



## Lexicon for the Washington State Interoperability Executive Committee

Version 3 – December 30, 2014

This lexicon is a work in progress and an attempt to explain the technical work of the SIEC in a fashion more easily understood by citizens and elected officials.

Note about the FCC. The Federal Communications Commission (FCC) licenses radio spectrum for use in the United States. Radio spectrum is denominated in Hertz, from 3000 (3 kHz) to 300,000,000,000 (3GHz). Different parts of spectrum are allocated for different uses, e.g. FM radio stations, television, public safety radio, cellular radio and broadband data. For example, the FCC has allocated the spectrum from 52 kHz to 72 khz for use by AM radio broadcasting. A [chart of the allocations can be found here](#).

**800 MHz Rebanding** – This is the process of exchanging one set of channels used by a public safety agency for another set, all within the 800 MHz band. When radio channels in the 800 MHz radio band were originally assigned by the FCC in the 1980s, the FCC allowed the use of the band by multiple users, e.g. public safety voice networks and Nextel’s cellular network. This meant that a channel for a Nextel cell site could be right next to a channel used by a police agency. As cell networks were built, this caused problems, especially right next to a cellular radio transmitter. Close to the cell tower, the power of the cell signal would interfere or block the use of the public safety officer’s radio, placing the officer at risk. In July, 2004, the FCC adopted a plan to exchange channels between Nextel and the public safety agencies operating in each area nationwide. Nextel agreed to pay for the costs of making this exchange. This exchange requires significant replacement of radio equipment including the portable and mobile radios used by public safety agencies. Rebanding is occurring in four phases or “waves”, and, as of 2014, is largely complete nationwide. The entire process is governed by an FCC-authorized 3<sup>rd</sup> party called the “[transition authority](#)” or TA. See [more information here](#). In Washington, DOC and WSDOT each operate 800 MHz radio networks which are being rebanded. The Office of the CIO (OCIO) project manages this work, which is done by Motorola and its subcontractors. Many County and regional radio systems, e.g. SERS in Snohomish County and King County’s 800 MHz system, were also rebanded.

**Broadband** – Technically, “broadband” just refers to radio channels which use more bandwidth than narrowband. In general use, “broadband” channels are used for transmission of data, rather than voice. Data transmission could be video streams, computer aided dispatch text,

images/photos and so forth. Voice can also be transmitted over broadband. Broadband channels typically might be 5, 10 or 20 megahertz wide.

**DOC** – Washington State Department of Corrections

**DNR** – Washington State Department of Natural Resources

**EF Johnson Technologies.** EF Johnson is a major manufacturer of public safety radio equipment. An older version of EF Johnson equipment is used by the Washington State Department of Transportation and some other agencies in Washington. Website: [www.efjohnson.com](http://www.efjohnson.com).

**Harris Corporation.** Harris is a major manufacturer of public safety radio equipment, but also a wide variety of other products and services, e.g. military communications equipment. Few, if any, public safety agencies in Washington presently use Harris equipment. Website: [www.harris.com](http://www.harris.com).

**Hertz** – Radio spectrum or frequency is divided into units called hertz. One hertz (Hz) is equal to one cycle per second. A kilohertz (kHz) is 1000 cycles per second and a megahertz (MHz) is a million cycles per second and a gigahertz (GHz) is one billion cycles per second. The range of human hearing, for comparison, is 20 to 20,000 Hz. Generally a voice radio channel takes about 25 kHz (25,000 hertz) of bandwidth, although recent technology advances allow channels in 12.5 kHz and 6.25 kHz as well. See also narrowbanding. More information here: <http://en.wikipedia.org/wiki/Hertz>

**kHz** – kilohertz – one thousand hertz.

**MHz** – megahertz – one million hertz.

**Mobile units** – “Mobile units” are two-way radios mounted in vehicles, as opposed to “portable” ones which are handheld. “Mobile units” usually have greater range and battery life is less of a problem.

