STATEWIDE EMERGENCY COMMUNICATIONS BOARD

INTEROPERABLE DATA COMMITTEE

September 20, 2016 - 10:00 a.m.
Chair: Mike Risvold
MnDOT Arden Hills Training Facility
1900 West County Road I
Shoreview, MN 55126

Call in Number: 1-888-742-5095
Call in code: 2786437892#

AGENDA

Call to Order

Approval of Agenda

Approval of the Previous Meeting's Minutes

- June (no quorum at August meeting)
- August

Action Items

- Overview of the State Plan Review Process (Televate)
- State Plan Review Stakeholder Letter (Televate)

Discussion Items

- GIS CAD Review (Televate)
- Collaboration Site (Melinda Miller)

Other Business
Announcements

Adjourn

STATEWIDE EMERGENCY COMMUNICATIONS BOARD
INTEROPERABLE DATA COMMITTEE

Chair: Mike Risvold
August 16, 2016

ATTENDANCE

Jackie Mines	Dept. of Public Safety	Melinda Miller
Jim Johnson	MN IT Services	Ullas Kamath
Jim Mohn/Tim Lee	Dept. of Transportation	
Dean Weis	Dept. of Corrections	Steve Ouradnik
Thomas Humphrey	Metropolitan Council	Vince Pellegrin
Brian Askin	Dept. of Natural Resources	vacant
Steve Bluml	Minnesota State Patrol	Tim Boyer
John Hyde	Minnesota Sheriffs' Association	vacant
Michael Risvold, CHAIR	Minnesota Police Chiefs' Association	vacant
Wayne Kewitsch	Minnesota Fire Chiefs' Association	Al Fjerstad
Mary Borst	Minnesota Ambulance Association	vacant
Vacant	League of Minnesota Cities	vacant
Mike Wisnieski	HSEM Region 4	vacant
Dave Deal, Vice Chair	Association of Minnesota Counties	Nate Timm
Vacant	Minnesota Indian Affairs Council	vacant
Jake Thompson	Metropolitan Emergency Services Board	Rod Olson
Kristen Lahr	Central Emergency Services Board	Brandon Larson
Brian Zastoupil	Northwest Emergency Communications Board	Beryl Wernberg
Ken Yurrick	Northeast Emergency Communications Board	Mark Stanberry
Brad Milbrath	South Central Emergency Communications Board	Andy Buckmeier
Rick Freshwater	Southeast Emergency Communications Board	Dave Pike
Stacy Tufto	Southwest Emergency Communications Board	Vacant

ALSO ATTENDING

Rick Juth, ECN
Carol-Linnea Salmon, ECN
Mark Navolio, Televate
Chad Steffan, Lower Sioux
Joe Reichstad, Metro Transit
Dave Sissor

CALL TO ORDER

Chair Risvold calls the meeting to order at 10:05 with no quorum.

DISCUSSION ITEMS

STATE PLAN REVIEW

Melinda Miller introduces the state plan review. The state plans will be coming from FirstNet sometime next year and it is important to be prepared to review our state plan and know how we can influence the build out. In reviewing the state plan template in the RFP, it looks like the area where we have the ability to make changes is in Section Four, which is the build out of the state radio access network plan. Included in the meeting materials is a spreadsheet with 37 requirements that are specific to Minnesota. Miller added comments on the spreadsheet about where the requirements are located in the RFP. Some items that are implied in Section Four but reside in other sections.

Miller notes that it has been about a year since the committee looked at this. She asks if people will look at the questions on the spreadsheet and send her responses along with any other comments. She adds that the committee will need to determine what the scope will be and how the items will be quantified. Mark Navolio from Televate will help the committee to numerically define some of these things. Some of it has to do with coverage and what the quality of the service is, what the uplink and down link are from the edge of the cell, etc. Some of it has to do with coverage and whether it happens on non-band 14 or on band 14. Minnesota put out some requirements about what kind of reporting the state wants. Miller would like to go through some of that to get a feel for the concerns that were around these requirements and if they still exist or if some of them were answered when the RFP was put out. She asks what some of the concerns surrounding reporting were and how FirstNet would let Minnesota know about quality of service. FirstNet refers to a quality assurance surveillance plan in the RFP.

Mark Navolio says the state plan can be divided into two parts. The opt-out scenario only has to deal with the Radio Access Network (RAN) which means the bay stations and backhaul to the EPC, the core network. That's where the state can affect the most change because if Minnesota opts out that is all that the state has control over. In 2015, Minnesota published a series of requirements that are pretty much end-to-end, from the core network to the RAN. Many of the launch requirements, in the document that came out of the workgroup, deal with a lot of the issues that come out of the core network, such as security, support for applications, and functionality of devices—things that are not part of the scope of an opt-out scenario. There are items in the state plan that we can provide advice to but FirstNet is under no obligation to follow. FirstNet is responsible for that part of the network and for the core and will be bringing devices to market. That is FirstNet's purview. Our purview is the RAN network and it is there that we are going to need feedback from this committee and the workgroup. The committee has developed coverage requirements and laid out five phases and a strategy for coverage. We termed it the bookends approach—simultaneous deployments in both rural areas as well as the heavily populated dense urban areas. On top of that, we added an objective of 95% coverage on a county-by-county basis. Those requirements are quantifiable. We have incident data, road count data, accident data on the rail lines, CAD data. We can use this data to judge

the sufficiency of the coverage from a statistical basis. We have a lot of tangible, statistical points that we can build into our analysis of the state plan. Most of the things I'm referring to are in Section 4 of the state plan. There are six other sections that FirstNet will provide for us. We would like to set up the criteria for evaluating the state plan. To do that, we want to leverage the same structure that we put together last time to generate our five-phased strategic build out. Last time we tapped the members of the IDC and we also made a request to the technical committees in each of the regions to offer up volunteers to set up those criteria. Our question to the committee today is do you think that is a good forum for setting up the evaluation criteria for FirstNet's state plans or not? Or do you think it should be the sole purview of the IDC or some other organization?

Miller says she thinks it is a good idea to include the IDC members and the people that were involved initially. She asked the RICs to let her know if there is anyone who was on the initial work group who does not want to be a part of it now and also if there are new people that would like to be added. She would like to hear the feedback from committee members if they think this is a good process.

Chair Risvold clarifies that Miller is suggesting to reconvening the original work groups.

Navolio says the first task we are going to take upon ourselves is to focus on the scope of our evaluation. The state plan is going to be a massive document. Our first step will be to look at the state plan document or at least the outline that FirstNet provided in the RFP and evaluate our priorities. The second step will be to evaluate how we will pass or disapprove each component of the state plan. For example, coverage—we might say coverage is a colored map but we also require more tangible information. We may want, for example, a prediction of the RSSI which will allow us to infer an availability of the network. We don't just want to see the extent of coverage but we want to see how much coverage is everywhere.

Wayne Kewitsch says that is an excellent idea. He can't imagine moving forward without knowing to a relatively high degree of certainty what the coverage will be.

Dave Deal says we also need details on the backhaul capacity.

Miller asks if we want to evaluate the backhaul separately from coverage.

Navolio says it is part of the RAN. We can include it and set parameters such as Deal has suggested. It affects the availability of the network as a whole.

Navolio says Receive Signal Strength Level (RSSI) is a very crude way of accessing service level for LTE. It's better to look at the quality of the received signal strength which takes into account the amount of noise in the environment. A lot of that depends up on the base assumptions of FirstNet. These prediction tools have to emulate traffic. We have given FirstNet a baseline of traffic and have shown them where the users are based on our CAD data. When FirstNet import that into their planning tool, they will be able to give us a lot more details. Not just the signal strength of the bay station. FirstNet will also be able to report how much noise is generated in the environment and how much those cell to trunk based on the traffic map we've provided.

Mike Wisnieski asks if there has been any consideration about the leaf-on and leaf-off which has a dramatic effect on the signal strength in a lot of the rural areas, especially in northern Minnesota. There are some areas that are completely dead in the summer.

Navolio says we have taken your CAD data and generated a user density map based on the worst case scenario in your county. We ask you when we publish those maps next month that you take a very close look to ensure that those populated areas that are very seasonal in nature are highlighted in red because that will affect the elasticity of the sight. The closer we put the sights to those areas of usage the better coverage we will get overall.

Navolio adds that that is one of the items we identified in the launch requirements. We were requesting a full-length budget. There were assumptions that were made from the enode B all the way up to the antennae and back down to the device that enter into whether it is a viable link. There are stade margins as well as losses for cables. All of that feeds into the ability of the network to provide that connectivity to that point.

Miller says as far as the link budget is concerned and the specifications, they don't have a lot in here about what is required. We probably need to quantify what is an acceptable level and is it worth opting out for.

Navolio says FirstNet might make a series of assumptions that might be detrimental to our ability to subscribe to the service in rural areas and one of the examples that has been floating is an idea that they would leverage on enode B in the trunk for some of the more rural agencies in order to provide localized service for surrounding agencies. There is obviously a cost factor and an operations maintenance cost factor there as well so all of that we need to set up as a point of evaluation prior to us receiving the state plan so we can be prepared to comment on it once we receive it.

Miller assumes that everyone on the IDC would like to be a part of this workgroup and please let her know if you do not. She is going to send an email to the people that were on the work group before and will include the spreadsheet that was in the meeting materials with a request for feedback. She will ask if they would like to continue and, if not, if they can suggest a replacement. She will send out to everybody who is a part of the evaluation working group Section Four where it talks about the different parameters where we might have influence and some of the questions that we had in our requirements and things we need to be thinking about.

Chair Risvold notes that a lot of the original members are subject matter experts and are important to the process.

At the next meeting, Navolio will give a presentation on the results of the CAD analysis.

ANNOUNCEMENTS

Chair Risvold welcomes Chad Steffan, from the Lower Sioux, who has joined the committee.

Miller says that she has discipline-defined presentation packets that include a small PowerPoint and some FirstNet handouts. These are available to anyone who would like to give a presentation about FirstNet. There is one for Fire, one for EMS, one for Law.

Meeting adjourns at 10:29 a.m.

STATEWIDE EMERGENCY COMMUNICATIONS BOARD
INTEROPERABLE DATA COMMITTEE

Chair: Mike Risvold
June 21, 2016

ATTENDANCE

Jackie Mines	Dept. of Public Safety	Melinda Miller
Jim Johnson	MN IT Services	Ullas Kamath
Jim Mohn/Tim Lee	Dept. of Transportation	
Victor Wanchena	Dept. of Corrections	Steve Ouradnik
Thomas Humphrey	Metropolitan Council	Vince Pellegrin
Brian Askin	Dept. of Natural Resources	vacant
Steve Bluml	Minnesota State Patrol	Tim Boyer
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Michael Risvold, CHAIR	Minnesota Police Chiefs' Association	vacant
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Bruce Hegrenes	Northeast Emergency Communications Board	Monte Fronk
Brad Milbrath	South Central Emergency Communications Board	Andy Buckmeier
Rick Freshwater	Southeast Emergency Communications Board	Dave Pike
Stacy Tufto	Southwest Emergency Communications Board	Vacant

ALSO ATTENDING

Rick Juth, ECN
Carol-Linnea Salmon, ECN
Tom Berent, Ancom Communications

CALL TO ORDER

Chair Risvold calls the meeting to order at 10:01 a.m.

APPROVAL OF THE AGENDA

Victor Wanchena makes a motion to approve the agenda.
Mike Wisnieski seconds the motion.

Melinda Miller requests to remove the CAD Summary Presentation from the agenda.

Motion carries to approve the agenda as amended.

