2017–2018 BIENNIAL REPORT
2019–2021 STATEWIDE EMERGENCY COMMUNICATIONS BOARD STRATEGIC PLAN

DEPARTMENT OF PUBLIC SAFETY
DIVISION OF EMERGENCY COMMUNICATION NETWORKS

CONTENTS

CELEBRATE THE PAST, FOCUS ON THE FUTURE

The Minnesota Department of Public Safety division of Emergency Communication Networks (DPS-ECN) has experienced many changes in the past two years. As you compare this biennial report to our last submission you will see how far we've really moved forward in advancing public safety communications throughout Minnesota and beyond. It truly is a good time to celebrate the past and focus on the future.

ECN has plenty to be proud of as we achieved many milestones. In March 2017, the Integrated Public Alert and Warning System (IPAWS) program celebrated its five year anniversary in Minnesota, as the Statewide Emergency Communications Board (SECB) honored five of the founding members. That same month, the First Responder Network Authority (also known as FirstNet) announced a 25 year partnership with AT&T to develop a dedicated national public safety wireless broadband network for first responders. Seven months later, Governor Mark Dayton announced that Minnesota would opt in to FirstNet. 2017 went out with a bang as ECN deployed statewide Text-to-911 service in December using a regional approach. The deployment was the culmination of years of diligent work with public safety partners, wireless carriers and vendors. This involved installing capable software and hardware, developing technical and operational standards, training telecommunicators in all public safety answering points (PSAPs), and testing the system's functionality.

In January 2018, I was both humbled and honored to take the helm of ECN as we bid a fond farewell to former Director Jackie Mines. This past year offered many building blocks for our programs. A broad cross section public safety professionals (representing all seven Minnesota governance regions) convened under the leadership of a professional facilitator and the ECN leadership team to participate in constructing the 2019 – 2021 SECB Strategic Plan, which will serve as the guiding force to collectively move all of our initiatives forward for the next three years. In May 2018, the State of Minnesota finalized the contract with FirstNet, effectively paving the way for public safety agencies to consider using the service. Adoption considerations are now underway in many jurisdictions across the state. ECN continues to deploy individual PSAPs with Text-to-911 service. ECN staff proudly accepted a Minnesota State Government Innovation Award (SGIA) for the deployment of Text-to-911 in August 2018. ECN was also pleased to lead three regional leadership meetings which provided an opportunity to address communications ideas, issues and initiatives with our diverse group of public safety stakeholders throughout the state.

And in November 2018, I was happy to announce the appointment of Dan Craigie as ECN's first deputy director. His background serves him well, as he continuously demonstrates himself to be an excellent leader for our team and our public safety partners. With new hires in 2018, the talented and dedicated ECN team is now fourteen members strong.

As we pause briefly to celebrate the milestones achieved over these past two years, we continue to look forward to those yet to come. We encourage you to review our accomplishments, the scope of our work, and consider the 2019 – 2021 SECB Strategic Plan initiatives, which are located behind the tab in this report.

Thank you,
Dana Wahlberg, Director
Emergency Communication Networks

DIVISION OVERVIEW

The Department of Public Safety's Division of Emergency Communication Networks (DPS-ECN) funds and supports interoperable public safety grade mission-critical communication solutions that allow 911 telecommunicators, emergency services personnel, state, local and federal agencies to communicate easily with each other to provide an immediate response to Minnesota citizens and visitors in an emergency.

SERVICES PROVIDED

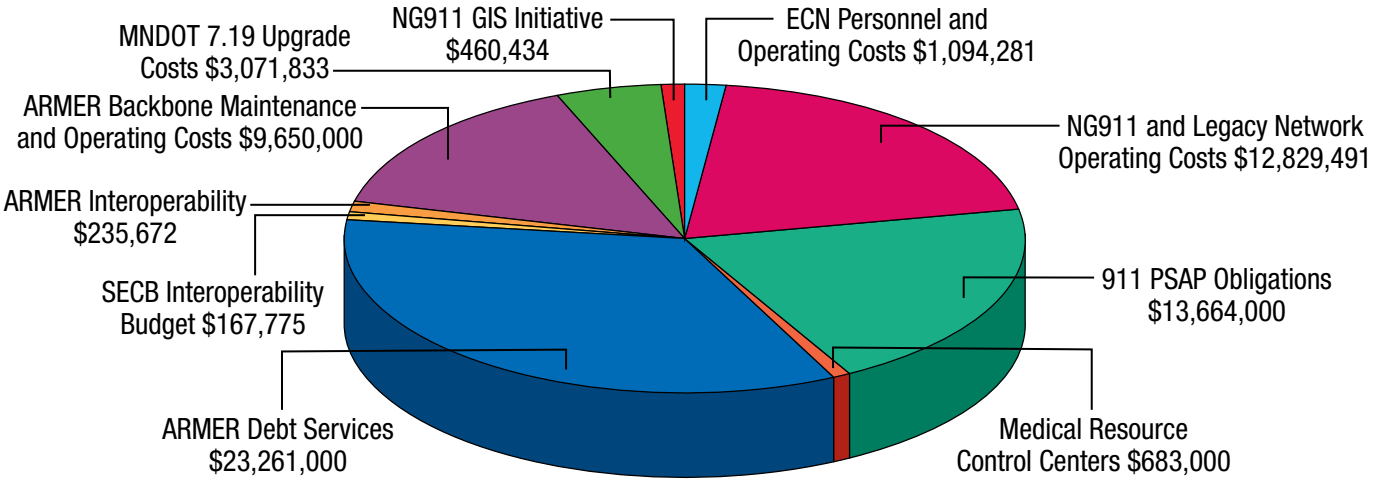
- Managing the state-of-the-art voice and data 911 communications backbone to 100 percent of Minnesota residents and visitors who request emergency assistance.
- Deploying the statewide Text-to-911 system to serve as a primary contact option for the deaf, deaf blind and hard of hearing as well as an alternative option to calling 911 in an emergency.
- Achieving 95 percent or better mobile radio coverage across all rural and metro counties. This enables emergency responders to communicate seamlessly with each other, as well as with every PSAP while responding to an emergency.
- Overseeing the implementation of a dedicated Wireless Broadband service for public safety across Minnesota under the First Responder Network Authority (FirstNet).
- Overseeing IPAWS to ensure all citizens and visitors to Minnesota receive notification to take a specific action during an event to keep themselves safe.
- Building and supporting an environment of interoperability across emergency communication platforms.
- Grant dollars to local governments to purchase necessary equipment for emergency responders.
- Applications to support comprehensive region-wide training and exercises for emergency responders.
- Support the established statewide and regional emergency communications governance structure to ensure each user has a voice in how Minnesota's interoperable public safety systems function through collaboratively developed and implemented standards.

OPERATING EXPENSES

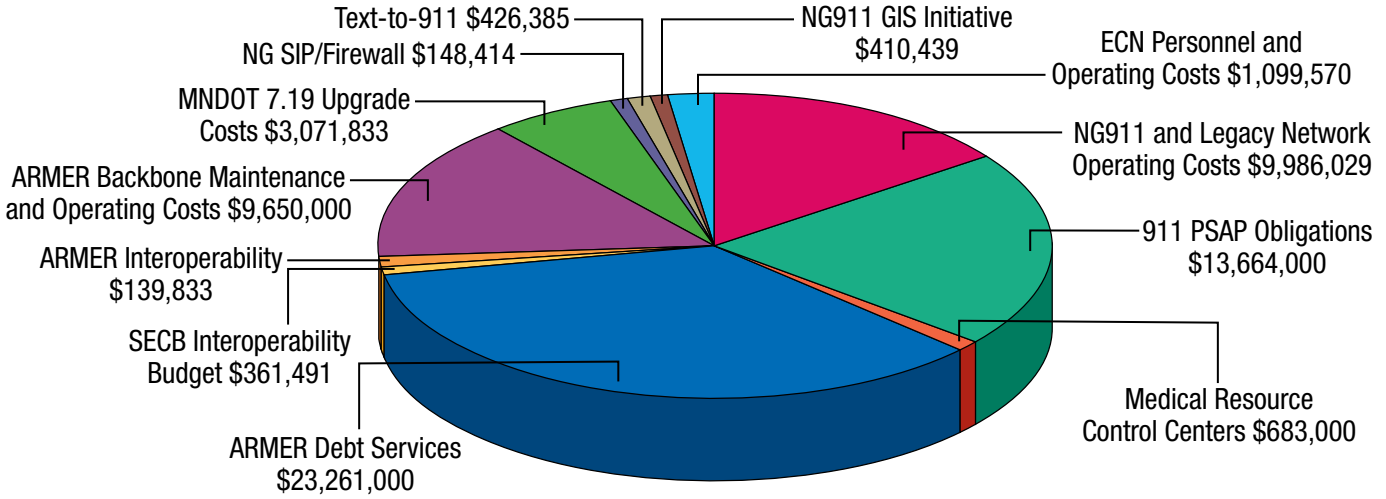
DPS-ECN programs are funded with revenues collected from a 911 fee paid by every Minnesota telephone communications customer and deposited in the 911 Special Revenue Account. Those funds support:

- The statewide 911 program.
- The Next Generation 911 (NG911) network backbone, new features and functionality.
- Equipment and dispatch proficiency expenses for Minnesota PSAPs.
- Debt service on revenue bonds sold to construct the statewide public safety land mobile radio system known as ARMER.
- The ARMER backbone maintenance and operation costs.
- The statewide wireless broadband program.
- The Integrated Public Alert and Warning System.
- Minnesota's Interoperability program.
- The Statewide Emergency Communications Board (SECB).