**Motorola Solutions.** Motorola solutions is a major manufacturer of public safety radio equipment. Motorola Solutions also sells, distributes and supports such systems. Most, but not all, public safety radio systems in Washington are of Motorola Solutions manufacture. Motorola Solutions is distinct from the company Motorola Mobility which makes Android smartphones and Bluetooth devices. The two companies were formed in 2011 by a split of Motorola Inc. Motorola Solutions website: [www.motorolasolutions.com](http://www.motorolasolutions.com).

**Narrowband.** Narrowband channels have relatively small allocations of bandwidth, e.g. 12.5 kilohertz or 25 kilohertz. In general use “narrowband” often means channels used for transmission of voice, e.g. dispatch of firefighters by a public safety answering point (PSAP). Technically data (e.g. images) can also be sent over narrowband channels, but very slowly. The FCC often restricts the use of narrowband channels to voice uses.

**Narrowbanding.** Narrowbanding is the process of reducing the amount of bandwidth used by voice radio channels, for example moving from 25 kHz of bandwidth to 12.5 kHz. This is done to improve the efficiency of spectrum use. If, for example, a public safety agency needs 10 channels to operate, those 10 channels, after narrowbanding, will use only 125 kHz of spectrum rather than 250 kHz, leaving the remainder to be used for other purposes. However narrowbanding is expensive, as typically all the radio equipment at transmitter/receiver sites and also all portable and mobile radio equipment in vehicles must be replaced. More information on [the FCC website here](#).

**OCIO** – State of Washington Office of the Chief Information Officer. The SIEC is constituted under the authority of the Chief Information Officer per the Revised Code of Washington. See also [www.ocio.wa.gov](http://www.ocio.wa.gov).

**P25** – Project 25. Project 25 is a public safety communications standard dedicated to ensuring interoperability in public safety radio communications. Prior to 1990, each manufacturer of public safety radios created their own proprietary technologies for those radio systems. Therefore the handheld radios from one manufacturer would not, in general, work with the radio site transmission equipment of another manufacturer. P25 is envisioned as a basic standard which all manufacturers use, so that radios will interoperate with each other and with each other’s networks. Many systems presently in use today, however, are not compatible with the P25 standard. And the standard is not perfect, so even fully compliant P25 radios from different manufacturers do not necessarily interoperate fully. [P25 website](#).

**Portable units.** “Portable” generally refers to two-way radios which are handheld – can be carried by an individual person, as opposed to mobile radios, which are vehicle-mounted. Battery life is typically an issue with portable radios – ideally a portable radio can be constantly “on” and sending/receiving transmissions for at least an eight hour shift. Portable radios have less transmission power and therefore less range than mobile radios.

**RCW** – Revised Code of Washington

**SCIP** – Statewide Communications Interoperability Plan. The current version of Washington’s SCIP is April 4, 2008, and is online here. The SCIP is undergoing revision in 2014-15. The ultimate purpose of the Washington Statewide Communications Interoperability Plan (SCIP) is to establish a future vision for communications interoperability and align emergency response

agencies with that vision by creating goals, objectives, and initiatives that achieve improved public safety communications

**SIEC** – State Interoperability Executive Committee. Almost every state and territory has an SIEC or another SIGB which oversees the improvement of radio systems interoperability statewide. See also [www.siec.wa.gov](http://www.siec.wa.gov) .

**SERS** – Snohomish Emergency Radio System – the agency which operates, maintains and upgrades the public safety radio system for Snohomish County, which uses 800 MHz frequencies and Motorola technology. [Website here](#).

**SIGB** – State Interoperability Governing Board. Another term for SIEC. Some states refer to their SIGB rather than their SIEC.

**South Sound 911** – The consolidated public safety answering point and 911 dispatch center for most public safety agencies serving Pierce County. [Website here](#).

**TIP** – Technical Implementation Plan. The SIEC’s blueprint for interoperability in Washington, prepared in November, 2005. [Online here](#). The TIP provides a high-level approach for planning the transition of the current agency-based public safety mobile radio systems to a standards-based, frequency-independent, multiple subsystems technology architecture. The TIP lays out a plan but it has never been fully implemented.

**WSDOT** – Washington State Department of Transportation

**WSP** – Washington State Patrol