



COVERAGE PHASES FOR FIRSTNET IMPLEMENTATION

April 6, 2017



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Acknowledgements

The Wisconsin Public Safety Broadband Project team would like to thank the hundreds of volunteers throughout the state that provided their time, expertise and information to support this project. Every county in the entire state, the Wisconsin State Patrol and the cities of Milwaukee and Madison contributed to the success of the project. In total, these contributions represent thousands of volunteer hours.

Introduction

This Document

This document serves as a guide for accompanying Geographical Information System (GIS) data. It provides a summary of Wisconsin's buildout phases submitted for FirstNet state planning purposes. It also provides a summary of network requirements as determined through an extensive and inclusive data collection process. This report documents Wisconsin's final coverage needs for FirstNet state planning purposes as of December 16, 2016, and serves as an update to the report dated September 30, 2016.

This document reflects Wisconsin's final coverage requirements from FirstNet. The following files are included with this document:

Table 1: Accompanying Files

File	Purpose
Phase1_161216.shp	Required FirstNet buildout, year 1
Phase12_161216.shp	Required FirstNet buildout, year 2
Phase123_161216.shp	Required FirstNet buildout, year 3
Phase1234_161216.shp	Required FirstNet buildout, year 4
Phase12345_161216.shp	Required FirstNet buildout, year 5
CAD_161216.shp	Incident data collected from stakeholder counties
HalfMiGridswithCAD_161216.shp	Incident data divided into half-mile grids
WIPhasedBuildoutStats_161209.xlsx	Detailed buildout statistics

About the Project

The U.S. Tax Relief and Job Creation Act of 2012 created the First Responder Network Authority ("FirstNet"), an independent authority within the National Telecommunications and Information Agency (NTIA) charged with building a nationwide high-speed broadband cellular data network exclusively for public safety.

The Wisconsin Public Safety Broadband (WiPSB) project represents the state's efforts to prepare for the implementation of FirstNet in the state. This project includes collecting user requirements, performing user population modeling and analysis, reviewing the state's public safety communications governance structure, and performing stakeholder outreach.

This project is housed under the Wisconsin Department of Justice, Crime Information Bureau, Interoperability Unit. It is funded by the U.S. NTIA State and Local Implementation Grant Program (SLIGP).

The objective of this project is to ensure successful implementation of the Nationwide Public Safety Broadband Network (NPSBN) in the state of Wisconsin based on a comprehensive statement of stakeholder requirements.

Interactive Content

An interactive version of the map included in this report is available on the WIPSB website at <https://wipsb.wisconsin.gov/interactivemap>. The interactive map allows readers to see detailed vectors of the maps included in this report without the use of specialized mapping software.



Figure 1: Online Map Viewer



Coverage Priorities

Buildout Phases

These buildout phases represent Wisconsin's requirement for geographic coverage by the NPSBN during each phase of buildout. These phases are designed to align with FirstNet's request for proposal (RFP),¹ which divides implementation of the network roughly into 1-year phases with substantial rural buildout milestones.² These phases are divided into roughly 20% of the geography of the state in each phase. The program targets the largest percentage of incidents within the earliest phases of buildout, and progressively provides more comprehensive coverage in later phases as the network is built out.

The sections below provide an overview of the final data set, background on how the data was collected and rendered, information about participation from county and local government, and finally a brief description of each coverage phase.

Table 2: Area and Population Covered by Phase

Phase		Phase Area (sq. m)	% of Total Area	Phase Population	% of total pop	% of Incidents
Cumulative	1	12,542.41	22.36%	4,039,062.93	71.02%	81.68%
	1-2	22,641.11	40.36%	4,967,802.18	87.35%	93.44%
	1-2-3	35,620.56	63.50%	5,119,719.67	90.03%	94.27%
	1-2-3-4	41,506.08	73.99%	5,323,428.75	93.61%	96.22%
	1-2-3-4-5	54,330.40	96.85%	5,686,986.00	100.00%	99.26%
Individual	1	12,542.41	22.36%	4,039,062.93	71.02%	81.68%
	2	10,098.70	18.00%	928,739.25	16.33%	11.76%
	3	12,979.45	23.14%	151,917.49	2.67%	0.83%
	4	5,885.53	10.49%	203,709.08	3.58%	1.95%
	5	12,824.31	22.86%	363,557.25	6.39%	3.04%

