cross patch between the School DMR emergency channel and the Police P25 system. School Resource Officers (SRO's) use this channel for real time communications to the WCC and Weston Police Department subscriber units.

Unlicensed Family Radio Service (FRS) frequencies are used to provide communications at the bus loops for most schools. These frequencies, although unlicensed, are restricted to a half watt of radiated RF power. It is doubtful the radios now in use are capable of this required low power setting.

At present, system service is performed only when there is an emergency outage.

5 Existing RF Sites

Weston's public safety communications systems operate on dedicated public safety frequencies. Public safety frequencies are protected from adjacent and co-channel interference by the Federal Communications Commission (FCC).

The system is currently configured with eight RF frequencies. Six repeated frequencies and two simplex frequencies. All licenses except for Family Radio Service (FRS) licensees appear to be current. Most FNE equipment within the Fire, EMS and Public Works Departments is at end of life and no longer supported by manufacturers.

At present, system service is performed only when there is an emergency outage.

5.1 Weston Communications Center, Norfield Road

The Weston Communications Center (WCC) is the primary emergency dispatch point for the Town. Dispatchers normally man one of two Motorola Elite console positions. These consoles are beyond end of life and no longer supported. This location utilizes a 190’ monopole and serves as one of the primary RF sites for the Town.

Connectivity to other sites is accomplished using microwave, leased lines, DSL modems or Comcast Business Class cable modems. DSL and Business Class cable modems are not considered suitable for public safety use. Leased lines are becoming problematic due to susceptibility to outages during inclement weather. A fiber optic connection to each site is recommended.

Antenna heights at this site do not corollate with tower mapping posted within this site. Mounted antenna heights are in violation of FCC licensing.

5.1.1 Board of Education (BOE)

Most BOE repeaters are located at the police monopole site. The present stations are older 50-watt Digital Mobile Radio (DMR) repeaters managed by a Smart Dispatch terminal located at WCC dispatch. This system is at end of life and no longer supported. The antenna for this system does not appear to be mounted at the FCC licensed height. Antennas not mounted at proper heights are in violation of FCC licensing.

All repeaters are capable of near real-time GPS location by using the GPS function built into the subscriber radios. System-wide GPS positioning has not been reliably available since a firmware update to the Smart Dispatch platform. The Hytera Smart Dispatch platform was discontinued and has been replaced by Hytera's SmartOne platform. The SmartOne platform offers more functionality and features to the Smart Dispatch system now in use. To access these features, repeaters now in use would need to be replaced with current production models. First Student Transportation and the school central offices do not have access to this system.

Each school has a mobile control station (Mobile radio on a power supply) within the school's office to communicate with subscriber radios.

5.2 Transfer Station

The Transfer Station site equipment is housed within an environmentally controlled communications shelter at Godfrey Road East. This shelter is acceptable for public safety communication equipment. TIA-R56 grounding is sufficient for the equipment installed.

Connectivity for the site is provided by microwave and leased lines. The Cisco Series 1900 switch used in the Police system at this site was discontinued as of January 2002. Support will end in January 2025.

5.3 Meadow Ridge Site

Fix Network Equipment (FNE) at the Meadow Ridge site is housed within a closet on the 3rd floor of the building. Access to the building was denied due to COVID restrictions. This site is not environmentally suitable for public safety communications equipment. A review of pictures from other installations at this site show TIA-R56 grounding is sufficient for the equipment installed.

Connectivity for this site is accomplished using a DSL leased line.

5.4 Lyons Plain Fire House Station 2

The Lyons Plain Road site equipment is housed in the attic area of the building. The attic lacks proper environmental control for public safety use. TIA-R56 grounding is sufficient for the equipment installed.

Performance at this site would be improved by increasing the height of the antennas now in use. A marginal increased height of these antennas would help improve coverage in the Lyons Plain Road and RT 136 area.

Connectivity for this site is accomplished using leased phone lines.

5.5 Bayberry Lane

The Bayberry Lane site equipment is co-located with the Town of Westport

Equipment is housed within an environmentally controlled building. This building is designed for public safety communication equipment. The Weston equipment has been relocated to a wall mounted rack that leaves little room for expansion. TIA-R56 grounding is sufficient for the equipment installed.

Connectivity for this site is accomplished using a leased line and a Cable modem. The Cisco Series 800 switch used in the Police system at this site was discontinued as of January 2021 and will no longer be supported by January 2025.

This site houses a recently installed FNE site for the Connecticut Land Mobile Radio Network (CLMRN).

5.6 Site/RF Locations Matrix

	Norfield Road	Landfill Godfrey Road	Meadow Ridge	Station 2 Lyons Plain Road	Bayberry Lane
Police	TX/RX Simulcast	TX/RX Simulcast	RX	RX	RX
Fire	TX/RX Main	TX/RX Backup		RX	RX
EMS	TX/RX Main	TX/RX Backup	RX	RX	
EMS (Digital)	TX/RX				
Public Works	TX/RX Main	TX/RX Backup			
BOE	TX/RX (3 Repeaters)				

5.7 Connectivity By Location Matrix

	Norfield Road	Landfill Godfrey Road	Meadow Ridge	Station 2 Lyons Plain Road	Bayberry Lane
Police	Microwave	Microwave	DSL	Cable Modem	Cable Modem
Fire	Leased Line	Leased Line		Leased Line	Leased Line
EMS	Leased Line	Leased Line	Leased Line	Leased Line	
Public Works	Leased Line	Leased Line			

6 Radio System Coverage

6.1 Self-Assessment

Police	Fire	EMS	Public Works
100 % coverage in all areas 100% mobile in Town 80% portable street in surrounding Towns	Good	Generally ok challenges Bradley Road and upper Georgetown areas, coverage is quite poor.	Unavailable

6.2 Field Propagation Test Results

Field tests were conducted with Communications Director, Larry Roberts. These tests simulated in-building coverage within a light density building using a portable on hip, in a swivel case and a lapel speaker microphone.

Test results tabulated were weighted as 1,2 or 3. These results correspond to Delivered Audio Quality of the radio signal. (DAQ). DAQ is the standard that defines wireless system performance of communication Systems. Conventional analog systems used by Fire and EMS are measure to a DAQ standard of DAQ 3.0. P25 digital systems are measured to a DAQ standard of DAQ3.4

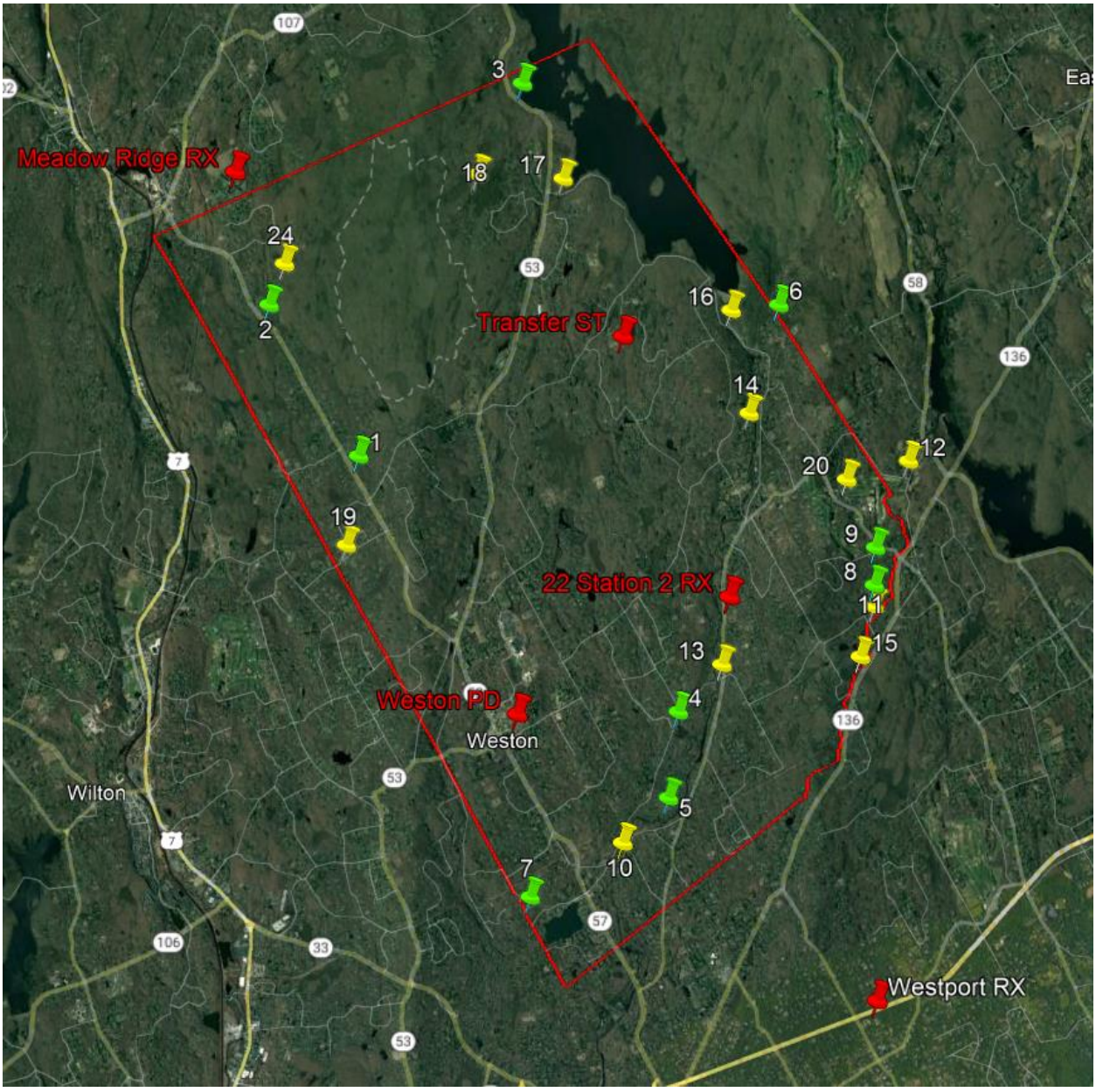
Test Result	DAQ	
1	1	Unusable, Speech present but not understandable.
2	2	Speech understandable with considerable effort. Requires frequent repetition due to noise or distortion.
3 Fire / EMS	3	Speech understandable with slight effort. Requires occasional repetition due to noise or distortion.
3 Police	3.4	Speech understandable without repetition. Some noise or distortion present.

6.2.1 Areas Tested with Results

Site #	Street Address	Agency Reporting	DAQ Fire	DAQ EMS	DAQ Police	GPS Coordinate
1	Georgetown Road @ Shinnecock Place	Fire Department / EMS	3	3	3	41°13'45.7"N 73°24'05.9"W
2	Georgetown Road @ Samuelson Road	Fire Department / EMS	3	2	3	41°14'43.3"N 73°24'51.4"W
3	Newtown Turnpike North of Valley Forge Road	Fire Department / EMS	3	3	3	41°16'07.8"N 73°22'42.8"W
4	145 Good Hill Road	Fire Department / EMS	3	3	3	41°12'08.1"N 73°21'23.6"W
5	18 Slumber Corners	Fire Department / EMS	3	3	3	41°11'35.3"N 73°21'28.6"W
6	Bradley Road @ Trout Brook Parking Lot	Fire Department / EMS	3	3	3	41°14'43.3"N 73°20'32.6"W
7	Calvary Road @ Highwood Road	Fire Department / EMS	2	2	3	41°10'57.4"N 73°22'38.9"W
8	9 Jana Drive	Fire Department / EMS	3	3	3	41°12'56.4"N 73°19'44.0"W
9	5 Fresh Meadow	Fire Department / EMS	3	3	3	41°13'10.8"N 73°19'43.5"W
10	River Road @ The Bridge	Police Department	1	2	3	41°11'18.0"N 73°21'52.0"W
11	Judges Hollow Road @ The Bridge	Police Department	3	2	3	41°12'48.4"N 73°19'44.3"W
12	Wells Hill Road @ The Bridge	Police Department	3	3	3	41°13'43.7"N 73°19'26.7"W
13	Cartbridge Road @ The Bridge	Police Department	2	3	3	41°12'26.1"N 73°21'01.5"W
14	Hemplock Ridge @ The Dead End	Police Department	3	3	3	41°14'02.0"N 73°20'47.5"W
15	Bridge Road North @ The Bridge	Police Department	3	3	3	41°12'29.1"N 73°19'51.2"W
16	Valley Forge Road @ Devils Glen Park	Police Department	3	3	3	41°14'41.2"N 73°20'56.8"W
17	Valley Forge Road 1/8 Mile East of Newtown Tpke	Police Department	3	3	3	41°15'31.43"N 73°222.11"W
18	Ledgewood Drive @ The Dead End	Police Department	3	3	3	41°15'33.1"N 73°23'05.6"W
19	Langer Lane @ Marshal Lane	Police Department	3	3	3	41°13'11.6"N 73°24'12.1"W
20	Aspetuck Valley Country Club Basement	Police Department	3	3	3	41°13'36.7"N 73°19'58.2"W
21	Main Street (Georgetown)	Police Department	1	2	3	41°15'28.2"N 73°25'38.7"W
22	Fire Department Station #2 Basement	Police Department	3	1	3	41°12'52.0"N 73°20'57.6"W
23	215 Georgetown Road Basement	Police Department	NA	NA	NA	41°14'00.5"N 73°24'19.3"W
24	Indian Valley @ The Dead End	Police Department	2	3	3	41°14'58.9"N 73°24'43.6"W

6.2.2 Areas Tested Map

As reported in the user surveys



Red Pin	RF Sites
Yellow Pin	Police
Green Pin	Fire

7 Interoperability

Interoperable communications is the ability for multiple agencies or organizations to send and receive messages and collaborate in its normal operational duties or during a multi-jurisdictional incident**.**

The standard for emergency interoperability communications is the National Response Framework. The National Response Framework is a guide to how the nation responds to all types of disasters and emergencies. It is built on scalable, flexible, and adaptable concepts identified in the National Incident Management System (NIMS) to align key roles and responsibilities across an incident.

NIMS is a collection of principles and methods utilized by local, state and federal emergency managers, educational institutions, and the private sector. The basic concepts of NIMS are:

- Using compatible communications equipment operating on the same frequencies, with the same signaling characteristics, and the same operating procedures
- Ensuring adequate signal coverage over the area of incident
- Scaling the size of the radio network with additional transmitter/receivers by sharing mutually agreed-upon procedures (shared resources)

Operational interoperability increases efficiencies within an organization by allowing personnel to communicate, as needed with a single radio, with other departments within the National Response Framework.

Many adjacent municipalities to Weston have migrated to P25 public safety communications systems.