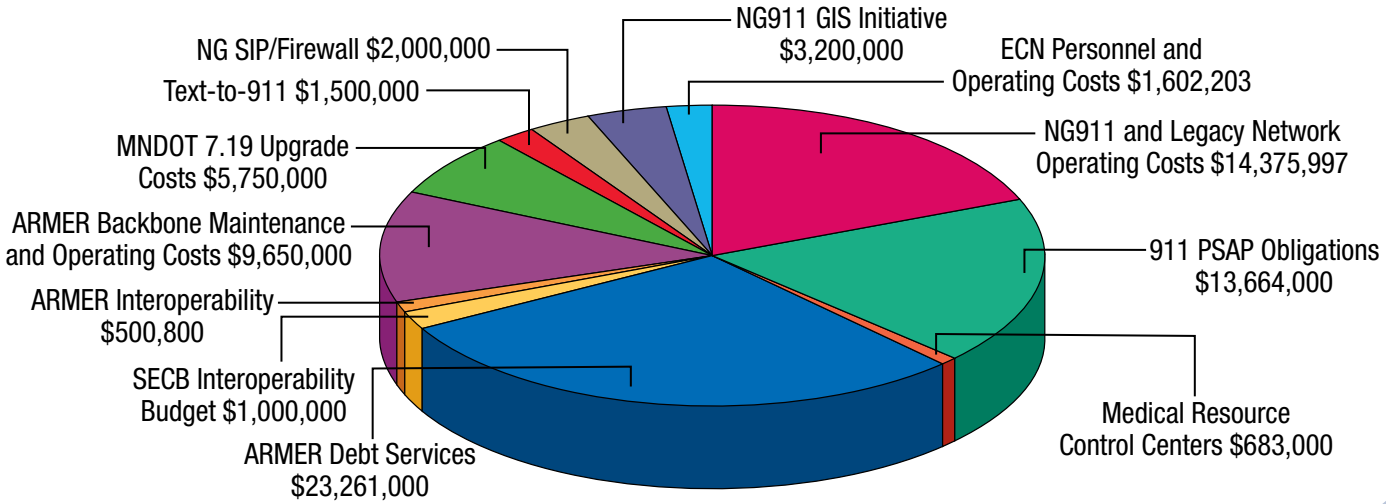
FY 2017 ACTUAL EXPENSES



FY 2018 ACTUAL EXPENSES



FY 2019 PROJECTED EXPENSES



STATEWIDE 911

NEXT GENERATION 911

Next Generation 911 (NG911) is faster, more flexible and resilient compared to the original 911 platform used by the public for more than 50 years. NG911 in Minnesota currently allows for both voice calls and text messages to 911. Eventually, it will allow for photos and videos to be sent from the public, as well as for crash data sent from vehicles equipped with telematics devices through the 911 system and on to emergency responders.

The backbone network to implement NG911 features to all 102 Minnesota PSAPs is available now, but complete transition to NG911 involves much more than just new network and equipment. Full implementation includes incorporating services into 911 that Minnesotans have come to depend on in daily life aspects, as technology advancements continue to be made. This includes, for example, the statewide Text-to-911 system as well as improving location accuracy of 911 calls using a statewide geospatial database.

TEXT-TO-911

Minnesota's Text-to-911 system turned one in December 2018. ECN launched the statewide service using regional PSAPs on December 5, 2017. Since then, ECN has received dozens of stories about the ways this service has helped many Minnesotans, including those who are deaf and hard of hearing.

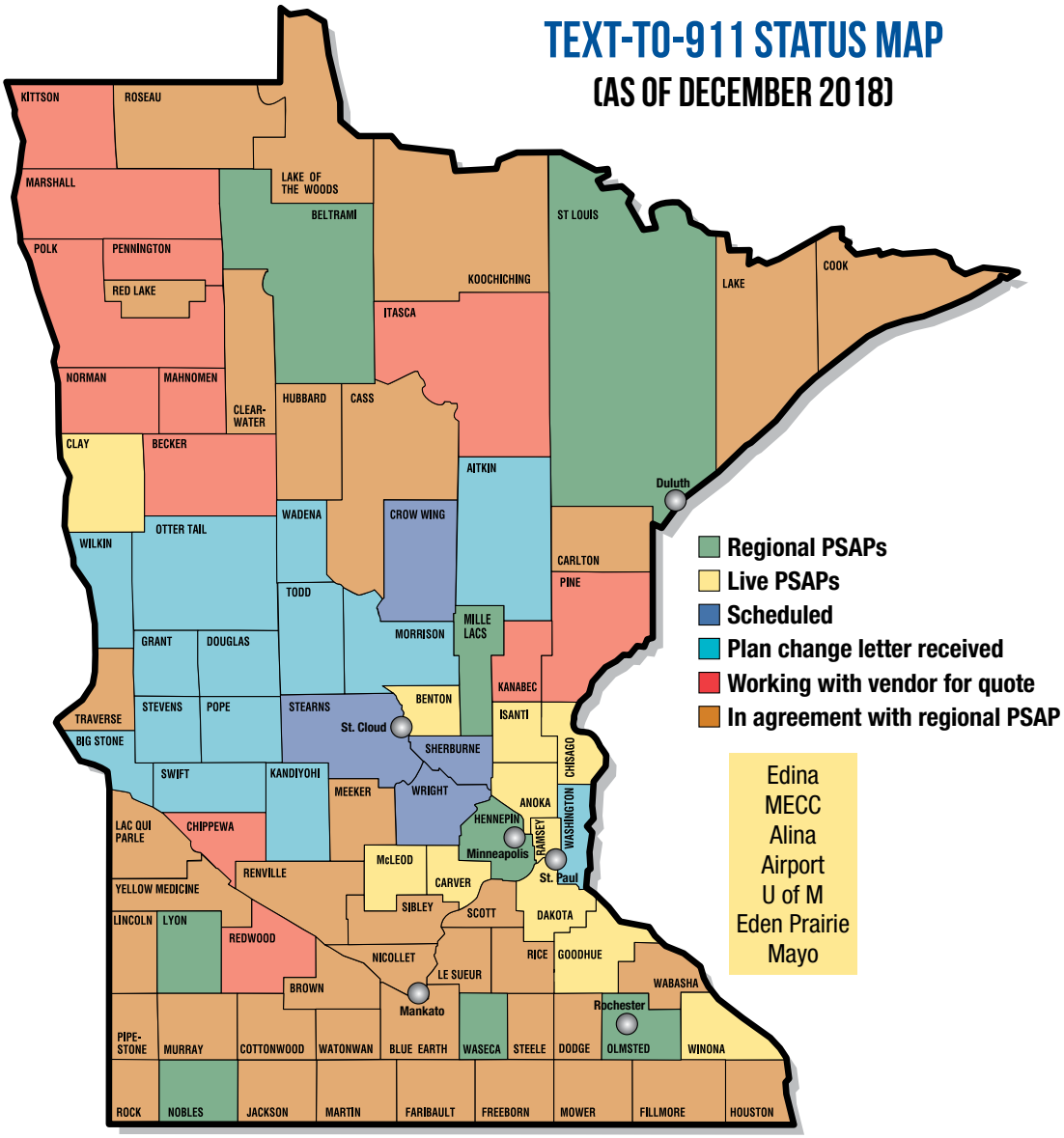
Here are some examples:

- A group of deaf boaters became stranded on a lake when their motor gave out, just as temperatures started to drop on a late fall evening. They texted 911 and were rescued by DNR conservation officers.
- A deaf driver saw a vehicle in front of her lose control on the ice. She was able to pull over and text 911 for help.
- A hunter got lost in the woods on a cold night and didn't have enough signal strength to call 911, but did have enough to text 911.
- A kidnapped woman texted 911, leading to her captor's arrest.
- Children who were afraid of being overheard when calling 911 have texted 911 when their parents were in a verbal or physical conflict.

Twenty-five PSAPs successfully became Text-to-911 capable across Minnesota in the first year. More PSAP implementations are scheduled every month throughout 2019.

In its first year of service (December 2017-2018) telecommunicators answered 4,860 texts for help. That's an average of 373 texts to 911 per month and is consistent with what was predicted, based upon what other text deployed areas of the country are experiencing. It's clear, the public is heeding the slogan, "Call if you can, text if you can't."

TEXT-TO-911 STATUS MAP
(AS OF DECEMBER 2018)



GIS

More than 80 percent of 911 calls came from wireless devices in 2018 across Minnesota. As the general public grows accustomed to requesting GPS-driven ride share services down to exact geographical coordinates, the need for improved location accuracy of 911 calls/texts is expected.

Today, 911 call routing is based on a number of factors including your location, cell-tower affiliation (if using wireless), and phone number. The goal of ECN's NG911 Geographic Information Systems (GIS) project is to save lives. The new GIS dataset will provide the foundation for improved location validation for users, as well as faster and more accurate response for public safety as soon as carriers choose to send that information with the 911 call.

ECN has partnered with the Minnesota Geospatial Information Office (MnGeo) to upgrade the state's emergency 911 system using GIS data from counties, municipalities and tribal nations. This project is one of DPS-ECN's highest priorities in its 2019-2021 strategic plan. While GIS data has been used in a supporting role in PSAPs for a long time, as we move further along on the migration path toward end state NG911, GIS is being utilized in a primary role. Therefore, we are asking for a higher degree of accuracy than ever before.

STATEWIDE 911

2018 911 CALL VOLUMES	
VOIP Totals	144,451
Wireless Totals	2,353,055
Wireline Totals	426,813
Unknown Totals	11
Total Calls	**2,924,330**

2017 911 CALL VOLUMES	
VOIP Totals	136,377
Wireless Totals	2,305,030
Wireline Totals	473,202
Unknown Totals	11
Total Calls	**2,914,620**

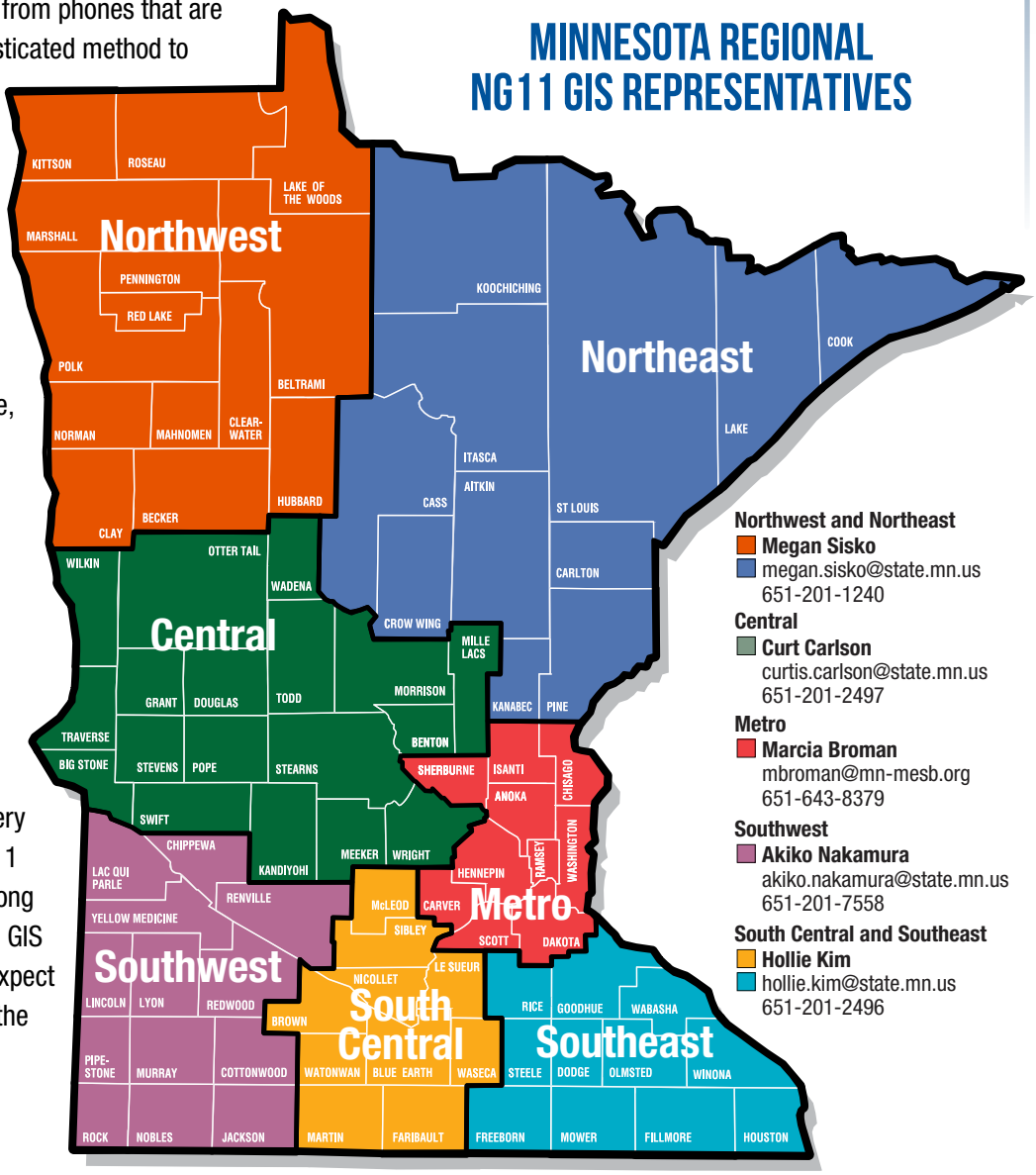
Currently, PSAPs and our 911 service provider use tabular data, such as the Master Street Address Guide (MSAG), to assist them to route calls. While tabular data is helpful, this technology was developed to locate callers from wireline devices located in a single static location before the introduction of mobile wireless and voice over internet protocol devices. With fewer than 20 percent of 911 calls originating from phones that are hard wired, we need a more sophisticated method to locate a 911 call/text. Our goal is to develop a single statewide GIS dataset to provide the foundation for next generation call routing, which will enable carriers to send accurate location information, regardless of the device. This data set will be seamlessly stitched together like a large puzzle, using a single set of standards.