APPROVAL OF MEETING MINUTES

Brandon Larson makes a motion to approve the previous meeting minutes.
Wanchena seconds the motion.
Motions carries to pass the minutes.

DISCUSSION ITEMS

PSCR REVIEW

Melinda Miller reports on the Public Safety Communications Research Program (PSCR) conference held in San Diego in June. The meeting was less technical than it has been in the past. There was a focus on new innovations that may come when the public safety broadband network is put into place. The main topics were Mission Critical Voice, Cyber Security and Price Challenges. Participants came away with a high level view of what kind of technology to expect in the future.

Dave Deal adds that the majority of his technical questions about FirstNet were not answered but that was understandable because of the timing of FirstNet's RFP. Participants in a security presentation were told that the presenters had been instructed to sidestep anything that might potentially relate to the RFP. The timing of the conference was unfortunate.

Miller notes that Rivada-Mercury and PDV Wireless each announced that they had submitted bids to the RFP. She adds that PDV Wireless is Morgan O'Brien's company. Rivada had a very big presence at PSCR. Rivada has added Governor Jeb Bush and Govenor O'Mally to their boards.

Miller had an interesting conversation with the Director of Development at PSCR. He has been researching existing virtual reality labs and would like to develop one specifically for public safety.

Ten people attended the conference from Minnesota and there was good representation from all areas of the state. Miller expresses appreciation for people's time and participation.

CONSULTATION TASK TEAMS

Members of Minnesota's Consultation Task Team (CTT) are Dave Deal, Kristen Lahr, Rod Olson, Jake Thomson, and Scott Hyde. Aconference call of the Consultation Task Team (CTT) is scheduled for June 30. The team will review questions that have been posted in the Drop Box. On July 12, CTTs from FirstNet's Region 5 will meet in-person in St. Paul. Miller will send the agenda as soon as she receives it.

MEMBERSHIP CHANGES TO THE SECB
INDIAN AFFAIRS AND COMMISSIONER OF HEALTH

Chair Risvold reviews that a few months ago this committee discussed the possibility of adding a position for the Bureau of Indian Affairs to the SECB. The recommendation was sent to the Steering Committee for consideration. The Steering Committee made the recommendation to the board, which approved it. The item will now go back to the Steering Committee for follow-up because requires a legislative change to the SECB By-Laws.

Miller is attending a tribal leadership meeting and reports that there has been a lot of discussion about getting the tribes more involved with technology. She talked to Lonna Hunter who is the tribal liaison for DPS-ECN, from the Office of Justice Programs. Hunter is excited about tribal representation on the SECB. One of the biggest challenges is that there is a need for more people in the tribes who know the technology. It is hard to find people to bring to the table because of lack of knowledge and those who have the technology background are over-committed.

Chair Risvold adds that there is a position on the IDC for tribal representation. It is noted that Monte Fronk is on the committee as an alternate from the Northeast Region. Chair Risvold will ask Fronk if he would be interested in representing the Indian Affairs Council.

Miller and Risvold ask committee members to reach out to any tribal members they know who have radio or data backgrounds to encourage involvement. Chad Steffan of the Lower Sioux Tribe is suggested.

FIRSTNET PRESENTATION AT THE BOARD MEETING

Chair Risvold reports on a presentation that FirstNet gave to the SECB. The presentation was thorough and similar to what committee members have been heard in the past. There were many unanswered questions. The presentation was given on the heels of the RFP closing and FirstNet responded that they will know more when a partner is chosen.

Miller adds that there was good representation from governmental affairs at this presentation and she sees it as a bit of a shift. FirstNet is trying to get in front of the state leadership and anyone who might have influence over the governor's decision. There will be a hearing in the Senate today about FirstNet. Miller has spoken with Senator Klobuchar's office a couple of times. She notes that there are very committed people in Minnesota who want to ensure that Minnesota gets the right solution.

Meeting adjourns at 10:19 a.m.

Subject: FirstNet State Plan Review Process

Dear Stakeholders:

In preparation for the FirstNet State Plan delivery to the State of Minnesota, and the actual evaluation and preparation of recommendations regarding the State Plan, the Department of Public Safety (DPS), Division of Emergency Communication Networks (DECN) is extending this formal invitation to participate in this important program. The State Plan represents the strategy that FirstNet and its commercial partner will undertake to deliver the Nationwide Public Safety Broadband Network (NPSBN). The State Plan is the next critical phase of the Minnesota FirstNet Consultation Project (MnFCP), and it is essential that we execute a comprehensive program to ensure that the State Plan meets and exceeds Minnesota public safety stakeholder requirements. Therefore, it is our objective to recruit experts from throughout the State to support this effort.

The purpose of this letter is to provide you a brief description of the State Plan Review Process, describe the associated activities, provide an overview of the roles and responsibilities of participants, and approximate the time commitment. While this is a voluntary program, we are requesting that participants continue to support the program over the full duration of the effort.

Time Commitment:

Kickoff: Sept 2016

Length – one year

Monthly commitment - 5-10 hours monthly, depending on domain working group. Some months will require no time commitment.

FirstNet State Plan Review Process

Objective: Develop a process to guide the evaluation of the draft State Plan. Use this process to assess the State Plan, determining strengths, gaps, and recommendations to provide to State executive bodies regarding the Plan. These recommendations will ultimately guide the Governor's out-in or opt-out decision.

Approach: Recruit the best and brightest experts from state and local governments, from rural and metro regions, representing public safety, public service, and others to ensure that all respective stakeholder communities are represented. Four working groups will be created based on anticipated key aspects of the State Plan. The four working groups will share the overall State Plan review based on their domain expertise. The domain working groups include the following:

- **Technical:** Includes but is not limited to network design assumptions, Radio Access Network (RAN), backhaul network, Core design, numbering plan, IP strategy, Land Mobile Radio (LMR) network integration and Public Safety Answering Point (PSAP) integration.
- **End Users/Operations:** Includes but is not limited to application management, application security, local control, devices, equipment, feature roadmaps, fleet management, deployables, and procurement vehicles.

- **Policy:** Includes but is not limited to network redundancy, application security, Bring Your Own Device (BYOD) policy, customer care, facility hardening, and cybersecurity.
- **Financial:** Includes but is not limited to State Plan inputs and outcome, coverage objectives, current mobile data usage, subscription plans and cost, and state decision process.

Please consider what domain working group(s) best meet(s) your skills sets and interests. If you know of someone that may have expertise in these areas, please feel welcome to extend the invitation to them.

Process: The State Plan Review Process will be divided into two distinct phases as follows:

- **Phase One:** Develop a process to evaluate the draft State Plan, which is expected to be delivered in May of 2017. The process will be anchored on stakeholder and working group defined requirements as gathered over the course of the Minnesota FirstNet Consultation Project (MnFCP) and as developed by the working groups. Additional insights and information to guide the State Plan review process will be developed during a series of facilitated meeting sessions.
    - **Phase One Timeframe:**
        - October to December 2016 to develop the process
        - January to February 2017 to present the process to the Regional Emergency Communications Boards (RECB)
        - March to April 2017 to present to the State Executive Steering Committee, the Interoperability Committee (IDC), and the Statewide Emergency Communications Board (SECB)
- **Phase Two:** Using the evaluation process developed during the Phase One activities, the working groups will evaluate the draft State Plan per domain working group. The State Plan evaluation will be based on the relevant criteria and approach as defined by the working group. The strength, weaknesses and gaps in the State Plan will be defined, and a recommendation to accept, reject or further negotiate specific elements of the Plan will be recommended by the working groups.
    - **Phase Two Timeframe:**
        - May to June 2017 to evaluate and prepare draft recommendations
        - July 2017 to present recommendations to the Regional Emergency Communications Boards (RECB)
        - August 2017 to present to the State Executive Steering Committee, the Interoperability Data Committee (IDC) and the Statewide Emergency Communications Board (SECB)

Facilitated Workshops: Facilitated meetings will be conducted on a weekly or bi-weekly basis for each domain working group. These WebEx meetings will be scheduled for one hour and will follow a formal syllabus and pre-determined agenda. Preparatory reading materials will be provided at the kickoff and in advance of each session. Working group team members will be requested to prepare for each workshop through their review of the materials prepared for the each meeting.

Primary Resources: The following resources will be provided to the various domain working groups to guide the State Plan Review Process:

- **State of Minnesota defined requirements:** These requirements and information include all relevant requirements captured from statewide stakeholders over the course of the MnFCP. This data desired coverage requirements, network capacity, device types, applications, subscription costs, and other relevant information.
- **The Minnesota NPSTC Launch Requirements:** The IDC and other stakeholders reviewed and refined the original NPSTC (National Public Safety Telecommunications Council) launch requirements delivered to FirstNet representing a minimal list of FirstNet launch objectives.
- **The FirstNet State Plan Template:** FirstNet published the State Plan Template within their RFP to select a commercial partner. This template provide a comprehensive overview and the expected content in the State Plan, and will guide working groups to prepare for the draft State Plan review.
- **The FirstNet Draft State Plan:** The draft State Plan will include the approach for implementing the NPSBN within Minnesota and will contain typical service level agreement (SLA) content including device options, cost of service and a variety of elements that will be evaluated by the domain working groups.

In closing, thank you for your interest in supporting the Minnesota State Plan Review Process. Please let us know if you have further questions, and reply with your preferred domain working group(s) interest. Please forward replies and inquiries to Melinda.Miller@state.mn.us and/or Mark Navolio (mnavolio@televate.com)

Sincerely,

Melinda Miller
State Program Manager, FirstNet
Deputy StateWide Interoperability Coordinator
Emergency Communications Networks
Work: 651-201-7554
Cell: 651-245-2182

Minnesota FirstNet Consultation Project (MnFCP)

TASK 17 – CAD Traffic Analysis For FirstNet Planning

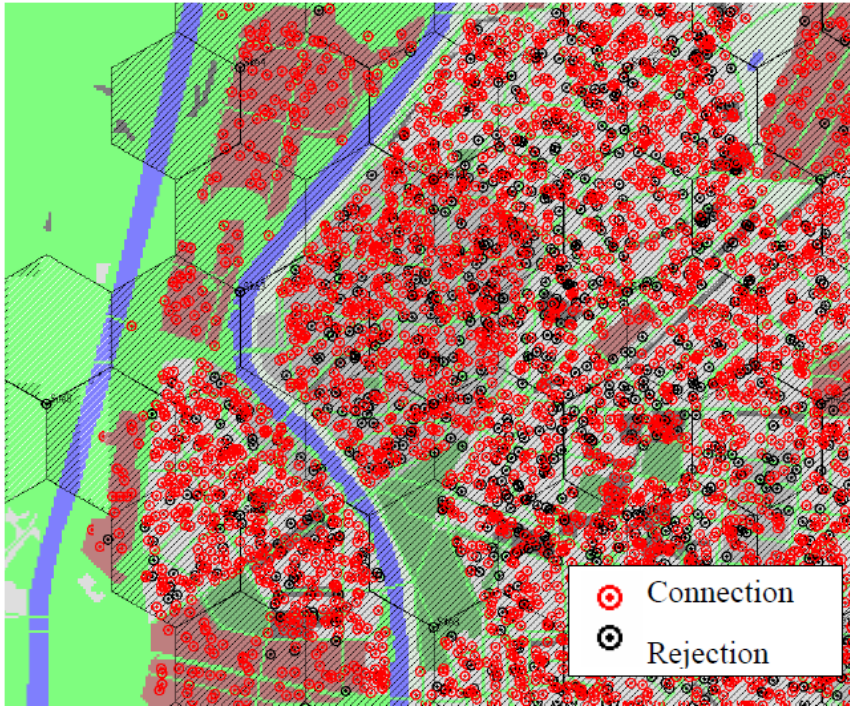
MnFCP Project Team
Emergency Communication Networks,
Minnesota Department of Public Safety

