

# No Noise! Safer Buildings Coalition Affirms FCC Rules for Signal Boosters – Issues Call to Action

**SBC calls for a cross-functional effort to address public safety radio interference**  
*December 21, 2020*

The Safer Buildings Coalition (SBC), an independent non-profit organization focused on eliminating in-building “Wireless Dead Zones”, is calling for the immediate convening of a task force to address public safety radio interference caused by the improper use of Signal Boosters<sup>i</sup> commonly deployed to remediate poor in-building public safety and commercial wireless coverage.

The National Institute for Occupational Safety and Health (NIOSH) issued a recommendation to “provide all fire fighters with radios and train them on their proper use.”<sup>ii</sup> Since a high percentage of First Responder (especially firefighter) work happens inside buildings, it is common sense that these radios must function reliably inside buildings.

On February 20, 2013, the Federal Communications Commission (FCC) issued a Report and Order that affirms the local governments’ authority to adopt ordinances, and/or fire or building codes that require signal boosters to be installed in certain buildings to ensure First Responders have reliable communications.<sup>iii</sup>

Adoption and enforcement of codes and ordinances requiring effective in-building wireless coverage is steadily increasing in the US (and in Canada and other countries). While many buildings have benefitted from Signal Booster deployment, there have been recurring challenges. The increase in incidents where improperly deployed Signal Boosters have degraded or totally disrupted public safety radio systems is concerning and must be addressed in an affirmative way. This is the essential purpose of this position paper and call to action.

## **Key Objectives of this Position Paper and Call to Action:**

- Combat RF interference (Noise!) caused by *improperly deployed in-building Signal Boosters*.
- Affirm and reinforce the essential role of Frequency License Holders in the deployment of Signal Boosters.
- Affirm the essential need for reliable wireless coverage inside buildings for both First Responders and the public, and reinforce the essential role of consistent codes and standards interpretation and enforcement in achieving that goal.

*Q: What do we mean by “improperly deployed in-building Signal Boosters”?*

*A: It can include things like:*

- *Selecting the wrong technology for the use case.*

- *Improper “design” of the overall system, such as using incorrect parameters, using poor RF design principles, and other technical errors.*
- *Improper installation of the overall system.*
- *Not following FCC rules or local requirements.*
- *Not considering the impact of structures nearby that also have installed BDA systems.*
- *Not coordinating with the frequency license holder and code officials.*
- *Selecting inadequate equipment.*

**Among the key stakeholders sought for this task force:**

- Frequency License Holders / Radio System Administrators
- Codes and Standards Bodies
- Fire and Building Code Officials
- Public Safety Agencies
- Industry members involved in manufacturing, engineering, furnishing, and installing Signal Boosters
- Federal Agencies and Authorities: FCC, FirstNet Authority, NIST, DHS, NTIA, others
- Wireless Broadband Carriers
- Related Industry Associations
- Property Owners and Managers

## **18 Principles for Safe and Effective In-Building Communications:**

**The Safer Buildings Coalition seeks to expand stakeholder collaboration and consensus to refine, adopt, and actively advocate the following principles:**

1. The ability to communicate inside buildings using wireless technologies is essential for the safety of the public and First Responders. <sup>ii, iii, iv</sup>
2. Technologies used to solve inadequate in-building wireless coverage must not cause harm to the surrounding public safety or private radio systems, or to commercial cellular services.
3. FCC and other rules provide essential guidance for the correct deployment of Signal Boosters.
  - a. All technologies used for this purpose must comply with all FCC rules, fire and building codes, applicable standards, and local ordinances.
  - b. Where any fire or building code, or local ordinance, conflicts with FCC rules, FCC rules must prevail until the conflicting requirements and FCC rules can be brought into alignment.
4. Fire and building codes must acknowledge and reinforce the authority and responsibilities of Frequency License Holders who are the only entities authorized to permit rebroadcast of their licensed frequencies.