NG911 GIS datasets will include:

- PSAP boundary polygons
- Emergency service response polygons
- Road centerlines
- Address points

You can find the status map for every county on ECN's website under "911 Program" and "GIS Information" along with the most recent version of the GIS newsletter. DPS-ECN and MnGeo expect that all GIS data will meet up with the NG911 infrastructure by 2021.

MINNESOTA REGIONAL NG11 GIS REPRESENTATIVES



Northwest and Northeast
Megan Sisko
megan.sisko@state.mn.us
651-201-1240

Central
Curt Carlson
curtis.carlson@state.mn.us
651-201-2497

Metro
Marcia Broman
mbroman@mn-mesb.org
651-643-8379

Southwest
Akiko Nakamura
akiko.nakamura@state.mn.us
651-201-7558

South Central and Southeast
Hollie Kim
hollie.kim@state.mn.us
651-201-2496

CYBERSECURITY FOR PSAPS

As PSAPs become more connected to the public, to various systems serving the public, and each other, the importance of having firewalls is increasingly important. NG911 systems are based on internet protocol (IP) networks that are increasingly and deliberately being targeted and attacked. Safeguarding the PSAPs and the NG911 core services is paramount. Having firewalls to protect the call handling equipment to the internet, to the 911 network, and to other inter-connected networks is the primary defense.ECN is in the process of implementing a managed service offering which includes the purchase, configuration, installation, management and ongoing monitoring of firewalls to provide protection including intrusion prevention and intrusion detection for all 102 Minnesota PSAPs.

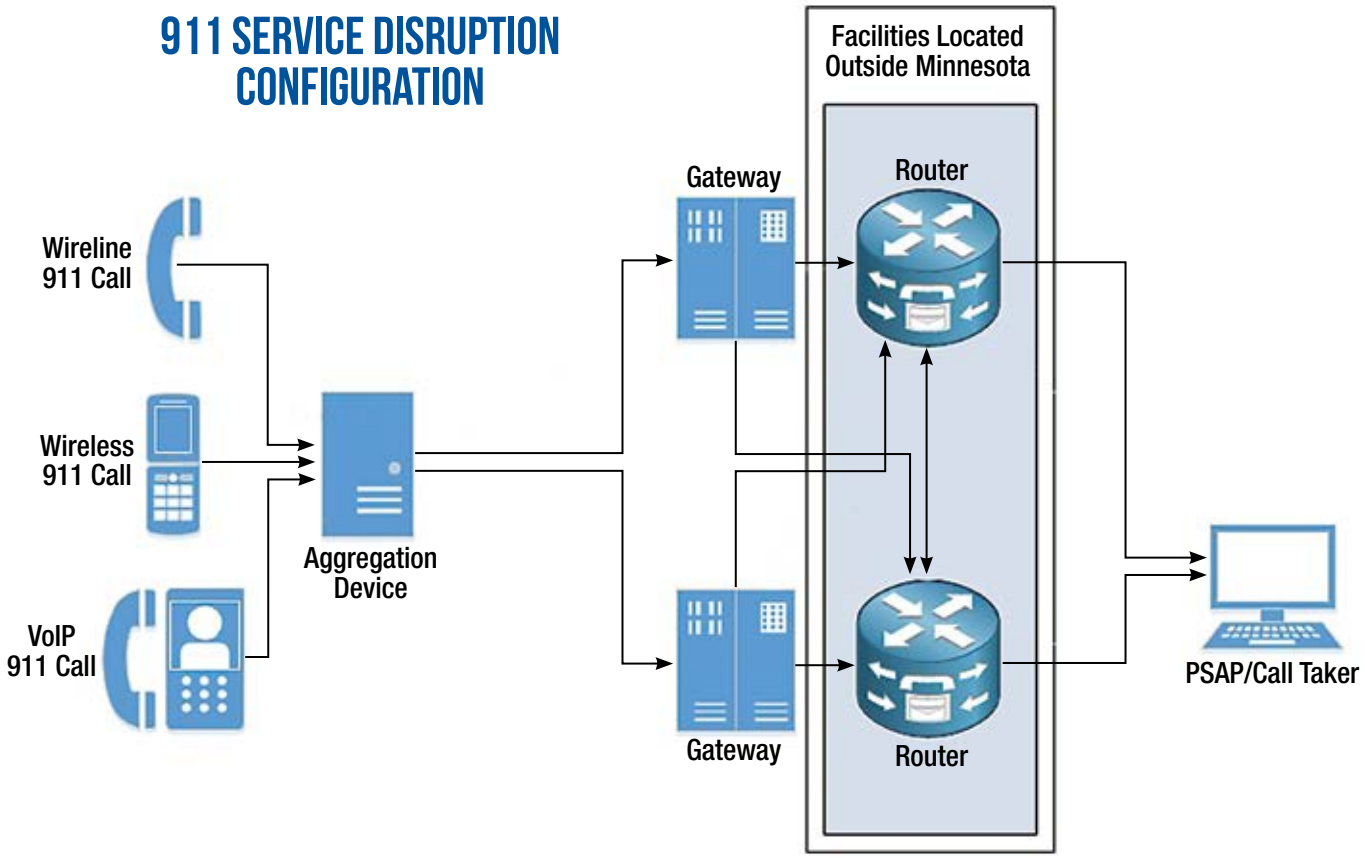
SERVICE DISRUPTION

ECN continues to work with our state contracted 911 vendor (CenturyLink) and their subcontractor (West Safety Services) on remediation efforts following a significant service disruption on August 1, 2018. The 65 minute disruption affected 74 PSAPs and resulted in 693 failed calls to 911. During that same time, 356 calls to 911 were successfully routed to Minnesota 911 PSAPs through a redundant router.

CenturyLink reported that an employee of West Safety Services made a mistake while making a routine network configuration change outside the maintenance window. This error prevented 911 calls from being accepted in Minnesota, North Carolina and North Dakota.

The service disruption resulted in an investigation by the Minnesota Public Utilities Commission. The findings of that investigation recommended that CenturyLink engage in meetings with ECN to improve its procedures and protocols during 911 service disruptions.

911 SERVICE DISRUPTION CONFIGURATION



LAND MOBILE RADIO: ALLIED RADIO MATRIX FOR EMERGENCY RESPONSE (ARMER)

ARMER is a robust, scalable land mobile radio (LMR) system serving as the primary voice communications tool for the majority of state, county and local public safety entities in Minnesota. ARMER is a Motorola Smart Zone trunked radio system operating in the 800 MHz radio spectrum. ARMER was first built in the Twin Cities in 2004, then in St. Cloud and Rochester, and has since migrated throughout the rest of the state. The Minnesota Department of Transportation (MnDOT) owns the core infrastructure providing the ARMER backbone and 95 percent mobile coverage, as measured county-by-county.

STATUS

Currently, 99 percent of the ARMER towers are complete. MnDOT had identified 335 sites for ARMER towers and repeaters. To date, 333 of those sites are "on the air." The two remaining sites are delayed due to land acquisition challenges. One of the "on-the-air" sites is in a temporary location; site construction and a move are pending. Complementing the state-built infrastructure are nearly 100 local enhancement tower sites that were built and are maintained by local entities.

