

CELL (PHONE) TOWERS

Frequently Asked Questions

The City of Calgary recognizes that its citizens are often impacted by cell towers and that they seek comprehensive information to address this issue. The City wants to ensure its citizens have information about cell towers and are aware of The City's role in the "approval process" for these telecommunication antenna structures. The aim of this document is to enhance public understanding and trust by being transparent about this process, as well as demonstrating The City's compliance with existing legislation, policies, procedures and by-laws. We also want our citizens to know how and when they can participate in providing feedback, comments and information once a cell tower is proposed in their neighbourhood.

Consequently, the most frequently asked questions about locating cell towers in Calgary are provided along with an answer for each question. Where further information or clarification is required, please contact The City at 311 or at 403-268-5311.

In addition, The City's *Telecommunication Antenna Structures Siting Protocols* and *Telecommunication Antenna Structures Procedures Manual* are [available online](#) and can be consulted for further detail and explanation on procedures and other City requirements for processing cell tower proposals.

What are cell towers?

A cell tower is a tall structure usually made of steel or galvanized steel. In Calgary, a cell tower is typically designed as a latticework structure (usually found in the industrial areas), a monopole structure (usually found in residential and commercial areas), or a tri-pole structure (usually found on church sites as an attempt to blend the structure as an architectural element of the building).

Most cell towers are between 14.9 metres (49 feet) and 35 metres (115 feet) in height, but can be as high as 45 metres (148 feet) to 65 metres (213 feet). The height of a tower is dependent on factors such as the topography of the area being serviced by the tower's antennas, the height of any trees in the area, the height of buildings (trees and tall buildings can block signals between towers, so antennas must be higher than these elements), and the number of antennas being placed on the tower. In addition, a line-of-sight is required for any microwave dish mounted on the tower – this line-of-sight being from one tower to another so signals may be passed back and forth between the towers via their microwave dishes.

Antennas are placed on a tower in an array or cluster of three, with each antenna covering a sector of 120 degrees, which is one third of the circumference of a circle ($120 \times 3 = 360$ degrees or one complete radius/circle around the tower). Each set of antenna arrays requires a separation distance on the tower of at least 1 metre (3 feet) so that the antennas do not interfere with or

receive interference from the signals being received or sent by other antenna arrays mounted on the same tower.

Why are cell towers necessary?

To provide service to customers with cell phones, smart devices and other wireless telecommunication devices, the wireless service providers (proponents) must install the necessary transmitters, antennas and microwave dishes to send and receive the radiofrequency (RF) signals associated with these devices. Each one of these facilities creates an area referred to as a "cell", and each cell makes up part of a cellular system (like a honeycomb), with RF signals overlapping from one cell to the next to provide a continuous service network.

Where do cell towers get located?

While the installation of antennas on the rooftops of tall buildings is preferred by The City, there are not enough tall buildings throughout Calgary to allow the coverage necessary to service the growing customer demand for wireless service. Rooftops in the downtown and Beltline areas supply the proponents with numerous opportunities on which to locate cell phone antennas. However, in the suburbs where most of the residential and commercial developments are only one or two storeys high, there are far fewer opportunities for access to rooftops that are high enough and towers must be used instead. Further, as new wireless technologies are brought into service, the need for more capacity to stream data means more antennas and, in most cases that means more cell towers to hold them.

The City is constantly on the lookout for other ways to support cellular coverage into the communities without the need for cell towers. In this regard, The City has been successful in pioneering the use of streetlights to house antennas. This means fewer cell towers are required to hold telecommunication antennas. Note, however, that streetlight antennas will not provide sufficient network coverage in all cases and that even the streetlight antennas must eventually relay signals back to a base tower.

How many cell towers are in Calgary?

Currently, there are over 1000 telecommunication antenna structure installations in Calgary. This amount covers every type including those mounted on cell towers, rooftops, the side of buildings and streetlights. It is estimated that there are approximately 400 cell towers located throughout the city to date.

