

Putting Edmonton on the map

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Spanning 7,600 acres, Edmonton International Airport (EIA) is Canada's largest airport by land area. It is also one of the country's busiest airports, with more than six million passengers passing through its facility every year. The airport offers non-stop travel service to more than 50 national and international destinations, and is also a critical part of air cargo operations in the country.

The province of Alberta has experienced rapid economic growth, even through the global financial recession, due primarily to a thriving oil and gas industry. Edmonton, the province's capital city, has more than 40,000 businesses and is home to more than one million people. The city's population has grown at a record rate, increasing by more than 30,000 in 2009 alone. With the demand for aviation services reflecting the region's economic health, the airport has seen passenger traffic double during the past decade. In fact, EIA was the fastest-growing airport in Canada from 2006 to 2008.

The airport terminal currently serves more than 6.1 million passengers, well above its 5.5 million capacity, and it is expected that passenger traffic will increase to nine million by

2020. To support this growth, the airport embarked on a \$1.1 billion dollar project in 2007 that will expand its facility and nearly double its passenger capacity by 2012.

As part of the project, more than a dozen new aircraft bridges and ramps for aircraft parking will be built. Car parking space will increase by 85 per cent and an additional 480,000 square feet will be added to the existing airport terminal. Travellers will also soon enjoy more comfortable passenger lounges and over 30 new shopping and dining outlets at the expanded terminal.

Implementing such a large-scale construction project involves co-ordinated planning and execution among many groups including hundreds of staff, contractors and consultants. To efficiently manage the project, EIA turned to geographic information system (GIS) technology to obtain a complete picture of who is where at the site and what construction project or activity may be occurring within its vicinity.

Leveraging intelligent web maps

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GEOGRAPHIC INFORMATION SYSTEMS (GIS)

routes. What's unique about this technology is its ability to integrate numerous databases of location-based information so that users can view and analyse the data using intelligent maps. The system can be deployed on multiple platforms, such as corporate servers, individual desktops, mobile devices, online and in the virtual cloud, providing a highly scalable and cost-effective means for communicating information to a large number of users.

EIA had used GIS previously to develop a web mapping application to manage real estate leases on its sites. Realising significant efficiencies from that application, the airport extended the technology to support efficient construction operations and improve facility management. EIA worked with leading GIS solution provider Esri Canada to develop an innovative web-

requiring additional user training. This was a critical factor in the technology selection because most of the target end users do not typically have a technical background.

Using ArcGIS for Server technology, EIA integrated numerous databases containing information on the airport's utility assets (including aviation fuel, airside and groundside electrical systems, natural gas, water, stormwater and sewer networks), construction projects, road networks, buildings and other geographic data into a geodatabase.

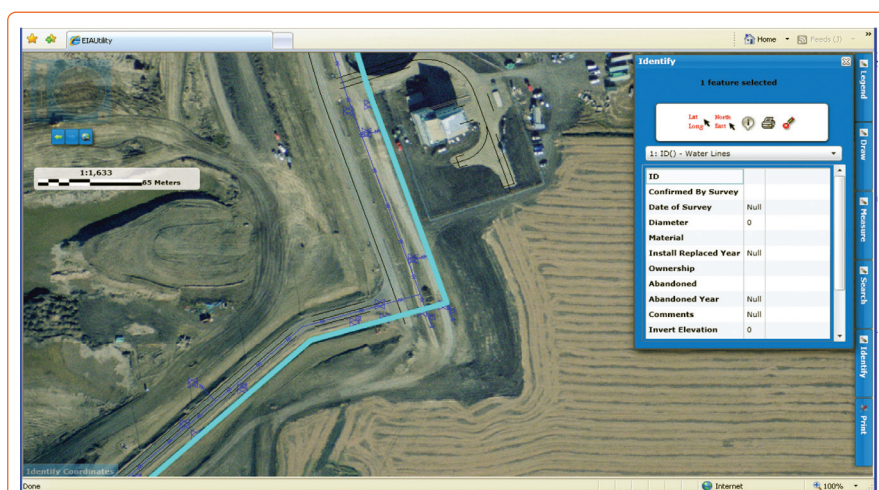
The application was developed using the ArcGIS API for Microsoft Silverlight, an easy-to-use application programming interface that allows developers to quickly integrate interactive maps into Web applications. The system enables the airport to control access to data and tools

Jerrit Purdie of 3-D Line Locating, which provides utility locating services for the project.

Through the Web application, utility locators can view all above-ground and buried airport assets and their location. It allows them to quickly look up underground cable networks and easily verify whether they are for power, telecommunications or other airport-owned utilities. They can customise maps to show only specific facilities if needed. The application also comes with a drawing tool that enables them to mark unknown lines found, create work areas, draw buildings and add notes directly to the locate report.

"The quality of our locate reports has also improved immensely. We're now able to produce more insightful reports that include complete details about a specific site. The application also allows us to include a map in the report to help staff and contractors make better decisions," remarks Purdie.

Utility locators can now create drawings that actually look like the site, both in context and scale. The application has eliminated the need for redraws, which can sometimes lead to incorrect depictions of a site or assets being missed. The accurate drawings make it easier for contractors to analyse the site and understand the risk they may encounter before they put the back hoe into the ground. This enables EIA to proceed with improvements to the busy airport terminal without posing a risk to facility operators and travellers.



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based Utility Locator application that allows staff and contractors to quickly access accurate and up-to-date information about the airport's utility assets.

Previously, EIA's Technical Services team supplied field workers with paper drawings of construction sites and utility networks generated using a computer-aided design (CAD) system. While delivering rich graphical representations of airport assets, the drawings did not provide a spatial context. The drawings neither captured all critical data needed to make informed decisions on site, nor could they be used to analyse relationships between assets. As work plans changed weekly, if not daily, it became a time-consuming and costly task to update, reprint and redistribute the drawings to field workers.

