

Public Safety E-Comm DAS for the New Heart of Surrey



Cartel Communication Systems, working with one of BC's top electrical contractors, designed and deployed a comprehensive campus-style Emergency Communications (E-Comm) radio coverage enhancement network throughout the 12-acre King George Hub in Surrey, BC.

Life is better when we communicate; read more to find out how that proved true at King George Hub.

The New Heart of Surrey

King George Hub is a 12-acre development located on the northeastern corner of King George Boulevard and Fraser Highway. Convenient, connected, and located adjacent to the King George SkyTrain station, the Hub is a community connected by grocery, food, retail, office spaces, banking, residential blocks, and a transit station. The development of King George Hub was separated into 4 phases.

Phase A, comprising the Coast Capital Savings Help Headquarters, standing 10-storeys tall, was completed in 2015.

Phase B, which began commissioning in 2017, headed by a new team of contractors, encompasses the retail buildings, a 15-storey office building, and two residential towers standing 40 and 29-storeys respectively.

Phase C is a 34-story residential tower with retail space on the ground floor and a separate underground parkade.

Phase D, under construction, will be comprised of several multiple-story buildings.

The electrical contract for the King George Hub was awarded to one of BC's top electrical contractors, who, in turn, commissioned Cartel as the Emergency Communications (E-Comm) designer, integrator, and systems manager.

Discovery and Collaboration

King George Hub allowed Cartel to collaborate with an existing client and create an innovative E-comm DAS system design. Public Safety and E-Comm systems are one of Cartel's top markets. The E-Comm (Public Safety) network provides radio communications for all emergency services in the lower mainland, ensuring uninterrupted operations of First Responder communications.

Burnaby, Surrey, Port Moody, Port Coquitlam, Township of Langley, District of North Vancouver, City of North Vancouver, Vancouver and White Rock are all among a growing list of communities with mandatory Bylaw requirements for an E-comm design in the building permit application.

As with all our projects, our communication and project management departments ensured that team members had up-to-date project information and provided the electrical contractor and client with ongoing and accurate communication during the King George Hub project.

The King George Hub project praised Cartel's project specialists' expertise on the project, stating that they were:

"very knowledgeable and professional, [and that they] engage the client really well on short notice and seemed to know a lot about the building without stepping foot in it before."



Cartel was initially commissioned by the Electrical Contractor for the E-Comm Distributed Antenna System (DAS) for Phase B. Seeing the need for continuity between phases, Cartel was then asked to deploy the E-Comm DAS for the whole development. We supplied the critical components, technical direction, and commissioning services; Cartel used Sunwave Solutions for their Crossfire Digital Distributed Antenna System.

Sunwave Solutions is an international provider of communication network solutions, specializing in IP-based wireless infrastructure and digital DAS end-to-end solutions. Cartel collaborated with Sunwave to design a comprehensive, future-proof Digitized DAS that would meet all the Bylaw E-Comm requirements in BC, while also being flexible enough for various deployments. This DAS will future-proof King George Hub, ensuring E-Comm coverage in all buildings, as the data capacity and requirements in King George Hub grow.

Coverage and Capacity over 12 acres

The engineering team designed the DAS to amplify and enhance the 700MHz E-Comm network for in building coverage throughout each phase of the project. Typically, E-Comm systems require a single donor antenna that feeds 1 amplifier in 1 building.

However, in a proposed development with multiple buildings over a large area, 1 amplifier in 1 building will not be able to provide the critical uninterrupted coverage and capacity needed in all buildings in the development. Cartel worked closely with Sunwave Solutions to design and deploy a digitized campus style DAS architecture, the first of its kind for Sunwave Solutions.

“When you are working in large projects like this, you have to figure out how to provide coverage to multiple buildings. How do you equally distribute your signal?”

-Lead Engineer, Cartel

This new campus-style DAS proposed to feed an off-air Radio Frequency (RF) signal into a bi-directional amplifier (BDA), which then distributes RF coverage to that building, as well as all other buildings. It accomplishes this by re-directing a sample of the signal to a Sunwave Access Unit (AU-PS). The AU-PS serves as a traditional head-end point of interface device by accepting an analog input, conditioning, and digitizing the signal into fibre.

Digitizing the signal allows for long-distance distribution to buildings over optical fibre cables. Each fibre can then feed a Sunwave remote amplifier in each building where the signal is converted back into RF to be distributed throughout the building via traditional DAS infrastructure. This cost-effective and expandable solution enables the system to grow with the infrastructure.