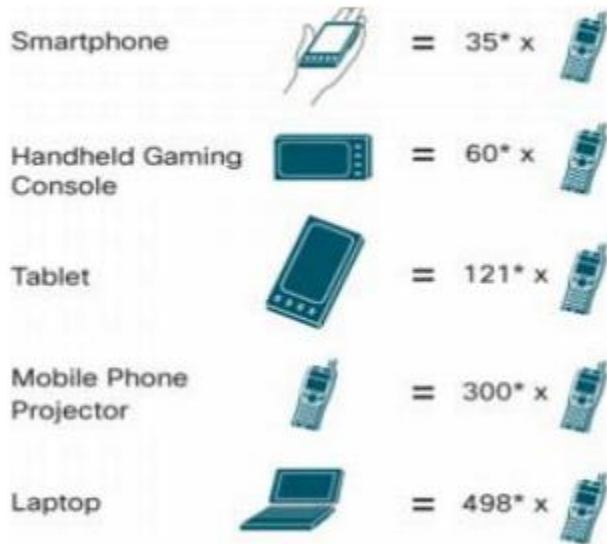
Why is the demand for cell towers increasing?

The need for more cell towers in Calgary is driven by a number of factors. First, more people are turning to wireless devices for their communication needs. This means more wireless devices, including cell phones, are competing for access to the network.

Second, the type of uses that a wireless telecommunication device can be used for has increased (music downloading, video streaming, wireless connection to the internet, and so forth). In

investigating this issue, The City discovered that a smartphone uses approximately 35 times more of the bandwidth capacity than the older type of cell phones used and an iPad uses approximately 498 times more. The following illustration¹ shows why increased bandwidth (cellular traffic) requirements are becoming more and more necessary.

High-End Devices Significantly Multiply Traffic



* Monthly basic mobile phone data traffic

Source: Cisco VNI Mobile, 2012

As these devices become more popular and more are put into service, this creates a demand for more bandwidth capacity to support their use. More bandwidth requirement means more antennas to carry the signals. Without this increase in carrying capacity, service outages would (and do) occur. This may mean an area or areas of Calgary become subject to dropped calls or an inability for these wireless devices to access the network for periods of time. Accordingly, the proponents endeavour to keep up with the increasing demand for service – and that means more antennas. This is accomplished primarily in two ways: one, by increasing the height of some of the shorter existing cell towers to carry additional antennas and, two, by building more cell towers throughout the city.

Who approves the cell towers placed in Calgary?

The City of Calgary is not the approving authority for cell towers. The federal Minister of Innovation, Science and Economic Development (ISED) is the approving authority for the development and operation of radiocommunication in Canada, including cell towers and other telecommunication antenna structures, pursuant to the Radiocommunication Act. Innovation,

¹ Source: Cisco Visual Networking Index Mobile, 2012.

Science and Economic Development Canada is tasked with, among other things, administering the orderly development and operation of these telecommunication antenna structures².

What is The City's role in the placement of cell towers in Calgary?

Innovation, Science and Economic Development Canada requires that, in certain cases, the local land use authority (The City) and the public must be consulted for input regarding the proposed placement of a cell tower in the community. The City of Calgary's Community Planning (CP) business unit is responsible for reviewing each proposal on The City's behalf and, depending on the nature of the submission, a letter of support (concurrence) or non-support (non-concurrence) is sent to the proponent upon completion of its review. The CP business unit examines each proposed submission it receives for a cell tower based on specific physical criteria. This involves reviewing and evaluating such things as the proposed location of a cell tower and aspects of its design, including, but not limited to, height, colour, type and number of antennae to be mounted on the structure, screening of any equipment compound, the design and materials to be used for any equipment storage shed, the potential for co-locating other proponents' antennas on the structure, and compliance with The City's Telecommunication Antenna Structures Siting Protocols. Based on this review, a letter of support (concurrence) or non-support (non-concurrence) is issued.

How many submissions for antenna structures does The City receive per year?

Monitored since 1991, the number of submissions received for processing by The City has varied widely. This is due to such factors as the speed and amount that various (mainly residential) areas of Calgary are growing, the state of the economy (nationally, provincially and locally), the number of new proponents offering wireless services, new and upgraded technologies being offered to customers, and so on.

For the twelve year period (2000 to 2011) the number of submissions received by The City, which includes all types of cell phone antenna submissions (towers, rooftops, streetlights, and so on) is shown in the following table.

Year	Submissions	Year	Submissions
2000	39	2011	116
2001	118	2012	49
2002	35	2013	29
2003	13	2014	38
2004	16	2015	18
2005	46	2016	26
2006	17	2017	11
2007	14	2018	31

² For additional information regarding ISED's mandate and the application of its authority in the telecommunication process, please consult <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/home>

2008	41	2019	28
2009	139	2020	22
2010	150		

How does The City’s submission process work?