Coverage Reviews

Interactive Coverage Review meetings were scheduled with every county and each major city, allowing first responders to provide first-hand information about coverage requirements and shortcomings within their jurisdictions. This process provided participants the opportunity to engage actively in the identification and mapping of "critical service areas" (areas with intensive public safety need), and "extended service areas" (areas with coverage needs that currently have insufficient or nonexistent coverage or other service issues).

¹ <https://www.fbo.gov/index?id=33106ecc75222458a6e4405b0f66bd2e>

² Note: FirstNet's RFP has six phases, labeled IOC (Initial Operating Capability) 1-6 that cover five years. FirstNet phase 1 and 2 are six months long. Accordingly, Wisconsin's Phase 1 is equivalent to FirstNet's IOC1 and 2, Phase 2 is equivalent to IOC 3, and so on.



Methodology

Each Coverage Review consisted of the following tasks:

1. **Initial Contact:** Regional Interoperability Coordinators (RICs) scheduled the meetings with city and county points-of-contact (POCs), providing background information about the purpose of the Coverage Reviews. This was followed by a formal meeting invitation.
2. **CAD Data Processing:** To provide an objective justification for the prioritized areas identified in the Coverage Review meeting, the Project Team asked each Public Safety Answering Point (PSAP) to provide three years of computer-aided dispatch (CAD) incident data. This data is normalized on a per-county basis so that incident density is relative to only the county providing the data. This ensures that incidents in large counties are not prioritized over incidents in less-populous counties.
3. **Coverage Review Meeting:** The Project Team conducted interactive meetings with city and county POCs in order to identify the critical service areas and extended service areas within their jurisdictions. During each meeting, the group collaboratively generated a map in GIS format depicting these prioritized areas.
4. **Data Verification:** Following the meetings, the team provided the maps to the cities and counties to review for accuracy.

Collected Data

The following maps display the data collected, including the critical service areas, extended service areas, and the CAD incident data.

Critical and Extended Service Areas

Critical service areas are indicated in red while extended service areas are indicated in blue. **Critical service areas** are those areas of most importance to the participating agency where highly-reliable service is required. These areas include populated areas, critical infrastructure sites and other areas the stakeholder designates as critical. **Extended service areas** are areas where the participating agency

reports service issues today, whether through poor commercial carrier coverage or, in some cases, frequent congestion.

