



# Edmonton Transit System Command and Control Centre





# 1. Confirmation Receipt



## 2. Entry Consent Form



# 3. Full Project Description







# Introduction

With over 400,000 Edmontonians taking advantage of Edmonton's Transit System (ETS) each day, having a clear operational picture is critical when you provide a vital service to the community.

With Edmonton's steadily growing population and transit ridership, the City of Edmonton (the City) has made transit expansion a top priority for infrastructure investment. But consider the implications on an operations centre that manages the operational needs of all bus operations, Light Rail Transit (LRT), and security requirements.

The redesign of the ETS Control Centre was a lynchpin project that aids in the City's urban renewal strategy and the implementation of several other priorities.

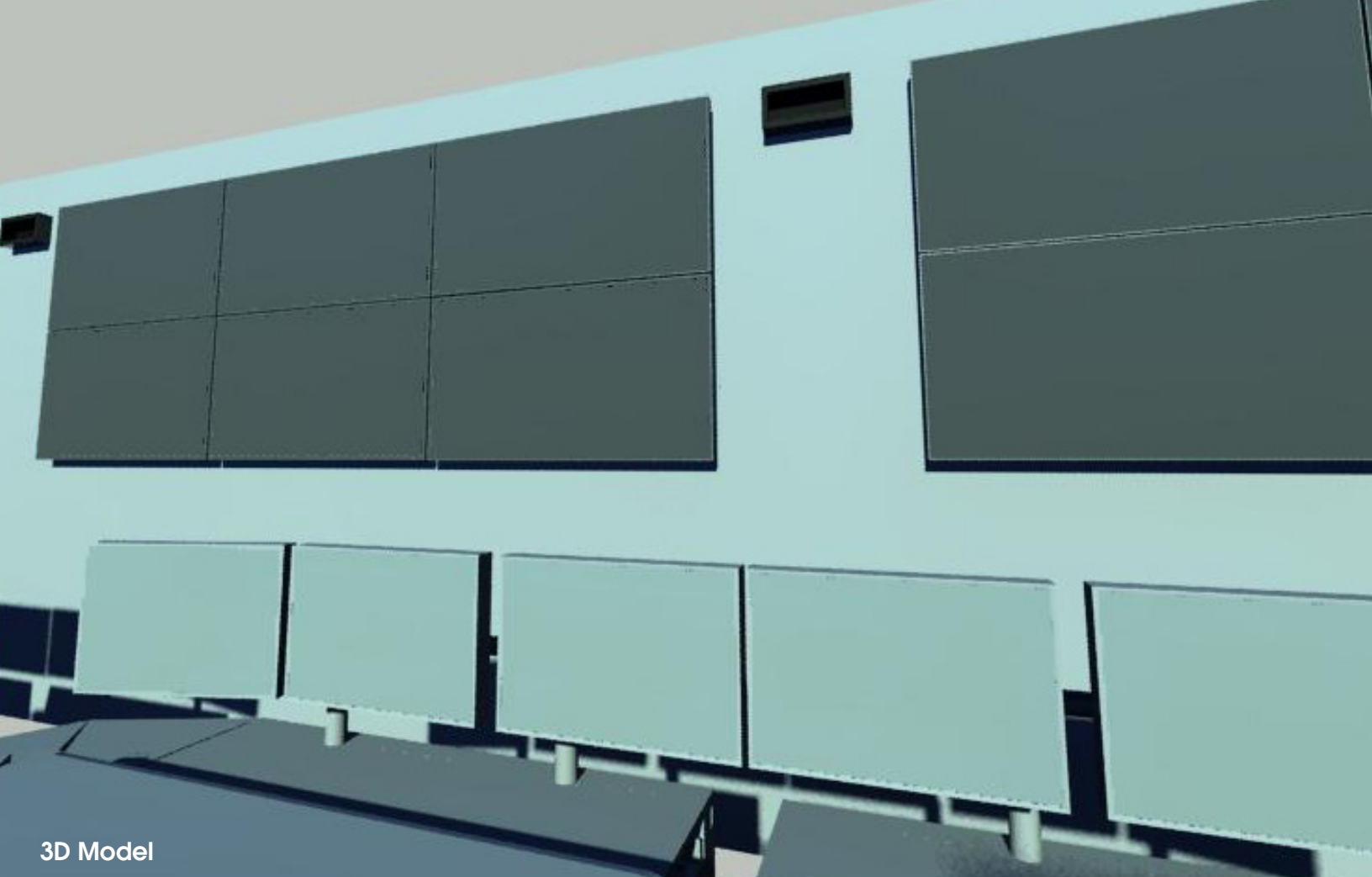
Transforming a former call centre space into a state-of-the-art operations centre was no easy task. The new design raises the bar in coordinating and organizing information in an efficient way, improving situational awareness, planning major events, allowing for additional back-up capabilities of the systems, and improving the workspace and staff retention. We also had to consider the relocation of the current the control centre with minimal impact to ongoing operations.

