

Edmonton is Leveraging Digital to Build Climate Resilience

Daryle Tilroe, City of Edmonton and Notarius

It's happening everywhere – cities are making massive changes in very little time, whether to adapt to the impacts of a hybrid work environment or climate change.

According to a report from the Canadian Institute for Climate Choices, the flooding, heat waves, and increased precipitation expected between now and 2050 will double the cost of maintaining buildings, roadways, and electrical infrastructure.¹ Cities will need to change how they serve their citizens and start building climate resilience now.

Daryle Tilroe, Director of Engineering Services for the City of Edmonton, has experienced the digital transformation of the past few decades first-hand and graciously agreed to tell us how Edmonton is preparing itself to face the challenges to come.

1 Canadian Institute for Climate Choices, "Massive investment needed to ready Canada's infrastructure for climate change: Report" on the website [climatechoices.ca](https://climatechoices.ca/news/massive-investment-needed-to-ready-canadas-infrastructure-for-climate-change-report/), 2021 [online], <https://climatechoices.ca/news/massive-investment-needed-to-ready-canadas-infrastructure-for-climate-change-report/> (Page consulted on November 12, 2021)

Pairing efficiency and longevity

The engineers in the department oversee the design, construction, and lifecycle management of Edmonton's public infrastructure, making sure it's safe and reliable. Their decisions clearly have an enormous impact on the lives of Edmonton's citizens and the construction companies in the region.

"We have subject matter experts in facilities, transportation and we also have designers. (...) So we both review, store and design professional work products. (...) We do some of our own work, but we also do a lot of outsourcing."

Daryle makes no bones about the fact that, as a public servant, his role is to ensure that the heritage built will be sustainable for future generations.

"We are here because the recreational centre needs to last 50 years. The road needs to last 20-30 years. To assure this, we must have the best Owner's Engineer team and a long-term view."

To put long-term thinking into practice and accelerate its implementation, the City of Edmonton has established an interdepartmental digital ecosystem.

For example, it relies on a centralized and building management system to operate its municipal facilities. Like a gigantic control panel, it detects changes in temperature and malfunctions in 200 buildings in real time.

"We did it for our fire stations, libraries and recreational centres, too. (...) It helps with building maintenance. It makes the overall city digitally progressive."

Their initiative to use digital technology to make it easier to manage buildings is just the tip of the iceberg. Over the years, Edmonton has instilled a digital culture among the city's administration that goes well beyond their 'building management system'.