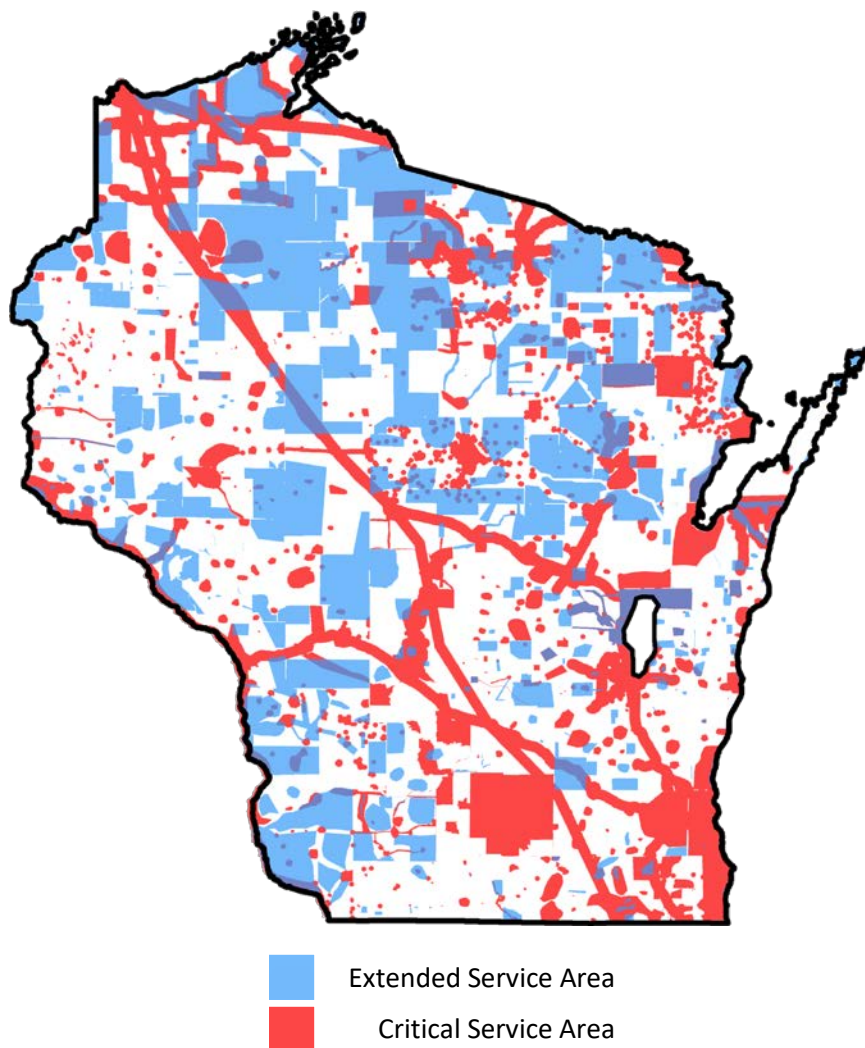


Figure 2: Critical and Extended Service Areas



CAD Data

The figure below illustrates final CAD incident records collected through December 15, 2016. CAD incident data was collected from 33 counties and the Wisconsin State Patrol. 11 counties were unable to provide CAD data and 28 declined to provide the data. In all, 2,316,409 incidents were used for this analysis. CAD data is rendered in ½ square mile bins. Because the data includes Wisconsin State Patrol incidents, the map below depicts incidents in every county in the state, even in counties that did not provide CAD data.

This data was used as a guide during Coverage Reviews as well as a key metric in evaluating coverage phases. For example, while the first phase covers only 22.36% of the geographic area of the state, it includes 81.68% of CAD incident record points statewide.