ARMER CONSTRUCTION BUDGET

ARMER CONSTRUCTION BUDGET STATUS AS OF NOVEMBER 1, 2018

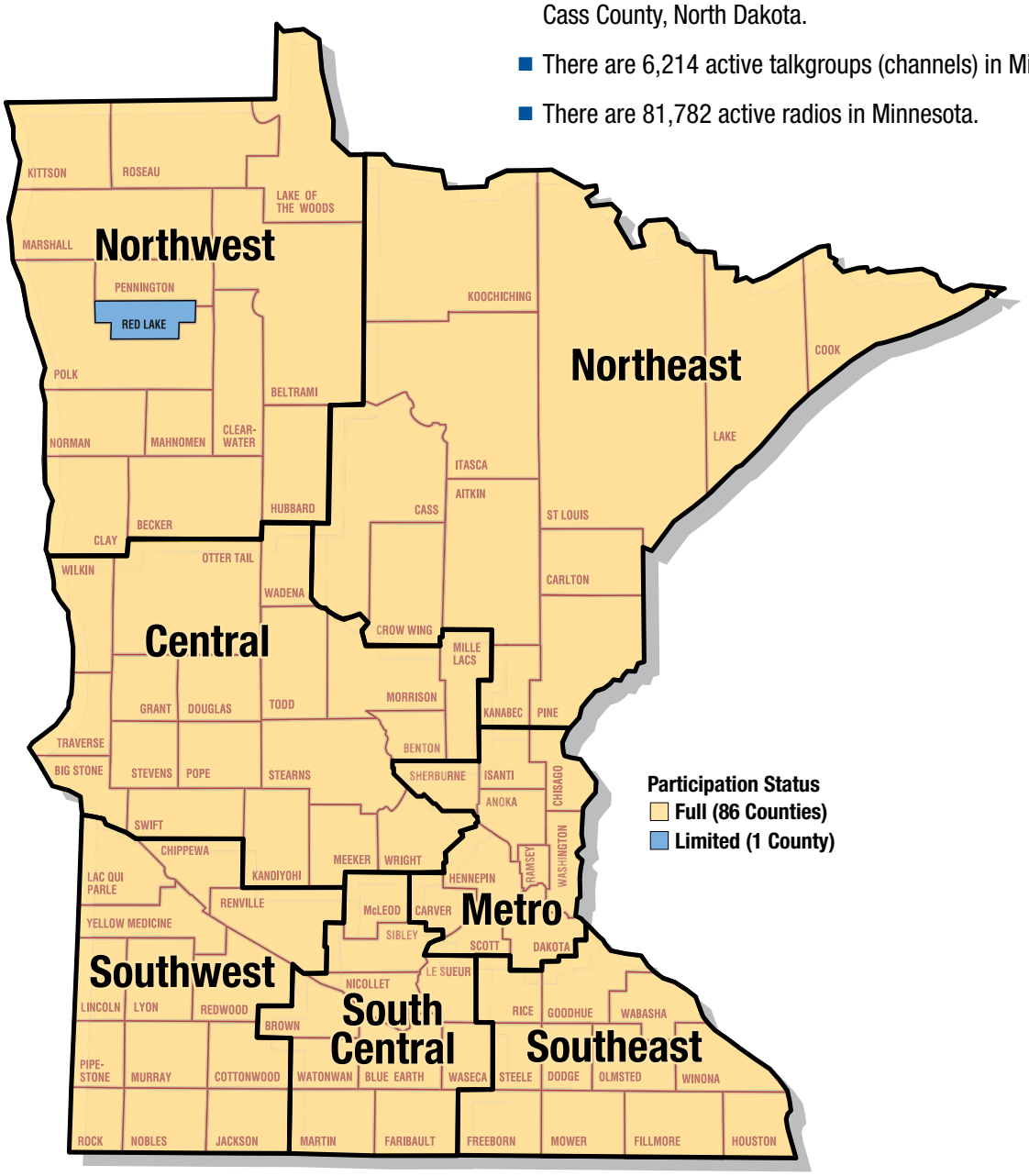
Project Funding	Original Budget	Spent to Date	Unspent Balance Remaining	Encumbered	Available Balance
Phase 3	$45,000,000.00	$44,952,397.19	$47,602.82	0.00	Complete
SRB Funds (FY 09)	$1,902,831.00	$1,902,831.00	0.00	0.00	Complete
Phase 456 (FY 09)	$61,996,957.89	$61,996,957.89	0.00	0.00	0.00
Phase 456 (FY 10)	$62,015,407.77	$62,005,047.77	$10,360.00	$10,360.00	0.00
Phase 456 (FY11,12,13 Bonds)	$61,987,634.34	$59,414,487.34	$2,573,147.00	$320,757.00	$2,252,390.00
Total Phase 456	$186,000,000.00	$183,416,493.00	$2,583,507.00	$331,117.00	$2,252,390.00
Project Contingency as of November 1, 2018					**$347,390.00**

Entities using ARMER file a participation plan with the Statewide Emergency Communications Board (SECB) and, when approved, enter into an agreement to operate under MnDOT's FCC license. Of Minnesota's 87 counties, 86 have requested and have received full participant status from the SECB. One county maintains its legacy VHF radio system and interoperates with its neighbors using ARMER under a limited participation plan.

The SECB has supported keeping the ARMER system upgraded to protect the large investment and avoid a potentially significant one-time upgrade cost in the future. The State of Minnesota is currently in a five-year Security Update Services (SUS), Software Maintenance Agreement (SMA), and System Upgrade Agreement (SUA) contract with Motorola. This contract runs through 2020.

PARTICIPATION

- 86 of 87 Minnesota counties are full participants plus Cass County, North Dakota.
- There are 6,214 active talkgroups (channels) in Minnesota.
- There are 81,782 active radios in Minnesota.



WIRELESS BROADBAND

FirstNet®

The status of FirstNet in Minnesota has changed dramatically over the past two years as it transitioned from a conceptualized idea to an actual service. This was the result of collaborative work between ECN and FirstNet as they led: countless engagements with public safety partners, hundreds of workgroup hours to evaluate Minnesota's State Plan, and dozens of workshops as agencies considered adopting into the National Public Safety Broadband Network (NPSBN) a dedicated wireless broadband network for first responders.

OPTING IN TO FIRSTNET

In October 2017, Gov. Dayton announced that Minnesota would opt in to FirstNet, becoming the 23 state to do so. The decision paved the way for AT&T and FirstNet to begin building the network, at no cost, to taxpayers.

The first decision was to establish AT&T's existing network as part of that deployment. This made FirstNet fully deployed when the network core came on line in March 2018. A five year implementation process was established to best serve rural coverage needs with strong oversight from the First Responder Network Authority.

IMPLEMENTATION TIMELINE

The implementation process will kick off its third year of a five year deployment in March 2019.

- Phase one: FirstNet implemented the network core and provided access to all of AT&T's spectrum in March 2018.
- Phase two: Selection of 23 public safety determined locations. All sights in MN upgraded to 4G service including band class 14 spectrum access. It included 21 new tower locations on the air.
- Phase three: Includes enhanced features — like WiFi calling, small cell deployment, multiple in-multiple out functionality, carrier aggregation and other services progressing to 5Ge and 5G in MN. This is providing speeds of 400MB to 1GB across the state.
- Phase four: Along with continued network improvements, mission critical push-to-talk will be available.
- Phase five: Public safety will see additional features such as broadcast technology and enhanced location-based services.

FirstNet established a 25 year contract with AT&T. This provided for an ever-evolving and advancing network for public safety. The First Responder Network Authority has invested in communications research to continually evolve broadband communication across the nation. Minnesota has a large share of first responders that use other carriers for their wireless broadband needs. ECN will continue to advocate for the communication requirements of the state and its first responders regardless of the carrier they choose. Interoperability across all carriers will be an on-going goal for this organization.

WHAT'S NEXT?

ECN continues to see advancements in technology including: sensors worn by first responders to situational awareness tools that keep incident commanders informed.

ECN is kicking off a user group in 2019 to discuss coverage expansion, devices and mobile applications, as well as considerations for cybersecurity and governance.

PUBLIC ALERT AND WARNING: INTEGRATED PUBLIC ALERT AND WARNING SYSTEM (IPAWS)

In 2017, Minnesota IPAWS transitioned to ECN and John Dooley was named ECN's first IPAWS program manager. Following that transition, IPAWS continues to flourish with additional jurisdictions becoming approved alerting authorities, and additional training, testing and outreach taking place.

BY THE NUMBERS

The following jurisdictions are approved IPAWS alerting authorities in Minnesota:

- 74 counties
- DPS (Bureau of Criminal Apprehension and HSEM)
- City of Minneapolis
- Metropolitan Airport Communications Center

There is still more work to be done. As of this report, 13 Minnesota counties have yet to become an IPAWS alerting authority.

TRAINING, EXERCISING, TESTING

As more counties became IPAWS capable, the need for training grew. In 2017, online training modules offered by Alexandria Technical Community College were released. One year later, IPAWS program manager John Dooley set out on a statewide tour to conduct 14 training workshops, resulting in an additional 196 trained public safety personnel. That brings the total to 514 trained personnel since the inception of the training program in November 2015.

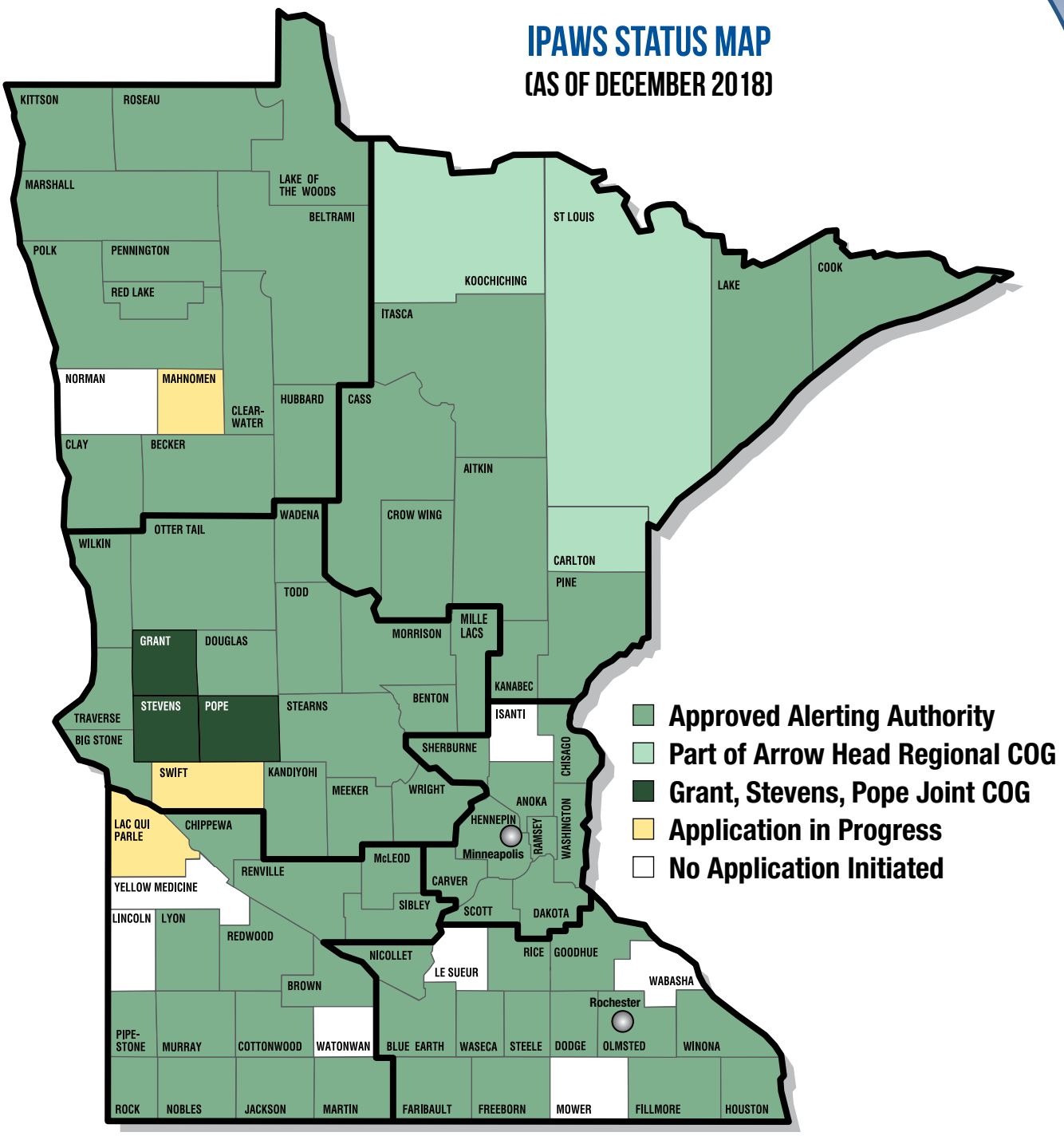
In addition, 10 Emergency Alert System (EAS) participant workshops were held in 2018, with 129 people in attendance to understand their responsibilities, address system-wide issues, and become informed about upcoming changes.