April 11, 2015

PURPOSE OF THE ANALYSIS

Purpose

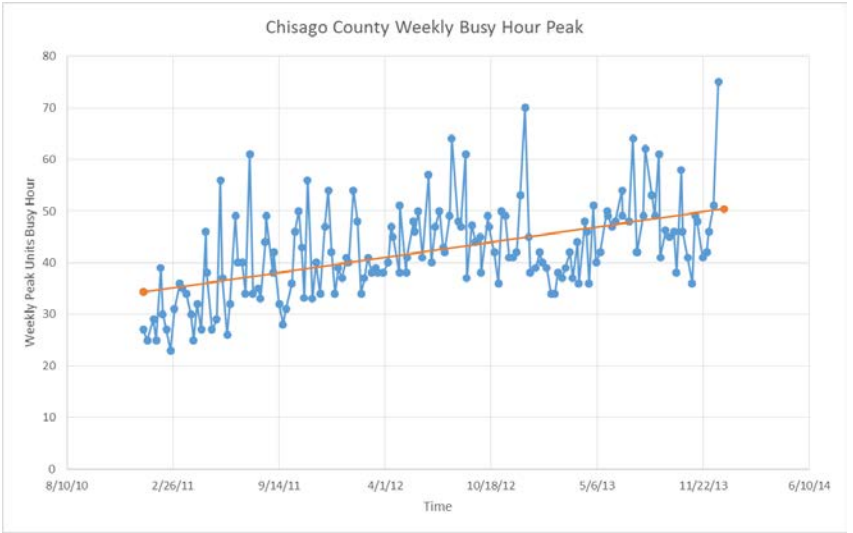
- To properly plan for the state's capacity and coverage needs, FirstNet requires a **user density** baseline; there are two components
  - Number of Busy Hour Users (by discipline)
  - Location



METHODOLOGY

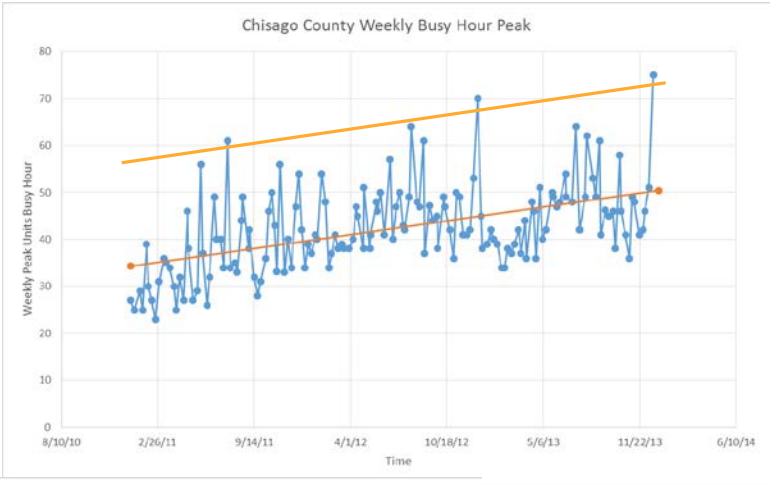
Analysis and Assess the Trend

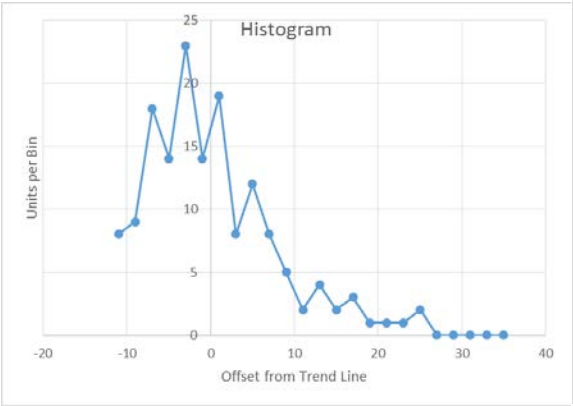
- CAD data is aggregated and normalized
- Each dataset was queried to assess the busy hour per week
- Busy Hour was calculated per discipline
  - Fire
  - Emergency Medical Service
  - Law Enforcement

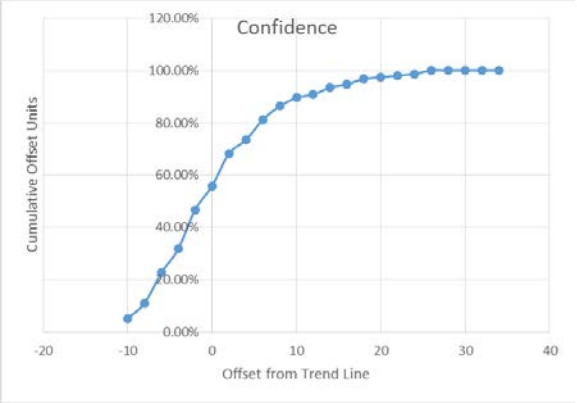


Establish the Busy Hour

- The CAD data is sampled to identify the “Busy Hour”
- Busy Hour Trend calculated on County-by-County basis
  - Projected until 31 December 2016
- Confidence Level = 99.9%





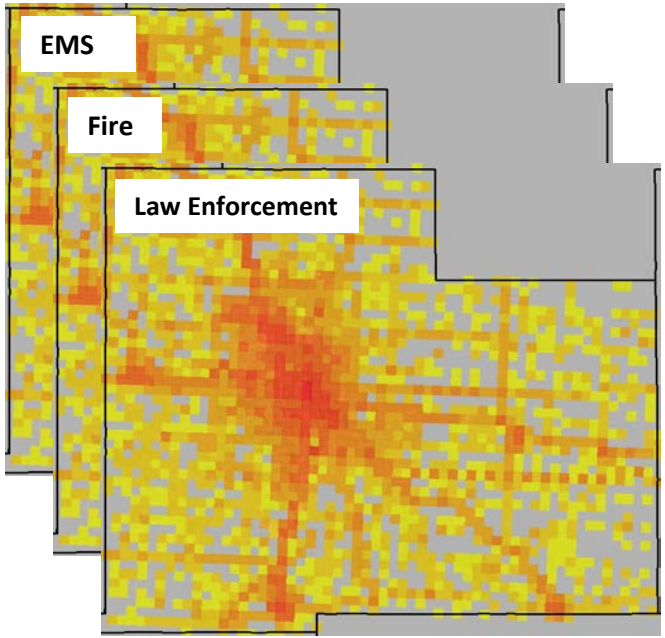


DELIVERABLES

Deliverables

Planning Tool inputs

- User Density Maps per Discipline
  - Law Enforcement, Fire, EMS
- Charts per County
  - Overall trends / County / Discipline



Conclusions

- Provides an accurate baseline for the worst-case (99.9%) incident-based traffic
  - Can be used to assess the sufficiency of FirstNet's State Plan
- A Unique Effort
  - Several localized studies were reviewed to establish the various methods used incident prediction, historical trends analysis is the *standard methodology*
  - **Minnesota is the first entity** to ever adapt this methodology for wireless systems planning
- Lessons Learned
  - There are several inconsistencies in the CAD records between PSAPs
    - Some due to operational and administrative requirements
    - Some appear to be due to system capabilities

State of Minnesota

Task 17: Capacity Analysis of CAD Data
For Minnesota Public Safety Broadband Network

Minnesota and FirstNet Consultation Project (MnFCP)
MN-SWIFT 70680

Mark Navolio, Televate, LLC

September 8, 2016

8229 Boone Blvd
Suite 720
Vienna, VA 22182

M.: 703-639-4200
F.: 703-992-6583
www.televate.com

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Table of Figures

EXECUTIVE SUMMARY

The State of Minnesota has provided substantial inputs to FirstNet as part of the State and Local Implementation Grant Program (SLIGP). In its September 30, 2015 deliverable, the State indicated that it would provide more detailed information on users and usage to FirstNet. The completion of Task 17 delivers on a major objective of the final deliverable. It provides user density maps representing the peak busy hour that was derived from a detailed analysis of computer aided dispatch (CAD) data. Accompanying it is a county-by-county trend analysis that is used to project usage into the future. The user density map as a data source is a foundational input for the capacity planning and designing of a wireless network.

The NPSBN will serve three general types of wireless data traffic; first and foremost is the wireless data traffic generated in support of emergency response or at the scene of an incident ("incident traffic"), the second type of traffic is the non-incident traffic generated either by the general use of first responders or supporting agencies ("secondary-use traffic"), and lastly, the traffic generated by FirstNet's commercialization of the excess capacity of the network ("commercialized traffic"). This study seeks to identify the traffic associated with incidents. FirstNet and its winning bidder can add the non-incident traffic generated by public safety agencies and the traffic it intends to resell commercially to determine the net demand that must be satisfied by the NPSBN. A separate task is envisioned that will provide more information on the application usage patterns per public safety discipline; with this information, a richer traffic profile of end users during an emergency response is provided.

Overview of Work

From a network perspective, the grade of service is driven by the ability of the network to cope with peak demand. If the network is more capable to provide the requested services during the peak busy periods, the grade of service improves.

Each cell site has limited capacity and covers a specified area that can range from a quarter mile to ten miles in radius. Furthermore, the capacity of cell site decreases as the users move further from the cell site. Therefore, the number of users and their location have a major influence on the ultimate quality of service. Because an incident will bring with it more public safety personnel and a higher demand for data, incident based traffic will likely be the first point where FirstNet and public safety sees degraded quality of service.

An incident can occur anywhere. There is no way to predict where and when an incident will occur and what its total data demands will be. The user density map does not predict the future, it reflects the historical pattern of incidents geographically and uses this basis to set a baseline for future needs. When incident information is aggregated over three years, the end result highlights areas of increased likelihood of public safety incidents, and users.

A key portion of the work included the creation of proxy incident data for jurisdictions where CAD data was not available or useable. To generate the proxy incident data, Televate referenced adjacent county data to correlate incidents and population data to estimate the user densities. The population was therefore used to estimate the CAD attributes. During this process, Televate identified a number of issues with the raw CAD data from several northern county PSAPs. Televate found many instances of erroneous data or duplicates – resulting in the correction of the raw data and removal of duplicates where appropriate. For incomplete datasets, Televate created proxies for the missing data. The entire process involved aggregating all incidents along

county borders to take account of occurrences of mutual aid. Therefore, areas where adjacent counties contribute to usage in neighboring counties are captured in the maps.

Televate's previous work for the State of Minnesota found that individual incidents require as much as 10 Mbps of throughput. This threshold sets a baseline to identify whether or not the NPSBN can accommodate such incidents at specific locations. A major, single incident scenario with a massive public safety response represents a "worst case". The analysis in this report, on the other hand, provides the State and FirstNet with a perspective of "typical" capacity needs across the entire state, rather than isolated hot spots.

The Public Safety Answering Points (PSAP) CAD data provides system designers with vital information about public safety "hotspots" where substantial capacity is expected. When aggregated, the CAD data highlights areas that have a much higher level of incidents than normal. These hotspots can occur in disproportion to the population. The proxy data will not capture the hotspots, but it will present a best possible approximation of the traffic expected for the counties where the CAD data is not available.