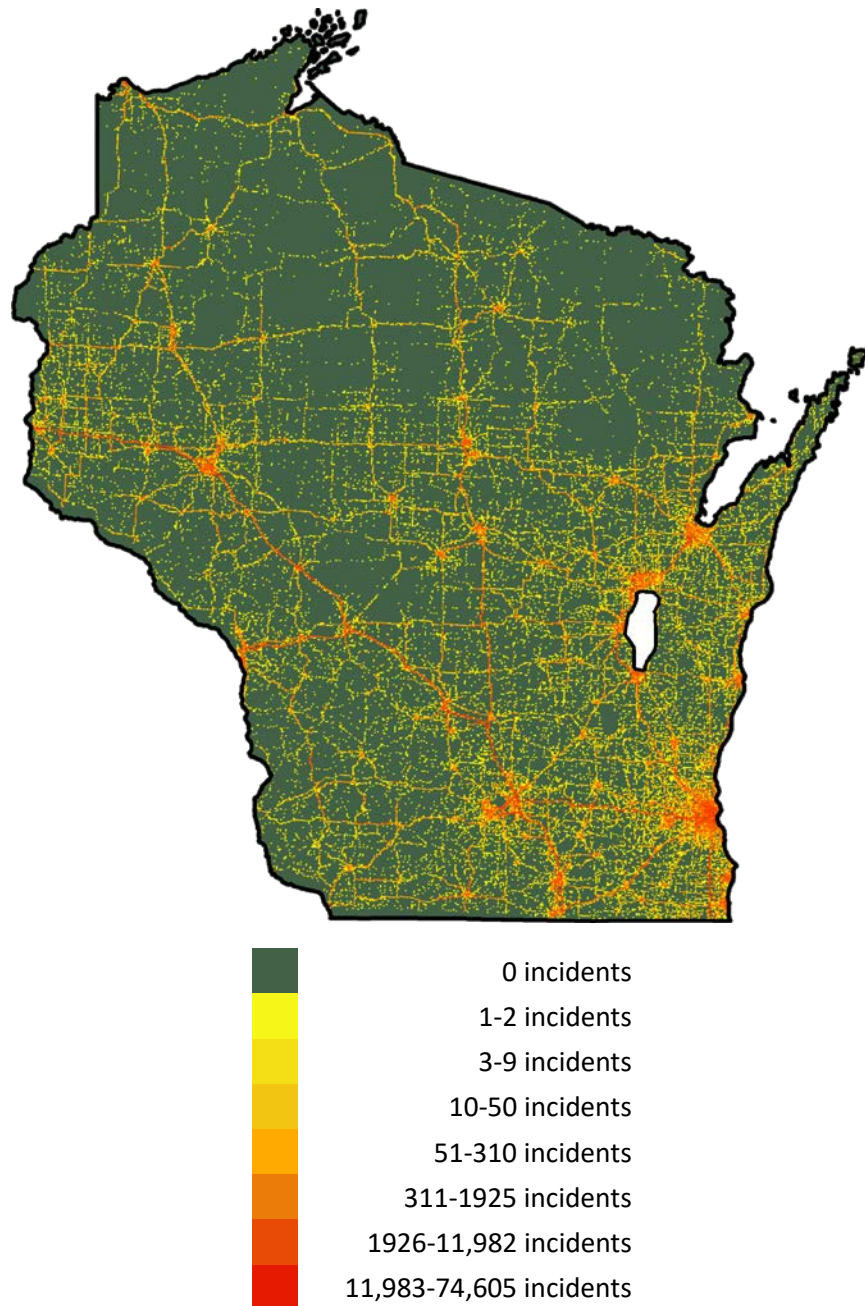




Figure 3: CAD Incident Data per ½ Square Mile

Participation

The following table provides each county's contribution to this dataset, including the number of people in attendance at each Coverage Review and whether the county provided CAD data. Note that in some cases, not all PSAPs within a county were able to provide CAD data. These counties are marked as "partial."

Table 3: County and City Participation

County or City	Coverage Review Attendees	CAD Data Provided
Adams	2	Provided
Ashland	1	Not Provided
Barron	1	Provided
Bayfield	3	Not Provided
Brown	5	Provided
Buffalo	2	Provided
Burnett	2	Not Provided
Calumet	1	Provided
Chippewa	2	Not Able to Provide
Clark	2	Not Provided
Columbia	1	Provided
Crawford	1	Not Provided
Dane	7	Provided
Dodge	3	Partial
Door	2	Provided
Douglas	2	Provided
Dunn	1	Provided
Eau Claire	1	Provided
Florence	2	Not Able to Provide
Fond du Lac	15	Not Provided
Forest	2	Not Able to Provide
Grant	3	Not Provided
Green	1	Not Provided
Green Lake	3	Provided
Iowa	3	Not Provided
Iron	1	Not Provided
Jackson	2	Not Provided
Jefferson	1	Provided
Juneau	4	Provided
Kenosha	1	Provided
Kewaunee	3	Not Provided
La Crosse	1	Not Provided
Lafayette	1	Not Able to Provide



Wisconsin Public Safety Broadband Project Coverage Phases for FirstNet Implementation



Langlade	1	Not Provided
Lincoln	1	Not Provided
Manitowoc	7	Provided
Marathon	12	Provided
Marinette	4	Not Provided
Marquette	3	Not Provided
Menominee	2	Not Provided
Milwaukee	21	Provided
Monroe	2	Not Provided
Oconto	1	Not Provided
Oneida	2	Not Provided
Outagamie	4	Not Provided
Ozaukee	1	Not Provided
Pepin	1	Not Provided
Pierce	1	Not Provided
Polk	1	Provided
Portage	6	Provided
Price	4	Not Provided
Racine	2	Not Provided
Richland	1	Not Provided
Rock	2	Provided
Rusk	1	Not Provided
Sauk	4	Not Provided
Sawyer	1	Provided
Shawano	3	Not Provided
Sheboygan	5	Not Provided
St. Croix	4	Provided
Taylor	2	Provided
Trempealeau	1	Provided
Vernon	2	Provided
Vilas	1	Not Provided
Walworth	1	Provided
Washburn	1	Provided
Washington	1	Partial
Waukesha	5	Partial
Waupaca	2	Provided
Waushara	2	Provided
Winnebago	2	Provided
Wood	2	Not Provided

Phase 1

Phase 1 includes **interstates and FirstNet-designated “urban areas.”** This phase will provide a robust early backbone for buildout of future phases. The phase covers the majority of the state’s population, 22% of the area of the state, and most of the incidents collected for this study.



