Understanding the SREC Regional Radio System

Introduction

The SREC regional P25 800MHz radio system is a shared public safety communications network used by multiple jurisdictions. Because it is engineered as a single integrated system, its components—simulcast sites, multicast sites, core controllers, and roaming radios—must all function together to provide reliable coverage and interoperable communications.

This document provides a clear explanation of how the system works, why coverage does not align with jurisdictional boundaries, and why agencies necessarily benefit from the entire system rather than from only a subset of tower sites.

System Architecture Overview

SREC's radio network includes:

- Six simulcast sites, each with 15 radio channels
- A primary simulcast controller ("Prime Site") at Fancher Hill
- A backup Prime Site at Krell Hill
- Nine multicast (stand-alone) sites, each with 5–9 radio channels
- A main core site located at the Combined Communications Building (CCB)
- A backup core at Fire District 9's backup dispatch facility

These elements operate together to achieve 95% portable radio coverage across the entire County when all sites are functioning.

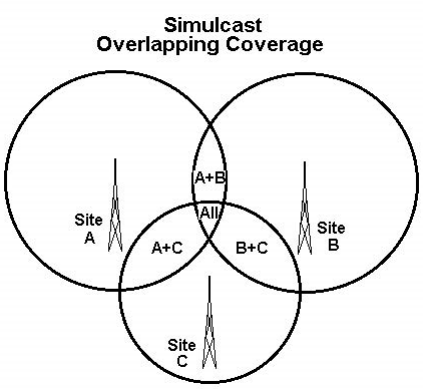
Although the physical sites exist in specific geographic locations, the network is designed as one unified regional system, not as individual, jurisdiction-specific towers. Coverage areas overlap by design, and system performance is interdependent.

Simulcast System Fundamentals

A simulcast system works by having multiple tower sites transmit the same signal at the same time on the same frequencies. In effect, the simulcast sites behave as one synchronized, wide-area transmitter.

This design provides:

- Consistent regional coverage
- Seamless communications for users on the move
- Reliability through overlapping tower operation



Because simulcast sites operate as a single entity, radios cannot be programmed to use "only some" simulcast sites. The simulcast subsystem must function as a whole to deliver expected public safety coverage and reliability.

Multicast Sites and Overlapping Coverage

Multicast sites supplement the simulcast layer in areas where terrain, distance, and building density require additional support. They help maintain coverage in valleys, dense urban environments, and higher elevations.

Many multicast sites also provide intentional overlapping coverage throughout Spokane. This overlap is necessary for portable radio performance in locations where simulcast alone is insufficient. Buildings, topography, and environmental conditions often make multi-site support essential.

As a result, radios operating within one area may still rely on sites located outside that area to maintain consistent, reliable communication across the system.

Radio Roaming Behavior

Public safety radios automatically roam between simulcast and multicast sites based on signal strength and quality, not on geography. This roaming behavior accounts for:

- Terrain changes
- Building interference
- Distance to towers
- System load
- Environmental factors

For these reasons, jurisdictional or organizational boundaries do not correspond to radio coverage boundaries. A radio operating in one area may connect to a site in another simply

because it provides the strongest or most reliable signal at that moment. Roaming ensures reliability for responders and consistent performance across the entire region.

System Resilience and Failover

Redundancy is built into the network so that if any simulcast components fail, radios automatically fall back to multicast sites. This prevents disruption to communications.

If radios were restricted to simulcast-only operation, failures in the simulcast layer would result in loss of communications, particularly inside buildings or in areas with known signal challenges. Multicast sites are essential for maintaining system resilience.

This redundancy also supports mutual aid and multi-agency operations. Public safety personnel must be able to communicate seamlessly anywhere in the region, regardless of tower location.

Systemwide Cost Principles

Although this document focuses on technical architecture rather than policy, it is important to note that the radio system is engineered, maintained, and operated as one shared regional network. All agencies depend on:

- Overlapping coverage
- Systemwide roaming
- Shared core controllers
- Multisite redundancy
- Coordinated maintenance and upgrades

Because the system functions holistically, its costs and operational considerations cannot be cleanly separated along jurisdictional lines.

Conclusion

The SREC P25 radio system is a unified, regionwide communications platform designed to deliver reliable public safety radio coverage for users throughout Spokane County. Simulcast and multicast sites work together as a single system, radios roam freely across all sites based on signal quality, and redundancy is built throughout the network.

Understanding the integrated nature of the radio architecture is essential for making informed decisions that support reliable, safe, and effective public safety communications for the entire region.