7.1 Current Interoperability

Current Weston Interoperability (By Department)

As Reported in the Needs Analysis Survey

Department	How Often	Weston Agency	Outside Agency
Police Department		Fire EMS Public Works Animal Control Board of Education Buses	
Fire Department	Weekly Occasionally Rarely Occasionally Monthly		Wilton Westport Fairfield Georgetown Easton
EMS	Weekly Daily	Fire	 CMED
Department of Public Works	Unavailable	Unavailable	Unavailable
Board of Education			

7.2 Desired Interoperability

Desired **Weston Interoperability (By Department)**

As Reported in the Needs Analysis Survey

Department	How Often	Agency
Police Department	Not reported	Not reported
Fire Department	Not reported	Surrounding Towns
EMS	Weekly	Police Surrounding Towns
Department of public Works	Unavailable	Unavailable

8 Interviews

Interviews were conducted with communications system stakeholders, key vendors, and potential future interoperability partners. Interviews were generally conducted in person, but when not practical, interviews were conducted by phone.

Topics reviewed during these interviews included:

- Accuracy of survey responses
- System configuration
- System evolution and history
- System performance, including reliability and serviceability
- System Coverage
- Interoperability with other Weston departments and outside agencies

Most general concerns raised by participants voiced during interviews was age and reliability of the present communication systems.

8.1 Departments and Personnel Interviewed

Entity	Person	Title	Phone Number	Date of Interview	Type of Interview
Weston Communications Center	Larry Roberts	Director	203-249-1008	Numerous times	In-person Phone
Weston Police Department	Ed Henion	Chief	203-222-2667	Numerous times	Phone
Weston Police Department	Patrick Daubert	Sargent	203-515-3129	Numerous times	In-person Phone
Weston Volunteer Fire Department	John Pokorny	Chief	203-515-2263	January 31, 2022	Phone
Weston Volunteer Emergency Medical Service	Michael Schlechter	Chief	203 278 4379	February 4, 2022	Phone
Department of Public Works	John Conte	Director	203-313-9759	Not Reachable	Not Reachable
Board of Education	Robert Hudak	Lead Security Specialist	603-803-5384	February 8, 2022	Phone
Connecticut Department of Statewide Telecommunications	Clayton Northgraves	Public Safety Director of Telecommunications	860-685-8080		Phone
Connecticut Department of Statewide Telecommunications	Scott Wright	Engineer II	860-685-8080	Various Times	Phone
NorcomCT	Julie Reibold	Owner	203-575-9008	Various Times	Phone
Marcus Communications	Chris Hack		860-646-1839	Various Times	Phone

8.2 Interview Highlights

8.2.1 Police Department

The Weston Communications Center dispatches the Police Department using a P25 formatted digital simulcast system. The RF infrastructure is maintained by Marcus communications of Manchester, Connecticut. Consoles are maintained by NorcomCT of Naugatuck, Connecticut.

Sargent Patrick Daubert reports that, for the most part, the Police Department has no major issues. Mutual aid is achieved by switching to a regional resource such as FAPERN or UASI trunked talk groups when needed.

Chief Henion confirmed acceptable communications for Police but voiced concern that the present system is 12 years old and is in need of a technology refresh.

8.2.2 Fire / EMS

Weston Volunteer Fire Department is dispatched by the Weston Communications Center (WCC), using an analog system maintained by NorcomCT of Naugatuck, Connecticut.

Chief John Pokorny reports mobile radio coverage for the Fire Department is less than sufficient and is plagued by co-channel interference from Long Island NY.

8.2.3 Public Works

Public Works Director, John Conte was unavailable for this report. Public Works Departments primarily use communications during inclement weather. Being a mobile system, addressing the needs of the Police, Fire and EMS Departments also addresses the Public Works communications needs.

8.2.4 Board of Education (BOE)

Lead Security Specialist, Robert Hudak, reports poor communications between school buildings. Communications is also a challenge within some buildings. Little to no training is given to radio users making it hard to isolate system and user communications issues. No one within the school system totally understands how this communications system works.

8.2.5 State of Connecticut

The State of Connecticut operates a P25 trunked radio system managed by the Department of Statewide Emergency Telecommunications CTS unit. This P25 system is designed to provide 98% mobile on street coverage within geographic State Police Troop areas. Department of Emergency Services and Public Protection Commissioner James Rovella has expressed the State's willingness to allow towns to join the State CLMRN P25 Trunked system.

System coverage maps shown in Section 11.3 of this report reference estimated coverage using the CLMRN. With the addition of two RF sites, located on the Towns existing monopoles at Norfield Road and the Transfer Station, the CLMRN system will provide the Town with public safety grade communications. The Town would be responsible for the cost of the FNE at these sites. Assurances would need to be given by Motorola with regards to the coverage in the Lyons Plain Road area of town.

9 FCC Licenses

At present, the Town holds various public safety licenses in the UHF band. These frequencies are well suited for a town-wide public safety communications system. For the most part, these frequencies provide the required street and in-building coverage for a public safety communications system. Due to frequency congestion in New England, additional frequencies are doubtful.

The BOE holds a business band licenses used to dispatch school busses, daily in house and emergency communications.

It is important to note, antennas now in use at both transmit locations are not mounted at licensed FCC heights.

10 Communication Systems Comparison Matrix

10.1 Present Communications System Matrix (Police)

Pro	Con
The Town owns and is responsible for its own communications infrastructure	
	Only repaired when broken
	Infrastructure is not Fault-tolerant
Frequencies are licensed to the Town	
System is still supported	
System is simulcast	
System is P25	
	No life cycle upgrades
	Limited street coverage in some areas of Town
	Limited in-building coverage in some areas of town
	Multiple single points of failure
System health is capable of being monitored 24/7	
Able to purchase subscriber radios from multiple manufacturers	
Meets public safety street coverage DAQ 3.4	

10.2 Update Current Infrastructure to APCO P25 Matrix (Fire / EMS)

Pro	Con
Town is in control of its own public safety communications infrastructure	
	Infrastructure buildout cost to the Town
Town controls the system life cycle	Cost of the system life cycle
Frequencies are licensed to the Town	
Able to purchase subscriber radios from multiple manufacturers	
Improved on street portable coverage	
Improved in-building portable coverage	
Fault-tolerant infrastructure	
System health capable of being monitored 24/7	
Addition of public safety grade subscriber radios	Requires purchase of public safety grade subscriber radios
	Requires replacement of 30 EMS pagers
Possibility of attaching dispatch consoles directly to the State system for sharing of mutual aid resources	
Well defined system migration path to P25	
Meets street-level public safety DAQ 3.4	

10.3 State P25 Trunked System Matrix (CLMRN)

Pro	Con
The system is APCO P25 compliant	Infrastructure buildout cost to the Town
Able to purchase subscriber radios from multiple manufacturers	
Town is not responsible for the maintenance of its own communications infrastructure	
CTS unit monitors Motorola service contract	
State requires ongoing Life Cycle contract (SUA II)	Town required to purchase ongoing Life Cycle contract (SUA II)
Weston can budget yearly for Life Cycle as a line item in its budget	
Newest System release every 2 years (hardware and software)	
State maintains life cycle infrastructure	
Wide area coverage	
Well defined system migration path to P25	Requires wholesale replacement of subscriber radios
	Requires replacement of 30 EMS pagers
Requires a single radio in vehicles to maintain interoperability with other Towns	
Fault-tolerant infrastructure	
System health monitored 24/7 by the State CTS Unit (NCC)	
Allows for future enhancements such as digital voice and data encryption, Fire Department accountability, individual subscriber emergency alerting, individual radio management, and more as defined by P25 specifications	
Meets street-level public safety DAQ 3.4	

11 Coverage Maps

The following maps were supplied in January of 2022 by NorcomCT and Marcus Communications. These maps represent expected coverage based on the current manufacturers FNE and subscriber offerings. Coverage maps are based on FCC licensed heights. Over time these heights were changed as user requirements were addressed. It is doubtful that the existing heights for FD/EMS and Public Works could be licensed at present heights because of co-channel users in Long Island New York. Marcus Communications and Motorola maps for a P25 system are virtually identical when compared to the existing Police system.

Coverage maps are for reference only. These maps do not represent guarantied coverage.

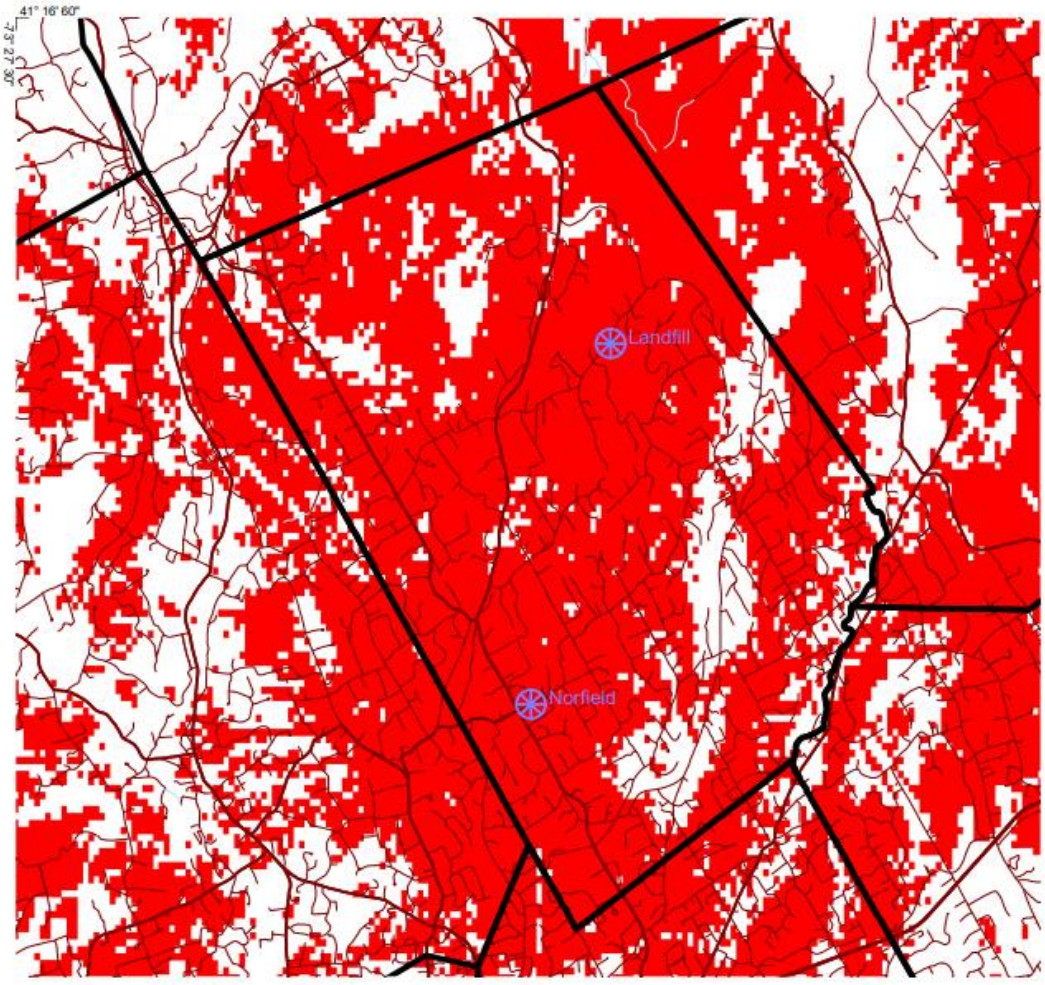
11.1 Marcus Communications Coverage Maps

11.1.1 Present P25 Police System UHF Talk-Out to Portable Light Residential Building

-

RAPTR Version 32.2.482
Friday, February 18, 2022 16:30:49
Project: Weston PD
MBP: 1
Figure: Indoor Portable Talk-Out (Light Residential)
Design: Bounded Area
Service: Portable, Talkout, Outdoors, No SMA, NB P25 Conventional
Engineer: C8DG
Map type - 1:72,864
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

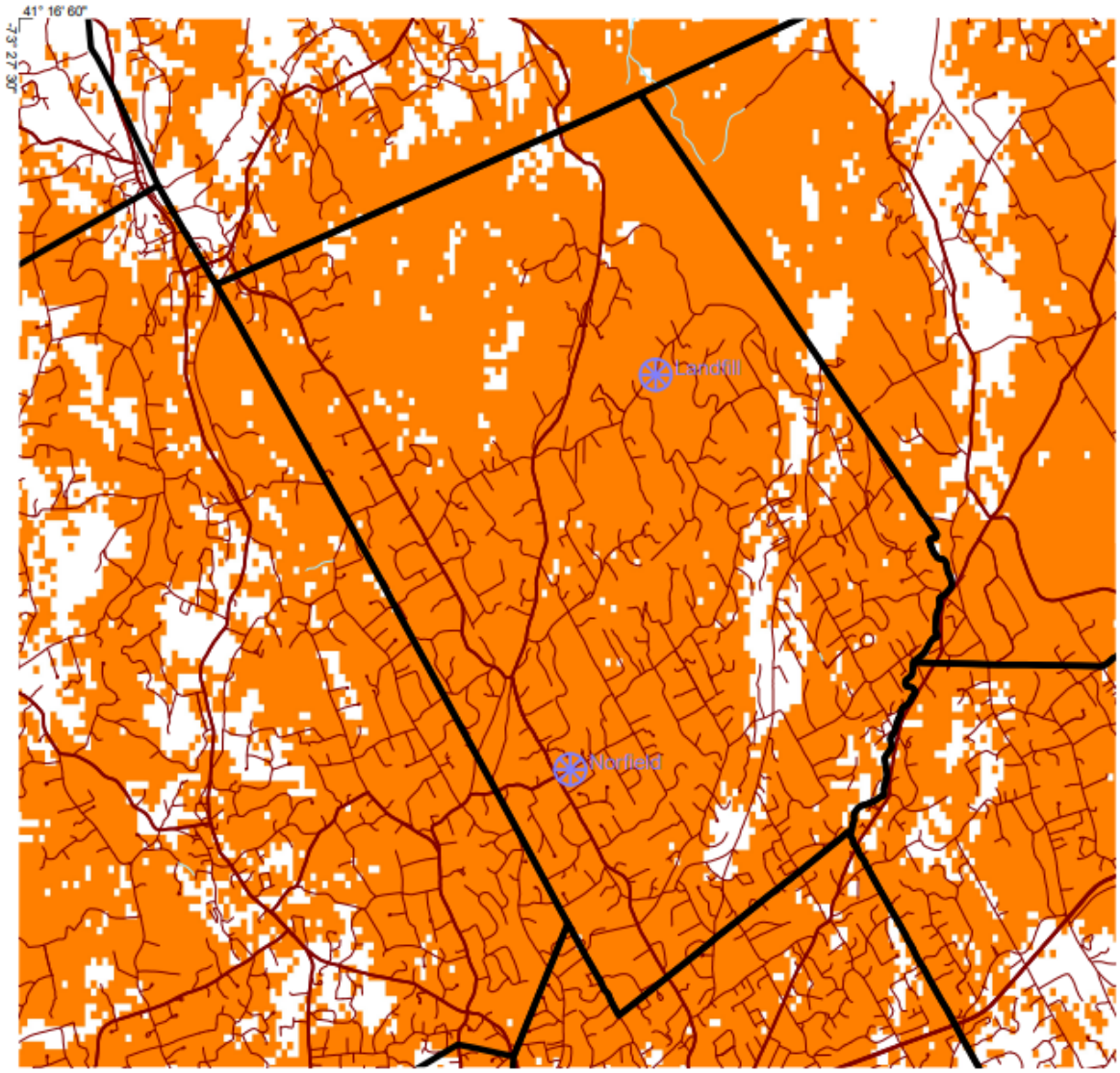
< -107.0dBm < -99.0dBm <0 dBm



11.1.2 Present P25 Police System UHF Talk-out on Street

RAPTR Version 32.2.482
Friday, February 18, 2022 16:22:25
Project: Weston PD
MBP: 1
Figure: Outdoor Portable Talk-Out
Design: Bounded Area
Service: Portable, Talkout, Outdoors, No SMA, NB P25 Conventional
Engineer: C8DG
Map type - 1:72,864
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