Figure 4: WiPSB Buildout Phase 1

Phase		Phase Area (sq. m)	% of Total Area	Phase Population	% of total pop	% of Incidents
Cumulative	1	12,542.41	22.36%	4,039,062.93	71.02%	81.68%
Individual	1	12,542.41	22.36%	4,039,062.93	71.02%	81.68%

Phase 2

Phase 2 includes county-specified critical service areas (CSAs) and major oil transportation routes (both by rail and pipeline). In cases where a county specified more than one half of that county's total area, the CSA was reduced to critical points of interest (e.g., power generation or distribution facilities and government buildings) and densely populated areas (census tracts of greater than 40 people per square mile). This phase includes about 40% of the land area of the state and covers about 90% of incidents and population in the state.

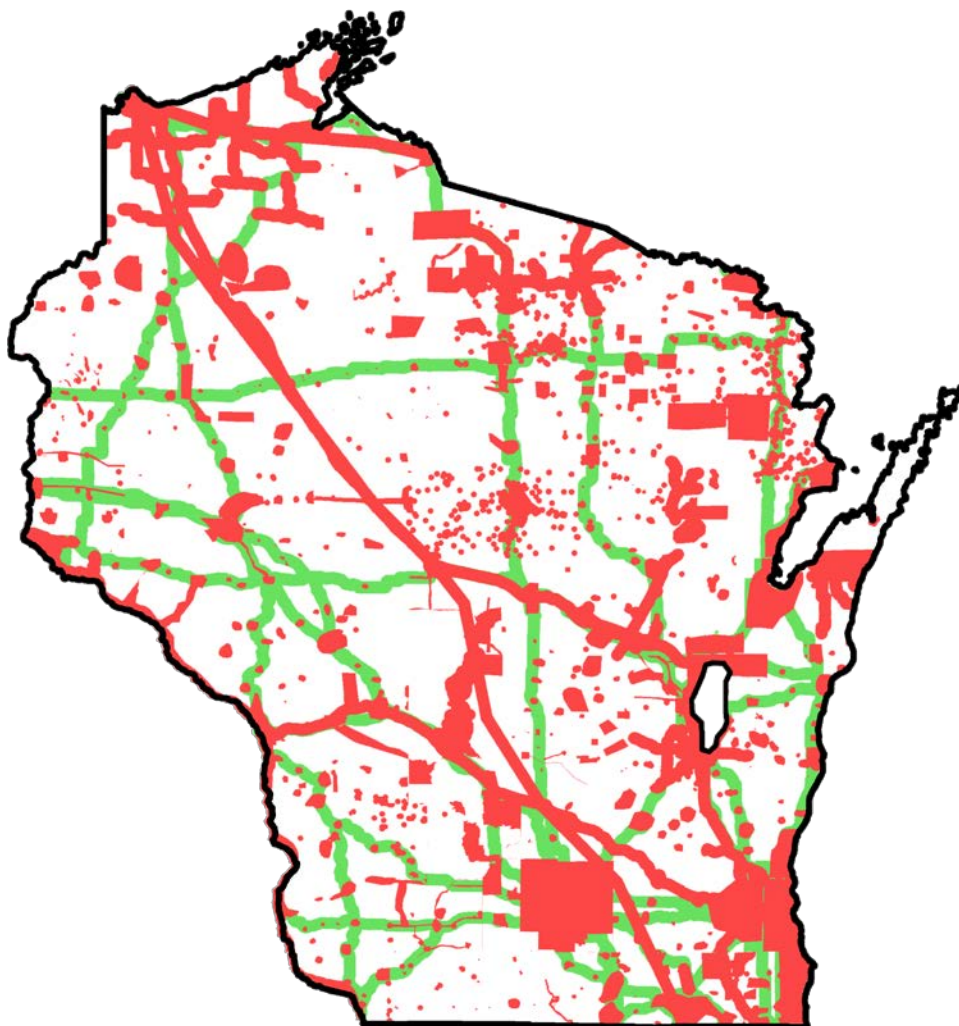