The ETS control centre also brought many opportunities that made all challenges worthwhile. Identifying stakeholder requirements and updating the catalogue and inventory of the systems allowed us to create an improved human/machine interface, which in turn made the workspaces more functional and ergonomically sound.

The existing control rooms for ETS surface operations, security, and LRT had evolved over the years with the installation of numerous technologies and disparate systems. The growth caused the control room to become increasingly cramped. Ergonomics for the operators, overall comfort of the work environment, and serviceability of the systems suffered.

Systems were added over a number of years, and because the applications were largely stand-alone in nature, it became difficult for operators to maintain comprehensive awareness of the various data coming into the operations centre at all times. The new facility, and in particular the new video management system, was designed to enhance situational awareness by consolidating the data into shared information windows accessible to any authorized user.

By creating a unified command structure, information processes could be streamlined and staff can now coordinate response activities in a much more efficient way. Overall, ETS is now better equipped to respond and coordinate transit activities in support of the community.



3D Model



Video Management System

# Innovation

As of 2014 the ETS was servicing about 850,000 Edmontonians with a fleet of 974 busses and 94 LRT Vehicles on about 200 routes—all organized and coordinated by one ETS control centre. With the new LRT Metro Line scheduled to open towards the end of 2014, and the Edmonton population continuing to grow, the control centre needed to find an efficient way to handle the increasingly complex multitude of systems, computers, and platforms to improve situational awareness. ETS turned to Stantec.

The new control centre, located in a former underground call centre, deals with a myriad of information to manage the fleet, resources, real-time information flow, and security operations –each with their own unique challenge.

## Our 3D Models

Actively engaging stakeholders and staff were key in completing this project on time and on budget and to drive decision making. In order to assist users in understanding the physical relationships of various display options, workstation layouts, and physical features of the space, our project team produced renderings using the 3D modeling software Revit. This added feature not only enabled users to better understand the design implications than by using two dimensional CAD drawings, it also encouraged their active engagement in the planning process.

The three dimensional views helped users understand some of the display height constraints as well as the overall design of the spaces from a user perspective. This approach prevented tight project timelines from being impacted by last minute adjustments.

## Video Management System

The video management system used within the facility is a state-of-the-art tool that allows password level controlled access to live and recorded video for users on the ETS network. Users within the control room, or supervisory staff for ETS located at other Transit offices, can access video in real-time while events happen. The video management system allows live video from any of more than 4,200 video cameras across ETS facilities to be displayed on several large video wall displays within the control centre or wherever an authorized user is located. The system is designed for collaboration and includes tools for video annotation and the ability to push video to end users at the operator's discretion.

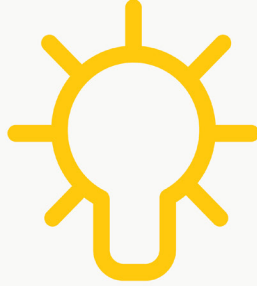
The system is also wireless-enabled, allowing authorized mobile client users to access and interact with video, whether from cameras, computers, or alarm systems, so users are able to share information and make decisions together regardless of location. Because the system is software driven, there have been upgrades since it was installed, and there are plans for further improvements and added features without requiring extensive hardware upgrades.





## Information In

- » Bus or Train Cancellations
- » Bus Route Information
- » Lost & Found Inquiries
- » Environmental Hazards
- » Information Requests
- » Road/Traffic Obstructions
- » Change Over and Mechanical Breakdown
- » Westwood Van Request
- » Potential Security Risks
- » Road Hazards and Blockages
- » Collisions and Near Misses
- » Passenger Mishaps
- » WCB and Injured Employees
- » Transit Related Bylaw Complaints
- » ETS Facility Alarms
- » Public Washroom Entry Requests
- » TransWatch Information
- » Mobile Data Terminal Problems



## Edmonton Transit System Control Centre



## Information Out

- » Service Continuity Measures
- » Edmonton Police Service Dispatch
- » Fire Rescue Dispatch
- » Ambulance Dispatch
- » Transit Peace Officer Dispatch
- » Surface Inspector Dispatch
- » LRT Inspector Dispatch
- » Mobile Computing Support
- » Public Washroom Entry
- » PLANT and Maintenance Van Dispatch
- » Re-Routes and Detours
- » Public Announcements
- » Change Over Dispatch





## 85 Million

Having a clear operational picture is critical when you provide a vital service to the community. Especially when this service is provided more than 85 million times each year—with more to come.