“Non-licensees seeking to operate Signal Boosters must obtain the express consent of the licensee(s) of the frequencies for which the device or system is intended to amplify”<sup>v</sup>

This express consent should:

- a. Be provided in written form
  - b. Be valid for a specific duration, renewable upon re-certification of system compliance with Radio Licensing Authority rules and local requirements.
5. Frequency License Holders “must maintain a reasonable level of control over these operations in order to resolve interference problems.”<sup>vi</sup> This should include:
- a. Providing the technical criteria specific to local jurisdiction requirements to local code officials who can make these available to property owners and vendors.
  - b. Frequency License Holder participation in the review of Signal Booster deployment design review and system acceptance processes.
  - c. Technical Criteria regarding frequency bands requiring coverage inside buildings should include fire service, law enforcement, Emergency Medical Service (EMS), School Resource Officers (SROs), and other essential public safety agencies as determined by the local jurisdiction.
  - d. Cooperation with building owners and vendors to facilitate both uplink and downlink signal strength and quality testing.
6. The establishment and regular update of a national database of all public safety and cellular Signal Boosters is essential to ensuring proper operation of public safety networks and timely identification of responsible parties when required to resolve RF interference or make necessary updates or changes.
- a. FCC rules currently require that Class B Signal Boosters must be registered with the FCC. This should be expanded to also include Class A Signal Boosters.<sup>vii</sup>
7. Jurisdictions should document *and make readily available* their codes, standards, technical requirements, and process for adequate in-building radio coverage that is both effective and mitigates the potential for RF interference.
8. Jurisdictions should establish active monitoring requirements for all in-building public safety Signal Boosters that includes the ability to shut off individual systems remotely in response to disruptive RF interference.
9. Industry must drive the innovation of technologies, materials, and methods that cost less and interfere less.
- a. As much as possible, standards, fire and buildings codes, FCC rules, and local ordinances should be performance-based, and be open to consideration of innovative alternate equipment, materials, and methods.
  - b. Standards, fire and buildings codes, FCC rules, and local ordinances that do not already consider currently available technologies, materials, and methods should be evaluated for updating to reflect the current state of the industry. This includes, but is not limited to:

- 1) Fiber-based and digital-based Signal Booster topologies.
  - 2) Newly developed fire-rated materials, cables, assemblies, and enclosures; flexible metal conduit; and other innovative pathway survivability technologies.
  - 3) Active and passive technology innovations that might safely and effectively combine multiple frequency bands within FCC rules.
- c. Standards, fire and buildings codes, FCC rules, and local ordinances should carefully consider the cost-benefit of any new or existing requirements. Costly requirements that do not provide a commensurate improvement in system reliability should be avoided.
10. Industry competency is essential. Jurisdictions should adopt and require an accredited, nationally recognized credentialing program for Signal Booster system designers and technicians.<sup>viii</sup>
  11. Fixed Signal Boosters are vastly superior to mobile Signal Boosters in their ability to guarantee reliable public safety coverage inside buildings.

Mobile or vehicle-mounted signal boosters cannot be relied upon to provide acceptable floor area coverage or quality as required by model fire code. They cannot be relied upon to be on scene when needed, and may not provide coverage for the bands utilized by all public safety agencies in a jurisdiction.

Mobile or vehicle-mounted Signal Boosters should only be used as a backup to fixed Signal Booster deployments. Further, by FCC rules Class B Signal Boosters may only be installed as fixed systems.<sup>ix</sup>
  12. Jurisdictions should avoid setting *arbitrary* lower limits on building sizes, on new buildings vs. existing buildings, or on specific building types when deciding which buildings shall require adequate public safety wireless coverage.

For example, setting a lower limit at 50,000 sq ft would eliminate 94% of all US commercial buildings from consideration for signal coverage requirements.<sup>x</sup>

Decisions on whether or not to exclude buildings by size, new vs. existing, or building types should carefully weigh cost vs. risk.
  13. Jurisdictions should not prohibit the shared infrastructure supporting public safety and commercial cellular technologies as long as the design complies with all FCC rules and performs as designed.
  14. Jurisdictions should not prohibit system designs that provide coverage for multiple buildings from a main or common building. Requiring individual Signal Boosters for each building in a close geographic cluster could actually increase noise and interference.