Figure 5: WiPSB Buildout Phase 2

Phase		Phase Area (sq. m)	% of Total Area	Phase Population	% of total pop	% of Incidents
Cumulative	1-2	22,641.11	40.36%	4,967,802.18	87.35%	93.44%
Individual	2	10,098.70	18.00%	928,739.25	16.33%	11.76%

Phase 3

Phase 3 includes county-specified extended service areas (ESAs). It includes 63% of the land area of the state and nearly all incidents and population.

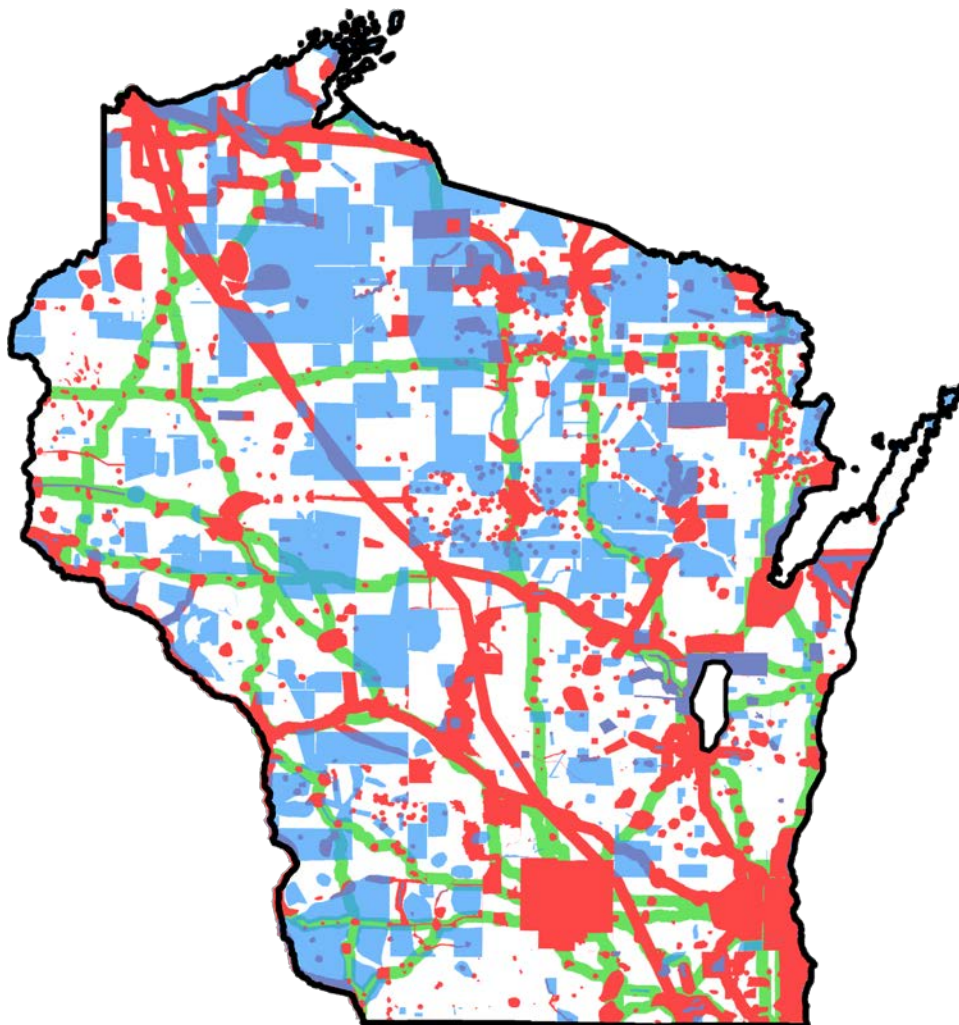


Figure 6: WiPSB Buildout Phase 3

Phase		Phase Area (sq. m)	% of Total Area	Phase Population	% of total pop	% of Incidents
Cumulative	1-2-3	35,620.56	63.50%	5,119,719.67	90.03%	94.27%
Individual	3	12,979.45	23.14%	151,917.49	2.67%	0.83%

Phase 4

Phase 4 includes remaining seasonal and tourist areas not otherwise specified as CSAs or ESAs. The seasonal and tourist area data was submitted to FirstNet on September 30, 2015.