To address this challenge, EIA selected Esri's ArcGIS solution because it allowed them to deliver information over the web without

within the application, depending on the user's role. This helps maintain data integrity and ensure its accuracy.

Facilitating safe and efficient construction operations

The web application was deployed in June 2011, just in time for the busy summer construction period. Utility locators within the Technical Services team had primary access to the editing functionality of the application, while project delivery staff were given secure, read-only access.

"Using the GIS application has significantly increased efficiency in responding to utility locate requests. Creating drawings and delivering information to field staff takes far less time than the CAD drawing system previously used for the task. This cuts down on field time and assists with keeping construction schedules on track," says

Improving communication

The web application provides a consistent view of utility and project data to internal and external users, fostering better communication and teamwork. With all critical data at their fingertips, architects, planners, engineers and project managers involved in different parts of the expansion will be able to see the overall picture and organise their workflows so that the project proceeds smoothly and on time.

The self-service portal provides an easy-to-use map of basic airport information including building outlines and names, roads and parking lots. This has already reduced the number of inquiries for site information received by the Technical Services team from internal staff, allowing them to focus on other tasks. It is expected that when released publicly in the first quarter of 2012, the number of requests will continue to drop.

The GIS also integrates historical and current



data, and aerial imagery, enabling users to evaluate the evolution of the facility and what impacts may have occurred. It also helps the airport provide a compelling visual that effectively communicates its development plan and progress with the public.

Looking forward, the airport will further expand its GIS application to display boundaries of construction projects. The web application will map all past, present and future projects and link their boundaries to project documents. This will allow staff to check for conflicts between projects that occur consecutively. EIA also plans to build upon the utility locator application by integrating

it with Microsoft SharePoint to manage critical airport utility systems.

Overall, GIS is a platform for increasing efficiency, improving communication and collaboration. It is a valuable technology that supports EIA's rapid facility expansion. It enables complex construction projects to be carried out intelligently and quickly. In fact, the airport's newly expanded terminal, which was initially slated to open in late 2012, has been completed ahead of schedule and will officially open on 11 February 2012. The new terminal will provide customers with faster, easier movement through Canadian, US and international

departures, with the opening of a new departures lounge and customs facility.

EIA was recently named the 'most efficient airport in Canada' by the Air Transport Research Society. Maintaining this exceptional level of efficiency requires embracing technology that helps the airport continuously improve its services. With the numerous important benefits GIS provides, the technology has become a critical information management system that will help propel EIA's service level to even greater heights.

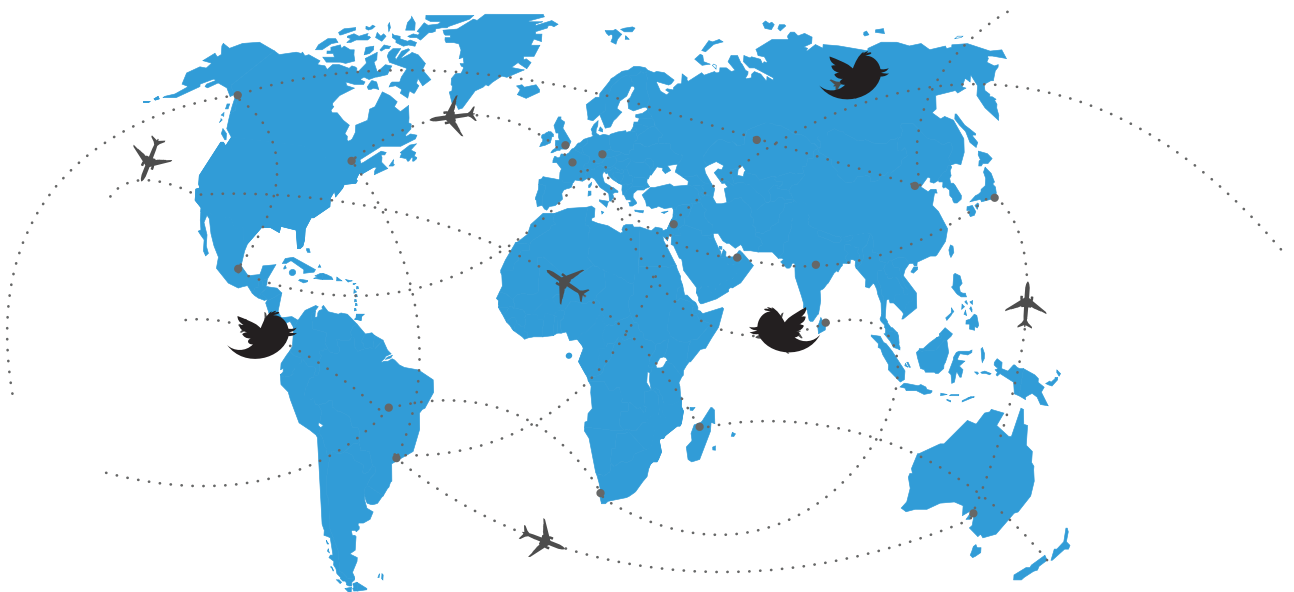
Biography



Corinne Kozak is the Technical Services Manager for Edmonton International Airport. Since starting her career with Edmonton Airports in the 1990s as a draftsman and now as a manager, she has seen the airport through three major expansions and various tenant and land developments. Prior to working for Edmonton Airports, Corinne worked in both private architectural consulting and municipal government, serving in various roles including owner/client, government agent and consultant.

A proud graduate of the Northern Alberta Institute of Technology's Architectural Technology programme in Edmonton, she is also a Certified Engineering Technician (C. Tech) with the Alberta Society of Engineering Technologists (ASET).

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