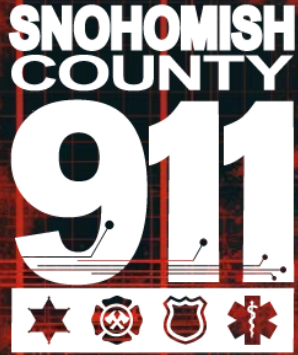




Radio Replacement Project

2025 Cutover Plan

**HELP
STARTS
HERE**



BACKGROUND

Snohomish County 911 is the technology hub for all county public safety agencies

Includes an integrated technology services team of 22, with 9 technicians specialized in Radio Communications

A vital lifeline for our community and 43 Fire/EMS, Law Enforcement, departments:

Serving: 844,000+ residents

20,000+ businesses

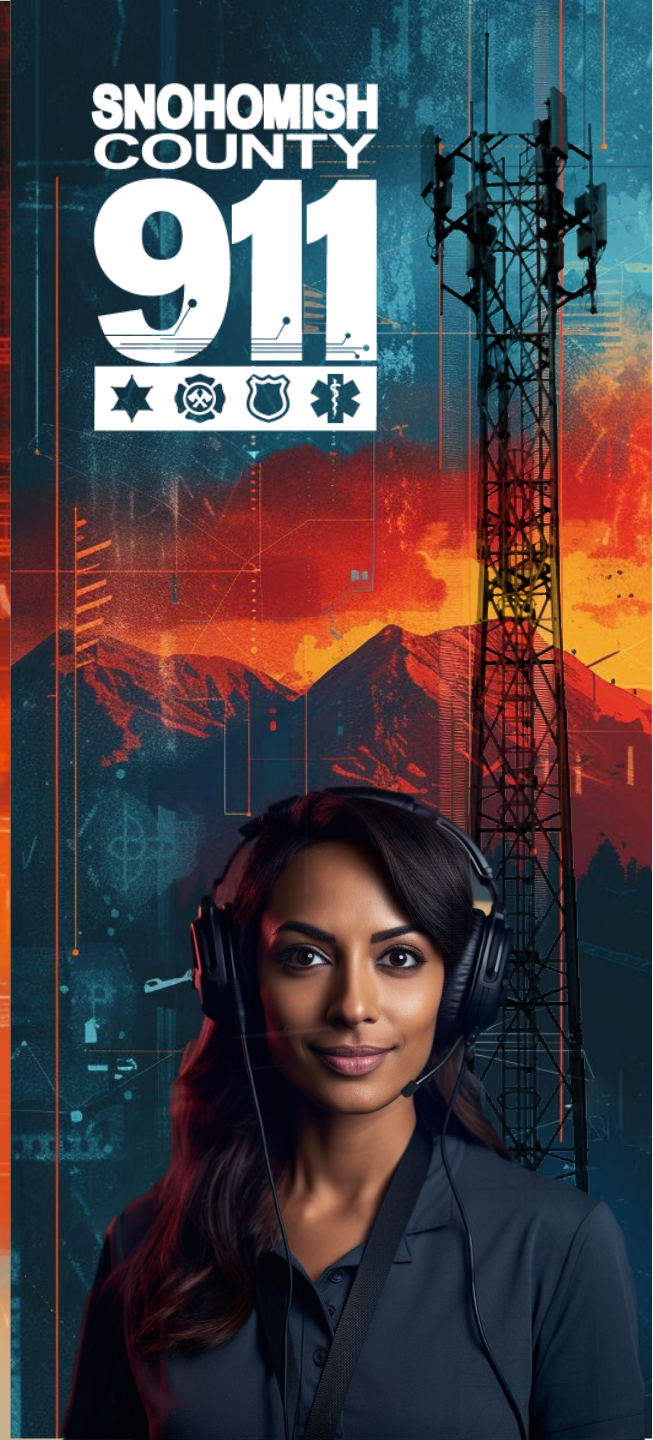
300+ Schools, hospitals and government facilities

Collaborating with Schools, regional and federal fire and police, numerous public/private partnerships

Covering 2,196 square miles of diverse terrain

Dozens of mutual aid partnerships incl. King, Skagit & Island Counties, US Coast Guard, and Washington State Patrol

