



Building Wireless Telecommunications Infrastructure: An Overview

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BC LAND SUMMIT: *Adapting to
Change*

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Today's Presentation

- Overview of wireless telecommunications in Canada
- How does wireless telecommunications work?
- What determines cell site locations/land requirements of a network/challenges?
- Jurisdictional framework, consultation requirements and public concerns with cell sites
- Cell site types
- Future of wireless telecommunications



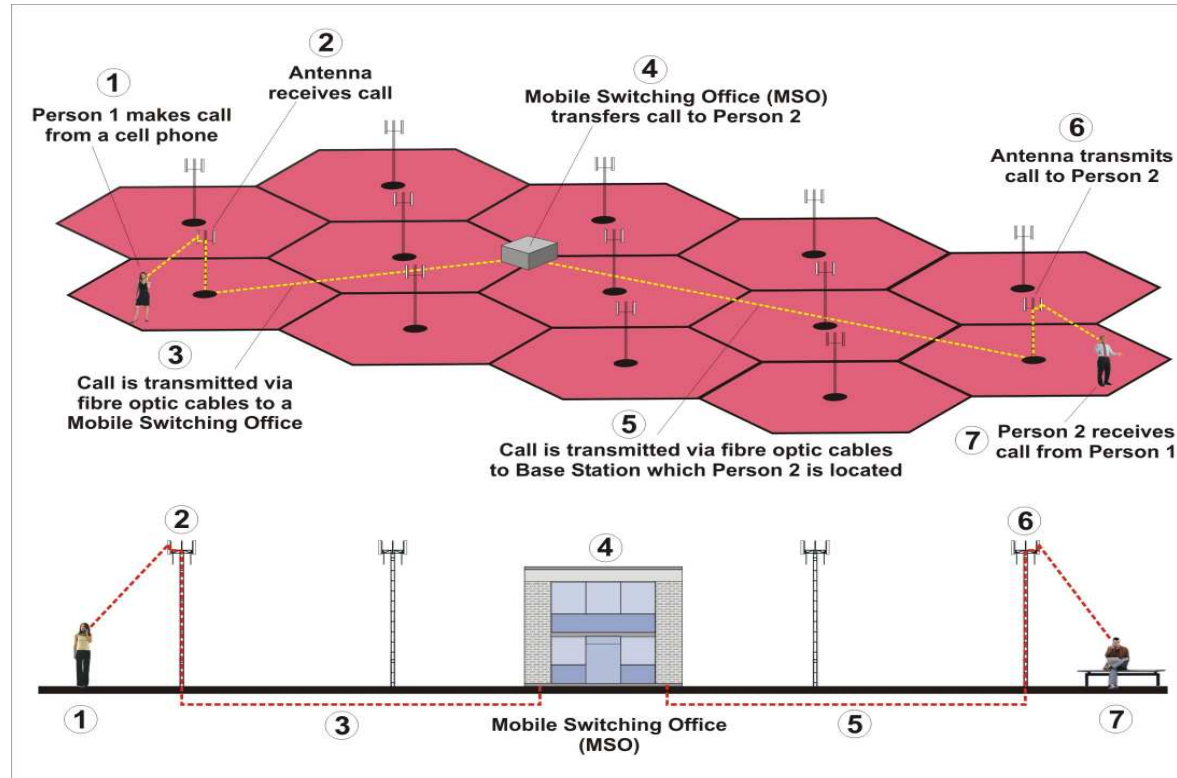
Wireless Telecommunications in Canada

- There are about 8000 wireless installations across Canada
- About 21 million Canadians have cell phones (67%)
 - **this number is growing by about 10% annually**
- Communities expect wireless service where they live, work and play
 - **98% of Canada's population have access to wireless network(s)**
- Wireless is an integral part of a communities safety infrastructure i.e. police, fire, EMS, etc.
 - **6 million 9-1-1**
- \$1 Billion annually invested in wireless infrastructure