Exercising these capabilities has also become paramount. In October 2017, the IPAWS program was utilized in a real-time exercise that translated public alerting information for dissemination in four primary languages (English, Spanish, Hmong and Somali) on Twin Cities Public Television (TPT) channel 2.5. This first-of-its kind exercise used a simulated radiological emergency to issue an EAS test message on that channel.

In June 2018, Stevens County participated in a live code test after months of local, state, federal and wireless carrier coordination. A carefully crafted test message was sent out through Stevens County's alerting system (CodeRed). The goal was to validate how far a message sent by Wireless Emergency Alert (WEA) would actually travel outside its intended target audience and to evaluate how EAS participants were following guidance within the State EAS plan. Overall public response to the test was positive, with over 230 residents responding to a survey sent out after the test. Most of the comments offered an appreciation that the test was completed, and they feel confident they will be warned of impending danger rapidly.

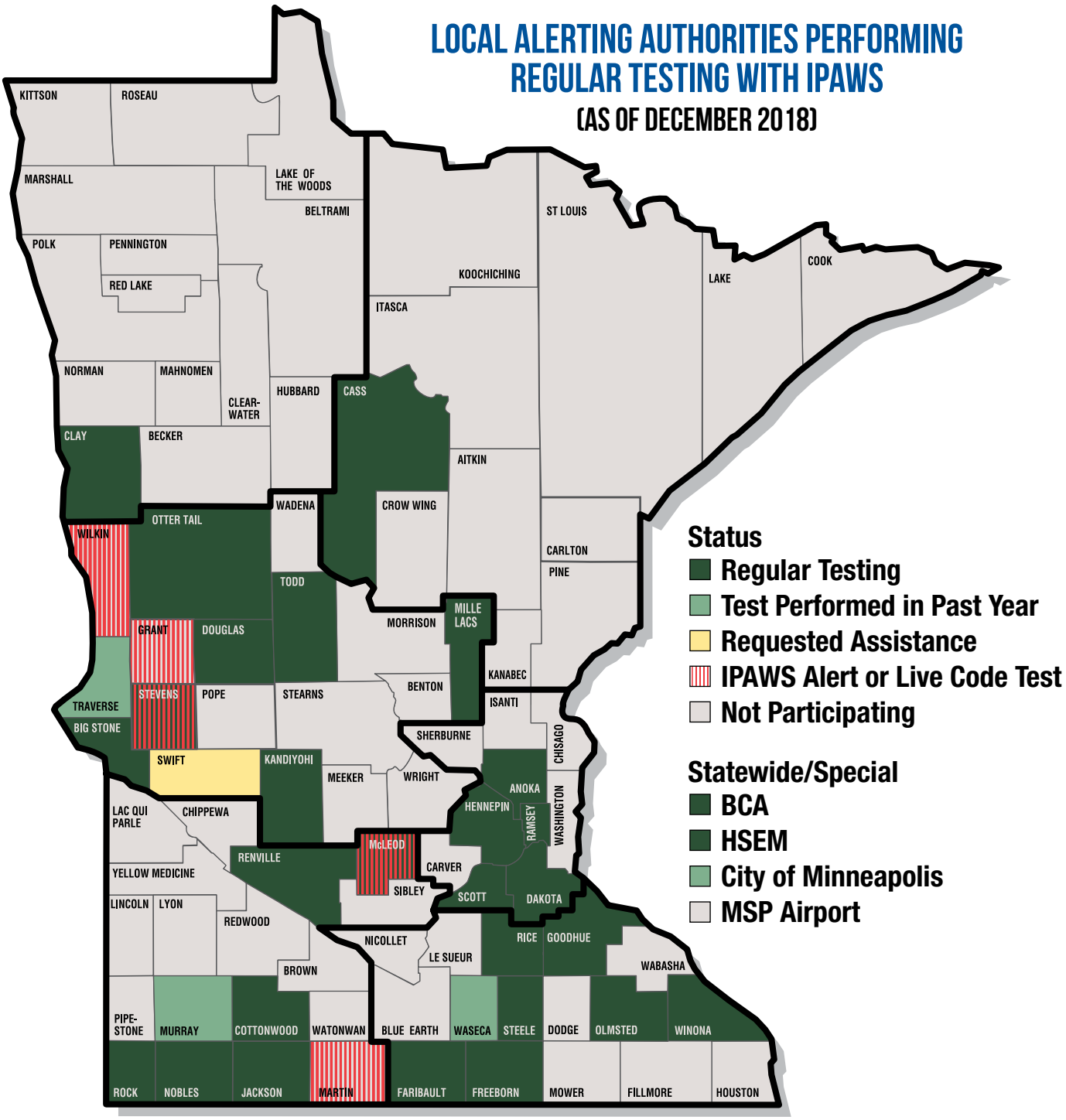
A strong emphasis was placed on regular system testing and training for local officials. In July 2018, ECN began tracking jurisdictions that were testing on a consistent basis. Congratulations to all the counties highlighted in dark green (map on page 13) for consistently testing and insuring that, when needed, they can send an important message to the public.

IPAWS STATUS MAP
(AS OF DECEMBER 2018)



LOCAL ALERTING AUTHORITIES PERFORMING REGULAR TESTING WITH IPAWS

(AS OF DECEMBER 2018)



Status

- Regular Testing
- Test Performed in Past Year
- Requested Assistance
- IPAWS Alert or Live Code Test
- Not Participating

Statewide/Special

- BCA
- HSEM
- City of Minneapolis
- MSP Airport

INTEROPERABILITY

There is an increased need for Minnesota's PSAPs and emergency responders to exchange information within and across their own disciplines. This is called interoperability and it can help emergency responders save lives.

Minnesota has adopted many federal recommendations for improved interoperability, including:

- Employing a statewide interoperability coordinator (SWIC).
- Engaging a Statewide Executive Interoperability Committee (SEIC).
- Following a Statewide Communications Interoperability Plan.
- Adhering to the U.S. Department of Homeland Security's Interoperability Continuum.
- Maintaining a Communications Unit program.

To work successfully, interoperability must include more than just technology sharing. It requires a sophisticated governance structure, standard technical and operational procedures, as well as training and practice. Interoperability solutions must also be incorporated into day-to-day use to ensure they will be effective during major events.

Minnesota is actively taking a deeper look at interoperability across all four of ECN's program disciplines. Interoperable data is garnering significant attention. Many of us use our telephones to text or to consume data more than we use them to make voice calls. Those same needs exist for public safety as well. How will we share and manage all of this data that is becoming available? How and for long will it be retained? What data is considered public?

911

Facing the need to replace aging 911 call handling equipment, PSAPs across the state turned to a novel approach to solve both technical and financial hurdles, while increasing interoperability at the same time. Termed "Customer Premise Equipment as a Service" (CPEaaS), PSAPs are able to avoid large capital expenditures by paying a monthly fee for hosted "next-gen" 911 call handling equipment. Not only does this save them money in the long run, it allows them a greater opportunity to share data and resources with neighboring counties and response authorities. In addition, any required software and hardware upgrades are applied to all system users, ensuring the same system versions are used.

Another development for interoperable communications for 911 revolves around Text-to-911 transfers between Minnesota and North Dakota. In late 2017, Minnesota rolled out Text-to-911 statewide, and it became obvious that text transfers between the two states was needed. While Minnesota and North Dakota have been able to transfer 911 voice calls for several years, the ability to transfer texts is a recent development and took coordination between the states, vendors and participating PSAPs.

LAND MOBILE RADIO

In November 2017, the SECB approved Minnesota's first Communications Unit (COMU) Standard Operating Guidelines (SOGs). With these new SOGs, Minnesota went from recognizing only Communications Unit Leaders and Technicians to recognizing six unique positions:

1. Communications Unit Leader (COML)
2. Communications Unit Technician (COMT)
3. Incident Communications Center Manager (INCM)
4. Incident Tactical Dispatcher (INTD)
5. Radio Operator (RADO)
6. Auxiliary Emergency Communications Specialist (AECS)

Overall, the health of Minnesota's COMU is very good, with many competently trained personnel who represent numerous public safety partners throughout the state.

Recognized COMU Personnel by Position and Region

The following table represents the number of state-recognized COMU personnel arranged by position and Emergency Communications/Services Board (ECB/ESB) region as of December 31, 2018.

RECOGNIZED COMU PERSONNEL

12/31/18	COML	COMT	INCM	INTD	RADO	AECS
Northwest						
Northeast	5	1				
Central	11	4				
Metro	35	12		2		6
Southwest	2					
South Central	3					
Southeast	4	2				
State*	2	1				
Total	**62**	**20**	**0**	**2**	**0**	**6**

*Statewide or multi-region jurisdiction

WIRELESS BROADBAND AND APPLICATIONS

Wireless broadband networks will provide opportunities for data sharing at greater speeds, which means more information can be shared in a timely manner. Communication speeds are continually improving with ultra-low latency. As capabilities expand, ECN is on target to guide public safety through these challenges within our strong governance structure. ECN's goal is to consider data integration between and amongst all of our programs, with the Wireless Broadband and Applications program taking the lead in providing this vision for the future of public safety communications in Minnesota.

FirstNet is fully implemented, but as with all technology, it is continually evolving. AT&T is expanding coverage and implementing the latest infrastructure to the radio access network. In addition to the work of AT&T, new software and device vendors are developing products for the public safety market. New public safety standards organizations are informing these vendors of the needs of first responders.

IPAWS

IPAWS received some unexpected media attention in 2018 following two national events. The first? A false alert sent by Hawaii's Emergency Management Agency in January, warning people of a ballistic missile threat. The false alarm had people in Minnesota wondering if the same thing could happen here. Program Manager John Dooley conducted several media interviews, assuring the public that the approval process in Minnesota is stringent enough to prevent an errant message from being sent to the public. The second? The first nationwide test of the WEA system. Read about that test in the Communications and Outreach section of this report

Looking forward, The SECB IPAWS committee is:

- Drafting a cross-border warning standard to enable jurisdictions to be able to draw a polygon across their jurisdictional border to cover an incident or reach the nearest cellular carrier tower in the neighboring jurisdiction.
- Reviewing the current statewide over-the-air distribution plan and looking for possible improvements.
- Assessing the impact the proposed FCC rule change will have on the State EAS Plan.