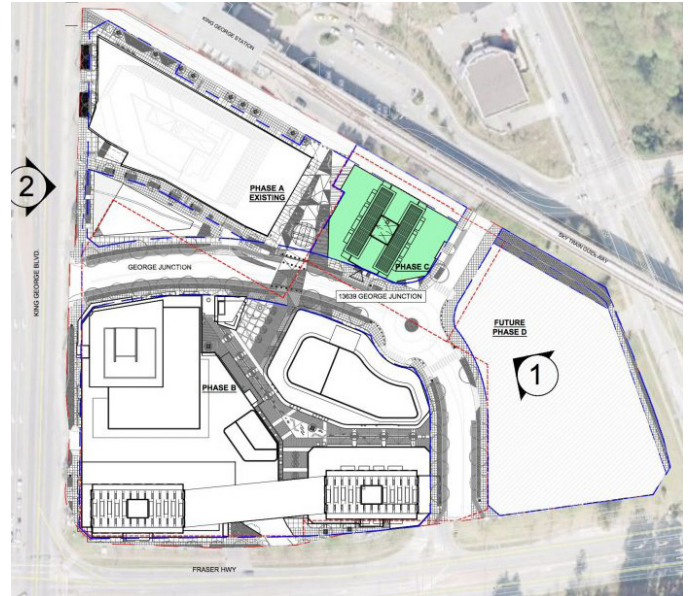
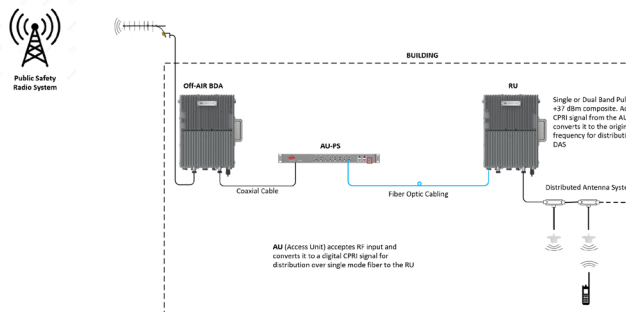
Deployment in King George Hub

Starting with Phase B, the donor RF signal is brought into the second-floor parking garage into a Surecall 0.5W Bi-directional Amplifier (BDA), which feeds the DAS system of that building, as well as a Sunwave AU-PS. The AU-PS accepts an analogue RF signal and allows the user to condition and filter the signal before digitizing it for distribution over single-mode optical fibre links to remote amplifiers. The AU-PS is located in the parkade of Building 3, Phase B. This AU-PS is considered the primary, or master AU, for all Remote Amplifiers (RA) in every phase of King George Hub.

More than 330+ antennas, each serving a 30 ft. radius and providing at least 10 dBm of coverage, are deployed in King George Hub, Phase B. They are linked by thousands of feet of coaxial and fibre cable. The primary AU-PS also feeds all of Phase C and Phase D buildings.

When the RF signal is digitized and brought into the other buildings over optical fibre it connects to a Remote Amplifier MP-PS (Mid Power for Public Safety) in a remote location within that building. The MP-PS re-converts that optical fibre signal back into RF and distributes the signal through a DAS in the building.

Remote locations are typically in a Communications Room in the parkade, basement, or lower levels of the respective building. Their location within the Communications Room comes with the understanding that as a signal travels through the coaxial cable it will lose some of its strength. In this approach, however, by locating the remote amplifier in the basement, areas typically thought of as having poor coverage, Cartel can still facilitate strong signal distribution to antennas. As the signal moves up the building through coaxial infrastructure the available signal power is reduced, but with stronger macro coverage in the upper levels of a tower fewer antennas are required. This allows for a balanced link budget with uniform power distribution to all in-building service antennas.



The Cartel Way

Cartel Communication Systems delivered a clear, harmonious E-Comm DAS for King George Hub through one of BC's top electrical contractors. Speaking about what set Cartel apart,

"Communication - it was key to get the E-Comm system finished 3-months ahead of occupancy which is no easy task. [The Cartel Team] made the process simple and communicated well along the way, which helped me to manage expectations upstream."

- Project Manager, Electrical Contractor

From the design and engineering of Phase B, Cartel has continued to provide agile design and engineering into Phases C, D, and future phases of the development. With the finalization of each phase, Cartel provides a yearly support plan to ensure all E-Comm systems remain fully operational, and calibrated.

If your project requires a multi-building, or campus-style Digitized DAS E-Comm system, or any E-Comm requirements give Cartel a call. We will find a solution to fit your communications needs.