< -107.0dBm <0 dBm

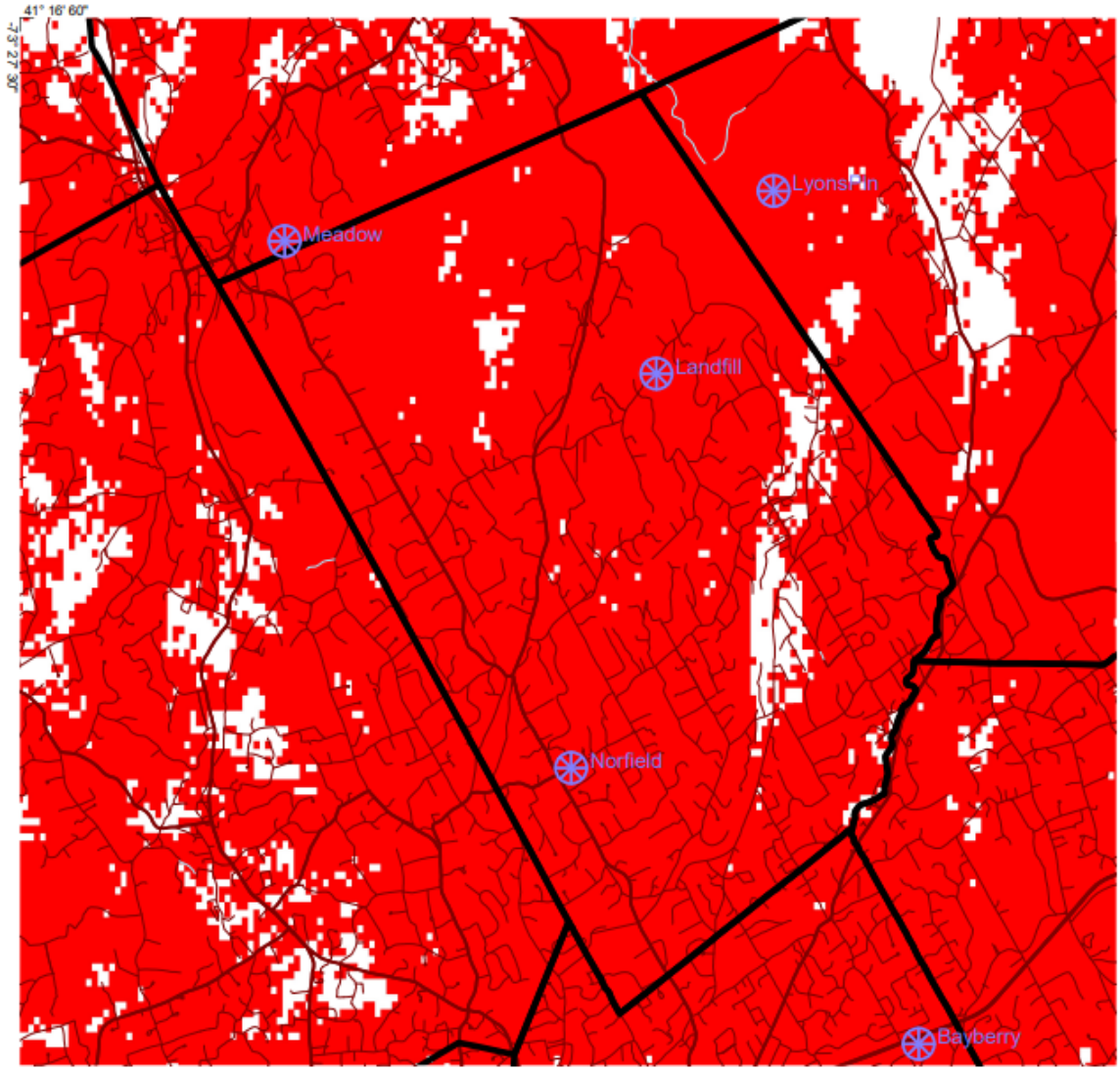


Maps are for reference only. Coverage is not guaranteed.

11.1.3 Weston PD – P25 Talk-in UHF From a Light Residential Building

RAPTR Version 32.2.482
Friday, February 18, 2022 16:32:20
Project: Weston PD
MBP: 1
Figure: Indoor Portable Talk-Back (Light Residential)
Design: Bounded Area
Service: Portable, Talkback, Outdoors, No SMA, NB P25 Conventional
Engineer: C8DG
Map type - 1:72,864
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

< -107.0dBm < -99.0dBm <0 dBm

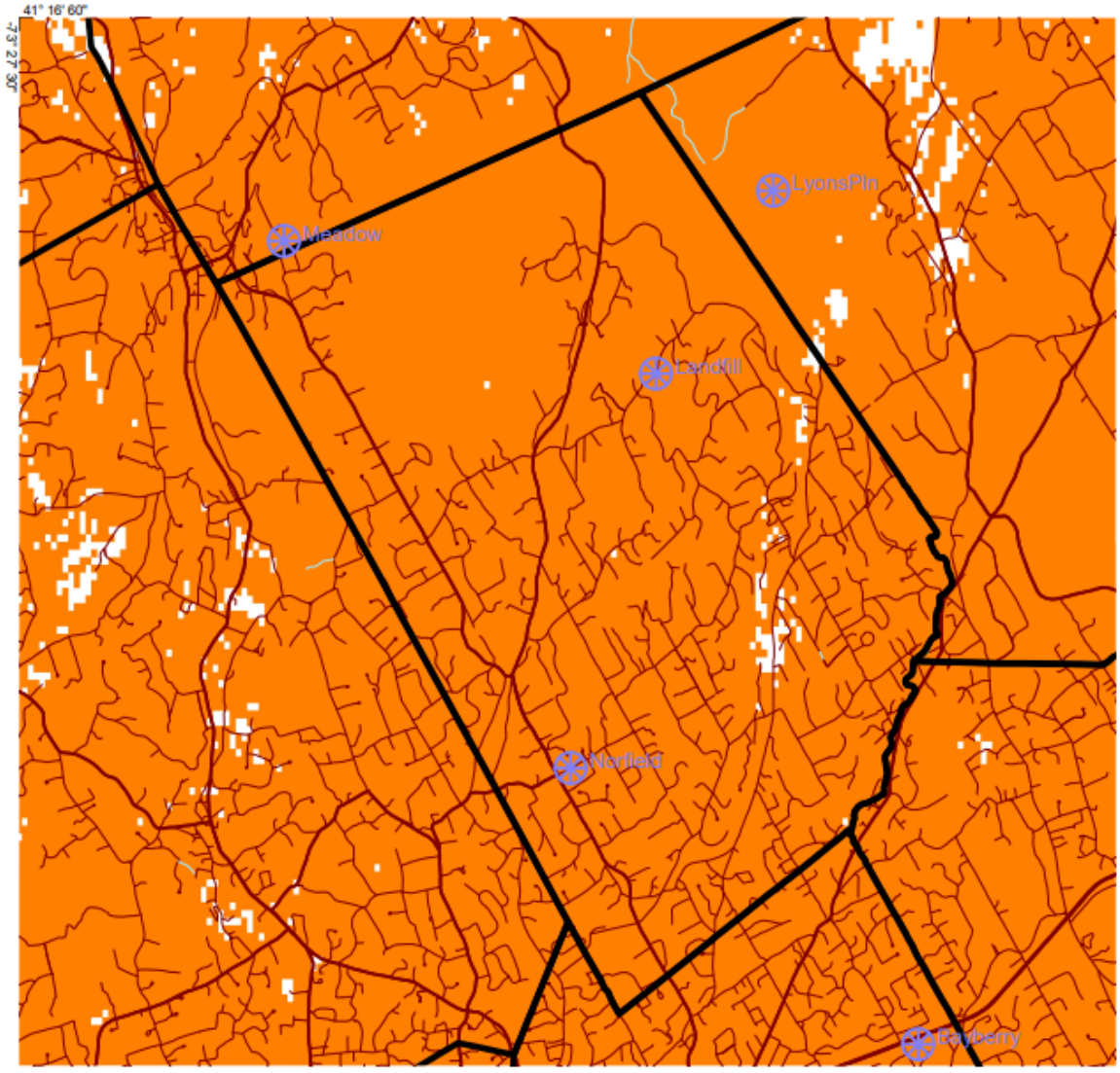


Maps are for reference only. Coverage is not guarantee

11.1.4 Weston PD – P25 Talk-In on Street

RAPTR Version 32.2.482
Friday, February 18, 2022 16:33:14
Project: Weston PD
MBP: 1
Figure: Outdoor Portable Talk-Back
Design: Bounded Area
Service: Portable, Talkback, Outdoors, No SMA, NB P25 Conventional
Engineer: C8DG
Map type - 1:72,864
Note: Map depicts coverage across the defined service area. Statistical variability does not allow for guarantee of coverage in specific locations, but does represent graphically area % coverage.

< -107.0dBm <0 dBm



Maps are for reference only. Coverage is not guaranteed.

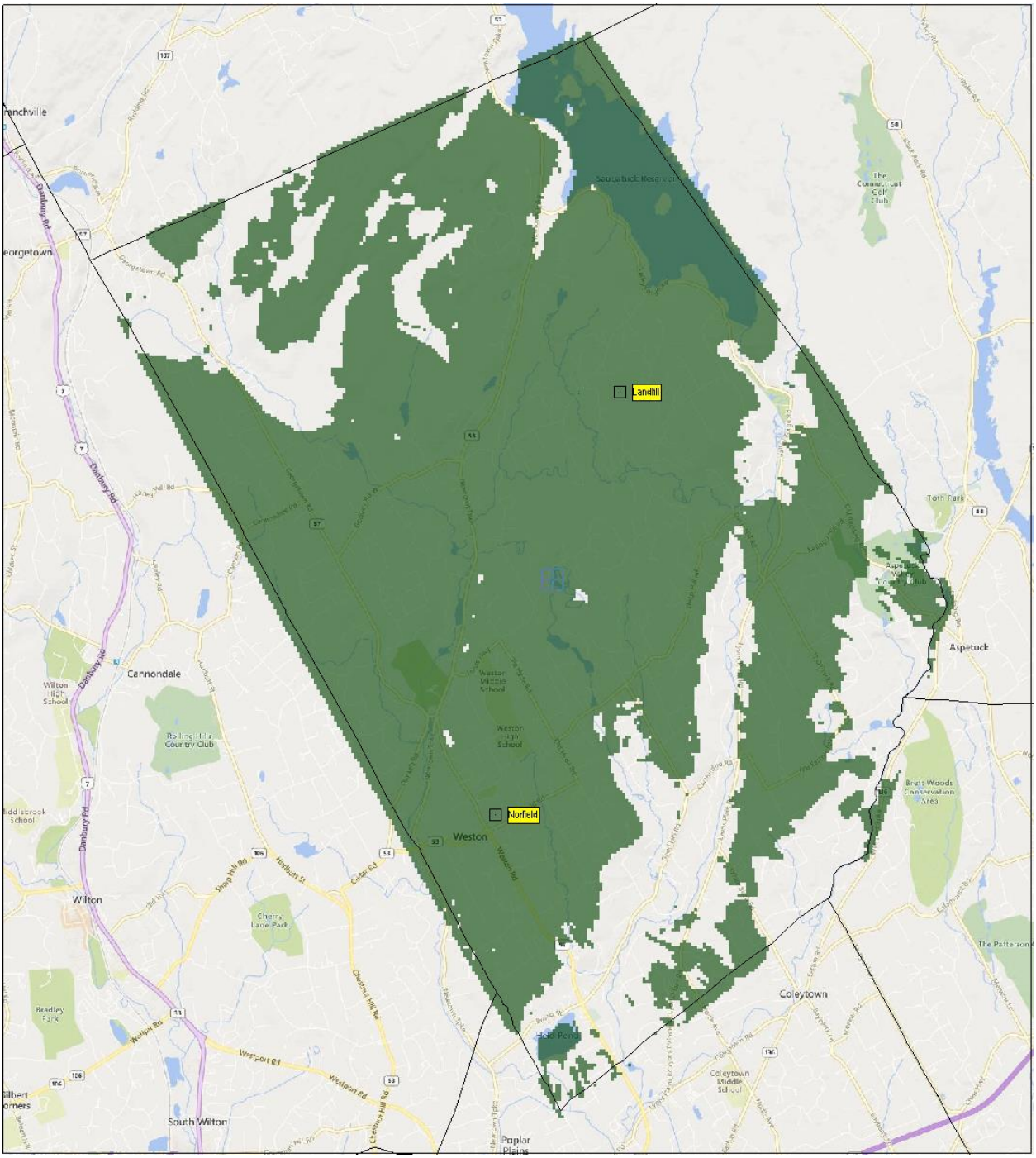
11.2 Motorola Coverage Maps Weston UHF

11.2.1 Maps Matrix

				Norfield		Landfill		Hill Rd		Lyons Plains		Meadow Ridge		Bayberry	
Map	Name	Direction	Target	Height	ERP	Height	ERP	Height	ERP	Height		Height		Height	
11.2.2	PD Talk Out	Outbound	Light Resid	36	60	180	20	95	20						
11.2.3	PD Talk Out	Outbound	Street	36	60	180	20	95	20						
11.2.4	FD Talk Out	Outbound	Light Resid	36	60	180	20								
11.2.5	FD Talk Out	Outbound	Street	36	60	180	20								
11.2.6	EMS Talk Out	Outbound	Light Resid	36	25	180	30								
11.2.7	EMS Talk Out	Outbound	Street	36	25	180	30								
11.2.8	PD Talk In	Inbound	Light Resid	160		180		95		35		40		140	
11.2.9	PD Talk In	Inbound	Street	160		180		95		35		40		140	
11.1.10	Fire/EMS Talk In	Inbound	Light Resid	160		180				35		40		140	
11.2.12	Fire/EMS Talk In	Inbound	Street	160		180				35		40		140	