Proponents wanting to install telecommunication antenna structures in Calgary must follow a specific set of requirements. These requirements have been devised to give The City both a clear indication of the proponent’s intent and an opportunity to negotiate with respect to height, type of installation, location, and co-location options. It also sets out when notification and a public consultation process must be done. You can access these requirements in the **Telecommunication Antenna Structures Siting Protocols** at www.calgary.ca

In addition, to provide better insight for the public as to how telecommunication antenna structure (cell tower) proposals are actually dealt with by Community Planning, the City has prepared a short eight page manual that details and explains each step of the procedure, entitled **Telecommunication Antenna Structure Procedures Manual**. This can also be accessed at www.calgary.ca.

Do City Bylaws and Policies control or apply to cell towers?

Cell towers are regulated under federal jurisdiction. The federal regulations are the “senior” ruling provisions for these structures. As such, The City’s “junior” provisions in **The Calgary Land Use Bylaw 1P2007** cannot override the federal regulations and jurisdiction. Accordingly, The City does not review and evaluate any telecommunication antenna structure, including cell towers, using the rules in the Land Use Bylaw. The Land Use Bylaw may be consulted if a question arises regarding the land use designation (i.e. residential, commercial, industrial, park, etc.) of a parcel of land upon which a cell tower is proposed to be placed.

With respect to policies, Council adopted the **Telecommunication Antenna Structures Siting Protocols** in June, 2011. These protocols updated and replaced The City’s former cell tower policy, *Freestanding Telecommunication Antenna Structure Planning Criteria*, which was adopted in 1997. The new protocols provide a much more comprehensive set of provisions and requirements for proponents wishing to place cell towers in Calgary. In addition, they set out procedural standards that were never provided in the original policy document so that both the proponents and the general public will have a better knowledge and understanding of the requirements and procedures involved with the placement of a cell tower in Calgary. (Note: Amateur Radio antenna structures are not covered by this protocol. The City has separate provisions for these structures.)

Does a cell tower need a Development Permit?

No, a development permit is not required for a cell tower. A development permit is issued under the authority of **The Calgary Land Use Bylaw 1P2007**, and cell towers are not subject to those

provisions (as discussed in the preceding question). The material The City receives from a proponent in support of a cell tower proposal is referred to as a “submission” specifically so that it will not be confused with a development permit application.

Can I appeal a decision to allow a cell tower in my community?

No, a decision cannot be appealed. There is no appeal procedure for cell towers. It is important, therefore, that, in those cases where a public consultation is required by the federal regulations and you are not in favor of the proposed cell tower being placed near where you live, you should say so and explain why. There are at least two opportunities for you to do this. One is to attend the public meeting and provide comments to the proponent at that event. The second opportunity is to send your comments to The City administration (a Community Planning Senior Planning Technician) tasked with processing cell tower submissions. See the FAQ question below about the Public Meeting for further details on this subject.

Can I stop a cell tower from locating in my neighbourhood/community?

Cell towers are part of a telecommunication network that is a utility. Refusing to accept the hardware that is required to provide the utility is like saying you want electricity to power your home but you don't want the power poles and electric lines that come as a necessary part of the service.

However, just as The City now buries electrical power lines in its newer subdivisions, thereby eliminating power poles and overhead lines, Community Planning is working with the proponents to improve tower design and camouflaging and even the need for towers at all in as many instances as it can.

So, what can you do? First, attend the open house the proponent holds to inform the community that a cell tower is being proposed. Look at the information, ask questions and get answers. If your questions can't be answered by the proponent's representatives, fill out the questionnaire provided (you should find it next to the sign in sheet) prior to leaving the meeting. The proponent must address all questions received at the meeting prior to making a submission to The City. Also make your opinions and concerns known to the proponent by placing them on the questionnaire and by sending them to your community association and The City. Educate yourself as much as possible about the proposal. Ask why a tower is required at all and why the proponent has chosen that specific location and that specific type of structure.

Second, speak with a Community Planning representative that attends the open house sessions. Their main role is to observe the proceedings and provide information about The City's process for reviewing and evaluating a cell tower proposal. You may also find out more about what The City might be considering about the proposal and the possibility of alternative locations, designs, and co-locating opportunities so that fewer towers are needed. Remember, at this point the proponent has not made any submission to The City, so things may still be in flux and

opportunities may exist to find a location or design (or both) you believe is better and that will suit the proponent's servicing requirements for the area.

