

Backgrounder Humber College Broadcast-Broadband Convergence *B²C* Lab

Humber College's *B²C* lab is at the cutting-edge of developing next generation television and data delivery applications enabled by the new Advanced Television Systems Committee (ATSC) 3.0 television broadcast standard. The new 3.0 standard is set to replace the current ATSC 1.0 standard in North America and Humber College is leading the way in establishing Canada's first Broadcast-Broadband *Convergence B²C* Lab.

The *B²C* lab, the first of its kind in North America, is housed at the Barrett Centre for Technology Innovation at Humber's North Campus. Phase One of the lab is now operational and will begin working with industry, students and faculty in early 2022 to research and harness the possibilities of ATSC 3.0 through novel applications.

The ATSC 3.0 terrestrial broadcast standard runs on an IP (internet protocol) backbone and can integrate with other global data delivery standards, including Wi-Fi and 5G. It offers enhanced audio and visual features for television, full broadcast mobility and is currently the world's most efficient one-to-many data delivery system.

Humber's *B²C* lab will be uniquely equipped with both an ATSC 3.0 broadcast ecosystem and 5G core network to explore hybrid data delivery applications across over-the-air (OTA) television and mobile cellular networks. The lab will also include multiple ATSC 3.0 transmitter/antenna sites to facilitate development and testing of a broadcast inter-tower communications network (ITCN). Additional technology clusters in the lab will include microwave testing equipment and an RF anechoic test chamber supporting the design and testing of a wide range of antennas, wireless devices and prototypes.

Adoption of the ATSC 3.0 standard by broadcasters can support the digital transformation of other industries through new data delivery (datacasting) opportunities. This could include industries deploying applications from IoT (Internet of Things) connectivity, autonomous vehicles, smart cities, geotargeted emergency alerting, programmable advertising, distance learning, smart agriculture, forestry and mining, and more.

Humber's research with industry stakeholders will incorporate several areas of research:

- **Television Interactivity:** With Next Gen capabilities, Broadcast TV is delivered via a broadcast application. Through this new delivery method, live-linear programming can be integrated with web-style delivered content creating an interactive experience for consumers. Other features in 3.0 broadcasts include addressable advertising and the ability for each viewer to customize their own broadcast experience through features such as switching between camera angles in a sporting event, and other forms of content substitution.
- **Data Delivery:** Broadcasting through ATSC 3.0 can move beyond a television service to a 'one-to-many' form of data delivery with positive implications for Canadians. The conversion of the broadcast industry to this full IP-based data system will allow it to become part of the connected world. A managed hybrid data delivery network that

incorporates both ATSC 3.0 broadcast and 5G delivery can serve as a capacity multiplier for end-users where content demands are exceedingly high, and address gaps in-network coverage, including offering internet data delivery support in rural, or remote areas.

- **GPS Augmentation:** ATSC 3.0's more robust transmission delivery system using UHF spectrum is capable of penetrating buildings and concrete more effectively. Inherent in its design is a precision clock reference that offers position and timing coordinates for data signaling. These capabilities can allow ATSC 3.0 to offer GPS augmentation service in the absence of conventional GPS service due to poor or no reception, in places such as underground parking garages, tunnels, and other low reception areas.
 - Humber College has been awarded a joint [NSERC/CFI College Industry Innovation Fund](#) grant valued at \$4.5 million to support lab infrastructure and growth of applied research capacity. The aim of the *B²C* lab is to foster partnerships between Humber College and the private sector leading to business innovation at local, regional and national levels.
 - The *B²C* lab supports multidisciplinary research and will hire approximately 150 students over the next five years from various programs and faculties at Humber. Students will be at the centre of leading-edge research in the *B²C* lab alongside faculty and industry partners. They will learn first-hand through the lens of working with a global standards development organization through ATSC and its partners. A leader in global polytechnic education, Humber College provides career-focused education to more than 33,000 full-time and 23,000 part-time and continuing education students across three campuses in Toronto, Canada.