11.2.2 Present P25 Police System UHF Talk-out

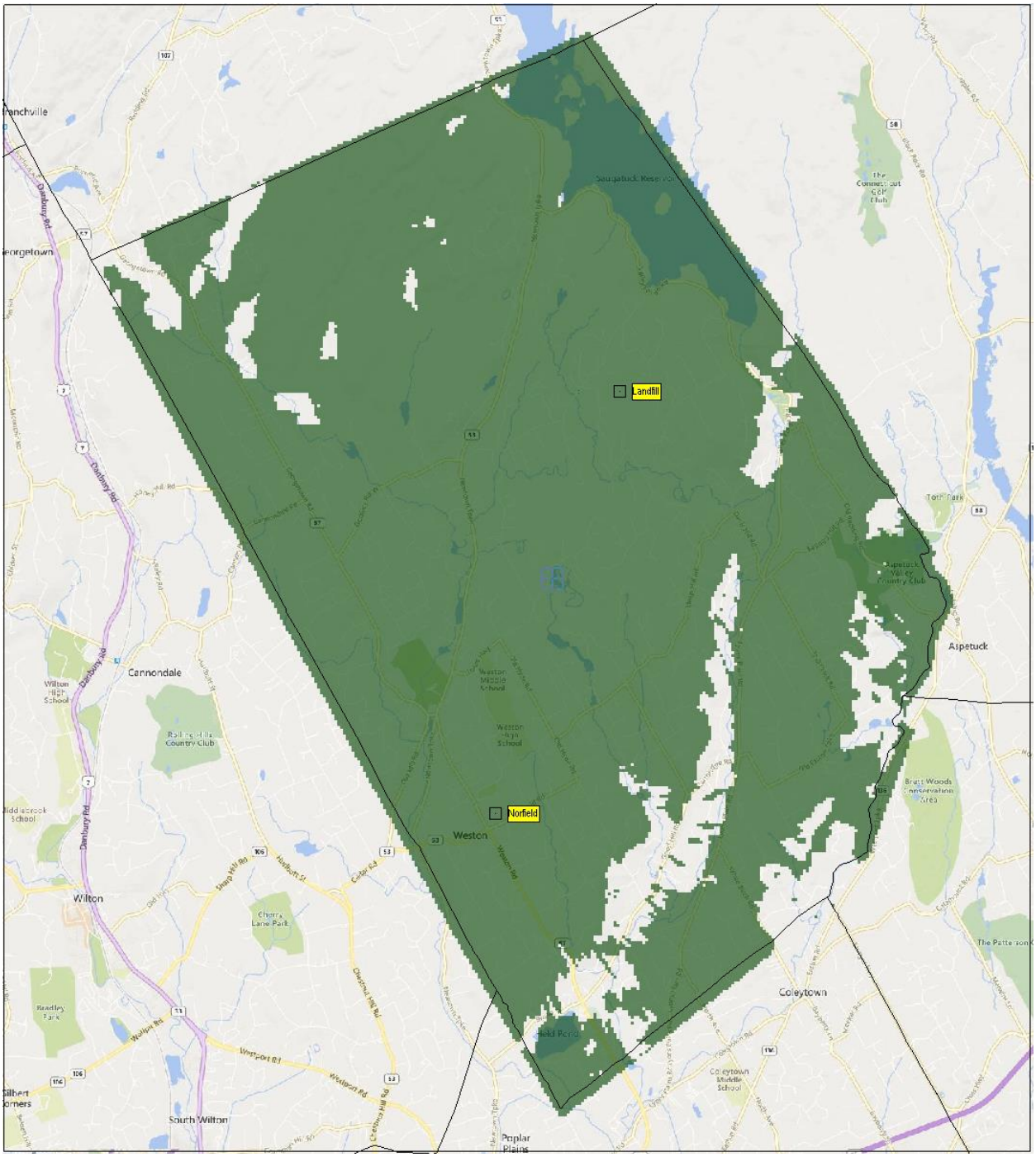
Portable on Hip in Light Residential Building
Three Sites (Hill Road not on map)



Maps are for reference only. Coverage is not guaranteed.

11.2.3 Present P25 Police System UHF Talk-out

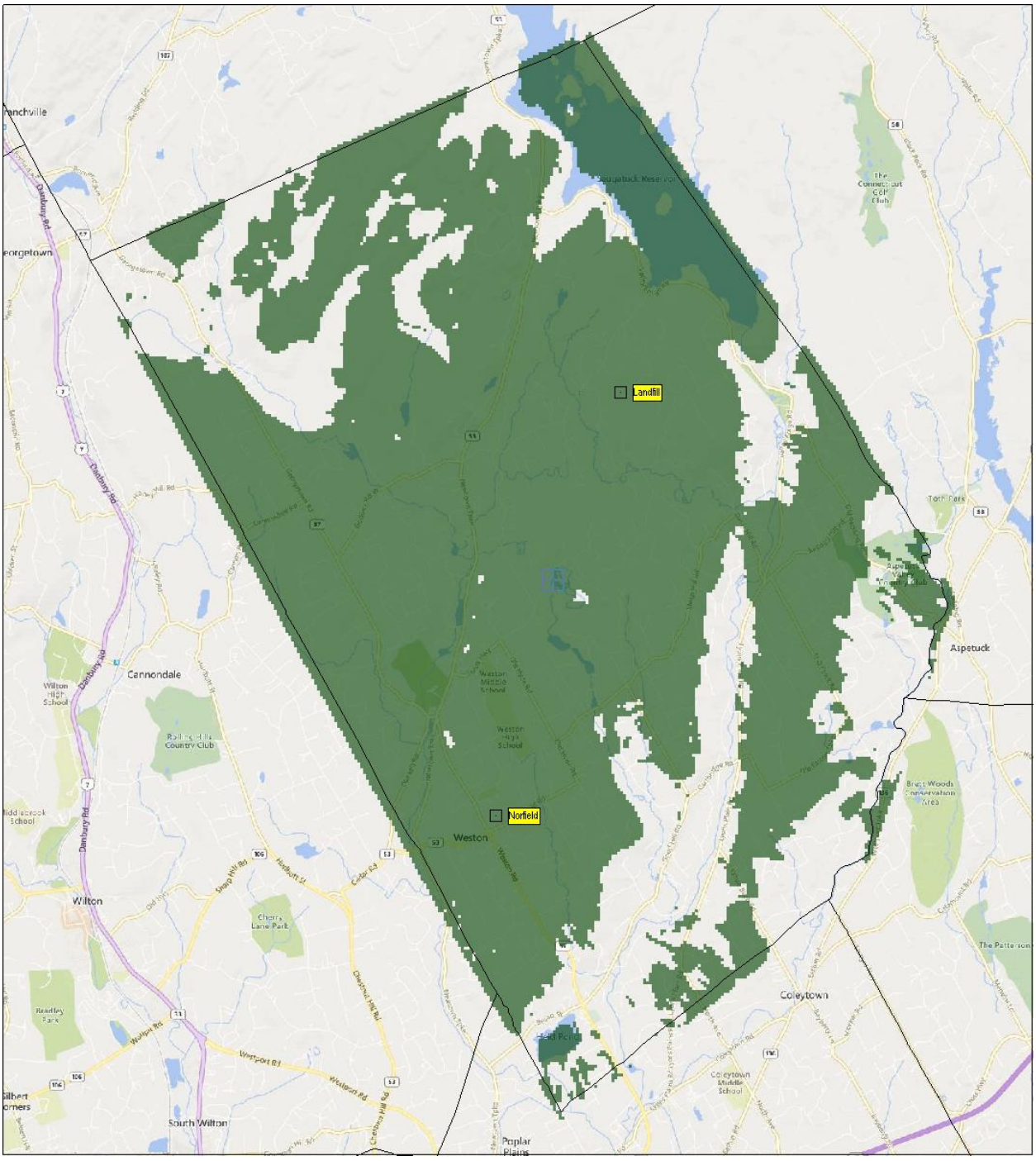
Portable on Hip on Street
Three Sites (Hill Road not on map)



Maps are for reference only. Coverage is not guaranteed.

11.2.4 Weston Fire – UHF Talk-out

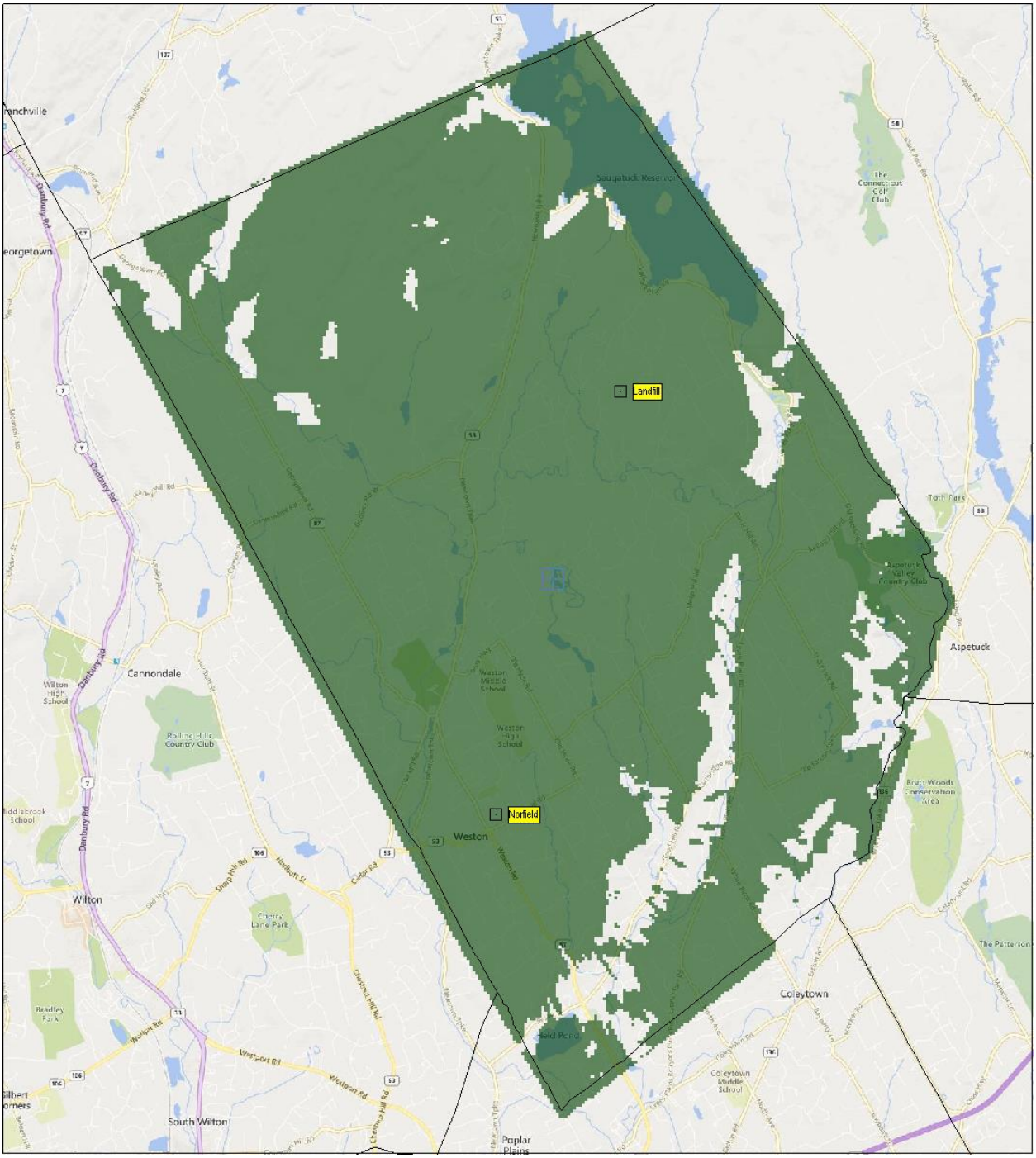
Portable on Hip in Light Residential
Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

11.2.5 Weston Fire – P25 Talk-out

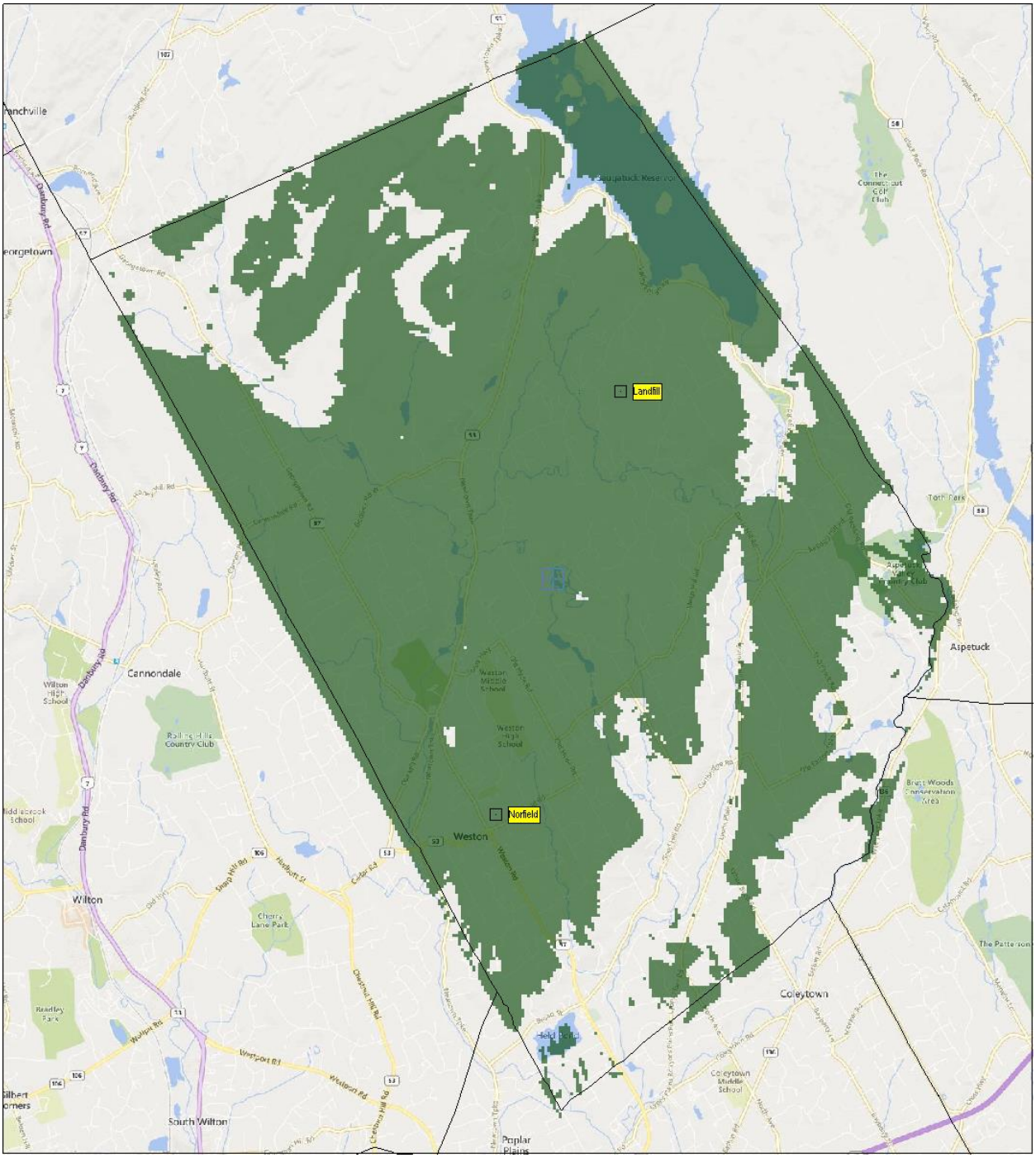
Portable on Hip on Street
Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