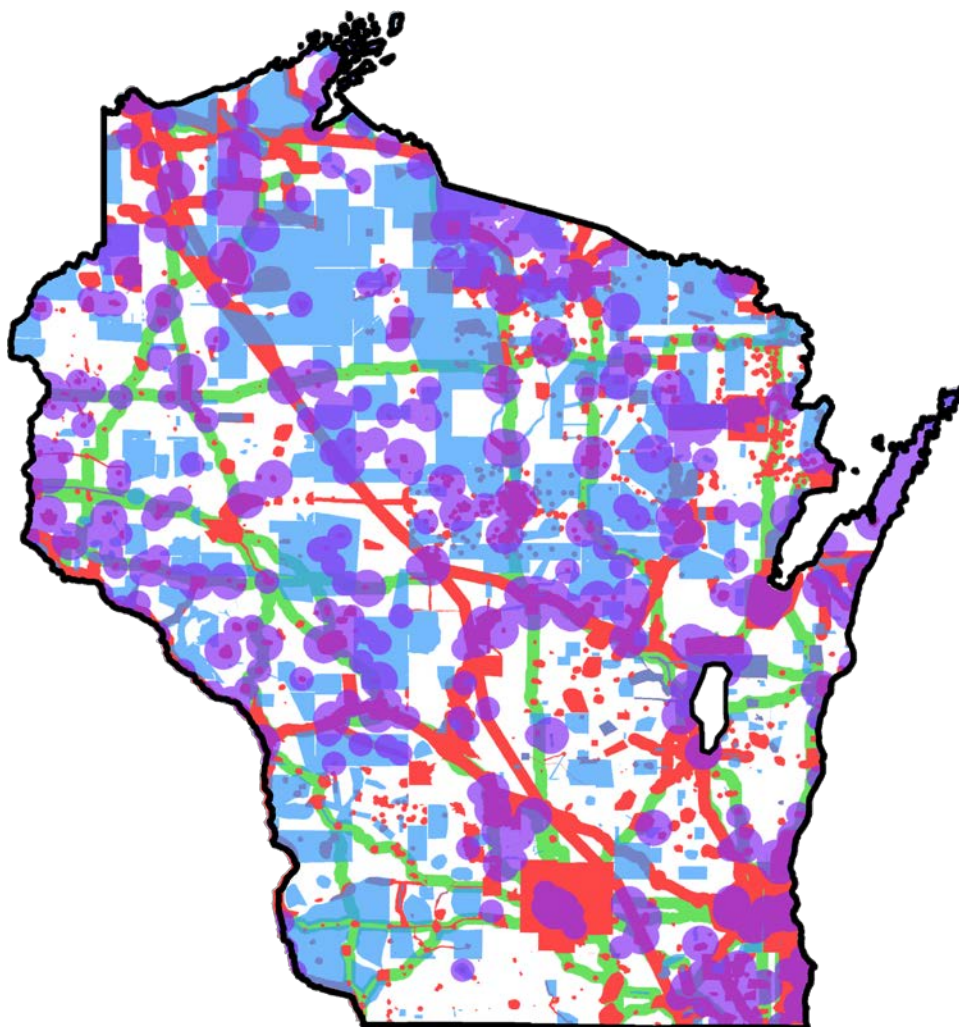


Figure 7: WiPSB Buildout Phase 4

Phase		Phase Area (sq. m)	% of Total Area	Phase Population	% of total pop	% of Incidents
Cumulative	1-2-3-4	41,506.08	73.99%	5,323,428.75	93.61%	96.22%
Individual	4	5,885.53	10.49%	203,709.08	3.58%	1.95%



Phase 5

Phase 5 includes all remaining inhabited areas of the state by census block.