**HELP
STARTS
HERE**



**SNOHOMISH
COUNTY**

911



What Does It Take To **ANSWER THE CALL?**

Agency handles over 1,500 911 calls/day

A team of 9 highly skilled/trained professionals provide and maintain the radio system:

- 5000+ radios used by Fire, Law Enforcement & EMS teams
 - Responding on land, water, and in the air
- 22 Integrated Emergency radio sites
- Backup Power systems including batteries & generators
- Paging system
- Microwave system
- Multi-Site redundancy
- Snowcat 'Sven' to ensure access to remote facilities

**HELP
STARTS
HERE**

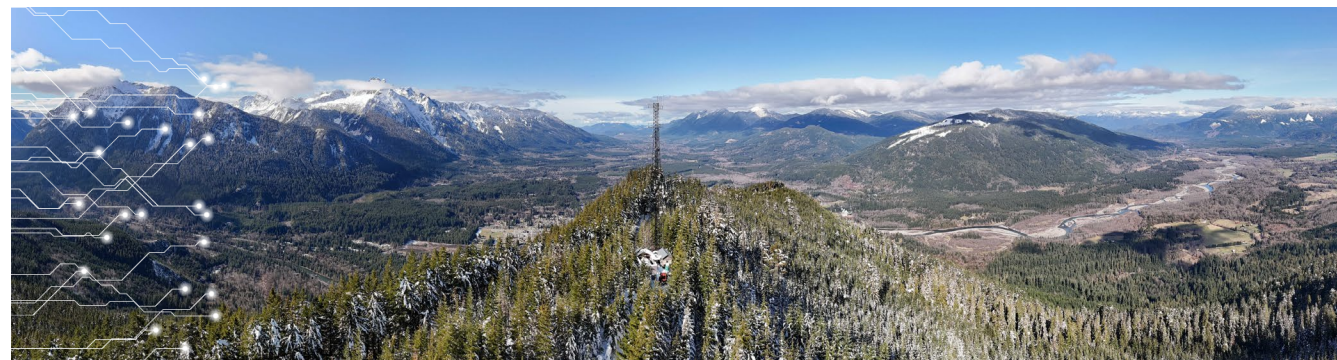
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911



THE CHALLENGE

- Legacy systems and equipment are at end of life
 - No manufacturer support
 - Finding spare parts from eBay
 - No software patches
- Cyber risk
- Inadequate local funds available to replace, repair, or add new equipment
- County growth requires system expansion
- Coverage challenges in rural areas



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THE SOLUTION SNAPSHOT

The 2018 Emergency Communications Systems and Facilities Sales Tax provides funding for:

- Full system replacement for all equipment at end of life
- \$23M to replace police and fire radios that previously would have been funded by individual agencies
- Funding to replace damaged, lost, or stolen equipment and normal wear and tear repairs
- Robust police/fire input and selection of equipment
- Fleet expansion to support community growth
- Funding for a full system replacement in 15 years
- Support for ongoing system maintenance & technical training
- Improvements to support interoperability with mutual aid partners

**HELP
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THE TEAM

An elite team of nine highly-skilled and dedicated professionals with diverse expertise in critical areas.



Key Skills

- Cybersecurity implementation
- AC/DC power systems
- Radio frequency engineering
- Project management
- Civil site construction
- Secure networking

Actions

- Requirements gathering
- Site readiness
- Infrastructure installation
- Radio programming
- Coverage validation
- Training development & delivery

**HELP
STARTS
HERE**



KEY TECHNOLOGY CHANGES

- **2 new tower sites:** Machias & North Stanwood
- Analog to digital audio
- Fully **encrypted police talk groups**
- Double system capacity
- Wi-Fi updates enabling remote programming & frequent updates
- New microwave system w/path redundancy & increased bandwidth
- DC Power replacement
- Alarming, monitoring and remote troubleshooting of support systems
- Ruggedized radios & batteries
- Paging system controllers & transmitter upgrades w/geo-redundancy
- Main system components/software **upgrade every 2 years**