11.2.6 Weston EMS – P25 Talk-Out

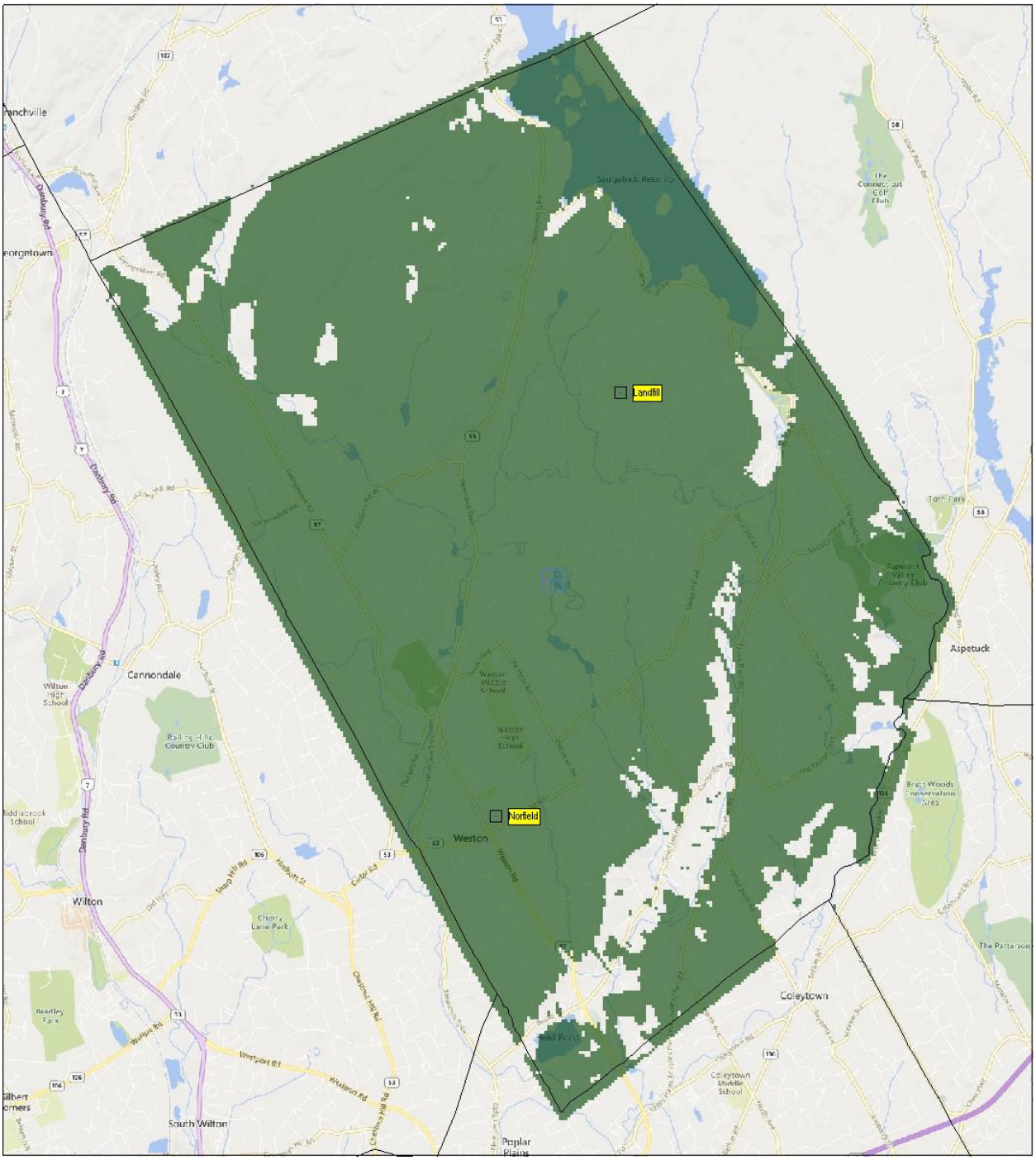
Portable on Hip in Light Residential
Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

11.2.7 Weston EMS – P25 Talk-out

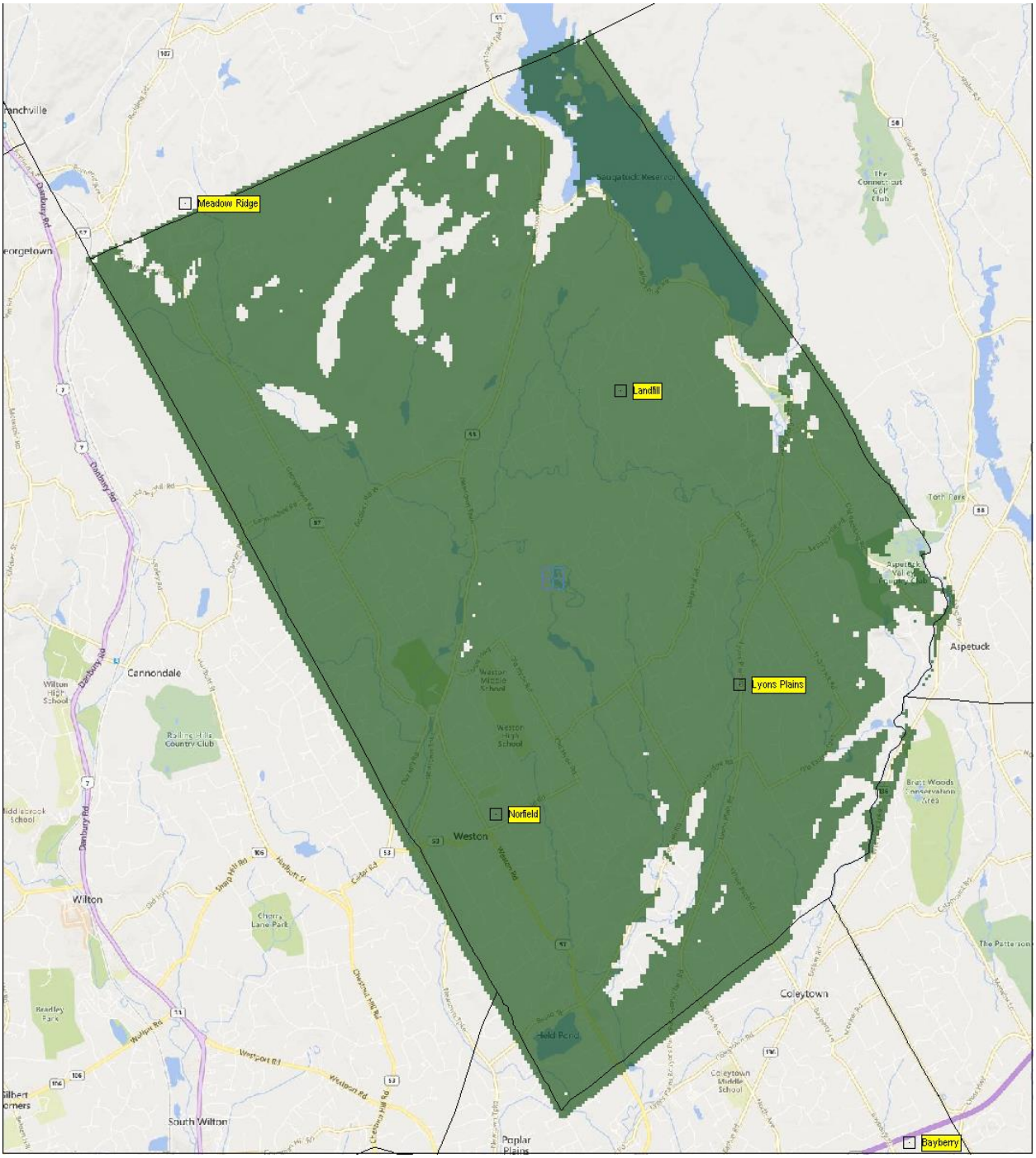
Portable on Hip on Street
Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

11.2.8 Weston PD – P25 Talk-in UHF Talk-out

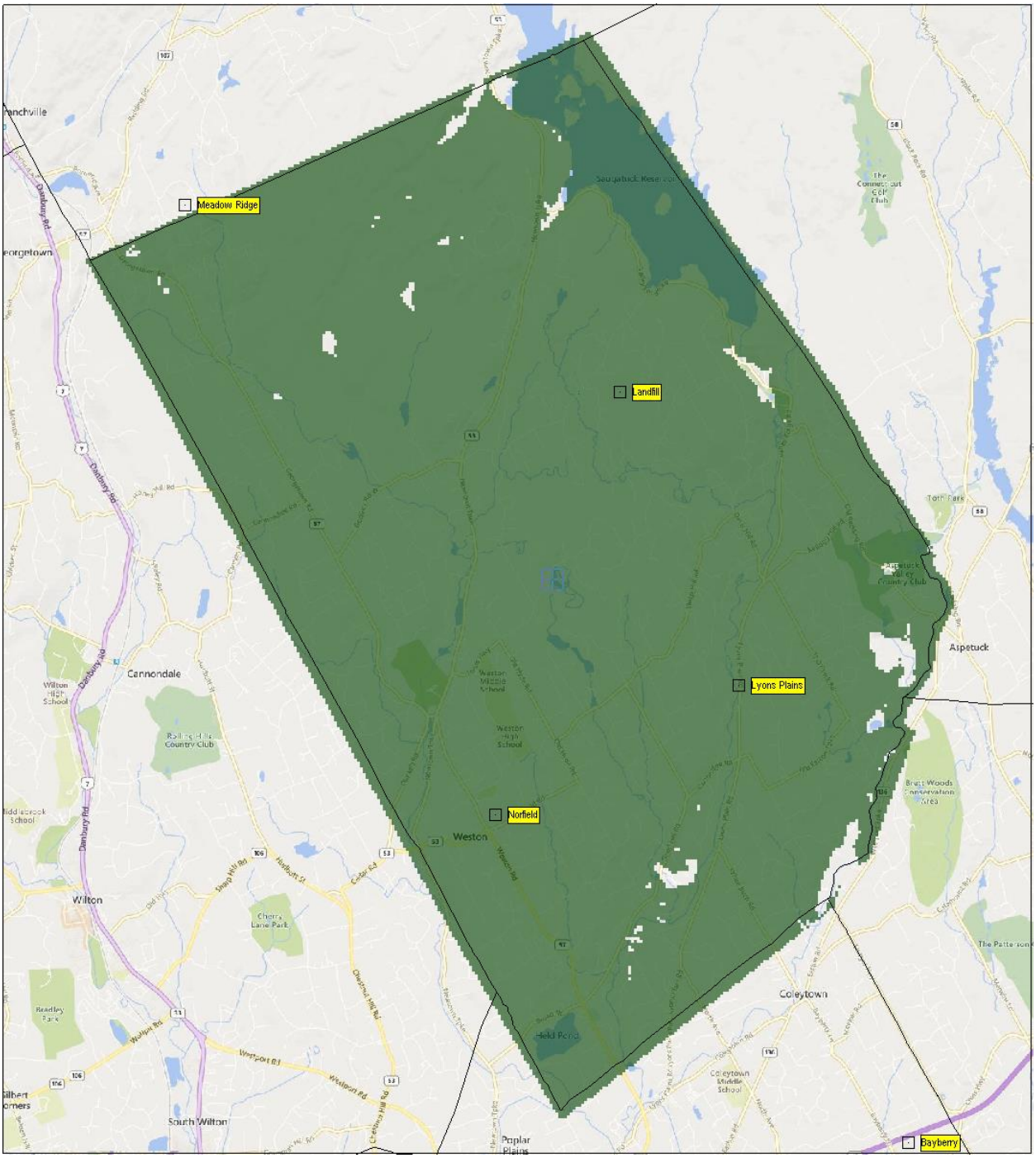
Portable on Hip in Light Residential
Sites as Indicated (Hill Rd Off Map)



Maps are for reference only. Coverage is not guaranteed.

11.2.9 Weston PD – P25 Talk-In

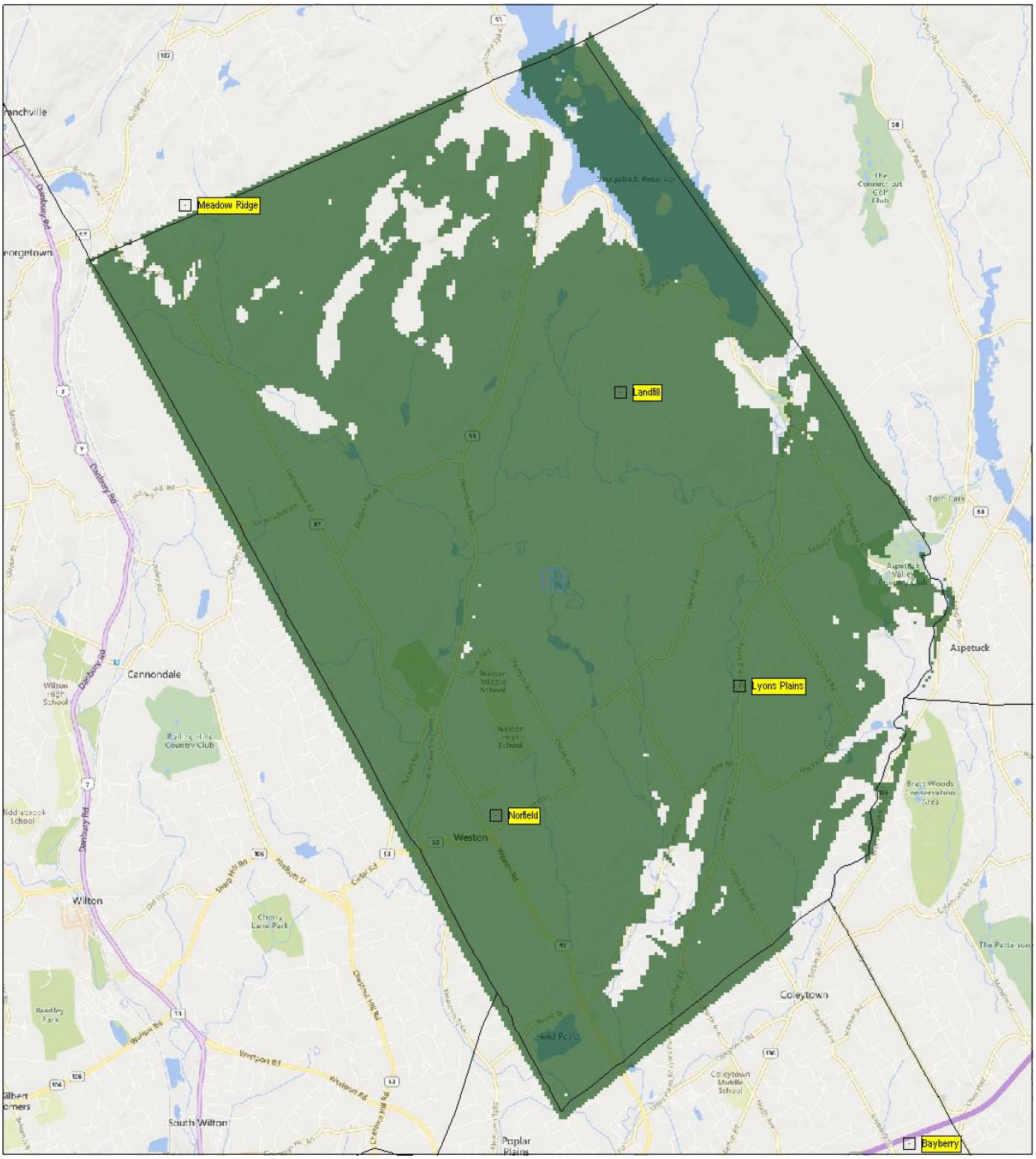
Portable on Hip on Street
Sites as Indicated (Hill Rd Off Map)



Maps are for reference only. Coverage is not guaranteed.