Third, speak to the member(s) of your community association about the proposal. Hopefully (though not always), one or more of the board members will attend an open house, but if not, contact them to express your views. Use the same approach as detailed in the first and second points above.

Fourth, be proactive. Statements like the following can be helpful: "I don't think the current location is appropriate. Have you or the proponent considered this location here, or that one over there?" Or, "I might find this proposal more acceptable if the built form was this type of design rather than what is being proposed." This is the type of information The City may be able to use when negotiating with the proponent.

Fifth, if you have concerns about the health aspects, consider researching online to find out more about this issue. Note that The City is not authorized to assess a cell tower submission based on perceived impacts on human health. The federal government has established RF exposure limits through the Safety Code 6 standards. Therefore, you could start with reviewing Health Canada's information about Safety Code 6, which the proponents' systems must comply with (see healthcanada.gc.ca). In addition, Canada's Spectrum Management Operations Branch can be contacted for information at spectrum.calgary@ic.gc.ca.

Why can't cell towers be restricted to industrial areas or the city's edge?

Each cell tower has a limited range of operation due to such factors as the transmitters' size and power, the frequency of the signal in use, the number/capacity of calls that can be handled at the same time, and the power of the cell phones and other devices using the system. Consequently, the distance between each cell tower in urban areas is likely to be between 1 to 2 kilometres. Hilly or uneven topography, tall buildings and even tall trees can reduce that operational distance by half or more. As a result, cell towers must be placed in close proximity to the customers they serve – and that means, in or beside residential neighbourhoods.

In addition, as more customers demand service, additional antennas must be installed to provide that service. This means that more cell towers are then required to carry these antennas.

How do telecommunications providers (proponents) find locations for cell towers?

When a proponent determines that a cell tower is needed in a particular area in Calgary, a representative is assigned to find a site. The representative will have a search area provided to him/her by the company's radiofrequency (RF) engineers. This may mean that there are two or three areas identified as potentials, and they may be shown as Option A, Option B and Option C. Option area A will be the preferred area, with areas B and C as secondary locations if there are no locations available in area A.

At this point, the proponent may go ahead and find a site and secure it through a licence agreement with the owner of that site. Note: a proponent cannot compel a property owner to accept a cell tower on his/her property. In addition, the proponent still has to make a submission to The City for concurrence.

The City prefers that, prior to any licences being signed (which commits a proponent to a site) the proponent contacts Community Planning to discuss the location it has found. That way any initial concerns The City has with the proposed location can be discussed and negotiations commenced to explore other locations if The City has concerns about or cannot support the proposed location.

As a last resort, The City may suggest the proponent consider locating its tower on a City-owned property if it determines that doing so would create less of or negate any potential impacts on the area the tower will be placed in.

Is a notice required to tell residents about a cell tower proposal?

Federal regulations state that cell towers proposed to be 15 metres (49.2 feet) or greater in height require both a notification by the proponent to the local land use authority (The City) and a public consultation. It should be noted, however, that in cases where the land use authority has adopted procedures for dealing with cell towers, the proponent must follow those requirements with respect to notification *for cell towers 15 metres or greater in height*. The City's protocols require that any tower, regardless of height, to be placed within 100 metres of residential development or a residential district will require a public consultation process. This involves a notification being sent to every dwelling within 300 metres of the proposed structure and a public meeting (primarily for those receiving a notification, though other parties may attend as the meeting is open to all the public).

While The City's protocols ask that proponents inform Community Planning of all proposed cell towers for placement in Calgary, regardless of height, there is no guarantee that a proponent will do so for any cell tower that will be less than 15 metres in height (again, an issue of the [senior] federal regulations verses the [junior] municipal protocols). For certain cell towers less than 15 metres in height, The City can ask Innovation, Science and Economic Development (ISED) Canada to compel a proponent to provide a consultation process if it can convince ISED that the proposed structure is being placed in a location where it would be prudent to have such a consultation. Note, however, that The City would actually have to have received information that a tower less than 15 metres in height was being considered by a proponent in order to make this request, which does not always happen.

How is notification of a public consultation meeting given?

The specific requirements for providing notification and the circumstances under which it must be provided in Calgary are set out in the *Telecommunication Antenna Structures Siting Protocols* available online at www.calgary.ca. These provisions are briefly summarized in the following text.

