

Calgary Transit Operations Control Centre

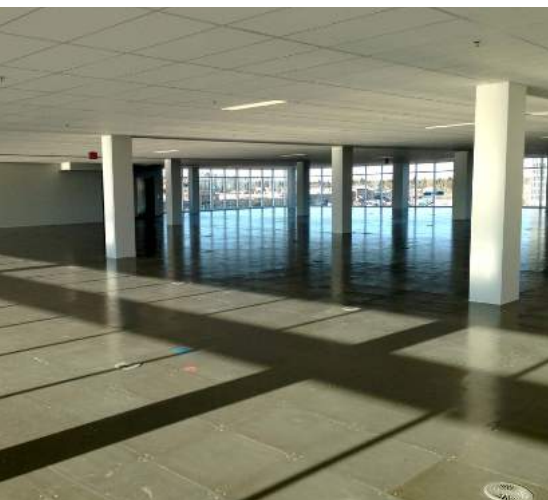
Mission Critical Facility



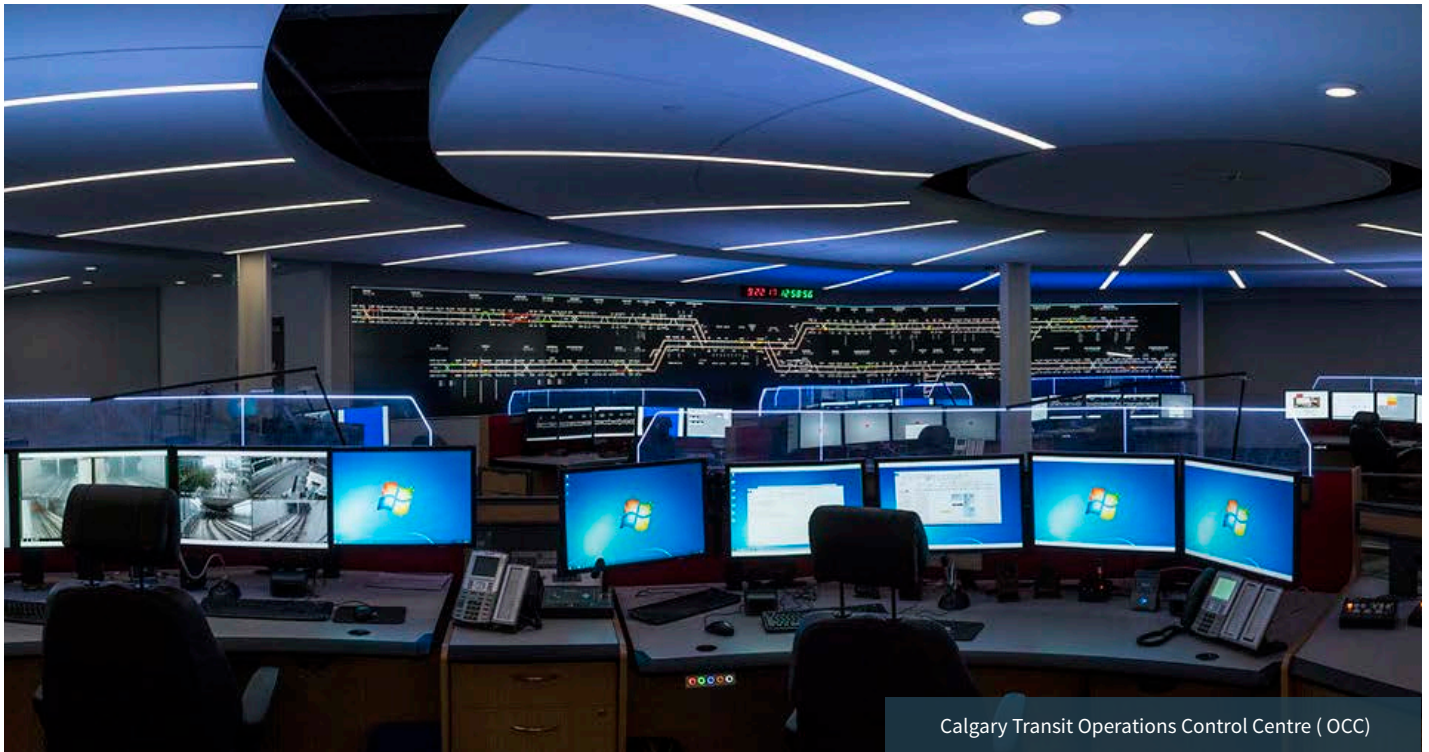
Entered by

HATCH

April 2019



Calgary Transit Operations Control Centre (OCC) Project Summary



Needing a new mission-critical control centre to replace aging facilities and support their 30-year strategic expansion, Calgary Transit engaged **Hatch** to lead a multi-discipline team responsible for the design, project management, construction administration, testing and transition of a new Operations Control Centre.