11.2.10 Weston Fire / EMS – P25 Talk In

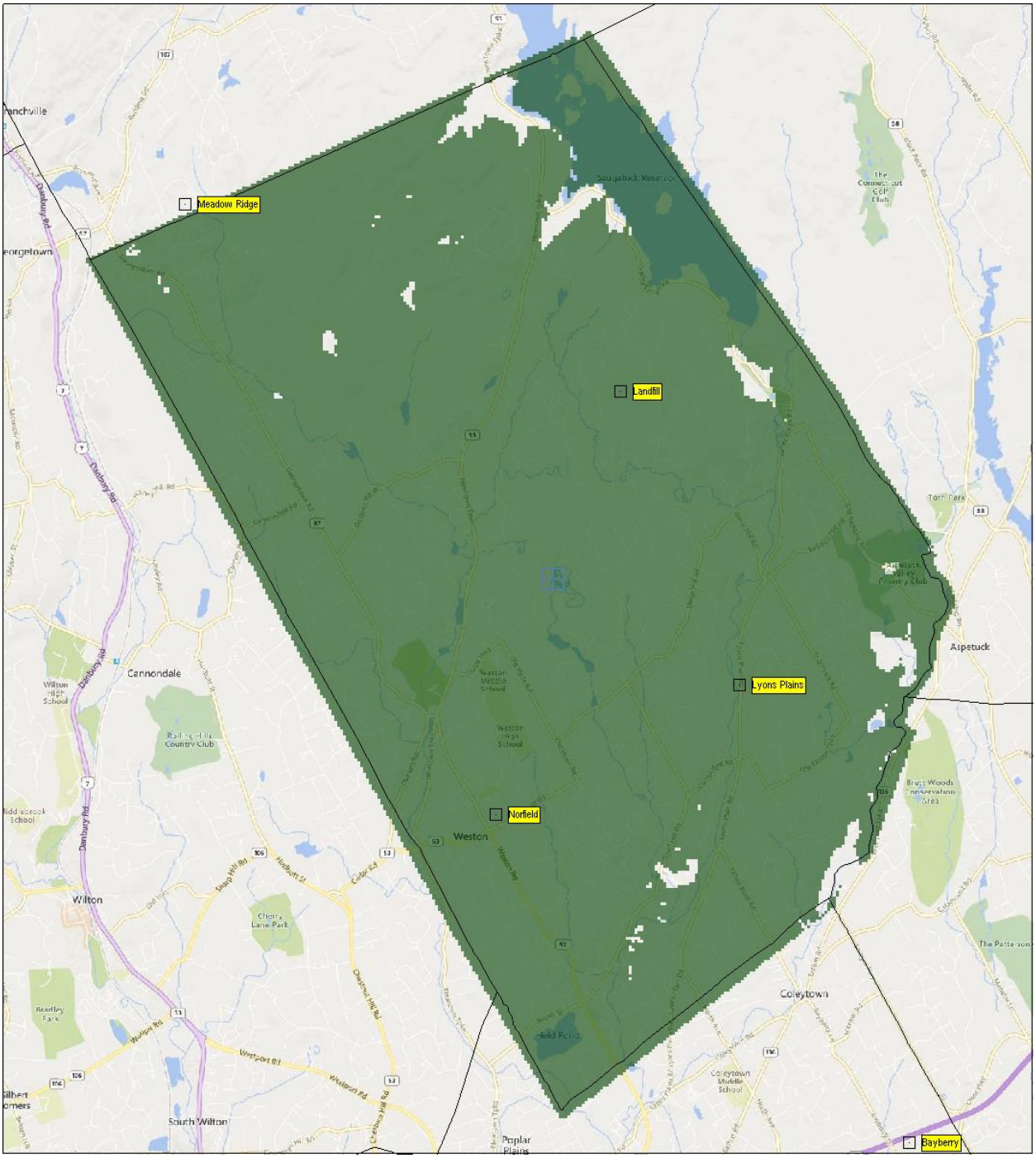
Portable on Hip in Light Residential
Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

11.2.11 Weston Fire / EMS – P25 Talk In

Portable on Hip on Street
Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

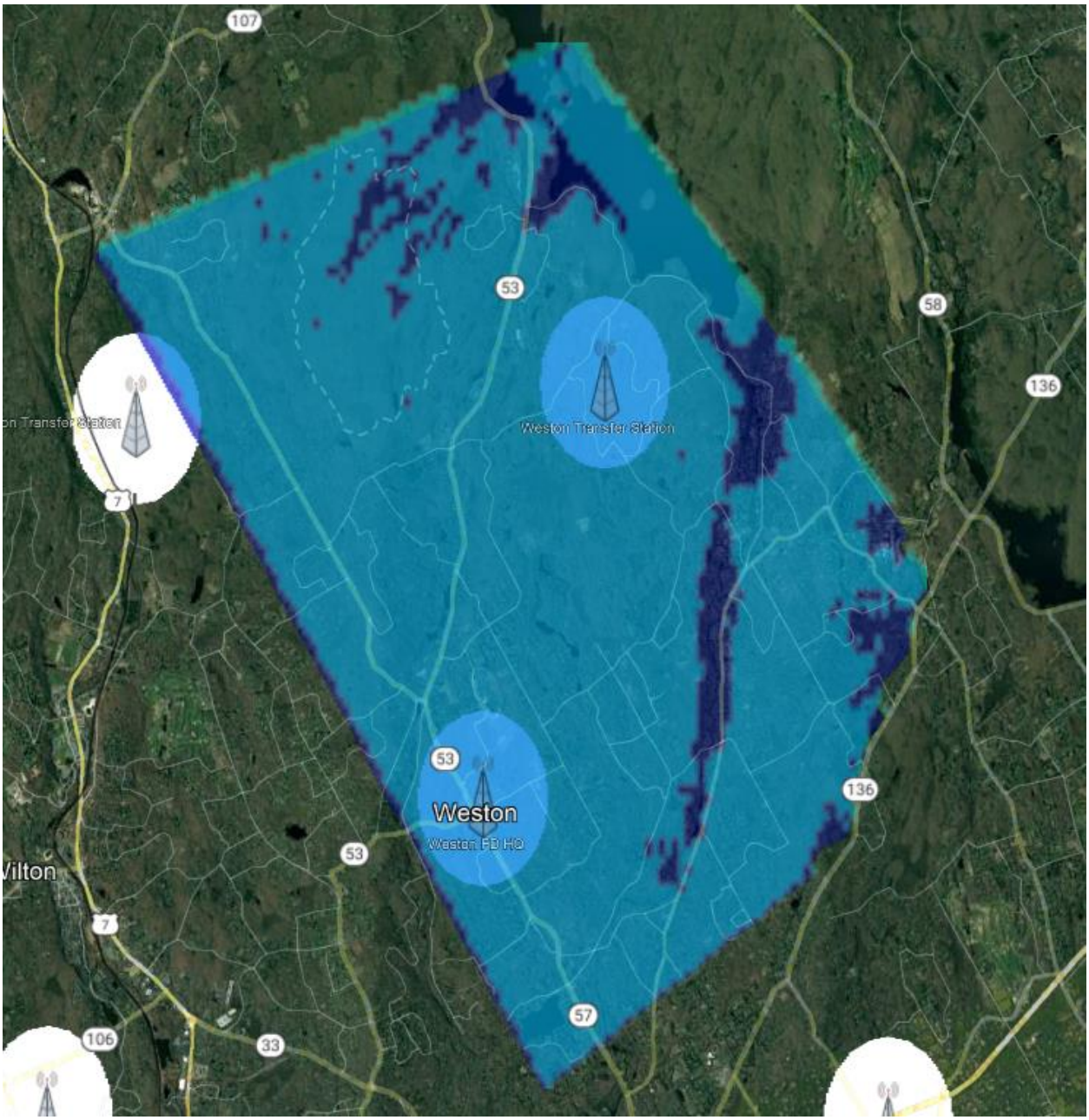
11.3 State System Coverage Maps (CLMRN)

The State CTS unit supplied the following maps. These maps were developed using existing guaranteed contractual Troop G coverage. Coverage is specific to the boundaries within the Town of Weston using existing State trunked radio sites and two additional Town sites.

11.3.1

11.3.2 CLMRN P25 Coverage Lite Residential Building

Portable on Hip in Light Residential
Sites as Indicated

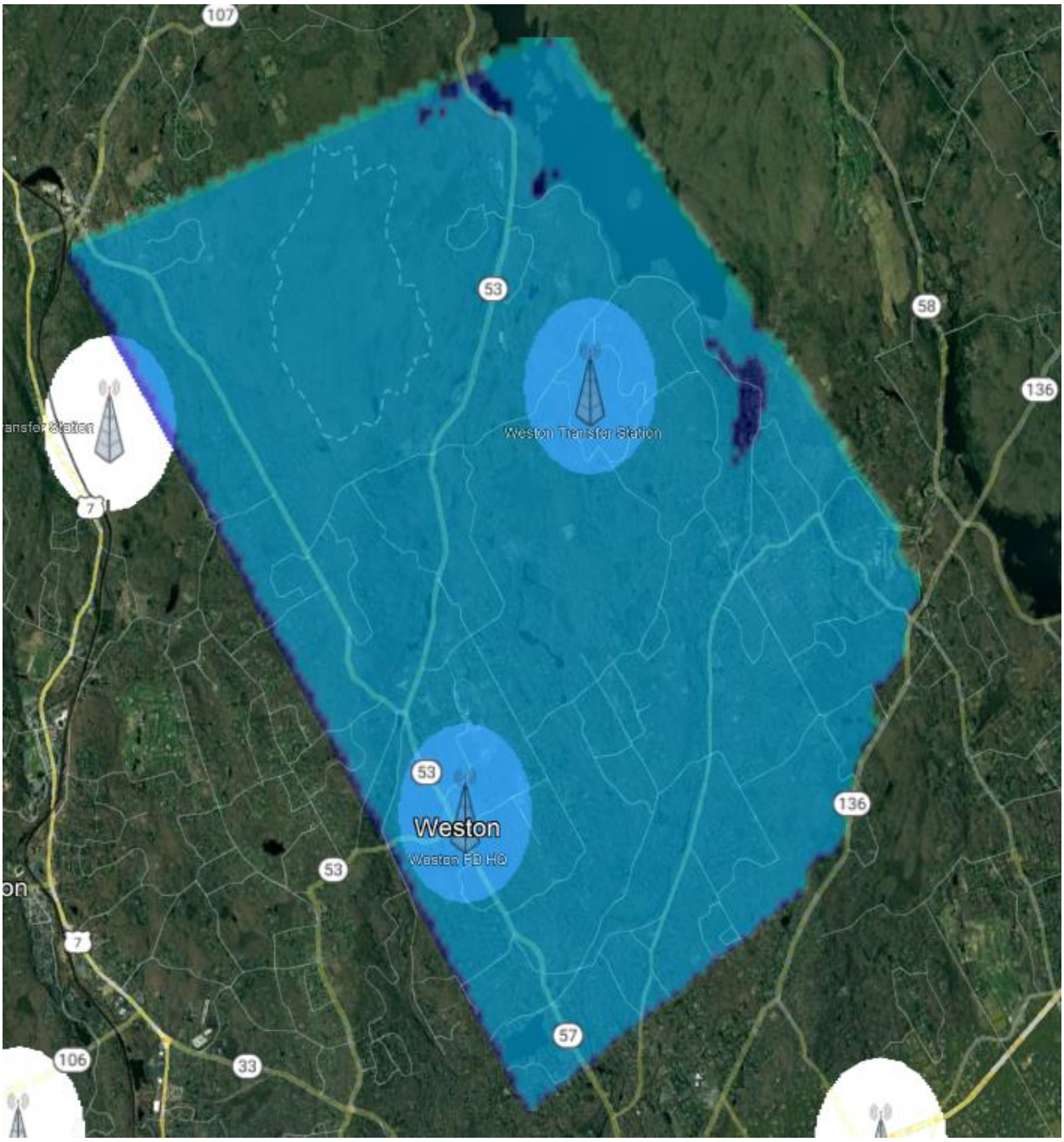


Maps are for reference only. Coverage is not guaranteed.

11.3.3 CLMRN P25 Coverage Lite Building

Portable on Hip on Street

Sites as Indicated



Maps are for reference only. Coverage is not guaranteed.

12 Appendix

12.1 Radio Inventory

Agency	Mobile	Portable	Control Station
Police	22	21	
Fire	15	36	0
EMS	4	75	0
Department of Public Works	26	5	1
Total	67	137	1

BOE	Not Reported	75	5

12.2 User Survey Questionnaire

Public Safety

LMR

Radio Inventory, Life Cycle & Needs Assessment

Survey

Person providing information:

Name: _____

Official Title: _____ Department:

_____

Office Telephone #:_____ Cell Phone #:_____

Email Address: _____

Please complete, to the best of your ability, all questions in the attached user survey. Answers should be as accurate as possible. If you are not sure of the information you are providing please indicate so in your response.

If additional space is needed please respond on in the space provided in section 5.8 at the end of this survey. Please include question reference numbers.