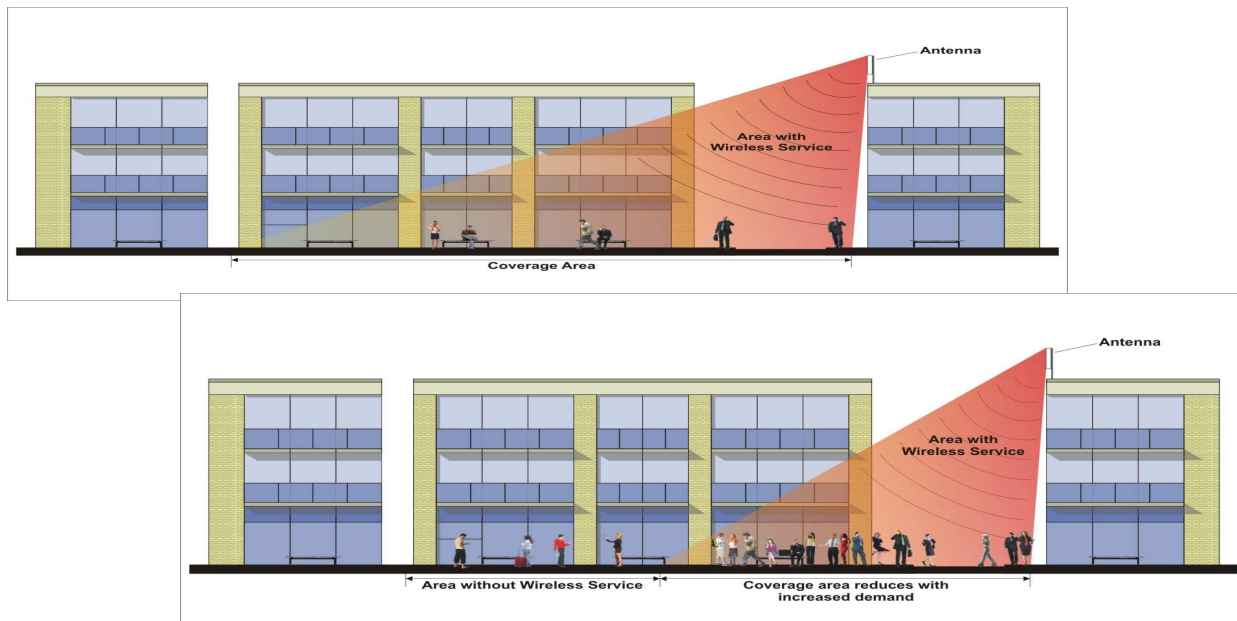
How Does Wireless Network Work?

- Wireless networks use radio waves to transmit and receive voice and/or data information over a specialized system of Base Stations (“cell sites”)



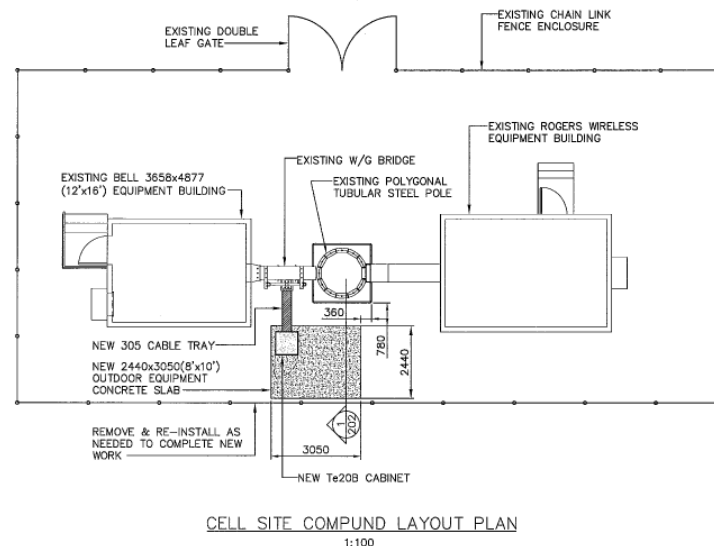
Determining Cell Site Locations

- Any new cell site is required for either capacity or coverage
- Radio Frequency Engineers determine the need for cell sites based on:
 - Customer complaints
 - Computer modeling
 - Carrier wave testing
 - Actual drive data



Land/Lease Requirements for Cell Sites

- Land is required for a structure and/or accessory equipment (SRW)
- Leased space for existing structure (rooftop) for antennas and equipment – (Lease/License)
- Wireless Carriers do not have the right to expropriate lands



Typical Compound Layout



Factors that Influence the Acquisition of Cell Sites

- opportunities to use existing structures (co-locate, hydro towers, buildings, etc.)
- availability of a willing landlord
- access to infrastructure (power, road access, etc.)
- structural requirements to support antennas (on existing structures)
- environmental constraints (watercourses, contamination, vegetation etc.)