When a public consultation meeting is required, pursuant to The City's telecommunication protocols, a written notification is sent by the proponent to all affected residential properties within a 300 metre distance from the base of the proposed cell tower. The protocols allow for a reduction of this distance in certain cases, but this must be negotiated with The City at the pre-submission consultation stage (see subsection 9.5 of the protocols for specific details). In order to ensure all properties have been identified, The City provides the proponent with a list of affected addresses to which a notification must be delivered.

In most cases, the proponent will choose to hand deliver the notification, which will be left at each residential property in an envelope stating:

Attention: Occupant

A CELL TOWER IS PROPOSED WITHIN 300 METRES OF THIS RESIDENCE. YOU ARE INVITED TO A PUBLIC MEETING. INFORMATION IS ENCLOSED.

Note that the envelope will be addressed to the "Occupant" rather than have the name of the property owner or resident on it. This is due to a Freedom of Information and Protection of Privacy requirement whereby The City can provide addresses to a third party (in this case, the proponent) but not the name of the person(s) living at these addresses. It is important, therefore, that the recipient of this information be observant as it is not uncommon for the notification to be mistaken for junk mail and disposed of instead of being opened and read. The obligation is on the resident / property owner to be vigilant and The City will not accept any plea that notification was not received because the information was thought to be junk mail and went into the garbage unopened.

How is a public consultation meeting conducted?

The public meeting format is the responsibility of the proponent to arrange, organize and conduct. Currently all public meetings regarding cell tower proposals are conducted using an open house format. This means the public is free to walk through a series of displays providing information about the proposed cell tower and telecommunications in general. The proponent will have a number of representatives on hand to discuss issues and answer questions on a one-on-one basis. A questionnaire is also provided to those attending who wish to make comments for the record or obtain additional information. Subsection 9.8 of The City's telecommunication protocols lists the basic information that must be provided by the proponent at the meeting.

A representative from Community Planning also attends the public consultation meetings to monitor the issues being raised and answer questions regarding processing procedures. Depending on scheduling commitments, the Ward Councillor or a Ward Assistant may also attend all or part of the public meeting to scrutinize the event.

What is meant by co-location and why is it important to The City?

Both the federal regulations and The City's protocols require co-location whenever possible. Co-location means the placement of antennas on a cell tower by a different proponent from the one installing the tower. As an example, Wireless Service Provider A proposes to erect a cell tower somewhere in Calgary. As part of the proposal, it must demonstrate that it has offered space on the tower for Wireless Service Provider B (and sometimes even C as well) to place their antenna arrays. The goal is to reduce the number of cell towers being erected throughout the city.

In Calgary, communities may be served by three or four proponents, each requiring a structure of a certain height to provide coverage for its customers. In addition, as more customers buy and use wireless telecommunication devices, additional antennas become required by each proponent to cope with the increase in demand for service. If each proponent was able to erect its own cell tower, the city would have hundreds more cell towers than are presently in place and each community would have one tower for each proponent providing service in the area.

Although The City encourages the proponents to co-locate, there are circumstances when it is not as advantageous from The City's point of view to do so. While co-locating reduces the number of cell towers required in an area, it may cause increases in the height of the towers being installed. A separation distance of approximately 1 metre (3 feet) between antenna arrays is needed on each tower. Proponents usually need two and sometimes three sets of antenna arrays on a tower to provide adequate service. Optimal operating heights for these antennas must also be taken into account. Consequently, a proponent who has proposed a 25 metre (82 feet) high cell tower may have to increase the tower's height to accommodate co-locators, putting that height into the 30 to 45 metre (98 to 148 feet) range. As a result, one of the factors that The City always considers when reviewing a cell tower proposal is the question, is one tower in the area better than two? In most cases the answer is yes. However, there are situations where it may be more appropriate to have two smaller towers rather than one very tall structure.

Is radiofrequency (RF) radiation from cell towers limited by anyone?

Yes. All cell phone antennas, including those on towers, in use by a proponent in Calgary, must comply with federal government standards and regulations. Health Canada has established guidelines regarding human exposure to radiofrequency energy, *entitled Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz - Safety Code 6* (available online at [Health Canada's website](#)). Each proponent must submit its RF calculations to Innovation, Science and Economic Development Canada for each installation with respect to the amount of radiofrequency radiation its installations will emit. When a tower will be used for co-location, the calculations for each proponent installing antenna arrays on it must be submitted and the accumulated emissions kept to or below the Safety Code 6 limits.

Besides Safety Code 6, what sources does The City review regarding cell towers and potential human health issues?