Finally, Televate performed an analysis over time to determine trends for each county. The analysis looked at the growth, or lack thereof, over the three year period: 2010 to 2013. This analysis resulted in a prediction of the total users. The maps created represent the projected user densities up until 31 December 2016.

PURPOSE FOR THE ANALYSIS

The purpose of this analysis is to provide the State of Minnesota and FirstNet with a perspective of the geographic distribution of capacity needs for the FirstNet Nationwide Public Safety Broadband Network (NPSBN). This information provides system planners with information that will help determine where cell sites are required to address particular high density needs. This information can also be used to help guide FirstNet to meet the state's requirements and provide throughput maps to steer the vendor to enhance capacity where public safety needs it most. A very simple rule of thumb for designing a wireless broadband network is to ensure that cell sites are located as close to the areas of high potential use as possible. Therefore, knowing where high density usage occurs will provide FirstNet with a powerful tool to customize the design and meet the public safety need. Specifically, the data that is output from this project is intended to be incorporated in engineering planning tools for wireless broadband systems. These tools have two primary inputs: user density maps and usage profiles for various user groups. These two data elements enable the engineering tools to predict how various usage scenarios affect network performance and capacity.

What are the reasons behind our methodology?

The approach chosen by the project team was to leverage the call for service records found at the PSAP's. The call for service records are stored by the CAD systems. The CAD systems store a record for each incident that is dispatched by the PSAP. When the CAD data is aggregated across all PSAPs including cities, counties, and state agencies, it provides a clear and complete picture of historical calls for service across the entire state and jurisdiction-by-jurisdiction where public safety communications needs are likely at their highest. Therefore, CAD data provides the best methodology for estimating the geographically based capacity requirements of public safety agencies absent geographically referenced usage information.

METHODOLOGY

The map results in this analysis uses a grid-based approach for user density. CAD incidents are aggregated in a grid system. The CAD data is then used to determine the user density on a geographic basis using this grid system. The CAD data is used to determine local trends in public safety activity on a per county basis.

Reference Grid

A master reference grid is used for the basis of all geographical representations of the data. The grid is a contiguous ½ mile by ½ mile square (1/4 square miles) across the entire land mass of the state. This level of detail better isolates the capacity requirements in dense urban areas where public safety is likely to experience higher capacity requirements. The quarter square mile area correlates with the typical cell site service area in urban areas. The reference grid is in alignment with the FirstNet grid system which uses an area of one square-mile (1 mile by 1 mile).

Figure 1: Example - Master Grid

Analysis of the Data

To achieve the goals of this project, the project team developed a series of unique algorithms to analyze and assess the concurrence of each and every incident record statewide. It was presumed – based on the instructions provided with the original request – that each CAD dataset contained a single record for each unit dispatched to a scene of an incident or that the incident record would denote multiple units. By and large, this was the case. However, upon a detailed analysis of all records statewide, Televate identified duplicate records for a number of the CAD datasets. For example, most CAD systems append the multiple 9-1-1 calls received for a single incident to a single incident record within the database, while others record a separate record for each call received. In one instance, Televate observed 22 different incident records for a noise complaint. Due to the structure of the data, the records imply a total of 22 units dispatched to the scene of the incident, whereas in actuality a single unit responded to the incident. Duplicates such as these were removed from the datasets in the final deliverable.

In addition, Televate identified what is likely to be significant differences in operational record keeping practices and capabilities throughout the state. For example, some CAD datasets show operational events, such as “bar-checks” or “community service” by law enforcement, while others do not. These differences are much more challenging to resolve. Without direct consultation with the PSAPs and relevant agencies, Televate was not in a position to judge the validity of the CAD data record. As a result, Televate did not attempt to remove operational incidents from the CAD data statewide. Such an effort would have required direct reengagement with the PSAPs to understand the records and their record keeping philosophy.

This difference in record keeping may then have influence on the traffic projections for some counties.

In general, the analysis found that approximately 90 percent of the calls for service are concentrated within an area that comprises less than 20 percent of a given jurisdiction or county. The maps of Olmstead County (Fig. 2 & 3) demonstrates this phenomenon.

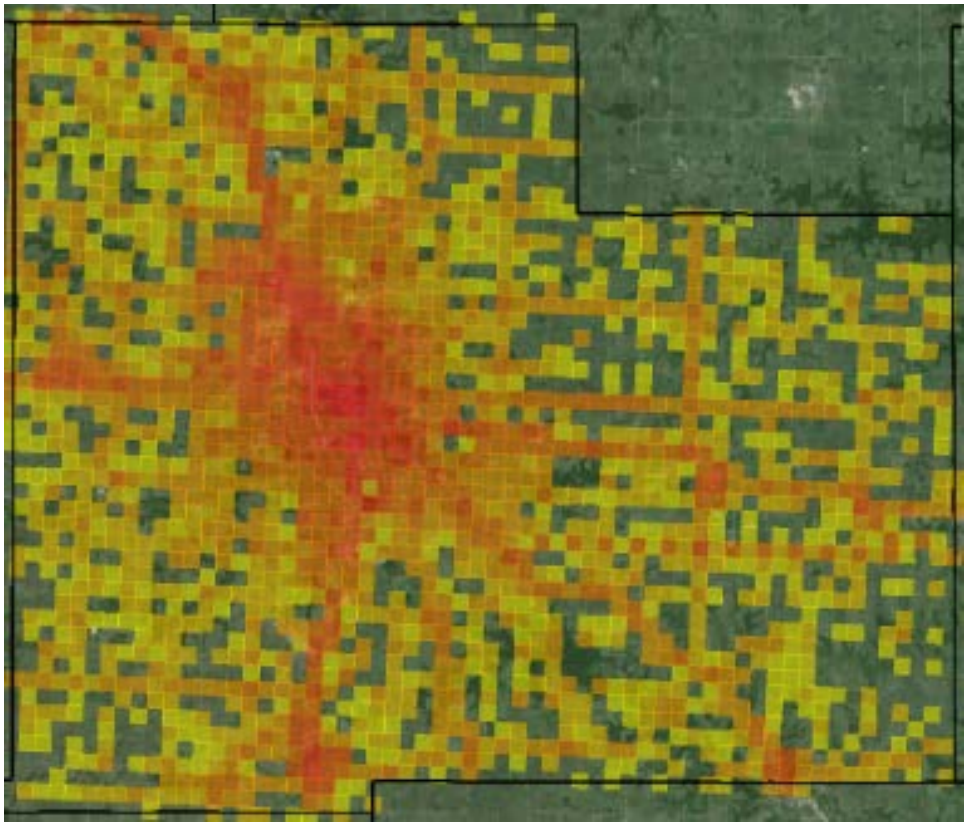


Figure 2: Distribution of incidents - 3 years Olmsted County[1]

[1] Figure 2 represents a heat map of three calendar years of incident activity in Olmsted County. It was derived from the Olmsted County CAD system data as well as concurrent activity pulled from state agencies and mutual aid from neighboring jurisdictions.

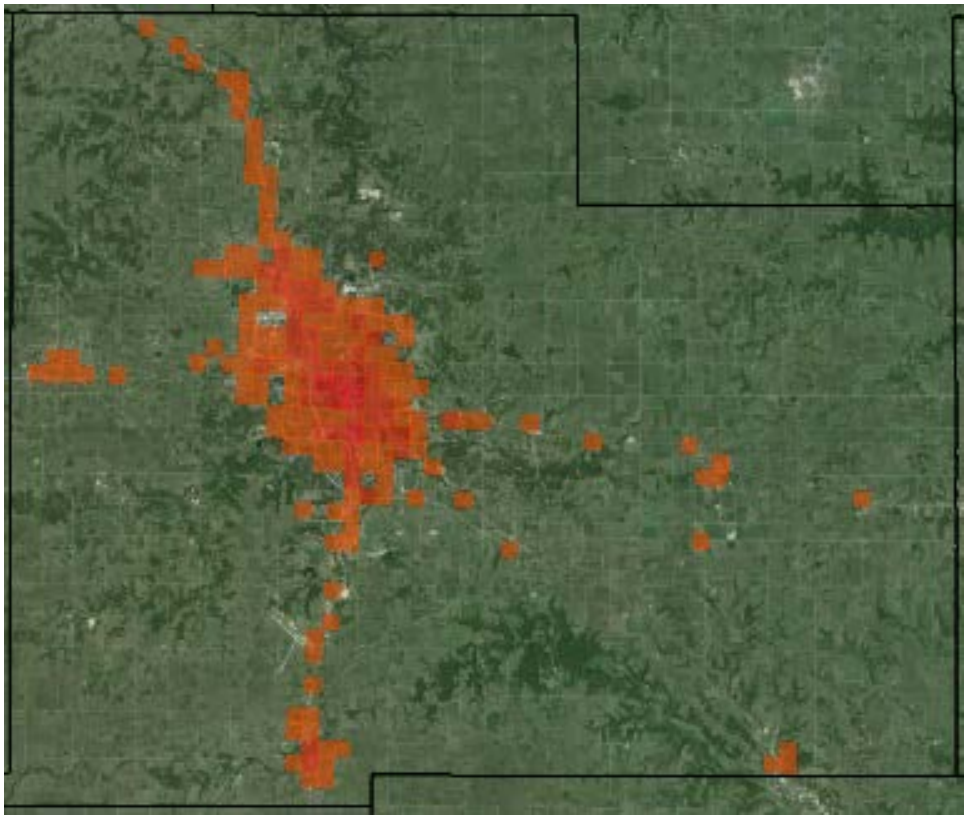


Figure 3: Distribution of Incidents - Top 90% Olmsted County

Based on the complete aggregate dataset, the records show that approximately 83 percent of the county has had an incident occurrence.[2] The premise of this analysis is that the geographic distribution over the three year period is representative of the geographic distribution of users in the future. If these areas are prioritized by their incident density and only the top 90 percent of incidents are displayed, the areas of highest activity comprise only 19 percent of the county jurisdiction. In other words, this suggests that 90 percent of the usage is located in 19 percent of the county. This distribution of users affects the network design significantly, meaning that one needs to ensure overall coverage and at the same time ensure sufficient capacity is built into the network in areas of high incident density. These high density areas need higher densities of cell sites in order to accommodate the demand.

The first step of this analysis is to create a unit density map. This is done by aggregating all units statewide in the grid system. Units, as opposed to individual incidents, were used to differentiate between incidents with smaller responses from incidents that generally had a large

[2] Note that the entire area of the county has been subdivided into areas or zones that form a regular grid pattern. Each area measures one half-mile by half-mile, or quarter-square-mile. This resolution was deemed sufficient because it is likely to be the smallest area serviced by a single antenna of a 700MHz macro base station. FirstNet utilizes a larger grid of one (1) square mile. The State's grid is in perfect alignment with FirstNet's so to allow comparisons and analysis between the two.

public safety response. This map is leveraged throughout the remainder of the process to determine the probability of future users in each grid.

The next step of the process is to normalize the data and edit it for anomalies to the best extent possible to avoid bias. For example, where gaps in the CAD datasets existed, proxy data was added to the database to account for the missing data. In addition, duplicate records were removed. Incidents involving mutual aid are included in the data. For example, if a unit is dispatched to an adjacent county, those incidents are added to incidents of that county. Once the dataset is cleaned and normalized on a consistent basis, the next step is to assess the busy hour of concurrent incident activity.