**HELP
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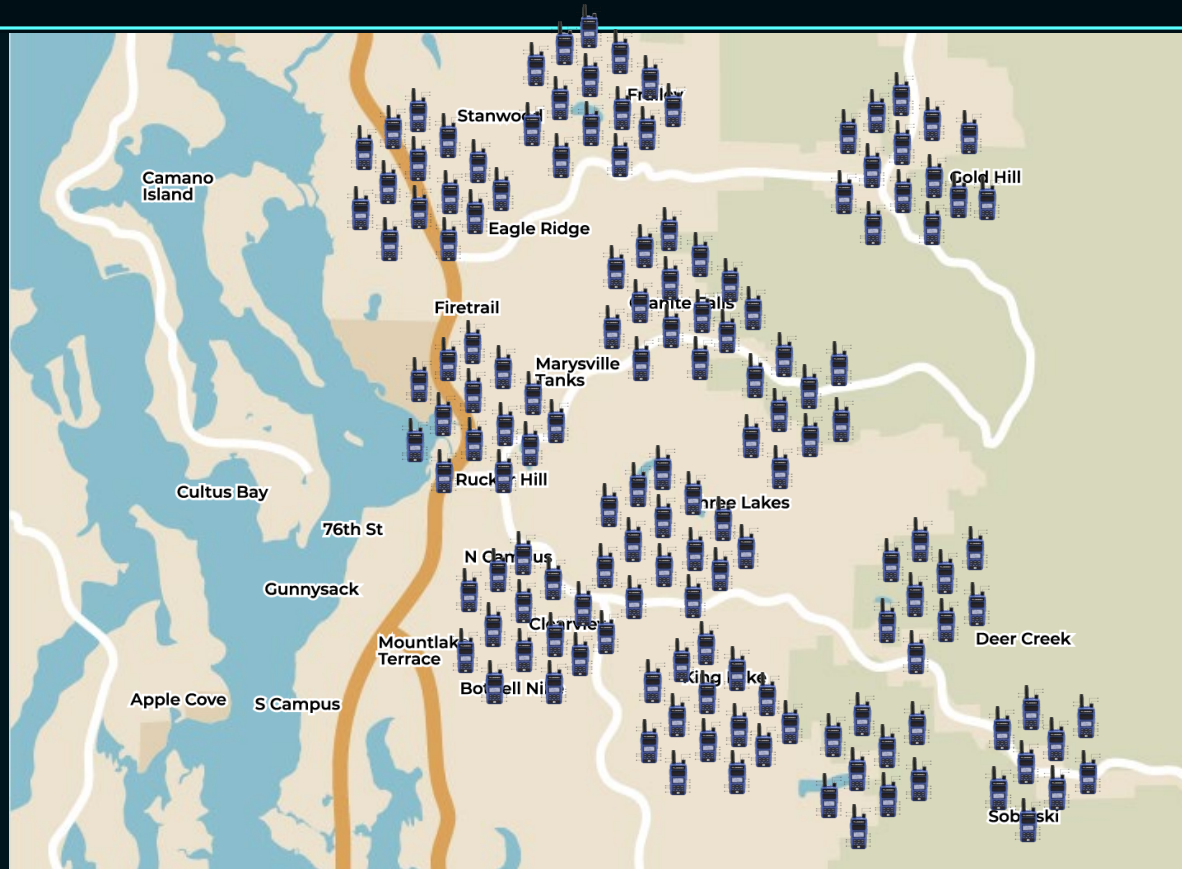
911



THE SYSTEM

**HELP
STARTS
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INFRASTRUCTURE



RADIOS

- 5000 Radios used by 43 Fire, Law Enforcement & EMS teams
- Provided by SNO911
- Analog to digital conversion
- Voice Encryption
- Wi-Fi
- Ongoing maintenance and training

RADIOS



IMPACT

- Increase durability, reliability, and capacity
- Saving agencies funding
- Reduce static & background noise
- Protect critical communications
- Enable remote updating and programming
- Enhance interagency interoperability
- Ensure optimal performance



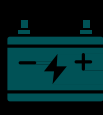
RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING



RESILIENCY



COVERAGE

RADIO DETAILS



DURABLE FRAME

NOISE CANCELING TECHNOLOGY

HIGH VISIBILITY FIRE

EXTENDED BATTERY LIFE

ENCRYPTED TRANSMISSIONS CAPABILITY

INTEGRATED GPS

RADIO DETAILS

- >> 5000 Radios used by 43 Fire, Law Enforcement & EMS teams
- >> Provided by SNO 911
- >> Analog to digital conversion
- >> Voice Encryption
- >> Wi-Fi
- >> Ongoing maintenance and training

