

TO: CHAIR AND MEMBERS
PUBLIC SAFETY COMMITTEE

DATE: 2018 Jan 17

FROM: DIRECTOR PUBLIC SAFETY &
COMMUNITY SERVICES
FIRE CHIEF
RCMP OIC

SUBJECT: PROPOSED EMERGENCY RADIO AMPLIFICATION BYLAW

PURPOSE: To outline terms for a new bylaw to enhance public safety and emergency response.

RECOMMENDATIONS:

1. **THAT** Committee recommend to Council that staff be authorized to prepare a bylaw on emergency radio amplification as outlined in this report.
2. **THAT** a copy of this report be sent to the BC Construction Association, the Vancouver Regional Construction Association, the Urban Development Institute of BC, and the BC Broadband Association for information.

REPORT

1.0 INTRODUCTION

Uninterrupted radio communications are vital in the delivery of the emergency services provided by police, fire and ambulance. Burnaby has grown from a suburb of single family homes into a modern, vibrant, diverse community with a well-balanced mix of residential, industrial and commercial buildings. This new development serves to meet Burnaby's commitment to a growing region and to fulfill community needs. New buildings are designed to meet these needs and conform to the BC Building Code, but an unintended consequence of the design and materials used in newly constructed buildings is that they may impede or block radio signals, which can negatively impact the safety of the public and emergency response personnel.

This report details the rationale for, and considers the implications of, a bylaw which requires certain types of new or renovated buildings to have radio amplification systems installed.

2.0 BACKGROUND

2.1 Radio Communications in Burnaby

The dispatch service for the City's RCMP detachment and for the BC Ambulance Service is provided by E-Comm, whose radio communications network supports digital radios in the 700 and 800 MHz radio frequency range. The City's Fire Department also uses digital technology in the same frequency range.

The radio waves used by the various devices in these systems have difficulty penetrating new or renovated buildings, which are constructed with rebar, metal studs, metal-coated insulation and low emissivity (low-E) glass. The impact of these materials on digital radio signals results in a weaker radio signal within the interior and underground areas of these buildings, otherwise known as signal attenuation. The digital frequency works well until attenuation occurs, but when the signal strength decreases to a certain point it reaches what is known as the "digital cliff" and the radio signal is lost.

In addition, buildings in the line of sight between a mobile/portable radio and the base radio site can create an impenetrable barrier for radio signals. This effect is known as a building shadow, and it typically prevents any communication in these shadowed areas. Digital radios were not being used by emergency responders when the current stock of buildings were being designed and constructed, so these challenges were not known or widely anticipated at the time.

Signal attenuation and shadowing present a risk for all emergency responders, but especially for police and fire personnel who rely on their portable radios as a lifeline in dangerous situations. An impact on service delivery related to this inability to communicate can also negatively impact public safety in emergency situations.

In order to obtain an accurate assessment of the signal attenuation issues, a private company was used to test signal strength at a larger footprint highrise building under construction. The test confirmed the experience of field personnel, in that there was insufficient digital signal strength to support the use of portable radios underground in the P2 level of the parking garage and in the interior of floor 2 and a weak signal received on floor 12.

2.2 Current Opportunities

The City's Official Community Plan and related Town Centre and Urban Village plans set direction for future growth that will continue to provide for new urban development in designated areas. This urban development pattern, together with digital radio technology, will increasingly require use of radio and repeater systems in buildings to support robust communication infrastructure for police, fire and ambulance services.

2.3 Legal Authority

Under section 2 of the Building Act General Regulation, local governments are permitted to regulate in respect to “radio repeater systems for emergency communications” without any restriction by the Province. This provision gives Council the authority to enact the bylaw proposed in this report.

3.0 DISCUSSION

Communication is vital for emergency services personnel. It allows the transmission or receipt of important information which can impact the safety of police, fire or ambulance personnel, as well as enhance service delivery to, and safety of, the public. In-building radio amplification systems for certain buildings provide a solid foundation for safe and effective radio communications.

It is most cost effective to install in-building radio amplification systems during the construction phase when all other building wiring systems are being installed. The application of bylaw requirements at the building phase for new construction will create the least financial impact for development while ensuring adequate communications for first responders in the future. A cost estimate was received from a company which does these installations, and the cost for a 30+ storey highrise with 4-5 underground floors is estimated to be \$70,000 to \$100,000.

Amplifiers, antennae and other equipment are compact and can easily be mounted in normal electrical or communications vaults, and annual maintenance would involve battery replacement and possibly minor amplification adjustments by a communications technician or electrician. Due to cost implications and complications associated with retrofits, the proposed bylaw would not propose to require existing buildings to be retrofitted unless they are undergoing a major renovation program.

Currently there are four local governments with such a bylaw including the cities of Surrey, Port Coquitlam, Port Moody and the Township of Langley. The City of Vancouver is in the process of creating a bylaw while White Rock and the City of North Vancouver include radio amplification in their development process but do not have bylaws in this regard.

Both E-Comm and the Canadian Association of Chiefs of Police (of which the RCMP is a member) support radio amplification bylaws for individual cities.

3.1 REQUIREMENTS, PROHIBITIONS AND EXEMPTIONS

Requirements

The Bylaw is proposed to apply to new buildings and structures, or alterations, reconstruction or renovations to existing buildings which add more than 20% gross floor area to any existing buildings and structures or have an interior building construction value in excess of \$1,000,000 and are constructed using:

- (a) reinforced concrete or structural steel or
- (b) using metal cladding, studs and/or flooring or
- (c) reflective or low-emissivity glass or
- (d) other attenuating materials,

and have

- (e) greater than 5,000 square metres of gross floor area or
- (f) over 12 metres in height measured between grade and the floor level of the top storey or
- (g) greater than 1,000 square metres gross floor area below grade or
- (h) floor level more than 10 metres below grade.

The proposed Bylaw would apply to the design, construction and occupancy of new buildings and structures, and the alteration, reconstruction or renovation of existing buildings and structures which meet the criteria above, and requires the installation and maintenance of radio amplification systems which will function with both the E-Comm and City of Burnaby radio communication systems to support uninterrupted radio network communications for public safety and emergency responders.

Prohibitions

The proposed Bylaw would require a building which meets the criteria to provide adequate radio coverage for E-Comm or the City of Burnaby radio communications network, where adequate radio coverage includes such items as audio quality, coverage areas, radio frequency to be supported, types of amplification systems allowed and back up battery systems or generators.

Exemptions

This proposed Bylaw includes exemptions for:

- (a) any single-family detached or semi-detached residence;
- (b) any building or structure constructed of wood frame and not metal-clad;
- (c) any building or structure less than 5,000 square metres;
- (d) any building or structure less than 12 metres in height.

4.0 POLICY SECTION

The proposed bylaw amendments identified in this report contribute to the Corporate Strategic Plan by providing a Safe Community through:

- enhanced procedures in emergency preparedness
- providing responsive emergency services

5.0 CONCLUSION AND RECOMMENDATIONS

The Fire Chief and the OIC Burnaby RCMP detachment jointly support the development of the proposed bylaw regarding the installation of in-building radio amplification systems.

It is recommended that Committee receive this report and forward to Council seeking authorization for staff to proceed with preparing bylaw provisions as outlined in this report,



Dave Critchley
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Joe Robertson
FIRE CHIEF



Deanne Burleigh, Chief Superintendent
OFFICER IN CHARGE, Burnaby RCMP

SC:jr

cc: City Manager
Director Planning and Building
City Solicitor