If you have any questions or require clarification please contact Paul Zito by email at paul.zito@neradioconsultants.com

1 Infrastructure

1.1 As of today, how many two way radio base station locations (RF sites) does your department operate?

☐

1.2 In what frequency bands does your department operate land mobile radio systems? (Select all that apply)

☐ Low band VHF (25-50 MHz)

☐ High band VHF (150-174 MHz)

☐ UHF (450-470 MHz)

☐ 700 MHz

☐ 800 MHz

☐ 900 MHz

☐ Other Please Specify _____

☐

☐

1.3 Which type of land mobile radio systems does your department currently operate? (Select all that apply)

☐ Conventional analog (non-trunked)

☐ Conventional digital (non-trunked)

☐ Conventional digital (APCO P25 compliant)

☐ Trunked analog

☐ Trunked digital (vendor specific)

☐ Trunked digital (APCO P25 compliant)

☐ Other Please specify_____

1.3.1 Identify the manufacturer of each of your radio systems identified in question 1.3

☐ Conventional analog (non-trunked) _____

☐ Conventional digital (non-trunked) _____

☐ Conventional digital (APCO P25) _____

☐ Trunked analog _____

☐ Trunked digital (vendor specific) _____

☐ Trunked digital (APCO P25) _____

☐ Other Please specify _____

1.4 Is your land mobile radio system a simulcast system?

- ☐ Yes
- ☐ No
- ☐ Not sure

1.5 Is your land mobile radio system a voted receive system?

- ☐ Yes
- ☐ No
- ☐ Not sure

1.6 Does your agency plan to upgrade its land mobile radio system within the next 5 years?

- ☐ Yes
- ☐ No
- ☐ Not sure

1.7 What radio technology is your department likely to use for its radio upgrade program?

1.8 Approximately how old is the infrastructure of your current land mobile radio system? (In years)

☐

1.9 Does your land mobile radio system share infrastructure or locations, with other communications systems? (Co-located sites, shared antenna systems, shared towers, etc.)

☐ Yes

☐ No

☐ Not sure

1.9.1 If yes to question 1.9, please identify:

System	Physical Location	Shared Location Y/N	Shared Infrastructure Y/N

1.10 Do you or your service provider shop have 24 hour access to all base station RF sites?

☐ Yes

☐ No

☐ Not sure

1.11 Does your agency lease or occupy 3rd party antenna space for your current land mobile radio system?

☐ Yes

☐ No

1.11.1 If yes to question 1.11, please specify:

System	Location

1.12 Does your department use a paging system for alerting of personnel?

☐ Yes

☐ No

1.12.1 If Yes to the question 1.12, is your paging system:

☐ Tone only Quantity_____

☐ Tone and Voice Quantity_____

1.12.2 If yes to the question 1.12, is your paging system:

☐ Agency owned

☐ Agency leased

☐ Commercial service Please specify _____

1.13 Has your department implemented mobile data?

☐ Yes

☐ No

☐ Not sure

1.13.1 If yes to the question 1.13, is your mobile data system:

☐ Agency owned

☐ Agency leased

☐ A commercial service. Please specify _____

1.14 Has your department implemented GPS tracking?

☐ Yes

☐ No

☐ Not sure

1.14.1 If yes to question 1.14, is your GPS tracking system:

☐ Agency owned

☐ Agency leased

☐ A commercial service. Please specify _____

1.14.2 Number of vehicles you track?

☐

1.15 Does your departments land mobile radio system use voice encryption?

- ☐ No
- ☐ Digital encryption
- ☐ Scrambling device
- ☐ Not Sure

1.16 Does your department have a capital budget plan for the wholesale replacement of any of your land mobile radio system infrastructure?

- ☐ Yes
- ☐ No
- ☐ Not Sure

1.17 Please identity all base stations or repeaters currently used your land mobile radio communication systems. (Include spares or backup systems)

Manufacturer	Model #	Location

1.18 How many repeaters, base stations and voted receivers are in your land mobile radio system?

1.18.1 Please list all locations

System	Base =B Repeater = R Voted RXer =V	**Location**

1.19 Does your department use Bi-Directional Amplifier Systems (BDA) or a Distributed Antenna System (DAS) to augment in-building radio coverage within your land mobile radio communication systems?

☐ Yes

☐ No

☐ Not sure

1.19.1 If yes to question 1.19, please specify:

Location	Manufacturer	Age	Last Inspected	Service Contract Y/N

1.20 If FCC mandated narrow banding was required on your land mobile radio system frequencies, has this narrow banding been completed?

- ☐ Yes
- ☐ No
- ☐ Not Sure

1.21 Does your land mobile radio system employ the use of microwave or wireless RF links?

- ☐ Yes
- ☐ No
- ☐ Not Sure

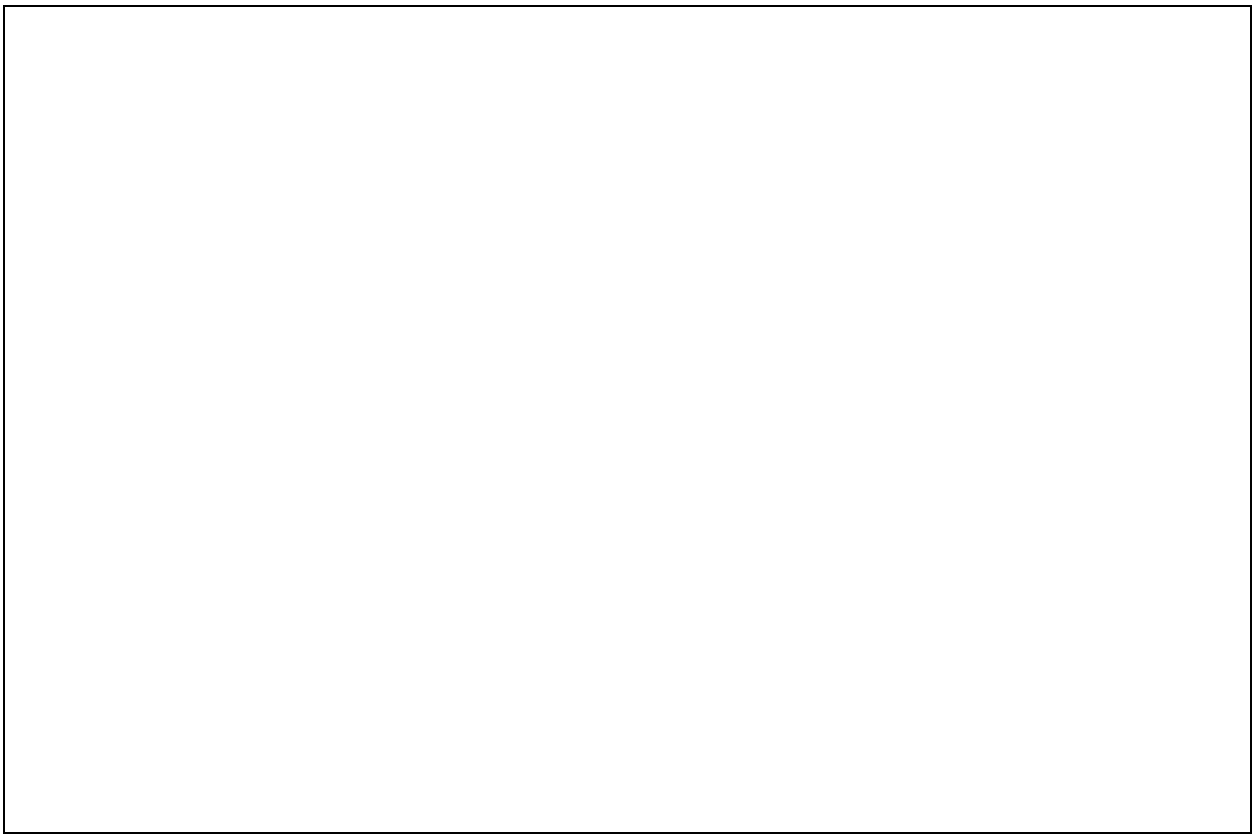
1.22 Do you remotely monitor the health of your land mobile radio system 24/7?

- ☐ Yes
- ☐ No
- ☐ Not sure

1.23 How would you describe you overall system reliability as it pertains to system availability and frequency of repairs?

1.24 How would you describe your systems overall congestion as it pertains to wait times to access and system cueing?

1.25 How would you describe your systems overall coverage? Are poor or non-coverage areas widely identified?



1.26 Please identify all “must have in-building coverage” locations within your town.

Name of Building	Location	Building Use	Type of Construction

1.27 Does your land mobile radio system employ in-vehicle repeaters?

☐ Yes

☐ No

☐ Not sure

☐

1.27.1 If yes to question 1.27, are they in-band or cross-band?

☐ In-band

☐ Cross-band

☐ Not Sure

1.27.2 If yes to question 1.27, please list all vehicular repeaters in your system.

Manufacturer	Model #	Frequency Band	Quantity

2 Dispatch Services

2.1 How many dispatch consoles does your department/agency have?

☐

2.2 Which of the following best describes your departments/agencies plan for radio dispatching?

☐ Department performs its own dispatching 24/7 hours per day

☐ Department performs its own dispatching 9 am to 5 pm

☐ Agency uses a combined dispatch center

☐ Agency uses a contracted dispatching service

2.3 Describe after hours dispatching arrangements

2.4 Please provide the location of any dispatch centers that are being used by your organization. Please include information about how you presently utilize their services.

Dispatch Center Name: _____

Street Address: _____

_____

_____

2.5 Utilization: Please include specifics such as hours of operation, means of dispatching and overall satisfaction with this dispatch arrangement.

3 Interoperability

3.1 What is your departments/agencies overall opinion on land mobile interoperability? For the purposes of this question, interoperability is defined as 2 way communications (transmit and

receive) using a channel, talk group or frequency that is used for inter or intra department or agency communications. (Select all that apply)

- ☐ Is not needed
- ☐ Is mandatory
- ☐ Not sure

3.2 Do you **need** land mobile interoperability with **other Town departments**?

- ☐ Yes
- ☐ No
- ☐ Not sure

3.3 Do you currently **have** the ability to communicate with **other Town departments**?

- ☐ Yes
- ☐ No
- ☐ Not sure

3.4 Do you **need** land mobile interoperability with other **non-Town agencies**?

- ☐ Yes
- ☐ No
- ☐ Not sure

3.5 Do you currently **have** land mobile interoperability with other **non-Town agencies**?

- ☐ Yes
- ☐ No
- ☐ Not sure

3.6 Do you have at least one radio channel or talk group designated for Mutual Aid or interoperability with other departments?

- ☐ Yes
- ☐ No
- ☐ Not sure

3.7 Identify all voice channel(s) available for interoperability.

Frequency

☐		Low band vhf (25-50 MHz)	_____
☐		High band vhf (150-174 MHz)	_____
☐		Uhf (450-470 MHz)	_____
☐	700 MHz		_____
☐	800 MHz		_____
☐	900 MHz		_____
☐	Other	Please specify	_____
☐			
☐			

3.8 Which **town departments** do you share land mobile interoperability with?

Agency	How Often (daily, weekly, monthly, rarely)

3.9 Which **non-town** agencies do you share land mobile interoperability with?

Agency	How Often (daily, weekly, monthly, rarely)

4 Subscribers

4.1 Does your department have a budget or plan in place for the replacement of mobile and portable subscriber radios that are no longer supported by a specific manufacturer?

- ☐ Yes
- ☐ No
- ☐ Not sure

4.1.1 If yes to question 4.1, please describe.

- ☐ Buy new
- ☐ Buy used
- ☐ Replace from spare inventory
- ☐ Other Please specify:

4.2 Does your department have a capital budget plan for a volume purchase of subscriber equipment?

☐ Yes

☐ No

☐ Not Sure

4.3 List the number of current and future (over the next 5 years) subscribers for each communications system, which your department utilizes. Fill-in all that apply. (Include spares or backups)

System	Mobile= M Portable = P Control Station=CS	Quantity	Replacement or Expansion

4.4 Please identity all **Portable radios** currently used in any of your land mobile radio communications systems. (Include spares)

Manufacturer	Model #	Quantity

4.5 Please identity all **mobile radios** currently used in any of your land mobile radio communications systems. (Include spares)

Manufacturer	Model #	Quantity

4.6 Please identity all **Control Stations** currently used in any of your land mobile radio communications systems. (Include spares)

Manufacturer	Model #	Quantity

4.7 Please identity all wired **remote control units** currently used in any of your land mobile radio communications systems. (Include spares)

Manufacturer	Model #	Quantity

5 Additional Information

5.1 Please describe any system enhancements or additions that were funded since 2015. (Include approximate costs)

5.2 Please provide invoices for the past 3 years with regard to infrastructure and subscriber repairs.

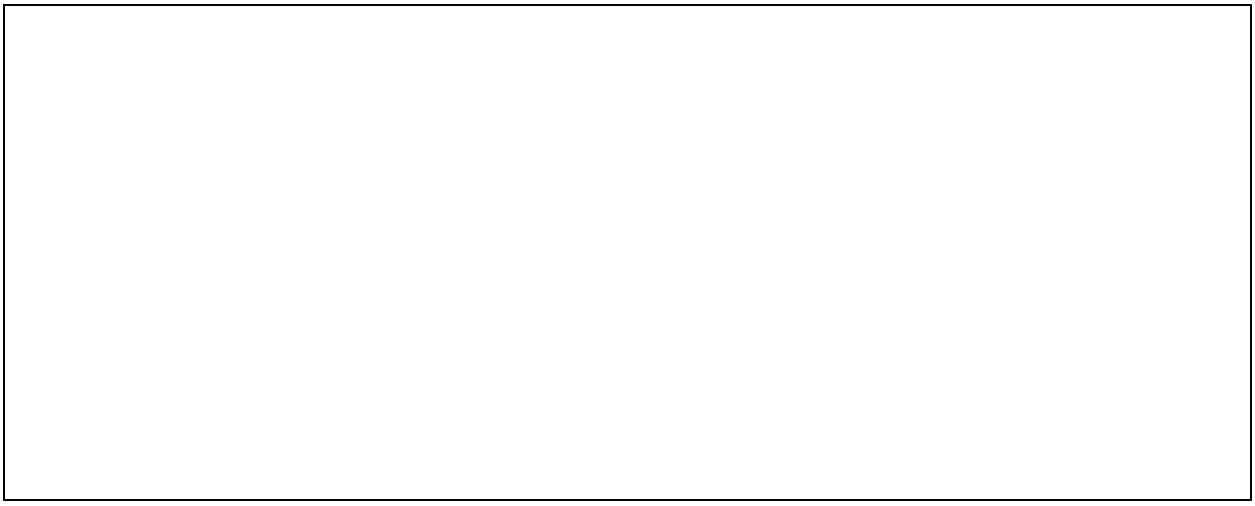
5.3 Please provide all FCC licenses for all land mobile communication systems and locations you presently use or plan to use in the future.