Marcus Bruning

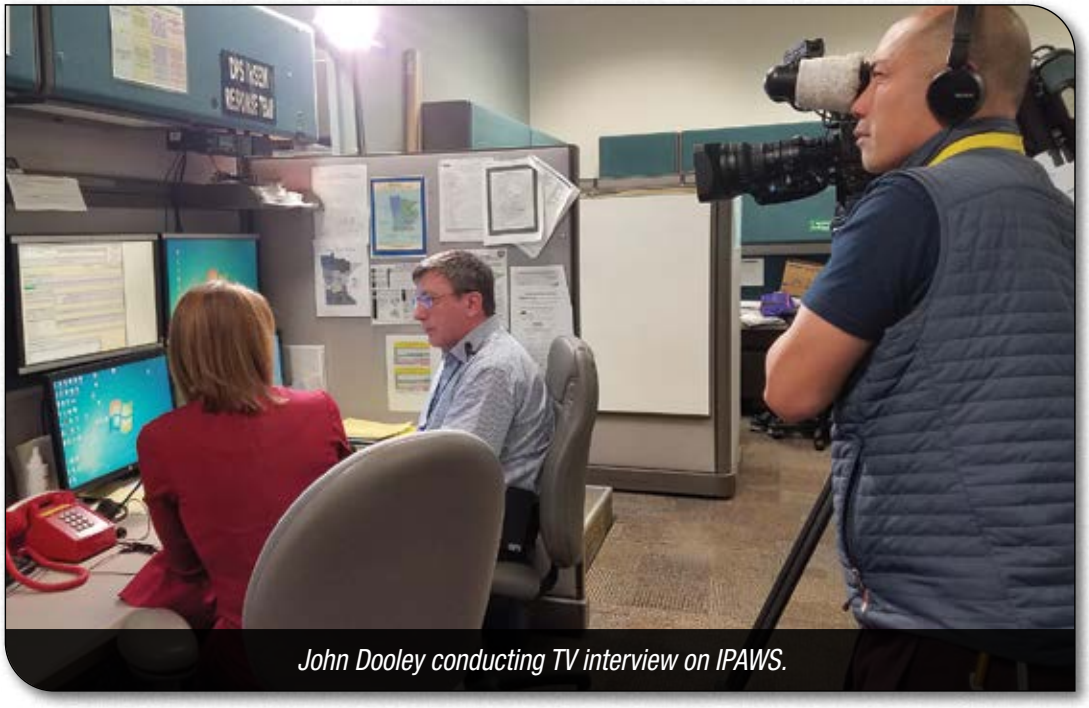
Steve Tait

MEET OUR REGIONAL INTEROPERABILITY COORDINATORS

In October 2018, ECN completed the contract process to acquire two Regional Interoperability Coordinators (RICs) for the next five years.

Marcus Bruning returned as the Northern RIC, supporting the Northeast, Northwest and Metro regions. Steve Tait also joined the team to support the Southeast, South Central, Southwest and Central regions. We are excited to have Marcus and Steve on board.

As RICS, Bruning and Tait are actively engaged in their respective regions. This includes providing education and outreach opportunities to all stakeholders in support of ECN and the SECB Strategic Plan.



John Dooley conducting TV interview on IPAWS.

COMMUNICATIONS AND OUTREACH

TEXT-TO-911

ECN's Text-to-911 deployment included a robust outreach campaign, not only for the general public, but for deaf, deaf blind and hard of hearing Minnesotans who may use the service as a primary contact option in an emergency. Leading up to the eployment, ECN worked with public safety stakeholders, as well as deaf and hard of hearing advocates, to educate people on the campaign's slogan: "Call if you can, text if you can't."

The campaign included the launch of a dedicated Text-to-911 website which served as a central source of information, including:

- When Text-to-911 should be used.
- Instructions on how to text 911.
- What information texting individuals should provide to telecommunicators.
- Challenges and limitations of the service.

Deployment of Text-to-911 took place on December 5, 2017 and included a news conference with public safety as well as deaf and hard of hearing partners. Media members were also given a demonstration of the system.

Outreach and education efforts led to ECN's first-ever paid media campaign which included: billboards across the state, paid ads online and on TV, as well as signage in skyways, bars and restaurants. This campaign launched after the deployment and spanned the several weeks in early 2018 when millions of visitors came to the Twin Cities for Super Bowl LII. Data shows the "Call if you can, text if you can't" paid media campaign reached more than 17 million people in just four weeks.

HOMELAND SECURITY INFORMATION NETWORK

Over the past two years, ECN has identified a new platform to exchange information with our public safety partners. HSIN (Homeland Security Information Network) is a secure website for sensitive documents. It has served as a repository for tracking ARMER system administrators, talkgroup history and radio count approvals. This platform also supports other ECN programs, such as Interoperability, IPAWS and Wireless Broadband.

PLEASED TO MEET YOU, VIRTUALLY!

As ECN embraces emerging technologies for public safety, it's also making great strides in public education and outreach through its social media and web pages. ECN's Twitter account has grown considerably, thanks to increasd interest in our evolving programs such as Text-to-911 and FirstNet. ECN garnered more than 320 followers in just the first 2.5 years of establishing its account. You can find ECN on Twitter at: @MnDPS_ECN.

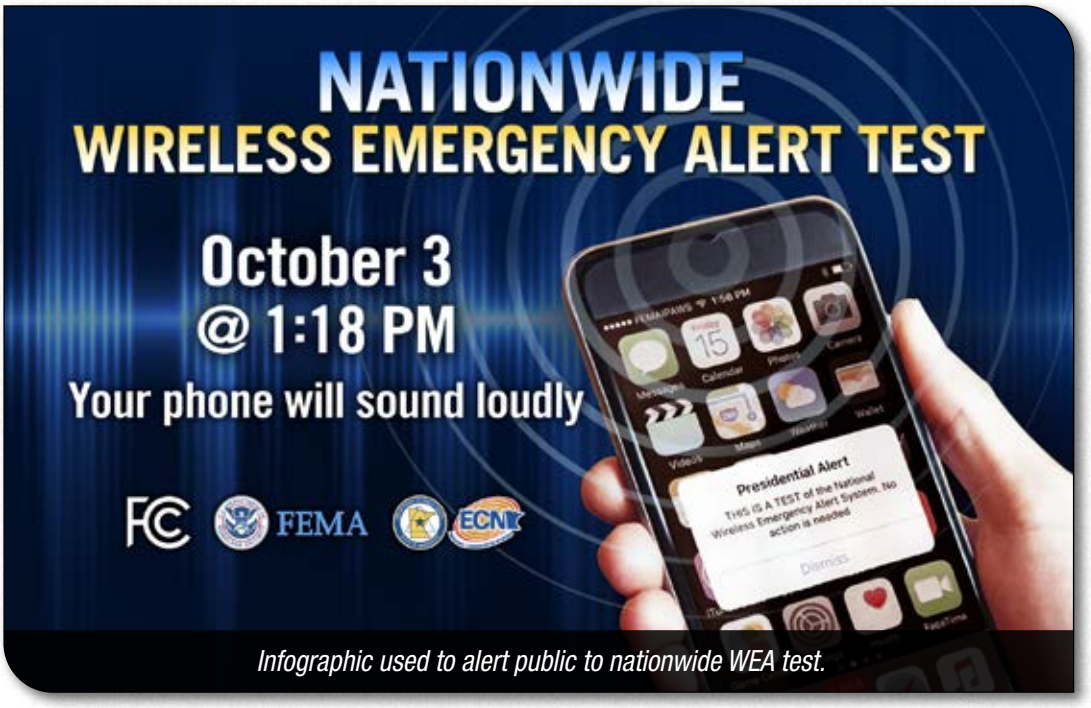
ECN's Facebook page also grew to more than 1,400 fans by the end of 2018. That's a nearly 1,600 percent increase since 2015. You can find ECN on Facebook at: facebook.com/MinnesotaECN/.

NATIONWIDE TEST OF THE WIRELESS EMERGENCY ALERT SYSTEM

For the first time in our nation's history, cell phones across the country sounded at approximately the same time on October 3, 2018. The tones were part of the first-ever nationwide test of the WEA system. In the weeks leading up to the test, the Office of Communications (OOC) launched a public information campaign to educate Minnesotans about the test and the purpose of using WEAs in an emergency. The goal?

- To answer common questions that the public had about this capability.
- To outline the protocols and procedures in using the system.
- To assure the public that this was only a test.

A blog on this topic, posted just two days before the nationwide test, garnered more than 4,000 views. This engagement accounted for half of the monthly views to the DPS blog website.



Infographic used to alert public to nationwide WEA test.


SECB

Noted below are definitions used to identify a goal, strategy or tactic, as well as details of acronyms.

- Goal: The end you hope to accomplish in a given period of time.
- Strategy: The broad approach you will pursue to achieve the goal.
- Tactic(s): The specific action steps you will take to implement the strategy.

