



Radio, Television, Cell Phone, and GPS Interference Facts

What causes interference?

Corona from transmission line conductors can generate electromagnetic “noise” at the same frequencies that radio and television signals are transmitted (corona is the breakdown or ionization of air within a few centimeters of conductors and hardware). This noise can cause interference with the reception of radio and television signals depending on the frequency and strength of the signal.

Will the Project interfere with my radio signal?

FM radio receivers usually do not pick up interference from transmission lines. If there is AM radio frequency interference, it typically occurs immediately under a transmission line and dissipates rapidly from the line.

A two-way mobile radio located immediately adjacent to and behind a large metallic structure, such as a building or transmission line tower, or a large landscape feature, such as a hill, may experience interference because of signal-blocking effects. This would generally require a movement of less than 50 feet away from the structure or to higher ground to reduce the interference.

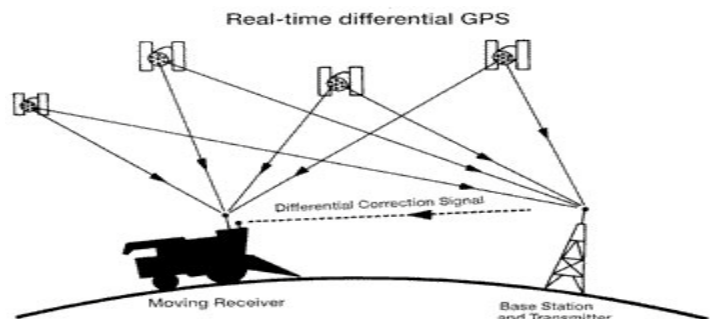
Will the Project interfere with my television reception?

Television interference is rare, but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Digital reception is, in most cases, more tolerant of electrical noise and somewhat less resistant to multipath reflections (i.e., reflections from structures) than analog broadcasts. The towers are proposed to be about 1,000 feet apart, thus there would be plenty of space between the towers for the signal transfer.

Satellite television interference may occur from any tall structure placed in front of the receiver. The Project is proposed to be located at least 500 feet away from residences. This spacing will greatly reduce the potential for interference.

Will the Project cause interference with my GPS unit?

GPS units collect location data from at least three or more satellites at any given time. The accuracy of the location data is dependent on the number of satellites and the strength of the signal. Since satellites are in constant motion above the earth, GPS units are constantly picking up and dropping satellites. At times there might be instances when the GPS unit is not able to connect to enough satellites and the required accuracy is not met.



GPS Interacts with farm equipment to Navigate in the fields
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In 2002 the IEEE (Institute of Electrical and Electronics Engineers) published a study¹ that investigated the effects of overhead power-lines on GPS receivers with respect to the effects of EMI (Electromagnetic interference) generated by two mechanisms: corona noise and gap discharges. Measurements evaluated whether the GPS signal could be scattered by overhead conductors and if EMI could adversely affect the signal received.

The test conducted in the study by IEEE used a Trimble GPS receiver near a 345-kV line to see if corona noise and gap discharge could affect the “lock” a receiver had on the satellite constellation above. They made multiple measurements in fair and foul weather conditions and also under double circuit twin-conductor transmission lines.

The study reported that exposure to corona noise or gap discharge noise did not cause a loss of satellite signal lock. They did however note that the receiver may lose lock due to temporary poor satellite configurations, which may happen from many different sources, including poor satellite constellation (less than four visible satellites) and/or outages to the base station or transmitter.

On rare occasions, a transmission line structure may cause a drop in accuracy due to blocking a view to one satellite, but this would only occur if the receiver, tower and satellite are in a line, which is rare. Connection is usually restored within minutes and the GPS units return to normal function.

Will the Project cause interference with my cell phone?

Cellular service will not be impacted by the Project, because cellular signals are transmitted in all directions and would not be blocked by the Project.

If interference occurs, what will Minnkota do to fix the problem?

If interference occurs, Minnkota would work with the affected entity to correct the issue until reception is obtained. Typically, tightening loose hardware on the transmission line and appropriate modification of the receiving antenna system will resolve any interference problems.

¹ “Use of Global Positioning System (GPS) Receivers Under Power-Line Conductors” published in the IEEE Transactions On Power (October 2002)