RADIOS



TECH IMPACT

- >> Protect radio in harsh environments
- >> Enhances communications in loud environments
- >> Ability to add feature if needed
- >> Battery life covers extended shift
- >> Prevent criminals from monitoring law enforcement
- >> First responder location can be mapped though GPS



RADIOS



EMERGENCY RADIO SITES



RESOURCES



POWER



PAGING

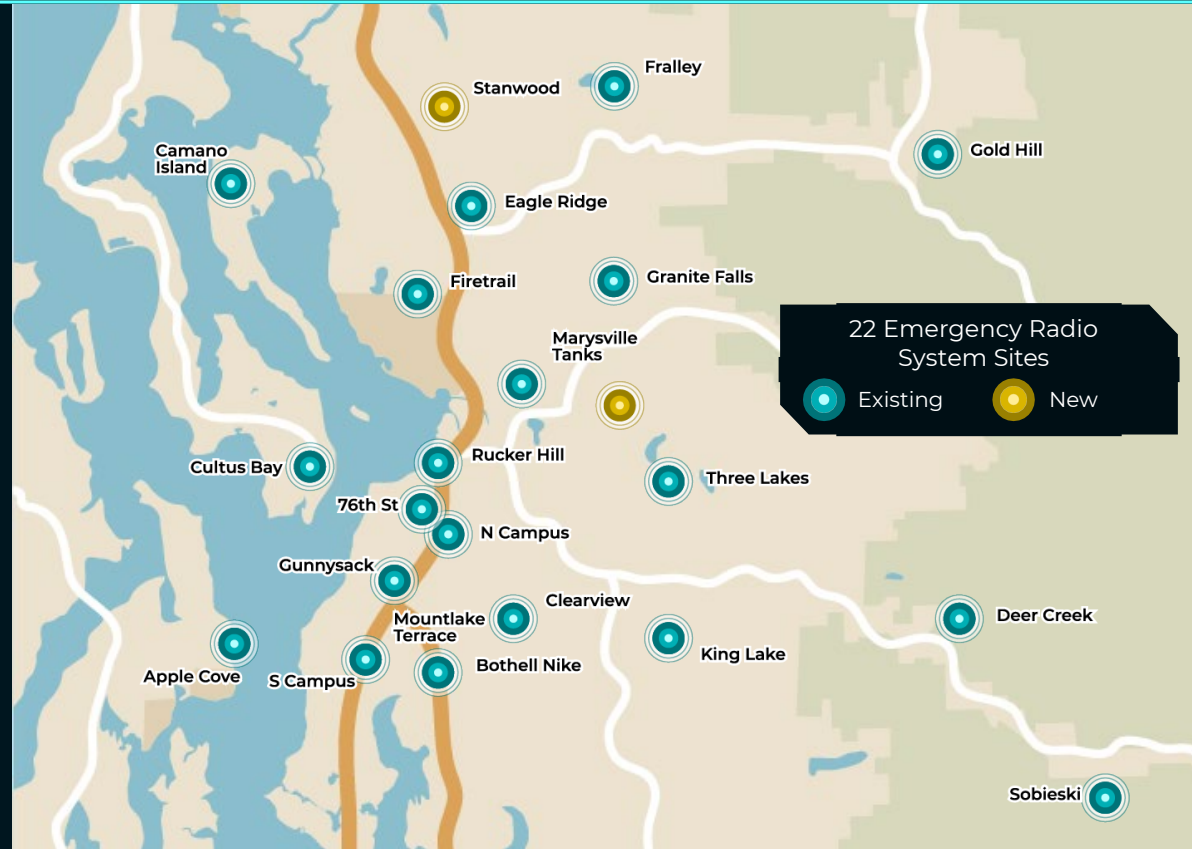


RESILIENCY



COVERAGE

INFRASTRUCTURE



22 SITES

- » Covering 2,196 sq. miles
- » 2 new site location
- » Multi-Site redundancy of system controls
- » Backup Power systems; batteries & generators
- » Tulalip Tribe transitioned their radio operations to new system
- » Integration with dozens of mutual aid partners