Cell Site on Hydro Tower



Challenges with the Land Acquisition Process

■ Search areas

- As networks mature, the target areas are less flexible; fewer candidates available
- BC's mountainous terrain and mature vegetation reduces flexibility

■ Landowners

- sophisticated landlords; belief that TELUS has deep pockets
- Availability of space (densely populated areas reduce the amount of available space for towers)
- Property owners not willing to enter into long term agreement

■ TELUS is one player in the market

- Rogers, Bell, E-Comm, RCMP, AM/FM/satellite radio providers, numerous wireless internet companies



Telecommunications Regulatory Framework

- TELUS operates an inter-provincial wireless telecommunications business that is exclusively regulated by the Federal Government through Industry Canada (IC).
- IC requires Carriers to consult land use authorities prior to installation of most cell sites (IC's CPC Issue 4)
- Different land use authorities have different approaches to consultation:
 - Telecommunications policies/protocol (Langley, Surrey, etc.)
 - Permitting process (DPs, DVPs, Site Plan, etc.)
 - No process/protocol (Kelowna, Prince George)
 - No process (may require Industry Canada's Default Consultation Process)



LUA Consultation

- TELUS' approach
 - Meetings with elected officials to educate them about the telecommunications Industry
 - Relationship building with municipal staff including planners and administrators
 - Pre-consult with planning staff on potential sensitive cell sites
 - Always willing to participate in municipal policy formation
 - Participation at UBCM, LGMA, LMLGMA , FCM, and other municipal conferences



Minimizing the Impact of Cell Sites

- TELUS strives to minimize the impact of the structures on neighbouring properties through:
 - Utilizing existing structure i.e. existing towers, hydro towers, light standards, buildings, etc.
 - Locating cell sites in industrial/commercial or agricultural zones
 - Locating structures in areas with mature tree cover
 - Setback structures as far from residential properties as possible
 - Paint structures to blend with surroundings
 - Consider the use of poles or stealth designs as apposed to towers



Common Public Concerns/Challenges

- Consultation with the public generally results in the following concerns:
 - Health and Safety - Standards Established by Health Canada (SC6)
 - Aesthetics - communities want the service but not the infrastructure
 - Property Values – no studies indicate a negative impact and IC does not consider this a valid concern
 - Historically community's have concerns: North Saanich, Saanich, Langley, Surrey, Vancouver, Colwood, Langford, Chilliwack, Kelowna



Common Challenges with LUAs

■ LUA Policies/Processes

- Many municipalities have either no policies/protocols
- Many policies/protocols have developed without the input from IC or carriers
- Some municipalities do not want antennas to be visible

■ Politics and Public Concerns

- Councilors/MLAs/MPs - no votes gained by supporting cell sites
- Community Associations / Opposition Coalitions – NSTOP
- Planning departments aren't always keen to process potentially contentious applications
- Many Councils/residents ask for coverage but don't want the infrastructure



Different Cell Site Types



GUYED TOWER



SELF-SUPPORT



MONOPOLE

Different Cell Site Types



Different Cell Site Types



Shrouded Antenna Installation

Telus antennas shielded behind fiberglass screen:
 Existing high front parapet to be lowered, and new fiberglass screen to be erected, recessed slightly from existing parapet.
 Fiberglass screen to match colour and texture of existing building finish.

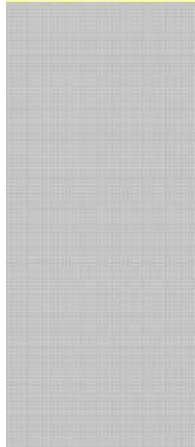


Figure 1 - West Elevation



Figure 2 - Existing Building



Stealth Cell Sites



Parting Thoughts – Adapting to Change

- Demand for wireless services is increasing – more infrastructure
- New technologies being deployed i.e. HSPA – improved service
- New wireless companies entering the market – more infrastructure
- Competitive market – better service = more infrastructure
- How does the industry best balance community's wireless needs with the location of cell site?





Questions?