A new display management system, a first in North America, was deployed to maximize user flexibility and minimize desktop clutter.

The new facility provides a spacious, modern and ergonomic workplace, designed to achieve LEED Silver certification.

“Special recognition goes to all involved for making this transition virtually seamless... I know there were many long hours and critical moments. Your perseverance has paid off.”

- Doug Morgan, Director of Calgary Transit

Project Highlights | Complexity

The new \$35 million Calgary Transit OCC is a state-of-the art, highly-resilient, mission-critical facility that required engagement and management of a wide range of industry experts from both within Hatch and numerous specialist sub-consultants, supported by a very knowledgeable and involved client team.

The Calgary Transit task assignments for the project were incredibly challenging in breadth and depth of scope and required an array of corresponding skillsets. The scope included the following activities to be undertaken within an existing four-storey building core and shell:

- + a standard building tenant fit-out of three floors;
- + a mission-critical, highly-resilient data and control centre installation on the fourth floor and mechanical penthouse levels;
- + systems engineering for new control systems and upgrade and transition of existing systems;
- + planning, training and transition of control room staff and systems.

Hatch was responsible for the project management and coordination, construction administration, and all system engineering capabilities to integrate, test, and successfully transition the Control Centre functions to the new facility.

The Hatch team was supported by the geographically-diverse team of specialist sub-consultants located in Calgary, Toronto and Philadelphia (USA).

The task of fitting a modern control room into an existing building proved to be a major challenge to the project. To meet the industry ergonomics standard for control centres required multiple iterations and many permutations of designs by the project team to overcome challenges including:

- + raising the existing ceiling and lowering the floor, thus increasing the available height to better support sightlines between the operator consoles and overview display walls;
- + the newly restricted floor and ceiling plenum spaces had to accommodate all necessary data, electrical and mechanical infrastructure while still ensuring adequate air flow to support heating and ventilation into the room;
- + providing accessible and barrier-free design;
- + positioning operator consoles to:
 - minimize sightline obstructions caused by the existing building's support columns where a structural assessment proved cost prohibitive to remove;
 - maintain the desired functional operator groupings and visual and audio communication paths;
 - ensure adequate circulation and emergency egress paths between consoles and the new ramps.

Hatch's Calgary-based project management and system engineering resources provided the strong local presence and critical expertise that allowed a closely-knit and integrated project team to be formed with The City's own dedicated team. The large and local presence of the key core team was a key factor in the success of the project.

Project Highlights | Meeting Client's Needs

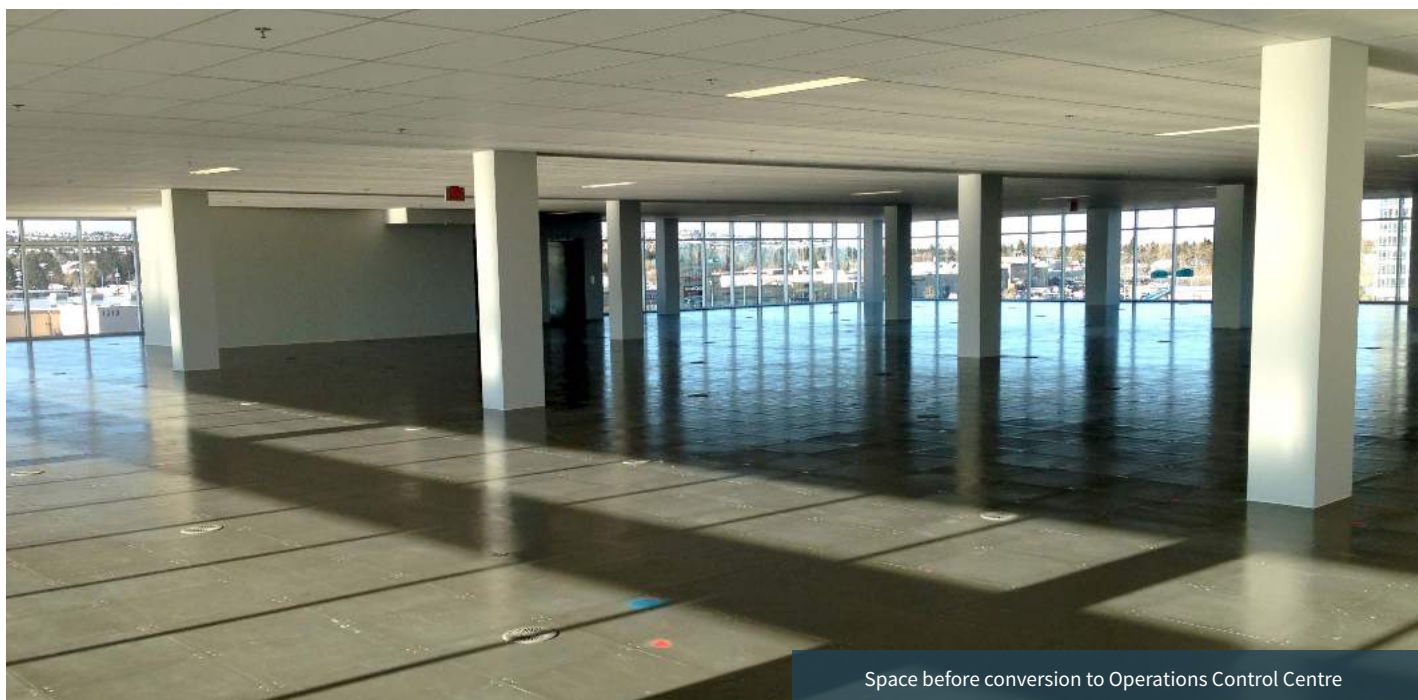
The OCC project had competing client project goals that adjusted as the project progressed. The core and shell of the City-owned building had sat empty for two years; hence, there was pressure to provide partial occupancy as soon as possible. It was also made clear that the allocated project budget could not be exceeded.