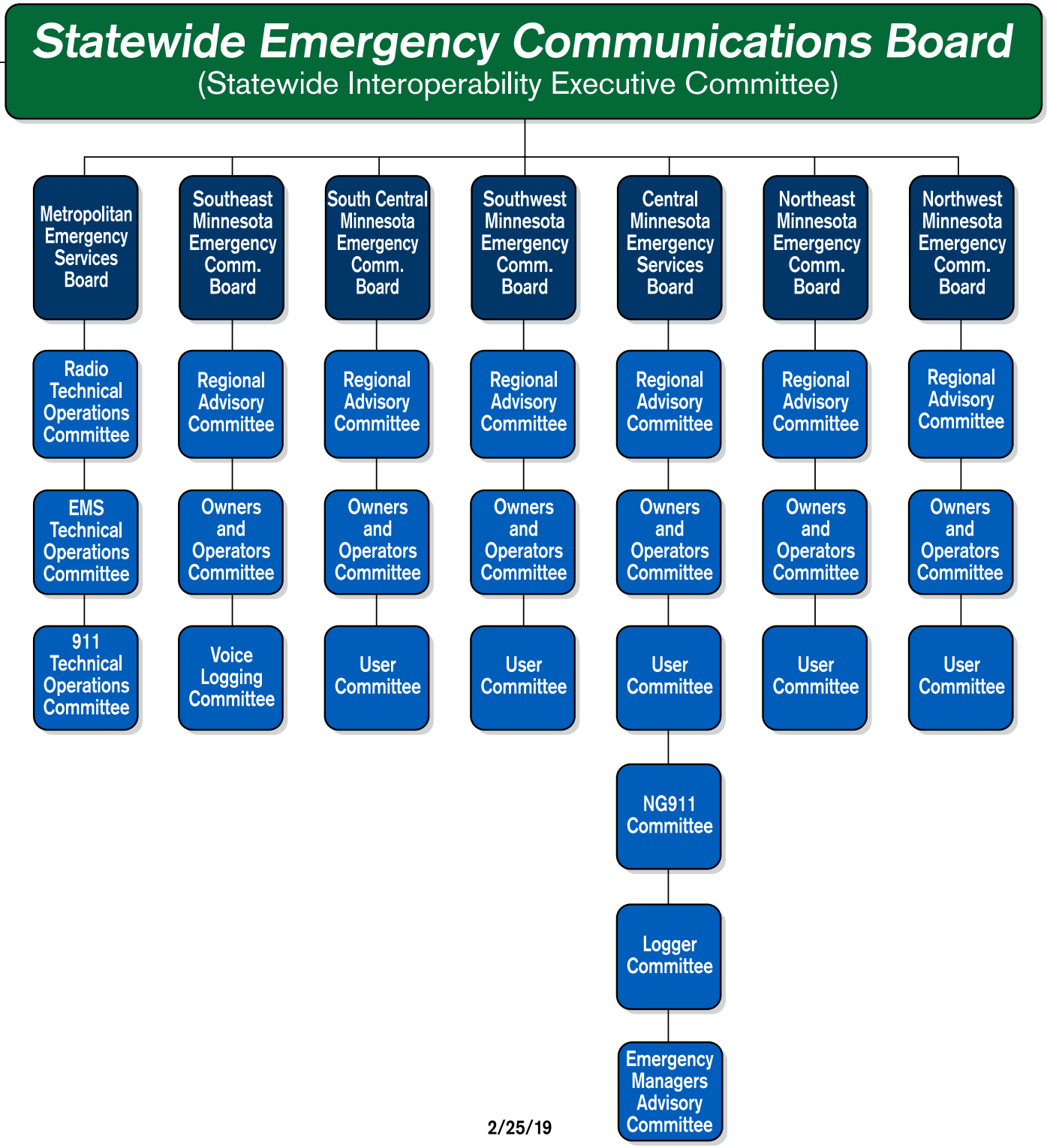
ALI	Automatic Location Identifier
ARMER	Allied Radio Matrix for Emergency Response (Minnesota's LMR System)
CAD	Computer-Aided Dispatch
COMU	Communications Unit
CPE	Customer Premise Equipment
CPEaaS	CPE as a Service
CSRIC	Communications Security, Reliability and Interoperability Council
DBH	Device-Based Hybrid
EAS	Emergency Alert System
ECN	Minnesota Department of Public Safety, Emergency Communication Networks Division
ECRF/LVF	Emergency Call Routing Function/Location Validation Function
ESInet	Emergency Services IP Network
FEMA	Federal Emergency Management Agency
GIS	Geospatial Information System
HSIN	Homeland Security Information Network
i3 FE	i3 Functional Elements
ICAM	Identity Credentialing and Access Management
ICS	Incident Command System
IPAWS	Integrated Public Alert and Warning System
ISSI	Integrated Sub-System Interface
LDB	Location Database
LEP	Limited English Proficiency
LMR	Land Mobile Radio
LNG	Legacy Network Gateway
LSR	Legacy Selective Router
LTE	Long-Term Evolution
MLTS	Multi-Line Telephone System
MnDOT	Minnesota Department of Transportation
MSAG	Master Street Address Guide
NCSWIC	National Council of Statewide Interoperability Coordinators
N-DEx	National Data Exchange (FBI tool for exchanging data)
NENA	National Emergency Number Association
NG911	Next Generation 911
NGCS	Next Generation Core Services
NPSTC	National Public Safety Telecommunications Council
OSP	Originating Service Provider
PS/ALI	Private Switch/Automatic Location Identifier
PSAP	Public Safety Answering Point
QPP	Quality of Service Priority and Preemption
RECCWG	Regional Emergency Communication Coordination Working Group
RFP	Request for proposal
RIC	Regional Interoperability Coordinator
SAFECOM	Not an acronym (Department of Homeland Security project)
SECB	Statewide Emergency Communications Board
SIP	Session Initiation Protocol
SLIGP	State and Local Implementation Grant Program
SOP	Standard Operating Procedure
WBB	Wireless Broadband
WEA	Wireless Emergency Alerts

VISION

The safety of Minnesota's emergency responders, citizens and visitors is accomplished through the state-of-the-art interoperable public safety communications systems.

MISSION

Enable emergency responders and citizens to communicate easily and respond immediately in critical emergency situations by providing reliable and robust systems for interoperable communications across counties, state, federal and tribal regions.


Statewide Emergency Communications Board
(Statewide Interoperability Executive Committee)
Metropolitan Emergency Services Board
Radio Technical Operations Committee
EMS Technical Operations Committee
911 Technical Operations Committee
Southeast Minnesota Emergency Comm. Board
Regional Advisory Committee
Owners and Operators Committee
Voice Logging Committee
South Central Minnesota Emergency Comm. Board
Regional Advisory Committee
Owners and Operators Committee
User Committee
Southwest Minnesota Emergency Comm. Board
Regional Advisory Committee
Owners and Operators Committee
User Committee
Central Minnesota Emergency Services Board
Regional Advisory Committee
Owners and Operators Committee
User Committee
NG911 Committee
Logger Committee
Emergency Managers Advisory Committee
Northeast Minnesota Emergency Comm. Board
Regional Advisory Committee
Owners and Operators Committee
User Committee
Northwest Minnesota Emergency Comm. Board
Regional Advisory Committee
Owners and Operators Committee
User Committee
2/25/19

Goal 1: Evaluate technology to provide optimal systems to secure paramount public safety solutions for Minnesota citizens, visitors and emergency responders.

NEXT GENERATION 911

NG911 Strategy

Create a statewide GIS dataset to support location-based routing for all current technology devices to 911 that will enable first responders to locate a caller with more speed and accuracy.

TACTICS

■ Initiate and complete GIS-based MSAG trial with current NG911 vendor.	Q1 2019
■ Complete the construction of statewide PSAP polygons to be used for call routing.	Q1 2019
■ Complete construction of aggregated statewide geospatial datasets.	Q1 2019
■ Develop ongoing data maintenance processes. — Implement data maintenance processes.	Q1 2019 Ongoing
■ Reach point of fully validated statewide geospatial datasets (98 percent accuracy).	Q4 2019
■ Have GIS data ready for i3 elements ECRF/LVF implementation.	Q4 2021
■ Develop plan for LDB implementation. — Maintain interoperability for carriers utilizing legacy data processing.	Q4 2021 Throughout Transition
■ Allow access to shared data as appropriate. — Complete statewide 911 data viewer.	Ongoing Q1 2019

NG911 Strategy

Migrate OSPs from LSRs to LNGs or NENA-defined i3-compliant SIP connections to the MN ESInet. Decommission LSRs once migration is complete. (Phase 4)

TACTICS

■ Resize carrier networks to ensure optimum number of trunks into the 911 network.	Q2 2019
■ Complete due diligence process to determine OSP interconnection and ESInet ingress options.	Q2 2019
■ Complete, negotiate and award RFP for OSP interconnection.	Q4 2020
■ Prepare RFP for NGCS (revise previous NG911 contract strategy to include this). — Initiate development of RFP content creation.	Q4 2021 Q1 2019
■ Perform outreach and education to local and national carriers regarding OSP interconnection.	Ongoing

NG911 Strategy

Upgrade network to PSAPs that meet the newly developed NENA ESInet design guidelines.

TACTICS	
■ Complete due diligence process to compare existing network against the NENA ESInetdesign guidelines.	Q1 2019
■ Complete and report on a trial of a network configuration that adheres to NENA's ESInet design guidelines.	Q2 2019
■ Work with vendors to identify and communicate minimum network requirements for hardware and software at the PSAP to support i3 elements.	Q4 2019
■ Investigate network requirements necessary to support workload sharing and continuation of operations.	Q2 2020
■ Include cybersecurity initiatives and goals during network implementations.	Ongoing

NG911 Strategy

Implement handset-based or device-based hybrid (DBH) coordinating routing for wireless calls.

TACTICS	
■ Define and trial required solutions that will deliver improved location information to be transmitted to the PSAP.	Q2 2019
■ Trial methods of coordinate-based (handset, tower or DBH) routing with carriers and third-party entities.	Q4 2019
■ Evaluate trial results to identify the best available technology for location-based routing.	Q1 2020
■ Work with Tier 1 carriers to enable best available location technology.	Q3 2020
■ Continue to support and enhance wireless call routing processes until initiatives under this strategy are met.	Ongoing

NG911 Strategy

ECN to implement or encourage shared services such as CPEaaS or shared CAD systems/integrations on a statewide level.

TACTICS	
■ Perform cost study on a statewide platform for sharing CAD data.	Q3 2019
■ Prioritize grant funding for projects that emphasize shared technologies and/or cross-vendor interoperable solutions.	Ongoing

LMR

LMR Strategy

Evaluate ongoing lifecycle sustainment needs for the statewide ARMER system in collaboration with MnDOT to determine the best approach for system maintenance and software updates.

TACTICS	
■ Identify and review benefits of software update packages offered beyond version 7.19.	Q1 2019
■ Identify costs associated with each software package and determine whether the value is in line with the cost. Establish value proposition by requiring itemized pricing from vendors and comparing prices with other states and systems.	Q1 2019
■ Determine whether funding is available for each software package beyond version 7.19.	Q1 2019
■ Evaluate adding a data component to the ARMER network.	Ongoing

LMR Strategy

Promote the physical and cyber security for the ARMER system.

TACTICS	
■ Create a workgroup and assign it with identifying opportunities and creating a work plan for improving the cyber and physical security of ARMER.	Q4 2020
■ Develop a timeline and procedure for refreshing ARMER encryption keys.	Q4 2020
■ Ensure that all new technology features are vetted through the established governance review process.	Ongoing

LMR Strategy

Update standards.

TACTICS	
■ Update ARMER specific standards" to "SECB standards" and establish method for identifying and categorizing standards specific to other program initiatives.	Q2 2019
■ Identify and merge or modify existing ARMER standards that contain duplicate or contradictory information.	Ongoing

LMR Strategy

Review LMR best practice resources.

TACTICS	
■ Update LMR best practices to emphasize best talk group or conventional channel selections for the event.	Q4 2019
■ Review existing best practices to identify strengths and weaknesses of existing guides.	Ongoing
■ Educate LMR users on updated best practices.	Ongoing

WIRELESS BROADBAND

WBB Strategy

Ensure the needs of the wireless broadband system, according to the Minnesota Needs Assessment Report, to guarantee access and interoperability in high-demand situations regardless of carrier.