The City relies on the RF exposure limits established in Safety Code 6, and has no authority to override those limits with any of its own. However, Community Planning does review material on

the topic to determine if there is any new information that The City should consider in determining the locating of telecommunication antenna structures in Calgary. It is important to note, however, that The City has no medical, RF engineering or scientific expertise in this regard.

The City has adopted a more precautionary approach to siting cell towers in residential areas by recommending setbacks for cell towers from residential development (see Subsection 7.6 of the *Telecommunication Antenna Structures Siting Protocols*). Note that these setbacks are **guidelines only** to be negotiated with the proponents at the time a cell tower is proposed. As such, they have no authority of enforcement and cannot supersede the federal regulations.

The following report, while somewhat dated, is referenced here as a potential place to start, should you want to review this issue. Community Planning has found it to be one of the most well written pieces of research that puts the scientific issues regarding cell towers and human health in clear terms. This document was one of the first reviewed by Community Planning back in 2000 when the topic of potential effects of cell phones and cell towers on human health became of increasing concern for Calgarians. Produced in Great Britain, the name of the document is *Mobile Phones and Health* by the Independent Expert Group on Mobile Phones, April, 2000. Another report from the *Executive Agency for Health and Consumers - Promoting healthy environments: Electromagnetic fields* is also worth mentioning.

Do cell towers impact residential property values?

The City has no accredited evidence regarding cell towers' impacts on residential property values. Community Planning has tried since 2000 to find accredited empirical evidence that either supports or refutes the claim that cell towers impact property values. There are few studies regarding this issue but nothing that addresses the Calgary, or even the Canadian, real estate market. Nor is there any information in this regard available from either the Calgary Real Estate Board or the Canadian Real Estate Association.

A study, published in *The Appraisal Journal*, Fall 2007 edition, entitled "The Effect of Distance to Cell Phone Towers on House Prices" in Florida by Sandy Bond, PhD, is the first North American study Community Planning has been able to find on the topic. The article cautions the reader that many similar studies in different geographic locations are needed to determine if the results are consistent. The abstract from the study is reproduced here for information purposes and should be viewed as a hypothesis rather than a final verdict on the subject for residential properties in Calgary.

"This article outlines the results of a study carried out in Florida in 2004 regarding the effect that cell phone tower proximity has on residential property prices. The study involved an analysis of residential property sales transaction data. Both GIS and multiple regression analysis in a hedonic framework were used to determine the effect of linear distance of homes to towers on residential property prices. The results of the research show that prices of properties decreased by just over 2%, on average, after a tower was

built. This effect generally diminished with distance from the tower and was almost negligible after about 656 feet.” [200 metres]

Community Planning corresponded directly with Dr. Bond regarding her study and its findings. She advised that the following be kept in mind when attempting to determine potential cell tower impacts on residential property prices anywhere:

“Please also note that the state of the market can have an affect. For example, in a tight (rising) market people have fewer choices when buying and may be prepared to live in closer proximity to a cell phone tower than otherwise may be the case in a slower market when more properties are available for sale.”

How long after a cell tower is given concurrence will it be installed?

A concurrence remains valid for a period of three years. The proponent is provided this time to commence construction of the cell tower.

In some cases, the proponent will install a cell tower within two or three months after concurrence from The City is received. However, there are also cases where a cell tower was not installed for two or more years after the concurrence was issued.

There is no way to predict when a cell tower will be built. This has led to problems and confusion on occasion as residents who opposed the tower may have come to believe it will not be built because it is not installed right away. Then, when the construction actually begins, those opponents believe the proponent has in some way cheated or bypassed the proper procedures. Consequently, The City encourages proponents to erect their towers as soon after concurrence is given as possible to avoid creating confusion and misunderstanding within the community. More recently, The City has asked proponents to contact the affected community association with a heads up prior to commencing a delayed installation so that this information can be communicated via the community newsletter to the residents of the area.

Why can't technology other than cell towers be used?

The City can influence and negotiate but cannot force the proponents to adopt new technology or cell tower infrastructure. The proponents are the ones who know what their systems require and where they require it. Thus, The City is reliant on the proponents' expertise in this regard.

The City does look for and review information regarding new telecommunication technologies and methods, particularly with respect to alternative methods to hide and camouflage cell towers and telecommunication antennas or replace them with less intrusive hardware. The initiative taken by Community Planning to negotiate the placement of telecommunication antennas on streetlights is one example of The City's recent efforts to reduce the visual impacts of cell towers on the residential areas and Calgary in general.