CITY OF MISSION

STAFF REPORT

To: Chief Administrative Officer **Date:** April 7, 2025

From: Mark Goddard, Fire Chief

Subject: **Public Safety Radio Building Amplification Bylaw**

Recommendation(s)

That Council direct staff to prepare a Public Safety Radio Amplification Bylaw.

Purpose

The purpose of this report is to provide background and evidence for the implementation of a new bylaw that sets the parameters whereby developers constructing new buildings may have to install in-building radio amplification systems to enhance radio signals for emergency responders.

Background

As radio signals pass through solid materials, they are weakened. The use of certain energy efficient materials in construction can diminish radio signals to the point where they are no longer reliable and even eliminated.

Modern building materials and construction methods have made radio communications in large buildings difficult. The cost of land leads more and more designs to include subterranean parking designs. Coupling underground parking with robust reinforced concrete to support a large building is an almost certainty of diminished radio communication.

Large and tall buildings dependent on location can also cast a radio shadow where they block or severely diminish radio signals.

“Emergency radio communications inside buildings has become increasingly difficult as builders modernize their construction techniques to increase energy efficiency.” (Garis et all, 2018., Attachment A).

Radio communications is the primary agent of organized command and control of incidents and when it is inhibited, responders may face severe safety consequences. Communications are inhibited in two ways:

1. First, from team to team inside a building. This issue is key as much of fire and rescue operations involves different task-oriented teams coordinating activities that without specific timing pose serious risk to fire crews operating inside a building. Tasks like ventilation of a fire could lead to negative outcomes without coordinated communications. Fire may spread, and toxic smoke and fire gases may be introduced into other parts of the building where residents may still be present without these carefully coordinated efforts. Special rescue operations like persons trapped in elevators also require coordinated communications as power and hydraulic systems need to be carefully controlled and manipulated to move elevator cars.
2. A secondary risk to diminished communications is the loss of communication from inside the building to the outside and vice versa. Except in very specific functions of the incident command system the incident command post is located outside the building at

an advantageous position to maximise situational awareness of the entire fire scene. The inability for crews to communicate with Incident Command and vise versa poses a serious threat to responders who may be relaying serious information such as trapped/ lost crew or personnel, location and extent of the fire, and imminent collapse of all or part of the building requiring immediate evacuation of all personnel.

In the United States NIOSH investigates and reports on all Firefighter line of duty deaths (LODD.) In looking at the incidences of LODD due to fire operations poor radio communications are listed as a contributing factor in many cases. Surrey, Vancouver and Burnaby have adopted in-building repeater bylaws.

Discussion and Analysis

The issue of radio signal quality is not a new challenge for the Mission Fire and Rescue Services (MFRS). Crews have reported locations of diminished radio signal quality as an Occupation Health and Safety (OHS) safety issue and have been noting areas of poor quality for the last two years.

Mission is at an opportune time to consider enacting legislation to protect the viability of our emergency radio signal. In November of 2023, the Minister of Housing announced new housing requirements and while not specific to the construction of large or tall buildings, these types of buildings are likely to meet the requirements and are anticipated to be proposed by the development community for Mission more so than in the past.

The current OCP supports the construction of larger and taller buildings in specific neighborhoods in the City including the waterfront revitalization lands and the Silverdale Central Neighbourhood Precinct area.

Having a bylaw in place prior to advent of this increased density development is strategically advantageous to the City with the alternative being retro-active enforcement and costly renovations to new buildings when emergency services ultimately must address a loss or weakening of radio signals.

SWOT ANALYSIS: IN-BUILDING REPEATER SYSTEMS

STRENGTHS	WEAKNESS
• First responder safety is greatly increased. • Can be used by multiple agencies (not just fire.) • Radio coverage is tested and consistent • Cost is born by the developer to install and the building owner to maintain • May decrease the need for City investment in more radio infrastructure.	• Systems will only work in the building they are designed for. • Radio technology varies as fire uses an analog system while RCMP uses P25 digital making installed systems more costly. • One time renovation costs to existing buildings.
OPPORTUNITES	THREATS
• Large building construction in Mission is relatively limited so bringing regulation now can be part of construction planning by developers.	• Poor owner maintenance may impair system operations • Developer opposition due to increase construction costs.

	• As more is built inspection burden is increased on the Fire Prevention Division.

Financial Implications

Implementing a bylaw requiring in-building radio repeater systems in new large or tall buildings has financial implications for multiple stakeholders.

For Developers and Building Owners:
The cost of installing in-building repeater systems will be borne by developers as part of construction, with ongoing maintenance falling on building unit owners through their strata corporations. While this increases initial construction costs, it eliminates the need for costly retroactive installations if signal deficiencies are identified later. Additionally, incorporating this requirement at the design stage is generally more cost-effective than post-construction modifications. Installation of an in-building repeater system within a10 storey concrete building would be about $75,000. Repeater systems are not required on wood framed buildings.

For the City:
Mandating repeater systems in new buildings may reduce the need for future municipal investment in expanded emergency radio infrastructure. However, increased inspections and enforcement by the Fire Prevention Division may require additional staff resources, especially as more buildings are constructed under this regulation. If poor maintenance by building owners leads to system failures, the City may face indirect costs associated with emergency response delays or safety risks.

For Emergency Services:
The primary financial benefit to the MFRS and other first responders is improved communication reliability, reducing operational risks and potential liability. While there are no direct capital costs for MFRS, coordination between fire, police, and emergency medical services may require occasional compatibility assessments, particularly given the differing radio technologies used by various agencies.

Overall, enacting a bylaw proactively distributes costs to developers and owners rather than the City, preventing future financial burdens from retroactive fixes while enhancing first responder safety.

Communication

A communications strategy will ensure key stakeholders are informed of the bylaw's requirements and timeline. Fire Prevention and Planning staff will be briefed to align enforcement with development processes. Developers, builders, and architects will be engaged through industry bulletins and pre-application meetings, while building owners will receive guidance on system maintenance. Public awareness will be raised through the City's website and social media. Ongoing feedback from emergency services, developers, and property owners will help refine enforcement and compliance strategies.

Summary and Conclusion

The increasing use of modern construction materials and methods has led to significant challenges in maintaining reliable emergency radio communication within large and tall

buildings. These communication barriers pose a direct risk to first responders and the public, particularly during fire and rescue operations where coordination is critical.

Mission Fire and Rescue Services (MFRS) has identified multiple locations where radio signal quality is insufficient, highlighting the need for proactive measures to ensure emergency communication remains effective. With the City anticipating an increase in high-density developments, implementing a Public Safety Radio Amplification Bylaw now will help mitigate future risks and prevent costly retroactive fixes.

By requiring developers to install in-building radio repeater systems, the financial burden is shifted to those constructing and owning the buildings rather than the City. This approach enhances first responder safety while minimizing municipal costs. While developer opposition and ongoing system maintenance remain concerns, the benefits of reliable emergency communication far outweigh these challenges.

It is recommended that Council support the preparation of the bylaw and ensure its application to new developments post-adoption allowing for some grandfathering period of time. Enacting this regulation now will help safeguard public safety and operational effectiveness for emergency services as Mission continues to grow.

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Attachment(s)

Attachment A: Improving In-building Radio Communications for First Responders