Busy Hour & Trends Analysis

The resulting user map generated by the above analysis represents the aggregate total of incidents over an extended timeframe; in this case three (3) years. However, the NPSBN must support capacity at any given instance. The worst case instance is when the peak usage occurs. This is when the most network congestion occurs and quality of service is generally at its worst. This analysis determines the peak period of usage by using a time based analysis of the CAD data. Figure 4 highlights the methodology:

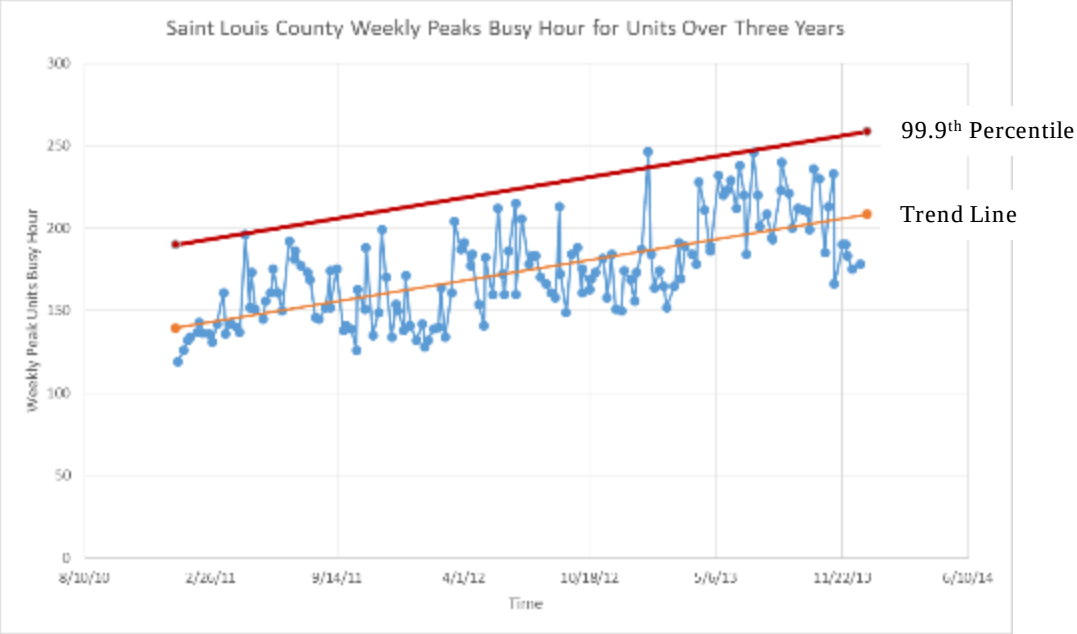


Figure 4: Busy Hour Units per Week with Trend - Saint Louis County

The analysis determines the trend of public safety incidents per county. It looked at the growth, or lack thereof, over the three year period of data (2010 to 2013). The outcome resulted in a prediction of the instantaneous peak number of concurrent users – in terms of active units

deployed. The task is accomplished by determining the "busy hour" of dispatched units on a per county basis. To do this, Televate performed a detailed analysis of the aggregated incident dataset. The analysis included incident activity from all public safety agencies at both a state and local level as well as neighboring jurisdictions. The analysis looks for the maximum number of units deployed in any given hour. Next the peak number is then recorded on a weekly basis. The peak busy hour per week is indexed over the entire three years to establish the trend of activity per county. The calculated trend was used to project the busy hour forward until the end of 2016. To generate the user density map the state chose the 99.9th percentile of all peak recorded activity to represent the busy hour of concurrent users. This represents a peak amount of incidents, units, and personnel deployed in an hour and represents the expected peak load such usage would place on the NPSBN.

Trend Analysis

The graph (Fig. 4) represents the busiest hour per week based on number of units dispatched from St. Louis County's CAD data. The peak number of concurrent and active units includes some seasonality. The orange line running through the center of the graph represents the best fit "average" number of dispatched units. The slope of the line represents the linear trend of incident activity. The trend line is used to predict the level of future incident activity. In other words, the growth of public safety traffic over time was determined from the data.

By subtracting the trend line values from the weekly peak data, the time variant part of the data is removed leaving only the incident units variant data. This offset from the trend line, can be used to create a histogram of the variance. When we look at the incident unit variance histogram, we can see the seasonal and other variability from the overall "average". Calculating the cumulative distribution of the incident variance, we can then determine the "time adjusted" peak traffic levels relative to this trend-line. The 99.9th percentile was chosen to represent peak usage level. In the case of St. Louis County, the 99.9th percentile represented a 52 unit offset from the trend-line; the number of active concurrent busy hour units rises from 204 (50th percentile) to 256 active units (99.9th percentile). That line is represented on the graph (Fig. 5). The 99.9th percentile line can then be extrapolated out to any date along the slope to represent the peak traffic value at that point in time. December 31, 2016 was chosen as the target date for the maps.

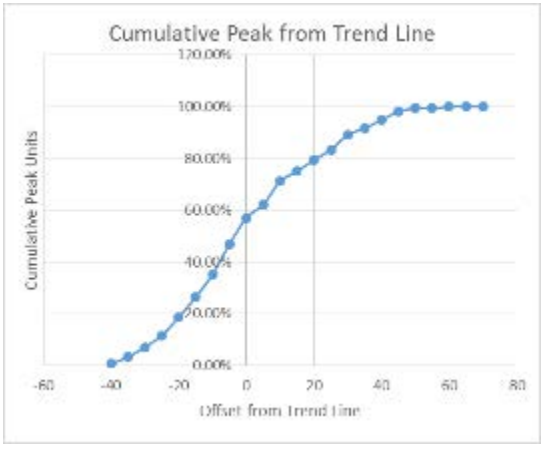


Figure 5: Histogram of Variance

Units verses Users

Based on a review of the CAD data records, a "unit" is described as a single response vehicle; ex. squad vehicle, fire engine or ambulance. Although there are variations of record keeping practices across the state, the number of units assigned to the incident is indicated – in most cases – along with the response agency type. For this analysis and in order for the data to be used in engineering planning tools, the number of "units" must be converted to "active devices".

As was noted in the 2015 statewide survey, many agencies provide multiple wireless data devices to individuals – or in this case – a single responding unit. For example, law enforcement agencies will provide a wireless data device for the squad vehicle to operate the MDT (mobile data terminal) and generally assign a separate smartphone or cellphone to the officer. In fact, the survey found an average of 1.7 devices per individual for law enforcement agencies, 1.0 device per individual for fire services and 1.2 devices per individual for emergency medical services (see table below).

Because the busy hour unit data was overwhelmingly law enforcement based, the assumption was made that there is one public safety "user" (an individual) per unit for all disciplines. Therefore, for the purposes of this study, the number of devices is derived by multiplying the number of units at the scene of the incident by the reported number of devices per user.

Table 1: Devices per Unit

Discipline	Estimated Totals			
	Agencies	Personnel	Devices / User	Devices
Law Enforcement (Police, State Police, Sheriff, Highway Patrol)	490	19,512	**1.7**	32,262
Fire Service (including rescue and quick response	843	22,615	**1.0**	23,537
Emergency Medical Services	500	9,917	**1.2**	12,205

The total number of devices are spread geographically according to the incident probability per grid, per county. The percentage of total devices is determined for each grid and multiplied by the peak number of devices to determine the value applied to each grid. This value is then divided by the area in the grid (1/4 square mile, or 0.65 square kilometers) to determine the device density per bin. In all actuality, the number represents the active "devices" per square kilometer, and not the number of personnel.

The map of Dakota County (Fig. 6) represents a sample of the final output of the process. As depicted in this image, the distribution of the busy hour users is proportional to the incident density across three years of CAD data.

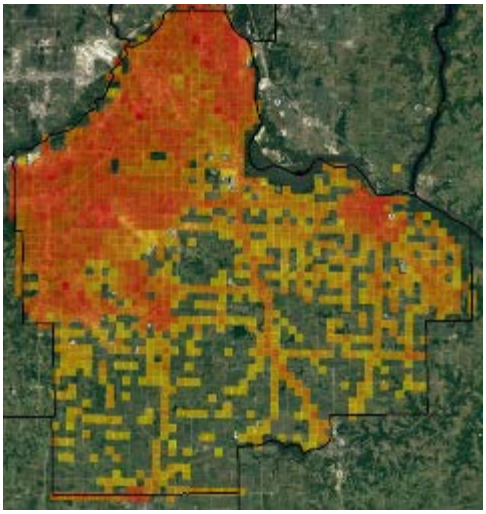


Figure 6: Dakota County CAD Data

Proxy Data

By September 2015, the project team collected CAD data from 93 of the state's 104 PSAPs. A total of 15 PSAPs experience technical problems and limitations in their ability to provide

incident data. Of the PSAPs that did provide data, four (4) of these datasets were unusable (Fig 7) leaving a total of 19 PSAPs without usable CAD data for this analysis.

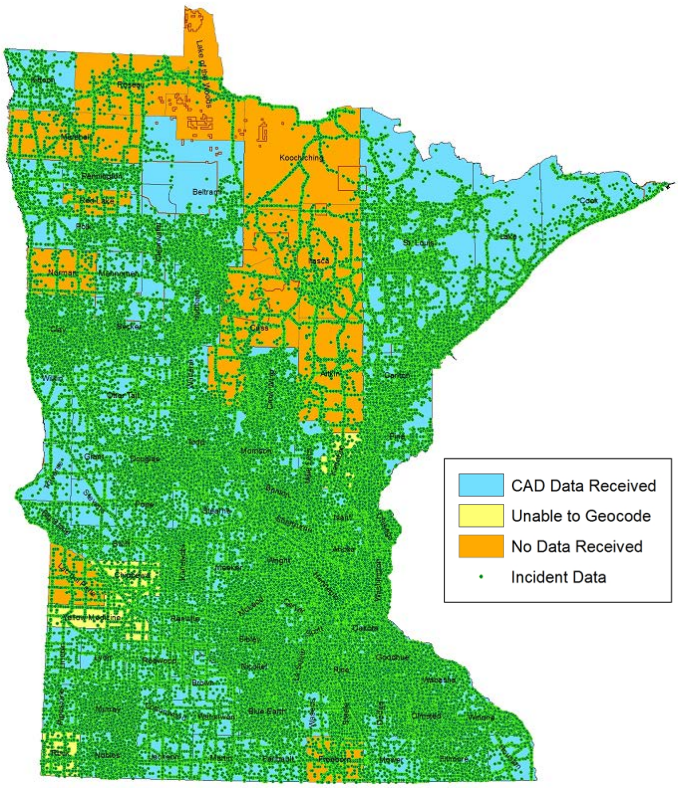


Figure 7: CAD Data Collected as of 30 September 2015

A second request for CAD data was made in February 2016. The second data request went out however only to those counties or PSAPs that provided insufficient data. This effort resulted in expanded data for four (4) and new data from five (5) county-level PSAPs. The end result was a total of ten (13) counties without CAD data for this analysis.

In order to create a comprehensive picture of device density across the State, the project team leveraged population as a "proxy". The analysis leveraged census population at the census tract level. These tracts are polygons that must be converted to grid values in order to compare to the gridded CAD data. As the CAD data maps show, the density of units deployed is generally highest where the population is the greatest. To determine the influence of population on units dispatched, a pool of 7 counties were chosen to be representative in area and population density to the counties that lack CAD data (Nobles, Swift, Crow Wing, Polk, Renville, Pennington and Beltrami counties). To create the proxy, a linear regression was performed on the aggregated data between units and population for each of the bins in the county. Figure 8 shows the correlation between units and population, and the linear progression used for the creation of proxy CAD data.