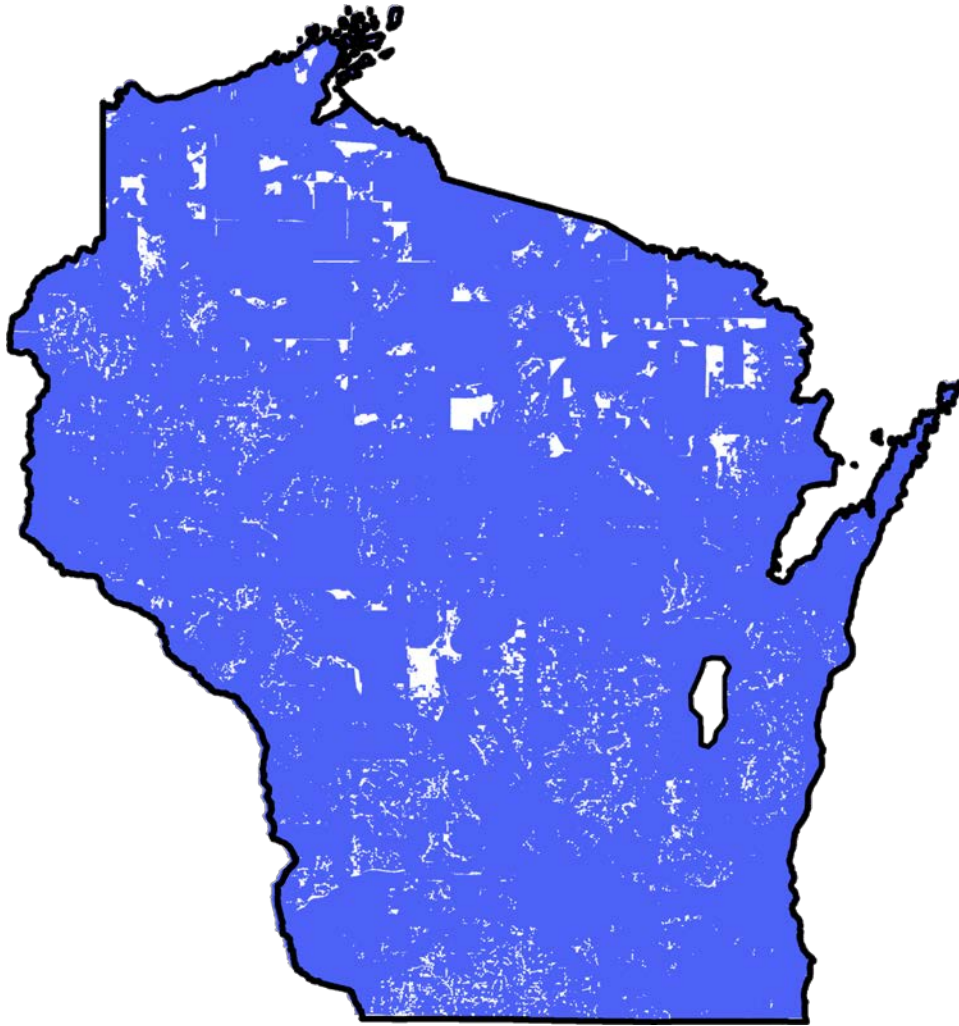


Figure 8: WiPSB Buildout Phase 5

Phase		Phase Area (sq. m)	% of Total Area	Phase Population	% of total pop	% of Incidents
Cumulative	1-2-3-4-5	54,330.40	96.85%	5,686,986.00	100.00%	99.26%
Individual	5	12,824.31	22.86%	363,557.25	6.39%	3.04%



Conclusion

The phased coverage requirements included with this report are most representative of Wisconsin users' requirements for implementation of the NPSBN over a five-year period. In developing these deployment phases, the project team considered multiple factors including population density, seasonal housing, and subjective expert opinion collected from individual interviews with every county in the state.

The state anticipates receiving FirstNet's state plan in Q3 of 2017.