TACTICS	
■ Create a WBB user group.	Q1 2019
■ Collaborate with Steering Committee, to include a designated Minnesota Indian Affairs Council membership on the SECB as well as on SECB committees and workgroups.	Q2 2019
■ Evaluate a basic toolbox of applications to encourage application interoperability across borders (mutual aid).	Q2 2019
■ Administrate SLIGP 2.0 grant.	Q1 2020
■ Evaluate tools for drive testing to have a better understanding of wireless coverage in the state, including a long-term plan for robust coverage evaluation.	Q2 2020
■ Advocate for Minnesota's requirements that were filed with the FirstNet Authority, including accurate coverage and capacity maps.	Q2 2021
■ Verify preemption testing.	Ongoing
■ Continue consultation with the FirstNet Responder Network Authority.	Ongoing
■ Engage tribal public safety and leadership.	Ongoing
■ Advocate for Minnesota stakeholders.	Ongoing

IPAWS

IPAWS Strategy

Promote statewide deployment and adoption of IPAWS to facilitate emergency communication to the public when the need arises. This alerting system is capable of disseminating a WEA and EAS messaging to individuals within a designated geographic area in situations requiring those in harm's way to take protective action, during events such as an active shooter scenario, a train derailment, or nuclear power plant incident.

TACTICS: OUTREACH

■ Develop and promote shared regional alerting partnerships.	Ongoing
■ Through presentations and workshops, promote best practices guidance and expand on what constitutes an IPAWS alert and when a message should be sent through a community notification system.	Q3 2019

TACTICS: TRAINING

■ Determine what continuing education training is necessary to stay abreast with national system operation changes.	Ongoing
■ Develop universal SOP template for local jurisdiction adoption.	Q3 2019
■ Develop staffing and training standards for shared usage.	Q2 2019
■ Develop template for building and testing guidance.	Q3 2020

TACTICS: TECHNICAL ASSISTANCE

■ Develop standards for multi-language alerts, including templates for messaging jurisdictions with over 5 percent LEP.	Q3 2020
■ Develop standards to review all broadcast alerts, intentional or unintentional, for appropriateness): — Provide corrective action as needed. — Provide feedback to alerting authority. — Provide event summary to EAS participants.	Q1 2019
■ Further develop planning and guidance to implement changes in the WEA and EAS.	Q2 2019

TACTICS: FUNDING

■ Continue to fund IPAWS as part of the allotment for mass notification systems through all recognized PSAPs 911 funding.	Ongoing

INTEROPERABILITY

Interoperability Strategy

Create methods for establishing interoperability amongst differing public safety communication platforms.

TACTICS	
■ Establish guidelines for interoperability between LMR (ARMER) and LTE networks.	Q2 2021
■ Evaluate ISSI as a potential statewide resource.	Q4 2019
■ Establish guidelines for data interfaces amongst public safety agencies.	Q2 2021
■ Establish on-going relationships with fusion centers and other public safety data warehouses to understand shared needs.	Ongoing
■ Evaluate feasibility of statewide CAD interoperability.	Q3 2019
■ Develop IPAWS tools for ICS leadership to include job aides and evaluation guidelines.	Q2 2019
■ Explore the value of a set of applications used statewide providing a common platform for key interoperability data needs.	Q2 2019
■ Explore existing government tools and applications to understand barriers preventing their use, such as N-DEx and HSIN.	Q4 2019
■ Explore tools and applications that are being marketed for public safety use to determine long term viability.	Ongoing
■ Continue to engage workgroups to further conversations such as standards, grants and training.	Ongoing

Interoperability Strategy

Support federal interoperability initiatives through participation in federal programs.

TACTICS	
■ Participate in federal committees and workgroups, including but not limited to: — NPSTC — NCSWIC — FEMA RECCWG — National 911 Program — FirstNet Authority — SAFECOM — CSRIC	Ongoing

Interoperability Strategy

Support the development of interoperable technical and/or operational plans, particularly for counties bordering another state or province or for those using disparate systems.

TACTICS	
■ Determine the future of Motobridge interoperability tool and identify steps to advance along that path.	Q4 2019
■ Work with border states to expand "edge match" geospatial dataset to improve call routing and enhanced mapping for location identification.	Q4 2021
■ Work with border states to allow IPAWS alerting across state borders.	Ongoing
■ Meet with border counties to evaluate current technical capability, awareness of capability and current interoperability plans.	Ongoing
■ Where technology exists and planning or awareness lacks, assist in the development of interoperable plans to support LMR interoperability.	Ongoing
■ Work with border states to allow 911 call/text transfer with ALI data between disparate networks.	Ongoing

Interoperability Strategy

Provide support for technology and personnel through the COMU and Strategic Technology Reserve programs.

TACTICS	
■ Identify funding needs and sources for upgrading or replacing existing Strategic Technology Reserve LMR technologies.	Q4 2019
■ Explore the viability of establishing a wireless broadband cache into Strategic Technology Reserve.	Q4 2019
■ Establish training and exercising expectations for Strategic Technology Reserve equipment.	Q4 2019
■ Develop ongoing maintenance and replacement schedules for Strategic Technology Reserve equipment.	Q4 2020
■ Provide support for COMU program by educating COMU personnel.	Ongoing
■ Maintain awareness of federal COMU guidance and strive to keep Minnesota's COMU program on leading edge.	Ongoing
■ Support exercising opportunities for COMU personnel.	Ongoing

Goal 2: Ensure adequate resources at the state and local levels of government to support current and emerging public safety communication technologies.

Strategy
Communicate the minimum technical requirements to all MN PSAPs for CPE and CAD to support i3.

TACTICS

■ Introduce minimum 911 technology standards for PSAPs via the NG911 Committee.	Q3 2020
■ Perform outreach to each region in order to communicate standards and provide feedback to PSAPs.	Q4 2021

Strategy
Evaluate funding alternatives to maintain a public safety communications platform.

TACTICS

■ Explore options such as user fees, prioritization, shared technology and other alternatives.	Q3 2019
■ Establish value proposition by requiring itemized pricing from vendors and comparing prices with other states and systems.	Ongoing

Goal 3: Ensure all stakeholders understand public safety communications and its critical role in all aspects of public safety.

Strategy
Provide increased outreach and education for enterprise/MLTS solution providers and system owners to properly integrate with 911.

TACTICS

■ Create a one-page fact sheet about PS/ALI services that PSAPs can use when working with MLTS solution providers and owners.	Q1 2019

Strategy
With SECB members, educate decision-makers about the criticality of public safety communication systems and changes necessitated by the changing technology behaviors of consumers.

TACTICS

■ Maintain ECN and SECB websites.	Ongoing
■ Educate public safety partners on the role of the SECB, Regional Emergency Communication Boards/Emergency Services Boards and ECN.	Ongoing
■ Support the RIC program.	Ongoing

Strategy
Define guidelines and recommendations for wireless broadband that are in alignment with pertinent federal, state and local goals.

TACTICS

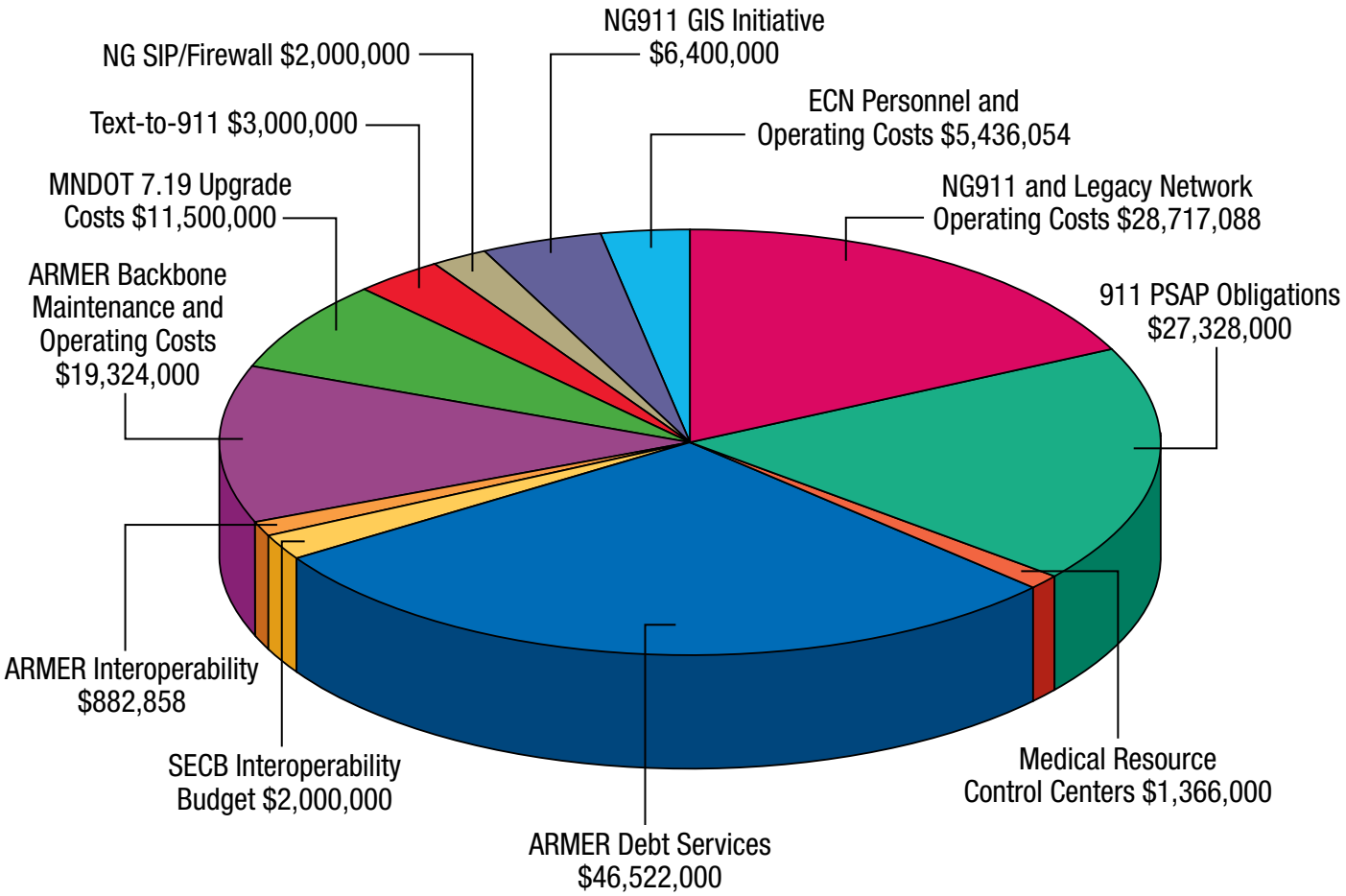
■ Create workgroups to develop recommendations and guidelines for wireless broadband.	Q2 2019
■ Develop wireless broadband recommendations and guidelines for ICAM, QPP, LTE talk groups and criminal justice data sharing on FirstNet and other wireless broadband requirements.	Q2 2019
■ Further develop roles of agencies, carriers and ECN.	Q2 2019

Strategy
Provide training opportunities to system users to ensure first-rate performance on new or infrequently used technologies.

TACTICS

■ ECN and Alexandria Technical College to review, update and expand training materials.	Ongoing

FY 20 – 21 PROJECTED EXPENSES



NOTES:

Minnesota Department of Public Safety
Division of Emergency Communication Networks
ecn.dps.mn.gov