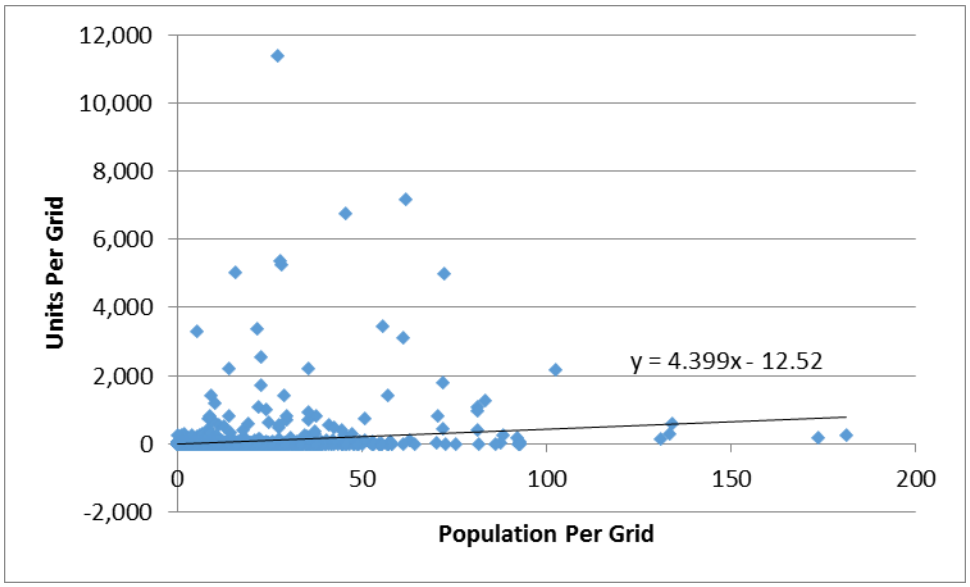


Figure 8: Correlation between Units and Population

Figure 8 shows the equation of Units = 4.399*population – 12.52

For very low populations where the resulting units would be negative, units were set to zero. Therefore, to apply the proxy for the counties with missing CAD data, we determined the population for each grid, multiplied that population by 4.399 and then subtracted 12.52 to determine the number of units that would be populated. We then applied the same busy hour methodology as described above to convert the total units into busy hour device. The proxy data was then added to State provided CAD data to create an aggregated view of for the proxy counties. The maps in Figure 9 and 10 displayed the addition of the proxy data for the following counties:

- Aitkin County
- Chippewa County
- Freeborn County
- Itasca County
- Koochiching County
- Lac qui Parle County
- Lake of the Woods County
- Marshall County
- Norman County
- Red Lake County
- Rock County
- Roseau County
- Swift Yellow Medicine County

The result of the insertion of the proxy data is displayed below.

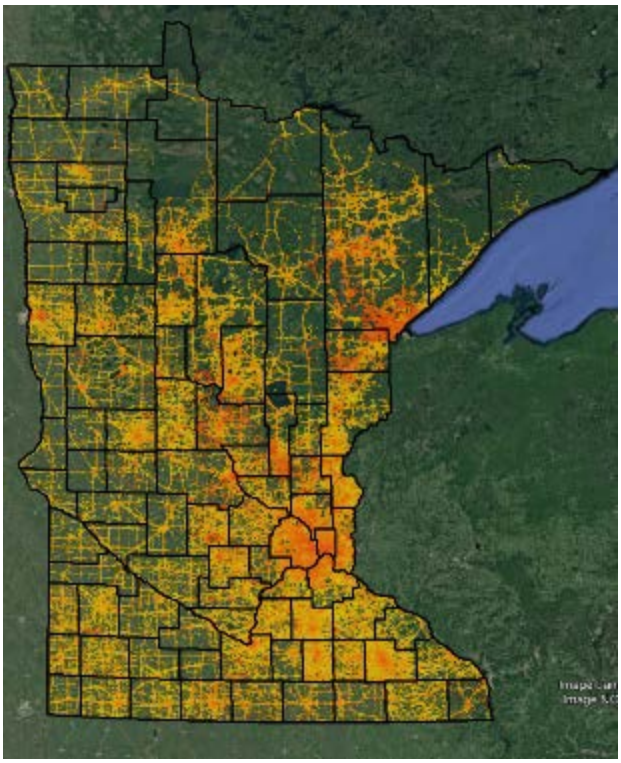


Figure 10: Without Proxy CAD Data

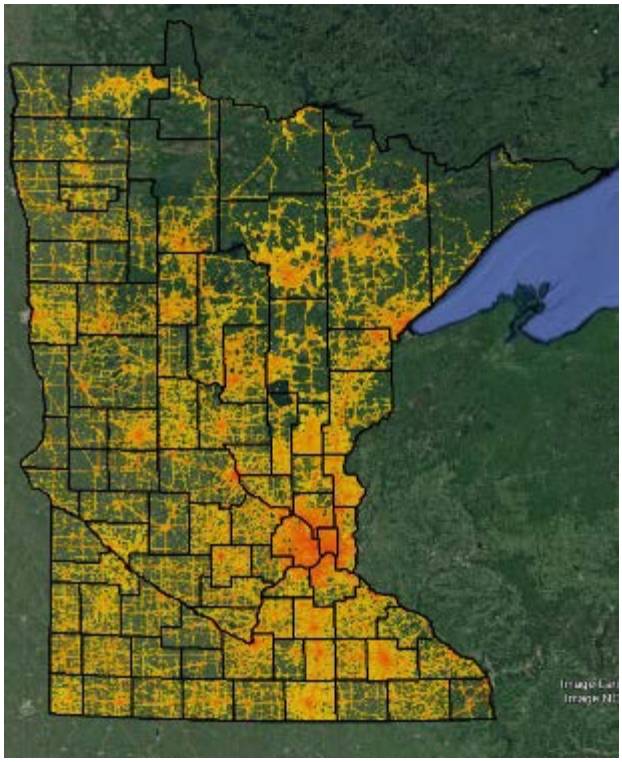


Figure 9: With Proxy CAD Data

NEXT STEPS

As described in Figures 9-10, this analysis provides user density maps of the predicted busy hour (December 31, 2016). Engineering tools require additional variables, such as usage per user, to determine the kilobits per second and other factors that are involved in the capacity analyses. The project team intends to supplement the report with additional information collected from future regional outreach events.

Elements that will be discussed may include the types of applications that are used at various events. As an example, a high and low "impact" assessment per incident type will be discussed for police, fire, and EMS agencies to benchmark wireless throughput requirements. A high impact incident is one where there is a substantial amount of broadband data transmission required to support the incident. These regional meetings are expected to occur in the winter of 2016.

APPENDIX A

Table 2 provides a summary of the incident growth rate derived from the aggregated CAD data records per county. It also provides the estimated total number of busy hour users or active devices. The trend is based on an average of three years of incident records. The estimated number of busy hour users is based on the 99.9th percentile of all peak busy hour units per year derived from the dataset over the three year period. The estimated number of busy hour users is projected forward until December 31, 2016.

Table 2: Estimated Number of Busy Hours Users

			Estimated Number of Busy Hour Units			
County	Estimated Population	Growth Rate of Incidents	12/31/13	12/31/14	12/31/15	12/31/16
Aitkin	15,762	-0.40%	25	25	25	25
Anoka	342,612	-0.80%	299	297	294	292
Becker	33,272	1.49%	77	78	79	80
Beltrami	45,770	0.58%	65	65	66	66
Benton	39,518	0.75%	197	198	199	201
Big Stone	5,124	0.05%	12	12	12	12
Blue Earth	65,620	-0.73%	152	151	150	149
Brown	25,463	0.11%	31	31	31	31
Carlton	35,576	0.97%	69	70	70	71
Carver	97,162	-0.17%	143	142	142	142
Cass	28,570	0.99%	44	44	45	45
Chippewa	12,132	-0.05%	15	15	15	15
Chisago	54,134	1.47%	89	90	92	93
Clay	61,196	0.67%	126	127	128	129
Clearwater	8,794	0.25%	19	19	19	19
Cook	5,231	0.04%	32	32	32	32
Cottonwood	11,633	-0.08%	14	14	14	14
Crow Wing	63,371	-0.10%	75	75	74	74
Dakota	411,507	0.77%	372	375	378	381
Dodge	20,352	0.26%	50	51	51	51
Douglas	36,789	0.31%	61	62	62	62
Faribault	14,124	0.33%	28	28	29	29
Fillmore	20,783	0.14%	39	39	39	39
Freeborn	30,831	0.22%	49	49	49	49
Goodhue	46,480	-1.18%	58	57	57	56
Grant	5,923	-0.05%	12	12	12	12
Hennepin	1,210,720	6.06%	694	736	781	828
Houston	18,766	0.17%	50	51	51	51

			Estimated Number of Busy Hour Units			
County	Estimated Population	Growth Rate of Incidents	12/31/13	12/31/14	12/31/15	12/31/16
Hubbard	20,596	0.10%	42	42	42	42
Isanti	38,397	0.27%	32	32	32	32
Itasca	45,639	-0.03%	32	32	32	32
Jackson	10,266	0.12%	22	22	22	22
Kanabec	15,966	0.44%	27	27	27	27
Kandiyohi	42,258	-0.04%	25	25	25	25
Kittson	4,440	0.16%	16	16	16	16
Koochiching	13,018	0.00%	17	17	17	17
Lac qui Parle	6,922	-0.06%	14	14	14	14
Lake	10,695	0.27%	44	44	44	44
Lake of the Woods	3,921	0.04%	16	16	16	16
Le Sueur	27,791	-0.09%	40	40	40	40
Lincoln	5,788	-0.10%	14	14	14	14
Lyon	25,746	0.07%	34	34	34	34
Mahnomen	5,503	0.19%	18	18	18	18
Marshall	9,420	0.17%	19	19	19	19
Martin	20,295	0.31%	85	85	85	85
McLeod	35,942	0.22%	82	82	82	82
Meeker	23,122	0.28%	26	26	26	26
Mille Lacs	25,862	-0.18%	31	31	31	31
Morrison	32,859	0.44%	44	45	45	45
Mower	39,356	0.04%	44	44	44	44
Murray	8,475	0.41%	36	36	36	37
Nicollet	33,350	-0.44%	38	38	38	38
Nobles	21,574	0.53%	34	34	35	35
Norman	6,643	0.01%	10	10	10	10
Olmsted	150,201	-1.93%	1,136	1,114	1,093	1072
Otter Tail	57,612	0.31%	48	48	48	49
Pennington	14,119	0.14%	23	23	23	23
Pine	29,196	0.36%	68	68	69	69
Pipestone	9,336	0.01%	18	18	18	18
Polk	31,545	0.27%	60	60	60	61
Pope	10,982	0.13%	43	43	43	43
Ramsey	529,506	2.27%	387	396	405	414
Red Lake	4,048	0.11%	15	15	15	15
Redwood	15,573	0.24%	29	29	29	29
Renville	15,067	0.02%	43	43	43	43