RADIO SITES



IMPACT

- » Expanded network and capacity
- » Enhance coverage
- » Increase system availability if there is a component failure
- » Enhanced cooperation of interoperability with Tulalip Tribe
- » Strong partnerships with numerous governmental agencies
- » Reciprocal benefits; reduced cost; for multiple systems



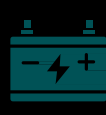
RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING



RESILIENCY



COVERAGE

RADIO SITE DETAILS

■ ■ ■ ■ ■



ANTENNA

TOWER LIGHTING

MICROWAVE

LIGHTENING PROTECTION

GENERATOR

SECURE SITE FACILITY
Radio
Transfer Switches
DC Power
Self Healing Network
IP Routers & Switches
Duplexer, Combiner

SECURITY FENCE

FUEL TANK

COOLING/HVAC

2 NEW SITES

- » Updated lighting
- » New Generators
- » Self-Healing network
- » DC Power replacement
- » Upgraded grounding cables
- » New Microwave system w/redundancy
- » Secure Fencing
- » Cooling and HVAC systems
- » All new cabling to new antennas

RADIO SITES



TECH IMPACT

- » Reduced maintenance costs
- » Increased capacity for new equipment
- » Automatic rerouting of network traffic in case of network issues
- » Increased component redundancy and capacity to ensure system availability during power outages
- » Cybersecurity enhancements and system hardware kept up to date to ensure parts availability
- » Increase bandwidth and maintainability
- » New systems to make sure investment is protected



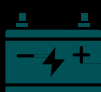
RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING



RESILIENCY



COVERAGE

INFRASTRUCTURE



RESOURCES

- » Mobile direction-finding equipment
- » Spectrum analyzers
- » Test equipment
- » Mobile refueling
- » Tracked snowcat with blade
- » Capable vehicle fleet
- » Environmental alarms

SNOCAT



IMPACT

- » Faster to identify and locate interference
- » Access to remote sites year round
- » Earlier detection of HVAC, generator and security
- » Sites stay in operation



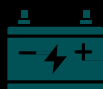
RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING



RESILIENCY



COVERAGE

INFRASTRUCTURE



EMERGENCY POWER

- » DC battery power banks w/ 12-Hour runtime
- » Each site has a generator(s)
- » Constructed to public safety standards
- » Large fuel tanks at generator only sites w/ 3-6 months runtime
- » Two generators on trailers that can be mobilized

POWER



IMPACT

- » Sites are equipped to continue to operate during power outages.
- » Continuous back up power for 7+ days
- » More dependable than commercial cellular
- » Ensures coverage for extended outages
- » Additional support to ensure continuous operations



RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING



RESILIENCY



COVERAGE



PAGING SYSTEM

- » New state-of-the-art IP based paging equipment from Swiss Phone Corp.
- » Network control from two radio sites
- » New system is GPS timed vs analog timing
- » Partnership with NORCOM
- » Encryption capable
- » Compatibility with existing equipment
- » Improved system health monitoring

PAGING



IMPACT

- » Cost effective system replacement
- » System wide management
- » Secure confidential information to protect responders and community
- » Compatibility provides cost savings
- » 10-year service life
- » Increased system resiliency, enhanced coverage and system performance
- » Greatly improved system status reporting and alarming of issues



RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING

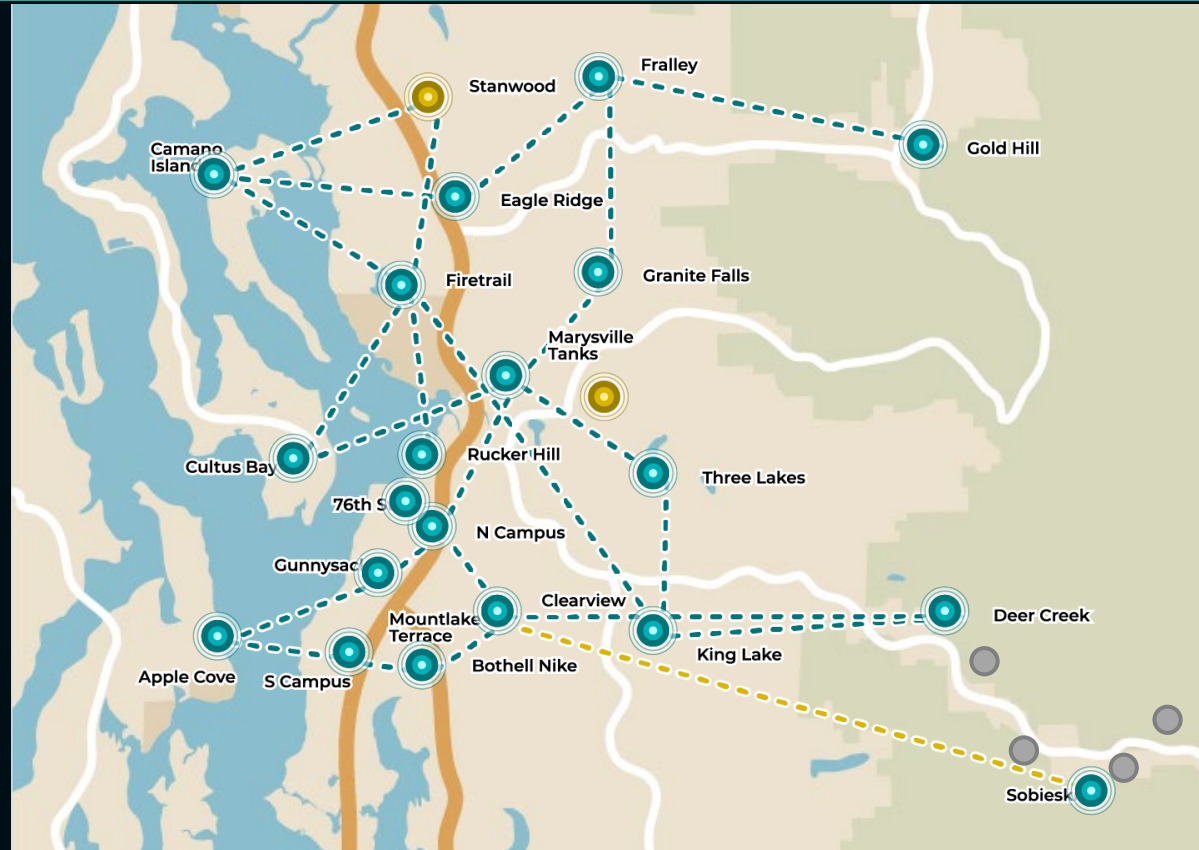


RESILIENCY



COVERAGE

INFRASTRUCTURE



RESILIENCY

- Multiple network paths
- Multiple zone controllers
- Multiple simulcast controllers
- Redundant IP-based audio logging
- Standards based technology
- Interconnections with PSERN

RESILIENCY



IMPACT

- Audio logging from core system with no lost transmissions
- Eliminated single points of failure; increasing uptime and reliability
- Two cores (brains) provides geographical redundancy
- Competitive pricing
- Regional Compatibility provides cost savings
- Extended coverage along Highway 2
- Greatly improved system status reporting and alarming of issues



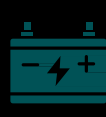
RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING

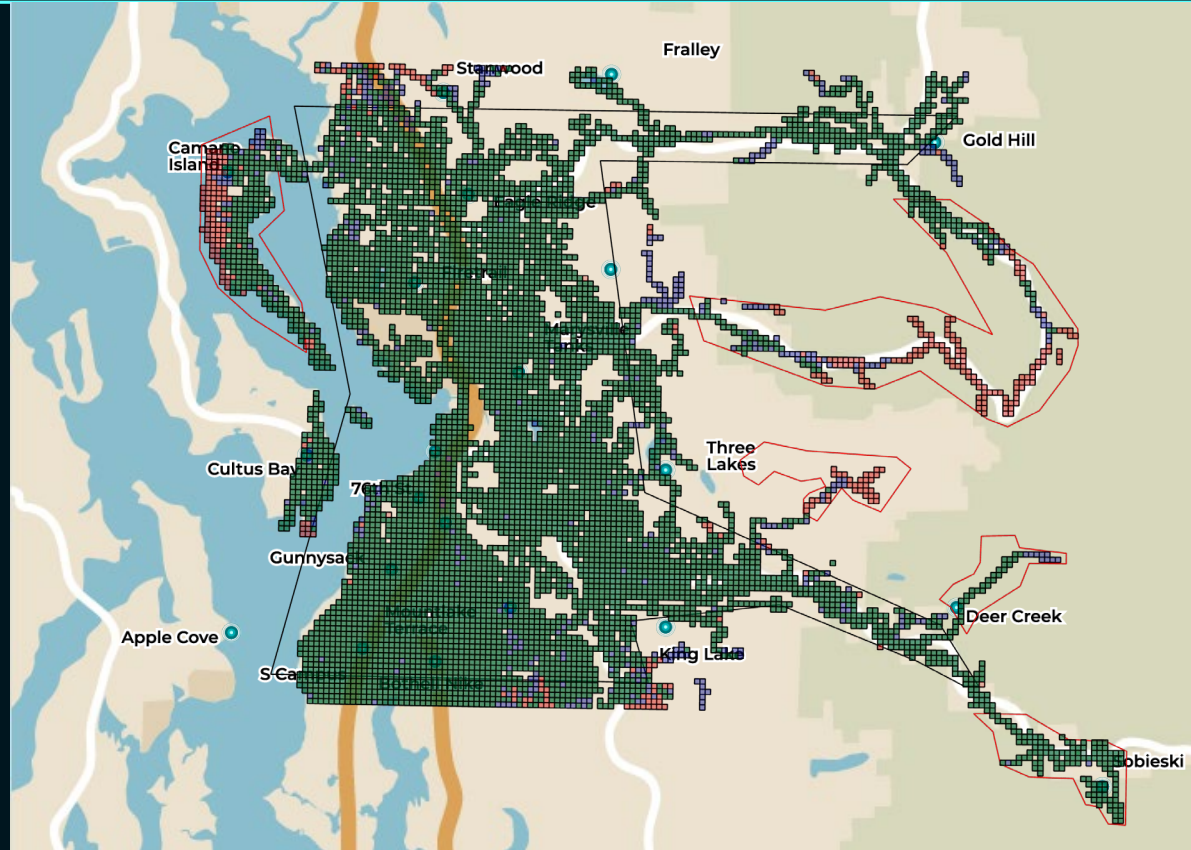


RESILIENCY



COVERAGE

INFRASTRUCTURE



COVERAGE

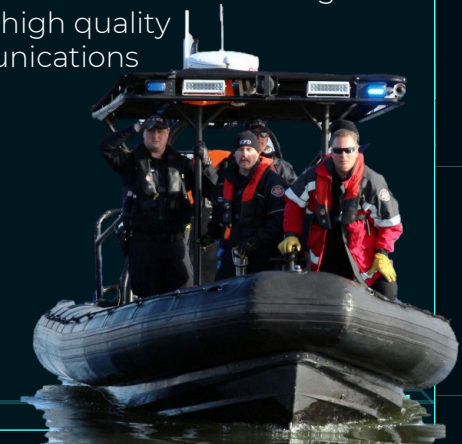
- Contract required coverage
- Test vehicles physically drove 6,393 1/3 sq. mi.
- Approx 4 weeks to complete
- TEST RESULTS
Portable Radios:
 - Required 95.0%
 - Result 96.86%Mobile Radios:
 - Required 91.6%
 - Result 98.26%

COVERAGE



IMPACT

- Confirmed full coverage
- Measured impact of upgrades
- Ensure the coverage that first responders need to do their job is there prior to cutover.
- Scientific method of testing in-bound and out-bound coverage to ensure high quality communications



RADIOS



EMERGENCY
RADIO SITES



RESOURCES



POWER



PAGING



RESILIENCY



COVERAGE

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COUNTY

911



THE RESULTS

The **Radio Replacement Project** is fulfilling the requirements and needs that have been coordinated with police, fire and EMS throughout every step of the project. From requirements gathered in the RFP to the selection of encryption down to the color of the radios.

Special thank you to the Project Performance Committee:

Darryl Neuhoff

Travis Katzer

Clint Korhonen

Eric Andrews

Raulie Robertson

Dave DeMarco



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