# Complexity

Managing information flow into and out of the control centre efficiently and consolidating the myriad of systems into fewer, more coordinated systems was critical to the project's success. The input of information coming in needed to be organized, reviewed, and processed accordingly to ensure there was a smooth flow of communication output. Working through technical details of the software applications used by operators within the control room environment allowed us to streamline a number of systems and provide operators with a much improved user interface.

The project was challenging not only from a technical perspective, incorporating numerous systems into one, but also required a great deal of coordination related to the continued operation of Edmonton's transit system. No interruption to LRT or bus operations was the goal, and through thorough planning and coordination between the City, the general contractor and sub-trades, and LRT operations, that goal was achieved.

With so many key players to organize, we faced the challenge to stay on schedule and on budget. There were challenges with regard to accommodating all staff, technology, and operational requirements within the available space. Our team prepared two floor plan layouts to allow the ETS staff to select the design that they felt was most desirable and that best achieved the project goals. The challenges of working in an existing underground structure included how to handle delivery and storage of construction materials, and how to improve the HVAC systems to handle both workspaces and the data centre and support spaces.





 **Stantec**

**4271**

**ETS**  
Edmonton Transit System



# Social and Economic Benefits

Public transportation is an essential part of our society's economic, energy, and environmental challenges—building a better quality of life.

An efficiently run transit control center is pivotal for providing better access to transportation services and smooth transit operations. For the community, it is the quickest means to beat high gas prices and gives personal mobility and freedom for people from every walk of life. Plus, it's a stress-free alternative to the hassles of commuter traffic—especially in winter. For the people who rely on transit, the City had to ensure their systems runs smoothly year after year and can support continual growth of the population. The new control centre will give transit riders peace of mind that they can get to-and-from their destination on time and without any hiccups.

In Edmonton, the safety of transit operations is important for the expansion of the public transit system through both light rail and bus initiatives. The new control centre meets the need for additional staff and updated technology to facilitate the system expansion. Without this, ETS would be unable to operate the new Metro Line (North LRT) and would continue to be challenged with crowded control facilities unable to handle the coordination of information flow required for the City's growing transit system. With updated technology and streamlined systems, the Edmonton population can ride transit stress free, knowing that their safety and wellbeing is being taken care of by the control centre.



One transit vehicle can replace about 40 private vehicles on our busy roads. That makes transit vehicles up to six times more energy efficient than cars, both in terms of vehicle emissions and number of people transported.







“These improvements are about building the foundation for a system that can develop and expand to handle the public transit needs and challenges of our city now as well as thirty years from now.”

- Mayor, Don Iverson

## Environmental Benefits

At the societal level the city's LRT system promotes and supports environmental and economic goals. Edmonton's effectively run transit operations increase transit ridership, which ultimately reduces greenhouse emissions and the overall carbon footprint, as well as congestion. Many people have taken their own initiatives to help minimize their carbon footprint by walking to work, car-pooling, or taking Edmonton Transit, including the LRT system completely powered by electricity. Knowing that the transit system runs smoothly and efficiently through the control centre, will encourage others to jump on board and start making their own decisions of how they can change their environmental impact.

At the project level we incorporated sustainable features where possible. We factored in asbestos mitigation requirements early in the project and ensured that the abatement was handled in a controlled manner. With the health and safety of the staff and the environment in mind, our interior designers chose carpets and paints for the workspace that reduce harmful exposure to chemicals.

Where possible, the design also included re-use of existing materials. Our team took advantage of the computer flooring which existed within the call centre space for use in the surface and security control room. This allowed for installation of new cabling and systems while reducing construction waste. A number of walls and doors were retained and various construction materials were recycled to keep with the City's project management policies.

## Meeting our Client's Needs

Our clients overall goal was to develop a space that their employees were excited to show up to work every day. At its previous state, the Edmonton control room had a very high turnover rate; it was a place with a variety of complicated systems, which had grown over time with numerous ergonomic issues and setup in a dark underground office. Our team turned the control centre space into an area that employees were comfortable in, having easy access to streamlined systems, and supporting improved situational awareness. With a stronger corporate culture, new workstations and simplified integrated operating systems the ETS now runs more efficiently and effectively. Employees are excited about their new space that they worked in everyday, boosting the overall feel of community within.

In addition to the City's goals for the control room environment, Stantec also designed an Incident Command Room adjacent to the control centre. This room is designed for strategic management purposes, allowing senior managers to gather in the event of a large scale emergency to plan and coordinate the ETS response. The Incident Command Room is outfitted with various audio visual and communication technology tied into the control centre systems to allow staff to monitor the incident response in real time. This allows operational staff to continue to manage the tactical level response to an emergency incident while senior staff is developing strategic plans for recovery and restoration of services.