			Estimated Number of Busy Hour Units			
County	Estimated Population	Growth Rate of Incidents	12/31/13	12/31/14	12/31/15	12/31/16
Rice	65,180	-0.04%	109	109	108	108
Rock	9,555	0.20%	29	29	29	29
Roseau	15,663	0.15%	29	29	29	29
Saint Louis	200,840	6.28%	280	298	316	336
Scott	138,727	-0.68%	119	119	118	117
Sherburne	91,223	-0.09%	138	138	138	138
Sibley	14,919	-0.02%	51	51	51	51
Stearns	153,326	2.99%	1,024	1,055	1,087	1119
Steele	36,532	0.30%	93	94	94	94
Stevens	9,836	0.55%	71	71	72	72
Swift	9,453	-0.06%	14	14	14	14
Todd	24,266	0.22%	28	28	28	28
Traverse	3,392	0.10%	11	11	11	11
Wabasha	21,376	0.46%	32	32	32	32
Wadena	13,768	0.20%	23	23	23	23
Waseca	19,029	-0.10%	22	22	22	22
Washington	249,109	1.16%	308	311	315	319
Watonwan	11,095	0.25%	28	28	28	28
Wilkin	6,503	0.24%	25	25	25	25
Winona	51,109	0.08%	68	68	68	68
Wright	129,946	-3.70%	345	332	320	308
Yellow Medicine	10,127	0.19%	30	30	30	30

This report includes detailed busy hour data on a per county basis. Each Excel file contains three graphs that represent different aspects of the data; a linear x/y graph of peak busy hour units versus time, a histogram of the number of units offset from the trend line and the cumulative offset from the trend line. The file also contains other data points such as the slope of the trend line and the standard deviation from the mean. There is one file per county with the exception of those counties that were unable to provide CAD data. The file name follows a standard naming convention:

"Busy Hour – Anoka County v3.xls"

APPENDIX B

This report also includes MapInfo format device density maps that can be used in engineering planning software. In addition, KML files are provided such that Minnesota stakeholders can easily view the data. Two files are provided per county using the following naming convention:

"User Density – Anoka County v3.tab"

"User Density – Anoka County v3.kml"

FirstNet's STATE PLAN Vision

FirstNet's vision for the State Plan is an online portal that will debut FirstNet's products and services designed to meet the unique needs of Public Safety. The portal will also include the necessary technical specifications and requirements for States/Territories interested in assuming the responsibilities of deploying the Radio Access Network ("Opt-Out"), including the funding level as determined by NTIA.

FOR PUBLIC SAFETY

This section will detail products and services for Public Safety agencies considering adopting FirstNet, such as:

COVERAGE

Band 14 coverage, possible non-Band 14 coverage, and deployable options

APPLICATIONS AND FEATURES

Public Safety-facing applications, Quality of Service, Priority and Pre-emption (QPP), ICAM and Mission Critical services

SERVICES

Plans, pricing, procurement options, security, and customer support

DEVICES AND ACCESSORIES

Band 14 device portfolio, accessories, and wearables

FOR POTENTIAL STATE RAN PARTNERS

This section will provide technical specifications and requirements for Opt-Out proposals on topics such as:

POLICY COMPLIANCE

FirstNet policies on coverage, security, performance and other matters must be planned for and adhered to in Opt-Out scenarios.

TIMEFRAME/COST

Opt-Out proposals must be comparable in terms of deployment timeframe and cost. Cost comparison metrics will be included.

INTEROPERABILITY

Alternative RAN proposals must have and maintain interoperability with the FirstNet core throughout the terms of agreement. Network policies and equipment specifications will be included.

Sensitive or proprietary information in this section of the State Plan will be protected with access controls.

WHAT IS THE STATE PLAN DRAFT?

An **OPPORTUNITY** for States/Territories to review and discuss FirstNet's RAN proposal **PRIOR** to delivery to Governors.

State Plan drafts will be developed by FirstNet and its Partner and delivered online

Drafts may be released simultaneously to States and Territories

The draft review process must be time-constrained to control costs and prevent delays

State Plan drafts are not required by the Act, and will not be written by States

WHAT IS THE SCOPE OF OPT-OUT?

States that Opt-Out **ASSUME THE RESPONSIBILITY** and associated **COSTS** and **RISKS** for the ongoing deployment, operation, maintenance, and improvement of the RAN in their State, which must be maintained in accordance with FirstNet's network policies. Opt-Out **SHOULD BE COST-NEUTRAL TO THE NPSBN**, and **DOES NOT IMPACT** FirstNet's network services, single spectrum license, or customer relationships.

OPT-OUT STATES:

- MUST apply to the FCC to build a State RAN
- MUST apply to sub-lease FirstNet spectrum capacity
- MAY apply to NTIA for RAN construction grant funding

BUT…

IN ALL STATES AND TERRITORIES:

- FirstNet will be dedicated to delivering the best service possible to public safety
- FirstNet service will be available for public safety agency adoption
- FirstNet network policies – such as priority, local control, and security – will be consistent

WHERE ARE STATE INPUTS?

State- and Territory-provided inputs have informed FirstNet's decision-making **EVERY STEP OF THE WAY**. Insights and interactions from **INITIAL CONSULTATION**, the **ACQUISITION PROCESS, PUBLIC NOTICE** processes, and **DATA COLLECTION** informed FirstNet's RFP, and thus the State Plan.

- **55** Initial Consultations
- **54** State Data Submissions
- **3** Public Notices
- **1** Special Notice Release

} **1 RFP**

FUTURE OPPORTUNITIES:

- ★ (Optional) updated data due 9/30/16
- ★ Consultation with Public Safety will continue beyond State Plan delivery

TELEVATE

MnFCP State Plan Decision Process

A Project Proposal for IDC Consideration

September 2016

The FirstNet State Plan

- FirstNet received vendor RFP responses on May 31, 2016
- Maintaining schedule to select partner within six months after RFP closes
  - Expected contract award in November of 2016
- Partner and FirstNet to develop deliver the draft State Plan in May of 2017
- Formal State Plan delivery expected in September of 2017
  - Provides a 3-4 month review and “negotiation” timeframe
- Governor’s response due 90 days after the State Plan is received
- Public Notice and FCC Rule Making to guide Opt-Out process in progress
  - NTIA Public Notice response was due on August 18, 2016
  - The FCC Notice for Proposed Rule Making (NPRM) has been released
  - Expect a FirstNet public notice regarding the opt-out requiements

State Plan Overview

- Provide a statement of the terms and conditions under which FirstNet and its Contractor partner will implement and deliver NPSBN services throughout the state.
- The plan is not considered a contract by FirstNet
  - Not binding upon FirstNet
  - Raises concern as to how the State Plan will be constructed and what it represents
- Under the best of conditions, the plan will exceed the State's requirements
  - Wide area coverage guarantees
  - Extensive capacity
  - Suitable devices and applications
  - Reliable and secure operations
  - Fast-paced implementation strategy
  - Service delivery at the lowest cost option
- At worst, it could be completely unacceptable
  - Limited coverage, capacity, devices, applications, reliability, and security,
  - Constructed under a lengthy implementation schedule
  - Unaffordable price
  - No specific guarantees or commitments

Minnesota State Plan Process

- The State Plan represents the culmination of the MnFCP program
  - Must prepare to review, evaluate, negotiate, and provide opt-in/opt-out recommendations
- Determine the process to review the State Plan and deliver recommendations to the Governor
- Role/Responsibilities of the IDC, Working Groups, the RECBs, the SECB, the State Executive Team, and the Governor
- Develop a comprehensive State Plan review and assessment program
  - Determine near/mid/long term strategy, tasks and activities
- Two phase process
  - **Phase One:** Preparation for the draft State Plan assessment
  - **Phase Two:** Review the State Plan based on the Phase One criteria established
- Other considerations:
  - Determine unique Minnesota requirements and prioritize accordingly
  - The role of state assets in the State Plan review and negotiations process
  - Other considerations?

FirstNet State Plan Review Process

- Develop a process to guide the evaluation of the draft State Plan.
  - Use this process to assess the State Plan, determining strengths, gaps, and recommendations to provide to State executive bodies regarding the Plan.
  - These recommendations will ultimately guide the Governor's out-in or opt-out decision.
- Recruit the best and brightest experts from state and local governments, from rural and metro regions, representing public safety, public service, and others to ensure that all respective stakeholder communities are represented.
  - Three working groups will be created based on anticipated key aspects of the State Plan.
  - The working groups will develop a methodology to evaluate the State Plan based on their domain expertise.

Working Group Domains

- **Technical:** Includes but is not limited to network design assumptions, Radio Access Network (RAN), backhaul network, Core design, numbering plan, IP strategy, Land Mobile Radio (LMR) network integration, and Public Safety Enterprise Networks (PSEN) and Public Safety Answering Point (PSAP) integration.
- **End Users/Operations:** Includes but is not limited to application management, application security, local control, devices, equipment, feature roadmaps, fleet management, deployables, and procurement vehicles.
- **Business Process (Policy/Financial):** Includes but is not limited to State Plan inputs and outcome, coverage objectives, current mobile data usage, subscription plans and cost, and state decision process, network redundancy, application security, Bring Your Own Device (BYOD) policy, customer care, facility hardening, and cybersecurity.

Primary Reference Resources

Phase One

- **The FirstNet State Plan Template**
  - The State Plan Template published in the FirstNet RFP to select a commercial partner.
  - This template provides a comprehensive overview of the expected content in the State Plan, and will guide working groups to prepare for the draft State Plan review.
- **State of Minnesota defined requirements**
  - All relevant information captured from statewide stakeholders over the course of the MnFCP.
  - This data includes the desired coverage requirements, network capacity, device types, applications, subscription costs, and other relevant information.
- **The Minnesota NPSTC Launch Requirements**
  - The IDC and other stakeholders reviewed and refined the original NPSTC (National Public Safety Telecommunications Council) launch requirements and delivered to FirstNet representing a minimal list of Minnesota launch objectives.

Phase Two

- **The FirstNet Draft State Plan**
  - The draft State Plan will include the approach for implementing the NPSBN within Minnesota and will contain typical service level agreement (SLA) content including device options, cost of service and a variety of elements that will be evaluated by the domain working groups.
- **Working Group evaluation criteria**

Phase One Schedule

Phase One - Task Name	Duration	Start	Finish
Presentation to the IDC	1 day	Mon 9/20/16	Mon 9/20/16
Recruit Working Group Volunteers	10 days	Tues 9/22/16	Mon 10/3/16
Workgroup (~12 meetings)	12 wks	Tues 10/4/16	Fri 12/16/16
Summarize Workgroup Findings	2 wks	Mon 12/19/16	Fri 12/30/16
DPS-DECN Review	2 wks	Mon 1/2/17	Fri 1/13/17
IDC Presentation - Draft	1 day	Tue 1/17/17	Tue 1/17/17
Regional Meetings (6)	38 days	Wed 1/18/17	Fri 3/10/17
IDC Meeting – Final	1 day	Tue 3/21/17	Tue 3/21/17
SECB Meeting – Final	1 day	Thu 3/23/17	Thu 3/23/17
State Executive Team (meeting window)	10 days	Mon 3/27/17	Mon 4/10/17

- 5-10 hour monthly commitment per Working Group volunteer
- One year duration for Phase One and Two