The Hatch consultant team split the project into four separate and phased work packages to meet the client's desire for early occupancy of the second floor. Separation of the work allowed construction to commence as soon as the corresponding work package design was complete.

This approach, however, exacerbated the budget problem whereby the actual construction cost would not be known until the last construction package (i.e. the OCC) had been tendered. Therefore, the budget had to be managed very closely and scope adjusted accordingly so that enough funds remained for the OCC.

Focused project management approaches were adopted at weekly meetings with the client including:

- + close collaboration between all project team members;
- + establishment of a 'scope ladder' with prioritized potential scope reductions and corresponding costs that could be realized to maintain the budget;
- + review of the project risk register to assess and review of any mitigations and the corresponding impact on cost or schedule;
- + contract changes, inevitable due to construction within an existing building, were tracked and reviewed on a weekly basis;
- + partnering sessions to ensure the entire project team remained aligned with the goals.



Space before conversion to Operations Control Centre

Project Highlights | Environmental Benefits

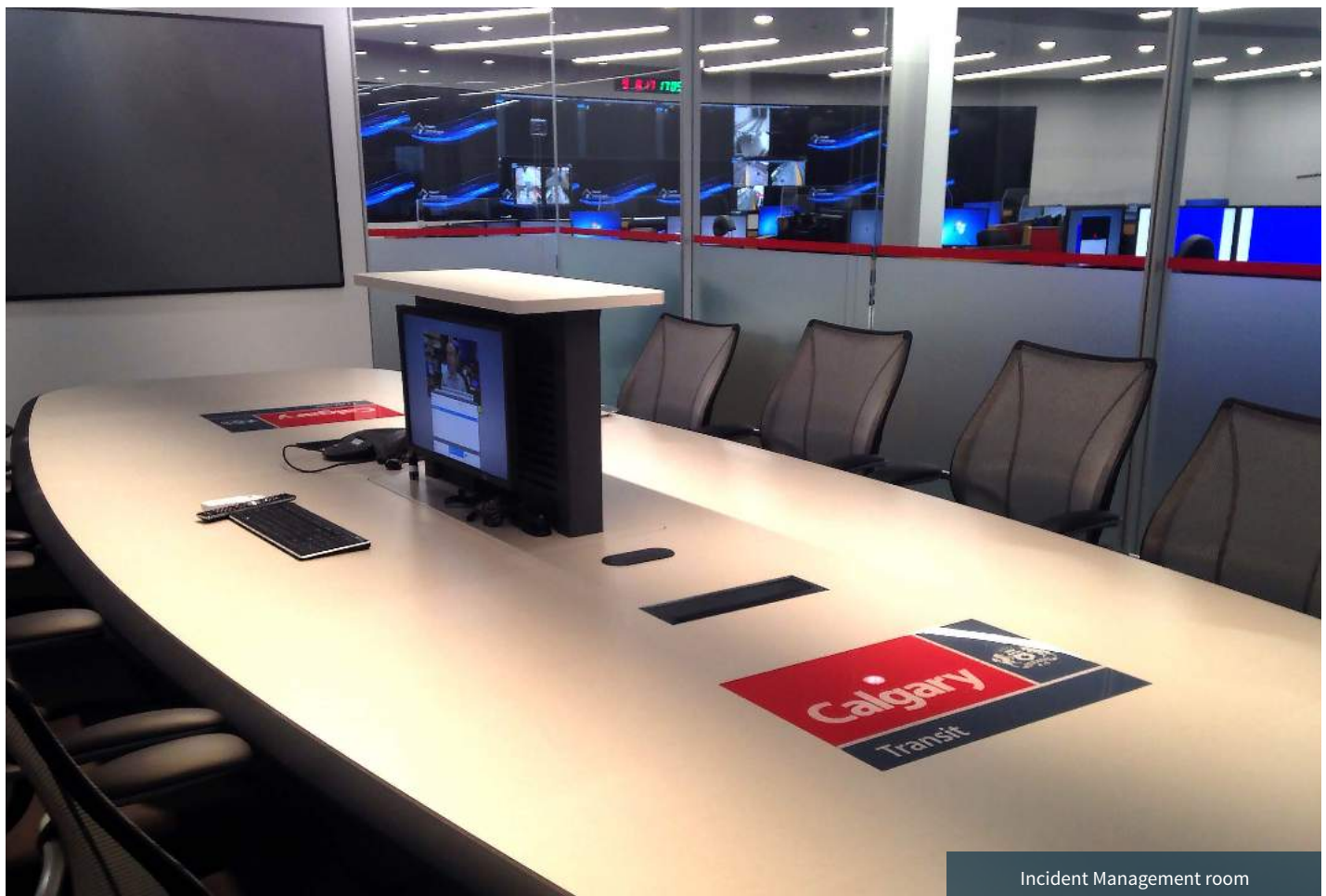
The OCC Project is currently under assessment for LEED Canada for Commercial Interiors rating system at the Silver level.

Many of the sustainable design and construction measures implemented were chosen for low-risk and aligning with industry good-practice to limit the need for post-occupancy modifications or adjustments within a facility which operates 24 hours per day, seven days per week and 365 days a year, and therefore has limited availability for shutdowns.

Major OCC elements, including the specialized control centre operator consoles and the demountable walls, were manufactured locally in Calgary.

The location of the new Control Centre, directly above an existing Calgary Transit light rail transit station and bus terminal, presented opportunities for Control Centre staff to choose a greener mode of travel.

Introduction of new state-of-the-art tools within the Control Centre should allow the operations staff to more efficiently manage the daily fleet operations of the bus, train and accessible transport fleets.