Jurisdictions should work with system designers to determine a reasonable balance between controlling noise and interference while maintaining system reliability.
  15. Where FirstNet or other commercial cellular service is utilized for public safety, jurisdictions should work with these commercial wireless carriers to apply these principles to the relevant cellular band(s).

16. Where FirstNet or other commercial cellular service is utilized for public safety and required by jurisdictions to be included on in-building systems, guidelines should provide for multi-carrier capability, since many jurisdictions and building occupants utilize more than one wireless carrier.

A key objective of multi-carrier support is enabling interoperability between agencies who may rely of different wireless carriers. Such multi-carrier designs include the additional benefit of ensuring the ability of building occupants to call for help or dial 9-1-1.

17. FirstNet and other commercial wireless carriers should publish and make available to building owners their technical criteria and process for connecting in-building wireless infrastructure to carrier networks.
18. All new and existing in-building wireless deployments should be checked and tested for the existence of other in-building wireless infrastructure in the same or nearby buildings to identify possible sources of interference or other technical conflicts.

### **Call to Action:**

The Safer Buildings Coalition is calling for the immediate convening of a task force to address increasing public safety radio interference caused by improperly deployed Signal Boosters.

If you would like to register your interest in participating in this process and task force, please visit [saferbuildings.org/no-noise](https://saferbuildings.org/no-noise) for more information.

### **About the Safer Buildings Coalition**

The Safer Buildings Coalition is a 501(c)4 not for profit focused on in-building technologies that seeks the following outcomes:

Three Pillars Of In-Building Public Safety Communications:

- Mobile 911 Calls Must Get Out with Location Accuracy
- Mobile Mass Notifications Must Get In
- First Responder Communications Must Work

Visit us at [www.saferbuildings.org](https://www.saferbuildings.org)

PRESS CONTACT: Mikkell Schultz, (215) 429-0966, [mikkell.schultz@saferbuildings.org](mailto:mikkell.schultz@saferbuildings.org)

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- <sup>i</sup> The use of the term “Signal Booster” in this Document is intended to include all manner of in-building wireless coverage enhancement solutions including but not limited to; amplifiers, repeaters, boosters, distributed antenna systems, and in-building radiation systems that serve to amplify signals between a device and a wireless network. It was selected because it is the terminology used in FCC rules.
- <sup>ii</sup> NIOSH F2010-38 Date Released: July 6, 2011 Death in the Line of Duty...A summary of a NIOSH fire fighter fatality investigation: Key recommendations
- <sup>iii</sup> FCC’s Report and Order to Improve Wireless Coverage Through the Use of Signal Boosters, WT Docket No. 10-4. ¶¶ 196, 197
- <sup>iv</sup> FCC’s Report and Order, WT Docket No. 10-4. ¶ 151. “Signal booster systems play a crucial role in allowing public safety first-responders to communicate in buildings, tunnels and other areas where signals would normally be blocked.” and, “We find that allowing third parties to operate signal boosters with express licensee consent serves the public interest by promoting reliable communications, particularly reliable public safety communications.”
- <sup>v</sup> 47 CFR § 90.219 - Use of signal boosters. (b) (1) (i)
- <sup>vi</sup> 47 CFR § 90.219 - Use of signal boosters. (b) (1)
- <sup>vii</sup> FCC’s Report and Order, WT Docket No. 10-4 ¶ 166. “In the event that a pattern of Class A signal booster interference is established, we may revisit a registration requirement for these devices.”
- <sup>viii</sup> Disclosure: SBC, in collaboration with NICET and the National Association of State Fire Marshals (NASFM), is developing an accredited credentialing program for Signal Booster system designers and technicians. Expected availability early 2021.
- <sup>ix</sup> FCC’s Report and Order, WT Docket No. 10-4 ¶ 146
- <sup>x</sup> US Energy Information Administration - EIA’s 2012 Commercial Buildings Energy Consumption Survey (CBECS) <https://www.eia.gov/consumption/commercial/reports>