Sample State Plan Decision Process Criteria

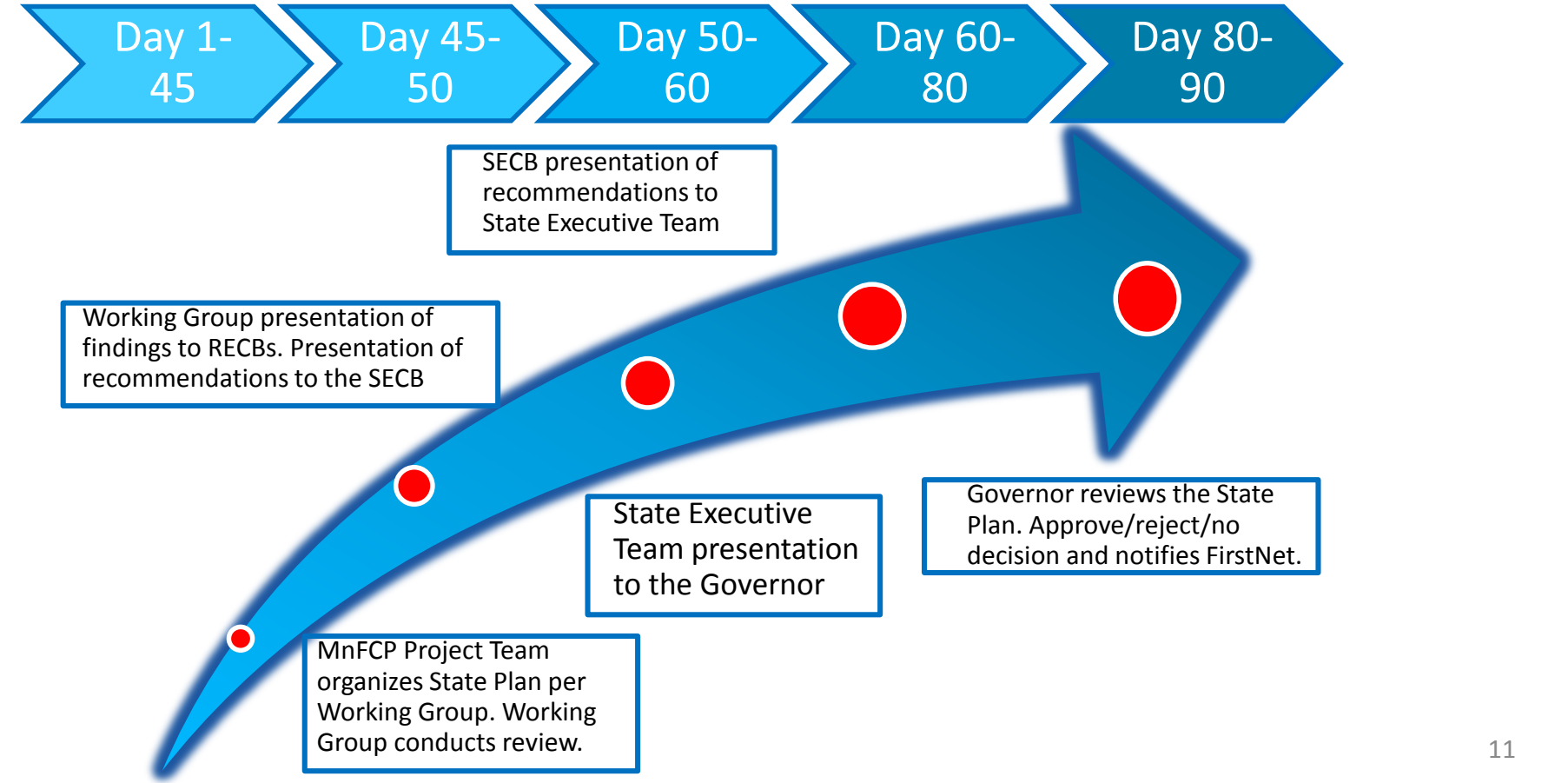
- Describe specific objectives, priorities, and requirements of the state regarding operational and performance items of interest and concern

- Network design and key assumptions
- Installation strategy and schedule
- State coverage requirements
- Operations and maintenance
- Deployment phases and timelines
- Network reliability
- Rural milestones
- Network resiliency
- Network upgrade and expansion
- Network redundancy
- State assets
- Environmental factors
- Spectrum clearing
- Security
- Coverage and hardening

State Plan Template – Sample Requirements

4	State Radio Access Network Plan	
4.1	Radio Access Network Partner	Technical
4.2	Network Design and Key Assumptions	Technical
4.2.1	Coverage Objectives and Requirements	Technical
4.2.3	Link Budget Specifications	Technical
4.2.4	Equipment Performance Specifications	Technical
4.2.6	Temporary Coverage Related to Incidents and Planned Events	User/Operations
4.3	State Coverage Summary	Technical
4.3.1	Persistent Coverage	Technical
4.3.2	Coverage Extension Assets for Purchase by Public Safety Entities	Business Process
4.3.3	Non-Persistent Cellular Service and Devices	User/Operations
4.4.1	Deployment Phases and Timelines	Business Process
4.5.1	Rural Milestones	Business Process
4.6	Network Upgrade and Expansion	Business Process
4.7	State Assets	Business Process
4.7.1	Memorandum of Understanding/ Memorandum of Agreement Requirements	Business Process
4.7.2	Tower Sites	Business Process
4.7.3	Backhaul	Business Process
4.7.4	Other State Assets	Business Process

Draft State Plan Decision Framework



Working Group Invitation Letter

August 2016

Working Group Volunteer Form

Contact Information

Name: _____

Agency:_____

Jurisdiction: _____

Phone Number: _____

Email Address: _____

State Plan Decision Process Working Groups

Check each domain Working Group that you are volunteering to support with an “X”.

_____ Technical Working Group

_____ End User/Operations Working Group

_____ Business Process Working Group

Subject: FirstNet State Plan Review Process

Dear Stakeholders:

In preparation for the FirstNet State Plan delivery to the State of Minnesota, and the actual evaluation and preparation of recommendations regarding the State Plan, the Department of Public Safety (DPS), Division of Emergency Communication Networks (DECN) is extending this formal invitation to participate in this important program. The State Plan represents the strategy that FirstNet and its commercial partner will undertake to deliver the Nationwide Public Safety Broadband Network (NPSBN). The State Plan is the next critical phase of the Minnesota FirstNet Consultation Project (MnFCP), and it is essential that we execute a comprehensive program to ensure that the State Plan meets and exceeds Minnesota public safety stakeholder requirements. Therefore, it is our objective to recruit experts from throughout the State to support this effort.

The purpose of this letter is to provide you a brief description of the State Plan Review Process, describe the associated activities, provide an overview of the roles and responsibilities of participants, and approximate the time commitment. While this is a voluntary program, we are requesting that participants continue to support the program over the full duration of the effort.

Time Commitment:

Kickoff: Sept 2016

Monthly commitment - 5-10 hours monthly, depending on domain working group. Some months will require no time commitment.

Length – one year

FirstNet State Plan Review Process

Objective: Develop a process to guide the evaluation of the draft State Plan. Use this process to assess the State Plan, determining strengths, gaps, and recommendations to provide to State executive bodies regarding the Plan. These recommendations will ultimately guide the Governor's out-in or opt-out decision.

Approach: Recruit the best and brightest experts from state and local governments, from rural and metro regions, representing public safety, public service, and others to ensure that all respective stakeholder communities are represented. Four working groups will be created based on anticipated key aspects of the State Plan. The four working groups will share the overall State Plan review based on their domain expertise. The domain working groups include the following:

- **Technical:** Includes but is not limited to network design assumptions, Radio Access Network (RAN), backhaul network, Core design, numbering plan, IP strategy, Land Mobile Radio (LMR) network integration, and Public Safety Enterprise Networks (PSEN) and Public Safety Answering Point (PSAP) integration.
- **End Users/Operations:** Includes but is not limited to application management, application security, local control, devices, equipment, feature roadmaps, fleet management, deployables, and procurement vehicles.

- **Business Process (Policy/Financial):** Includes but is not limited to State Plan inputs and outcome, coverage objectives, current mobile data usage, subscription plans and cost, and state decision process, network redundancy, application security, Bring Your Own Device (BYOD) policy, customer care, facility hardening, and cybersecurity.
-

Please consider what domain working group(s) best meet(s) your skills sets and interests. If you know of someone that may have expertise in these areas, please feel welcome to extend the invitation to them.

Process: The State Plan Review Process will be divided into two distinct phases as follows:

- **Phase One:** Develop a process to evaluate the draft State Plan, which is expected to be delivered in May of 2017. The process will be anchored on stakeholder and working group defined requirements as gathered over the course of the Minnesota FirstNet Consultation Project (MnFCP) and as developed by the working groups. Additional insights and information to guide the State Plan review process will be developed during a series of facilitated meeting sessions.
    - **Phase One Timeframe:**
        - October to December 2016 to develop the process
        - January to February 2017 to present the process to the Regional Leadership Group and to individual Regional Emergency Communications Boards (RECB)
        - March to April 2017 to present to the State Executive Steering Committee, the Interoperability Committee (IDC), and the Statewide Emergency Communications Board (SECB)
- **Phase Two:** Using the evaluation process developed during the Phase One activities, the working groups will evaluate the draft State Plan per domain working group. The State Plan evaluation will be based on the relevant criteria and approach as defined by the working group. The strength, weaknesses and gaps in the State Plan will be defined, and a recommendation to accept, reject or further negotiate specific elements of the Plan will be recommended by the working groups.
    - **Phase Two Timeframe:**
        - May to June 2017 to evaluate and prepare draft recommendations
        - July 2017 to present recommendations to the Regional Emergency Communications Boards (RECB)
        - August 2017 to present to the State Executive Steering Committee, the Interoperability Data Committee (IDC) and the Statewide Emergency Communications Board (SECB)

Facilitated Workshops: Facilitated meetings will be conducted on a weekly or bi-weekly basis for each domain working group. These on-line meetings will be scheduled for one hour and will follow a formal syllabus and pre-determined agenda. Preparatory reading materials will be provided at the kickoff and in advance of each session. Working group team members will be requested to prepare for each workshop through their review of the materials prepared for the each meeting.

Primary Resources: The following resources will be provided to the various domain working groups to guide the State Plan Review Process:

- **State of Minnesota defined requirements:** These requirements and information include all relevant requirements captured from statewide stakeholders over the course of the MnFCP. This data desired coverage requirements, network capacity, device types, applications, subscription costs, and other relevant information.
- **The Minnesota NPSTC Launch Requirements:** The IDC and other stakeholders reviewed and refined the original NPSTC (National Public Safety Telecommunications Council) launch requirements delivered to FirstNet representing a minimal list of FirstNet launch objectives.
- **The FirstNet State Plan Template:** FirstNet published the State Plan Template within their Request for Proposal (RFP) to select a commercial partner. This template provide a comprehensive overview and the expected content in the State Plan, and will guide working groups to prepare for the draft State Plan review.
- **The FirstNet Draft State Plan:** The draft State Plan will include the approach for implementing the NPSBN within Minnesota and will contain typical service level agreement (SLA) content including device options, cost of service and a variety of elements that will be evaluated by the domain working groups.

In closing, thank you for your interest in supporting the Minnesota State Plan Review Process. Please let us know if you have further questions, and complete the attached form to select your preferred domain working group(s) interest not later than September 30, 2016. Please forward replies and inquiries to Melinda.Miller@state.mn.us and/or Mark Navolio (mnavolio@televate.com)

Sincerely,

Melinda Miller
State Program Manager, FirstNet
Deputy StateWide Interoperability Coordinator
Emergency Communications Networks
Work: 651-201-7554
Cell: 651-245-2182

State Plan Decision Process
Working Group Preference

Please use the form to provide detailed contact information and to select the State Plan Decision Process domain Working Group(s) that you are volunteering to support.

Please return the form to one of the following MnFCP team members:

- Melinda Miller, State Program Manager, FirstNet: Melinda.Miller@state.mn.us
- Mark Navolio, MnFCP Project Manager (Televate): mnavolio@televate.com

Contact Information

Name: _____

Agency:_____

Jurisdiction: _____

Phone Number: _____

Email Address: _____

State Plan Decision Process Working Groups

Check each domain Working Group that you are volunteering to support with an "X".

_____ Technical Working Group

_____ End User/Operations Working Group

_____ Business Process Working Group