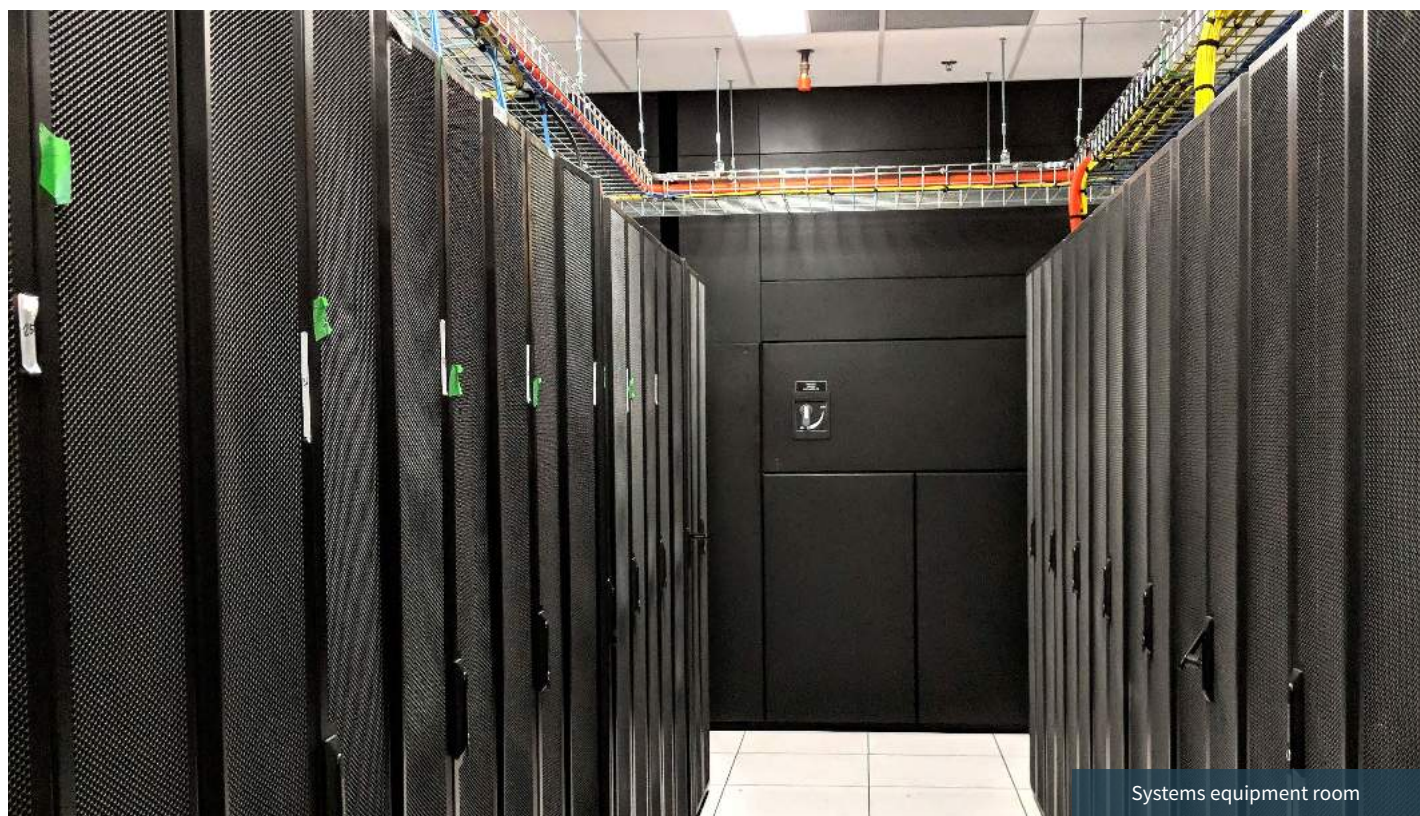
Project Highlights | Innovation

Hatch specified and implemented an innovative state-of-the-art display management system. The 'OpSpace' display management system software installation is the first deployment of its kind in North America. This new technology was so leading-edge that a non-disclosure agreement was signed with the supplier (i.e. Barco) while working through the details of the system.

Key advantages of the display system include:

- + significant flexibility in allowing the display of any of the numerous video feeds onto any operator workstation display and any of the three large overview display walls;
- + reduction in desk clutter whereby the previous requirement for separate keyboards and pointing devices was eliminated;
- + location of the workstation computers in a separate, environmentally-cooled and secure equipment room, thus reducing the associated heat-load and area of the control centre.

The measure of success of any relocation of a mission-critical facility is its relative impact on the existing operations. Hatch were required to "minimize disruption" - an acknowledgement that some disruption would be inevitable. Through meticulous engineering planning, regular communication, late night pre-testing, and advance soft cut-overs, the actual transition night was a major non-event with no disruption to any operations. The Hatch project team, along with their Calgary Transit counterparts, who staffed the new OCC throughout the night and next morning watched a flawless transition unfold.



Project Highlights | Social and Economic Benefits