5.4 Please provide paperwork for any FCC applications that are pending or in frequency coordination.

5.5 Please provide annual system maintenance budget/costs:

- Budget $_____
- Actual Costs $_____

5.6 Other radio systems maintenance costs $_____ Please define:



5.7 List all communications service providers and a point of contact for your land mobile radio communications system. (Use 1 line per system serviced)

Company	Contact	Phone #	Systems Serviced	Infrastructure, Subscribers or Both

5.8 Please provide any additional comments you may have in the space below. If comments relate to a particular question, please provide the question number.

12.3 User Questionnaire Tabulated Results

		Police	Fire	EMS	BOE	Public Works
1	Infrastructure					
1.1	As of today, how many two-way radios base station RF sites does your department operate?	2 Simulcast repeaters, 4 receivers	2		4	
1.2	In what frequency bands does your department operate land mobile radio systems?	UHF 460.2125 / 465.2125 P25	UHF			
1.3	Which type of land mobile radio systems does your department currently operate?	P25 Digital	Conventional analog		Trunked analog	
1.3.1	Identify the manufacturer of each of your radio systems identified in question 1.3	Tait	Motorola			

1.4	Is your land mobile system a simulcast system? mobile radio system a voted receive system?	Yes	No		Not sure	
1.5	Is your land mobile radio system a voted receive system?	No	Yes		Not sure	
1.6	Does your agency plan to upgrade its land mobile system within the next 5 years?	Based on evaluation	Yes	Yes	Not sure	
1.7	What radio technology is your department likely to use for its radio upgrade program?	P25 Digital	Digital State System			
1.8	Approximately how old is the backbone of your current land mobile radio system? (in years)	12 years	22			

1.9	Does your land mobile system share infrastructure or locations, with other land mobile communications systems? (co-located sites, shared antenna systems, shared towers, etc.)	Yes	Yes	Yes	Not sure	
1.9.1		Combiners and couplers				
1.10	Do you or your service provider shop have 24 hour access to all base station RF sites?	Yes	Yes		Not sure	
1.11	Does your agency lease or occupy 3rd party antenna space for your current land mobile radio system?	Yes	No			
1.11.1	If yes to question 1.11, please specify:	See reponse				
1.12	Does your department use a paging system for alerting of personnel?	No	Yes	Yes		
1.12.1	If Yes to the question 1.12, is your paging system:		Tone and Voice	Tone and voice		

1.12.2	If yes to the question 1.12, is your paging system:	NA	Agency owned			
1.13	Has your department implemented mobile data?	Yes	Yes	Not sure	Not sure	
1.13.1	If yes to the question 1.13, is your mobile data system:	Agency owned	Agency owned			
1.14	Has your department implemented GPS tracking?	No	No	Not sure	Not sure	
1.14.1	If yes to question 1.14, is your GPS tracking system:	NA	Agency owned			
1.14.2	Number of vehicles you track?	NA				
1.15	Does your departments land mobile radio system use voice encryption?	yes	No		Not sure	
1.16	Does your department have a capital budget plan for the wholesale replacement of any of your land mobile radio system infrastructure?	Yes	Yes	Yes	Not sure	

1.17	Please identity all base stations or repeaters currently used in any of your land mobile communication systems. (include spares or backup systems)	Tait TB9100 X5	Motorla MTR2000			
1.18	How many repeaters, base stations and voted receivers are in your land mobile radio system?	5	4			
1.18.1	Please list all locations	R 56 Norwood R Godfrey RD East, R Meadow Ridge, R Lyons Plain Road, R Bayberry Lane	B HQ B Transfer Station V Lyons Plain FH V Bayberry Lane			

1.19	Does your department use Bi-Directional Amplifier Systems (BDA) or a Distributed Antenna System (DAS) in your land mobile communication systems?	No	No			
1.19.1	If yes to question 1.19, please specify:	NA				
1.20	If FCC mandated narrow banding was required on your land mobile radio system frequencies, has this narrow banding been completed?	Yes	Yes	Not sure		
1.21	Does your land mobile radio system employ the use of microwave or wireless RF links?	Yes	No	Not sure	Not sure	
1.22	Do you remotely monitor the health of your land mobile radio system 24/7?	Yes	Not sure	Not sure	No	

1.23	How would you describe you overall system reliability as it pertains to system availability and frequency of repairs?	Very reliable	Old	The EMS system is part of the general FD / Town system. Reliability has been similarly impacted by the age, technology, and staffing levels. In general, we have the most users, and this also creates challenges. We have older portables for our student members, which almost don't work. We also have limited interoperability with mutual aid partners in our portables	Not sure	
1.24	How would you describe your systems overall congestion as it pertains to wait times to access and system cueing?	No issues	Good			

1.25	How would you describe your systems overall coverage? Are poor or non-coverage areas widely known?	No	Good	Generally, it is OK, but where we have challenges, like the Bradley Road and upper Georgetown areas, coverage is quite poor		
1.26	Identify all "must have in building coverage" locations		Schools School Road masonry	All Schools		
1.27	Does your land mobile radio system employ in-vehicle repeaters?	No	No	Not sure	Not sure	
1.27.1	If yes to question 1.27, are they in-band or cross-band?	NA				
1.27.2	If yes to question 1.24, please list all vehicular repeaters in your system.	NA				

2	Dispatch Services					
2.1	How many dispatch consoles does your department have?	2	2	4	4	
2.2	Which of the following best describes your departments plan for radio dispatching?	Own 24/7	Own dispatch 24/7		Own Dispatch 0900 - 1700	
2.3	Describe after hours dispatching arrangements	No plans to replace			NA	
2.4	Please provide the location of any dispatch centers that are being used by your organization. Please include information about how you presently utilize their services.	PD, 56 Norfield Road	Town Hall	Main Office 135 School Road		

2.5	Utilization: Please include specifics such as hours of operation, means of dispatching and overall satisfaction with this dispatch arrangement.	24/7	24/7 1 dispatcher good service		0700 - 1600 0k satisfaction	

3	Interoperability					
3.1	What is your department's overall opinion on land mobile interoperability? For the purposes of this question, interoperability is defined as 2 way communications (transmit and receive) using a channel, talk group or frequency that is used for inter or intra department or agency communications.	Mandatory	mandatory	Mandatory	Not sure	
3.2	Do your **need** land mobile interoperability with **other Town departments**?	Yes	Yes	Not sure	Not sure	
3.3	Do you currently **have** the ability to communicate with any **other Town Agencies** ?	Yes	yes	Yes - Only CMED	Not sure	
3.4	Do you **need** land mobile interoperability with other **non-Town agencies**?	yes	yes	I would like to see mutual aid partner channels in the rigs as well as in command staff portables	Not sure	

3.5	Do you currently **have** land mobile interoperability with other **non-Town agencies**?	Yes	yes	Not sure	Not sure	
3.6	Do you have at least one radio channel or talk group designated for Mutual Aid or interoperability with other departments?	Yes FAPERN	Yes UASI	No CMED only	Yes	
3.7	Identify all voice channel(s) available for interoperability.	VHF Mobiles- FAPERN, Redding, Easton, Ridgefield UHF- Mobiles and Portables- FAPERN, Wilton, Weston School Emergency Channel, 700 800	UHF		Other 450-520 MHz	
3.8	Which **Town departments** do you share land mobile interoperability with?	Weston FD monitor daily, & weekly communicate Weston EMS monitor daily, & weekly communicate Weston Public Works monitor daily, & monthly communicate Weston Animal Control Monitor daily, & monthly communicate	Wilton-weekly Westport-occationaly Fairfield-rarely Georgetown-occationally Easton-Monthly	Fire weekly		

		Weston Schools Staff and Security Monitor daily, & communicate every few months Weston Bus Transportation Monitor daily, & communicate every few months				
3.9	Which **non-Town** agencies do you share land mobile interoperability with?			CMED Daily		
4	Subscribers					
4.1	Does your department have a budget or plan in place for the replacement of mobile and portable subscriber radios that are no longer supported by a specific manufacturer?	No master plan	Yes	Yes	Not sure	

4.1.1	If yes to question 4.1, please describe.	Budget	Buy new	Buy new - replace from spares		
4.2	Does your department have a capital budget plan for a volume purchase of subscriber equipment?	No master plan	Yes	Yes	Not sure	
4.3	List the number of current and future (over 5 years) subscribers for each communications system, which your department utilizes. Fill-in all that apply. (Include spares or backups)	Tait portable X18 end of life, 28 Tait Vehicilar radios	Separate list			
4.4	Please identity all **Portable radios** currently used in any of your land mobile communications systems. (include spares)	10 Tait TP9100 6 TP-9400 portable, 5 APX600 UASI radios, 6 Hytera 782G DMR (school) radios			Hytera PD782GU (2) X10, Hytera X1PU (1) X4, Inovation Circuit Technology GS Ict12012-20A X1	

4.5	Please identity all **mobile radios** currently used in any of your land mobile communications systems. (include spares)	See response			Hytera PD782GU (2) X10, Hytera X1PU (1) X10, Inovation Circuit Technology GS Ict12012-20A X1	
4.6	Please identity all **Control Stations** currently used in any of your land mobile communications systems. (Include spares)				Hytera PD782GU (2) X17, Hytera X1PU (1) X6, Innovation Circuit Technology GS Ict12012-20A X1	
4.7	Please identity all wired **remote control units** currently used in any of your land mobile communications systems. (include spares)					
5	Additional Information					

5.1	Please describe any system enhancements or additions that were funded since 2015. (include approximate costs)	4 Tait TP-9400 portables, 4 Motorola APX8000 portables, 1Kenwood DMR				
5.2	Please provide invoices for the past 3 years with regard to infrastructure and subscriber repairs.	$6,000				
5.3	Please provide all FCC licenses for all land mobile communication systems and locations you presently use or plan to use in the future					
5.4	Please provide paperwork for any FCC applications that are pending or in frequency coordination.	NA				
5.5	Please provide annual system maintenance budget/costs:					

5.6	Other radio systems maintenance costs $_____	$500/month for cable modems				
5.7	List all communications service providers and a point of contact for your land mobile communications system.	Marcus Communications, Bruce Markus, Michael Bula	Norcom-All			

5.8	Please provide any additional comments you may have and attach them to the last page of this survey. If comments relate to a particular question, please provide the question number.			My main concern is interoperability and improved technology. As noted above, I'd like to have more channels in the ambulances for mutual aid partners, as well as command staff portables. Also, command staff having PD on portables would be a nice to have. For technology, GPS of portables and ambulances would be a nice to have, but may become a must have for safety purposes		

12.4 Definitions

Analog Mode	An analog signal is a variable signal continuous in both time and amplitude
APCO P25 (P25)	Project 25 (P25 or APCO-25) are standards for digital radio communications for use by federal, state/province and local public safety agencies in North America to enable them to communicate with other agencies and mutual aid response teams in emergencies
Co-Channel	Co-channel interference (CCI) is crosstalk from two different radio transmitters using the same frequency.
Adjacent channel	Adjacent-channel interference (ACI) is interference caused by leakage of a signal in an adjacent channel.
Conventional Radio System	A Conventional Radio System is the most basic radio communications system**.** Conventional radios operate on fixed channels. Each user group is permanently assigned a fixed frequency or a set of frequencies.
CLMRN	Connecticut land Mobile Radio Network (formally the CTS)
DAQ	Delivered Audio Quality: The standard that defines wireless system performance, TSB-88.3-D Wireless Communications Systems — *Performance in Noise- and Interference-Limited Situations*, suggests that public safety mission-critical radio systems be designed to provide a DAQ level of 3.4

	DAQ Levels Defined DAQ 1: Unusable. Speech present but not understandable. DAQ 2: Speech understandable with considerable effort. Requires frequent repetition due to noise or distortion. DAQ 3: Speech understandable with slight effort. Requires occasional repetition due to noise or distortion. DAQ 3.4: Speech understandable without repetition. Some noise or distortion present. DAQ 4: Speech easily understandable. Little noise or distortion. DAQ 4.5: Speech easily understandable. Rare noise or distortion. DAQ 5: Perfect. No distortion or noise discernible
Digital Mode	Digital voice modes encode speech into a data stream before transmitting it. Digital Mode is an APCO P25 standard
Disaster Recovery Plan	A disaster recovery plan (DRP) is a documented process or set of procedures to recover and protect Continuity of Operations in the event of a natural or man-made disaster.
DMR	Digital Mobile Radio (industrial)
End of Life (EOL)	End of Life (EOL), in the context of manufacturing and product lifecycles, is the final stages of a product's existence.
FCC	Federal Communications Commission (FCC) is a board charged with regulating broadcasting and interstate communication by wire, radio, and television. This includes public safety radio communications frequencies.

FNE	Fixed Network Equipment refers to support infrastructure used within a communications system
Infrastructure	Network infrastructure is the hardware and software resources of an entire network that enable network connectivity, communication, operations and management of an enterprise network.
IFC- 510	The International Fire Code IFC 510, specifies that "All new buildings shall have approved radio coverage for emergency responders within the building based upon the existing coverage levels of the public safety communication systems of the jurisdiction at the exterior of the building". By adopting this requirement, public safety agency first responders will have more effective and reliable in-building radio communications.
Life Cycle	Lifecycle Management includes multiple on going hardware and software upgrades, and professional services to address technology refresh cycles, security, information assurance and ongoing reliability and sustainability for a P25 system. The result of planning out technology needs in conjunction with funding cycles and expansion plans is a predictable and low-risk sustainment plan of a P25 system.
National Response Framework	The National Response Framework (NRF) is a guide to how the nation responds to all types of disasters and emergencies. It is built on scalable, flexible, and adaptable concepts identified in the National Incident Management System to align key roles and responsibilities.
NFPA	Nation Fire Protection Association
NFPA-1221	The Nation Fire Protection Association standard for the installation, maintenance, and use of emergency services communications systems
PSAP	Public safety Answering Point (PSAP) An E911 system answering point

Repeater	A radio repeater is a combination of a radio receiver and a radio transmitter that receives a weak or low-level signal and retransmits it at a higher level or higher power, so that the signal can cover longer distances without degradation.
Remote receiver	A receiver installed on an off premises location to help augment radio subscriber talk in to a dispatch or repeater system
RX	Receive
Simulcast System	Simulcast is a technique used to provide wide area coverage from a radio system to subscriber radios**.** In a simulcast system, the same radio signal is transmitted by two or more transmitters on the same frequency from different locations. Signal strength is additive in a simulcast system.
Subscriber Units	Mobile and portable radios used in conduction with a radio system
Talk Group	A Talk Group is a generic term that refers to virtual radio channels created for/by a Trunked Radio Systems (TRS).
TRS	Trunked Radio System
Trunked (Trunking) Radio System	A trunked radio system is an IP based packet switched multiuser communications system. Communication channels are pooled and dynamically assigned during a conversation.
TX	Transmit
TX/RX	Transmit and receive
UHF Band	Ultra-High Frequency Band (UHF) Usually used to designate 450-470 MHz radio frequencies

VHF Band	Very-High Frequency Band (VHF) Usually used to designate 150-170 MHz radio frequencies
UPS	Uninterruptable Power Supply (UPS) is a type of power supply that uses battery backup to maintain power during unexpected power outages.