The new Calgary Transit Operations Control Centre is fundamental to The City of Calgary's 30-year strategic roadmap 'the Route Ahead' for public transit. Existing control centres, supporting Calgary Transit Access and Train & Bus operations, were aged and over capacity.

Social benefits realized by the new Control Centre include:

- + efficient and reliable annual operation of over 102 million passenger rides through bus and rail fixed route services and over 1.13 million Calgary Transit Access trips for people with disabilities who are unable to use the fixed route services;
- + provision of a modern, ergonomic, spacious workplace with state-of-the-art tools for the Calgary Transit employees;
- + design with expansion capability to grow with the Route Ahead plan;
- + located directly above a transit station has encouraged a transport mode shift for Calgary Transit employees from motor vehicle to public transit;
- + provides a resilient post-disaster facility permitting continued operation in the event of natural disasters like the 2013 flood in Calgary which inundated the previous Operations Control Centre location and rendered the rail service inoperable for several days;
- + environmental silver rating under the LEED Canada for Commercial Interiors Version 1.0 rating system.

While there are no quantifiable economic benefits of the Operations Control Centre, there is an inevitable increase in operating efficiency introduced by state-of-the-art tools. With a net annual 2018 operating budget for the train, bus and Calgary Transit Access fleets of approximately \$230 million, even a 1% increase in efficiency will realize an operating saving of \$2.3 million.