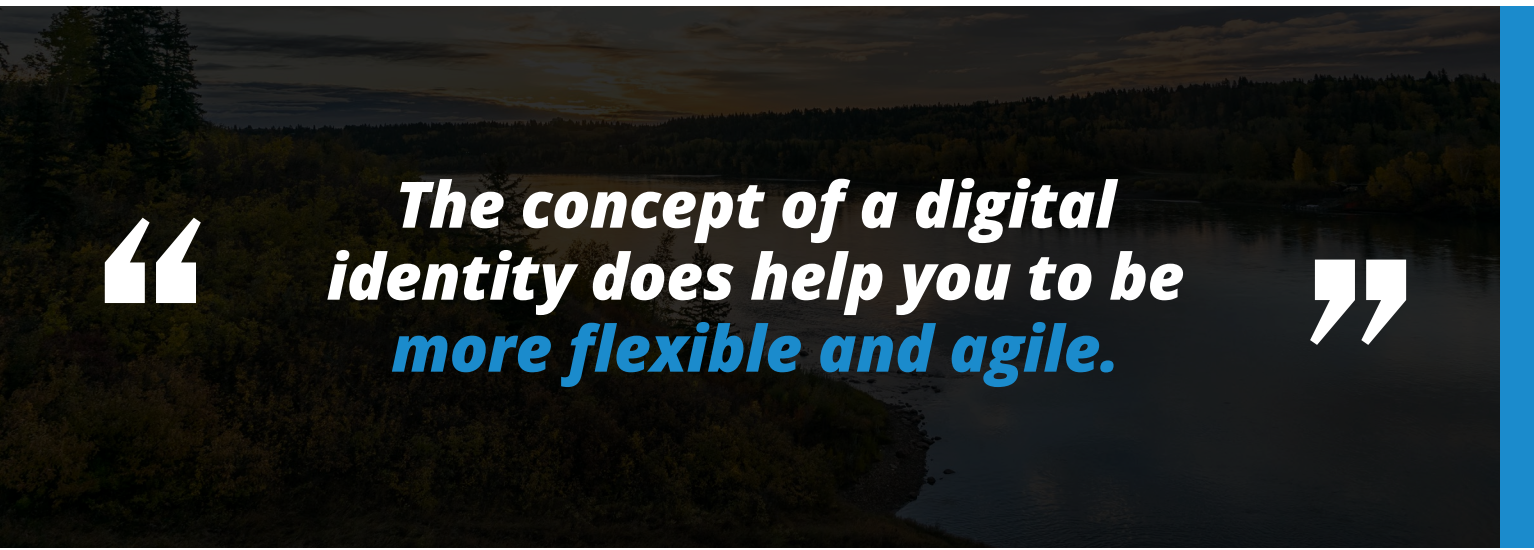
Building institutional agility

“You can have all the strategy you want, but things are often going to go off plan and you better be prepared for that.”

Daryle points out that, as early as the 90s, Edmonton started to digitize its workflow. Today, the city has migrated many of its paper processes to digital.

It also took the opportunity to review or eliminate steps that were slowing down services to citizens. For example, reviewing development submissions and issuing development permits is far less complex than in the past.

“At the start, when we counted, there were more than 100 workflow systems being used by the city. Currently, there are about 70 workflows and multiple systems. (...) But there’s an initiative in place to consolidate more of them.”



“The concept of a digital identity does help you to be more flexible and agile.”

The technological shift has also helped the city enrich its data banks and better map its territory. This enriched information, or metadata, is delivered in the form of the Geographic Information System (GIS). It is also used to operate their computerized maintenance management system (CMMS).

“Everything has metadata, like pipelines, electrical utilities, and roads. (...) We’ve gone from an older GIS system to a newer one. (...) Right now, we are trying to consolidate these systems further and simplify them.”

By putting metadata to work for its different departments and partners, Edmonton eliminates administrative redundancy and provides designers with the information they need to make better performance choices.

Daryle says, **“The ability to work on a cloud-based document, draft it, edit it, have conversations in it, tag people for things, have it reviewed almost**

in real-time... That’s a big win. (...) In terms of large municipalities, we may be fairly unique in significantly adopting the Google ecosystem, (...) One of the biggest advantages is collaboration on documents.”

As a result, Edmonton’s employees iterate faster and exchange ideas more fluidly, which increases their chances of finding better solutions.

In short, by digitizing workflows, integrating metadata and adopting cloud-based interfaces, Edmonton has increased its institutional agility, making it a much more resilient city. But some aspects of this transformation would not have been possible without one essential element.

“The concept of a digital identity does help you to be more flexible and agile.”



Notarius, Edmonton and digital identities

During their digital transition, the City of Edmonton hit a wall in terms of some engineering workflows. How could they ensure compliance for the electronic authentication of plans, technical documents and engineering documents?

As an institution, Daryle explains, **“Our biggest problem was the paper workflow and we ended up having to track those workflows and then what you store in the end. You need to be able to store a paper original for the regulatory authority and legal purposes.”**

Moreover, when engineers and other professionals apply their seals, they become accountable for the quality and safety of projects carried out under their oversight.

“Notarius’ digital signatures solved our problem by turning the paper version into a digital artifact that has the same authority. So, you can move it around. You can get it validated by another party. You can store the original digitally without using any old school paper.”

Thanks to the CertifiO for Professionals digital signatures issued by the Association of Professional Engineers and Geoscientists of Alberta (APEGA), Daryle and his colleagues have digital identities that allow them to authenticate all types of digital documents, including plans, reports and even AutoCAD designs.

Once a signature has been affixed on a document, a CertifiO digital signature will also detect any subsequent alterations to the signature. As a result, the integrity of the document is guaranteed and is compliant with the standards of the associations.

“My scope is in the technical and engineering documents, which is why we are using APEGA’s digital signatures provided by Notarius.”

In other words, for an engineer like Daryle, the CertifiO digital signature for professionals is a verified proof of identity issued by APEGA itself. It is not as an employee that Daryle signs, but as an engineer. It is this notion, among others, which makes it possible to authenticate digital documents and ensure that they are compliant.

“Across the city, other departments, like our waste management group, have adopted a similar digital workflow.”

But, beyond the question of compliance, the efficiency gain created by the CertifiO for Professionals digital signature makes it all the more attractive as an option. Because you can use it anytime and anywhere, professionals are much more flexible in their practice.

“Notarius gives us what we need in terms of digital certificates and a digital signature software, ConsignO Desktop, to work with.”

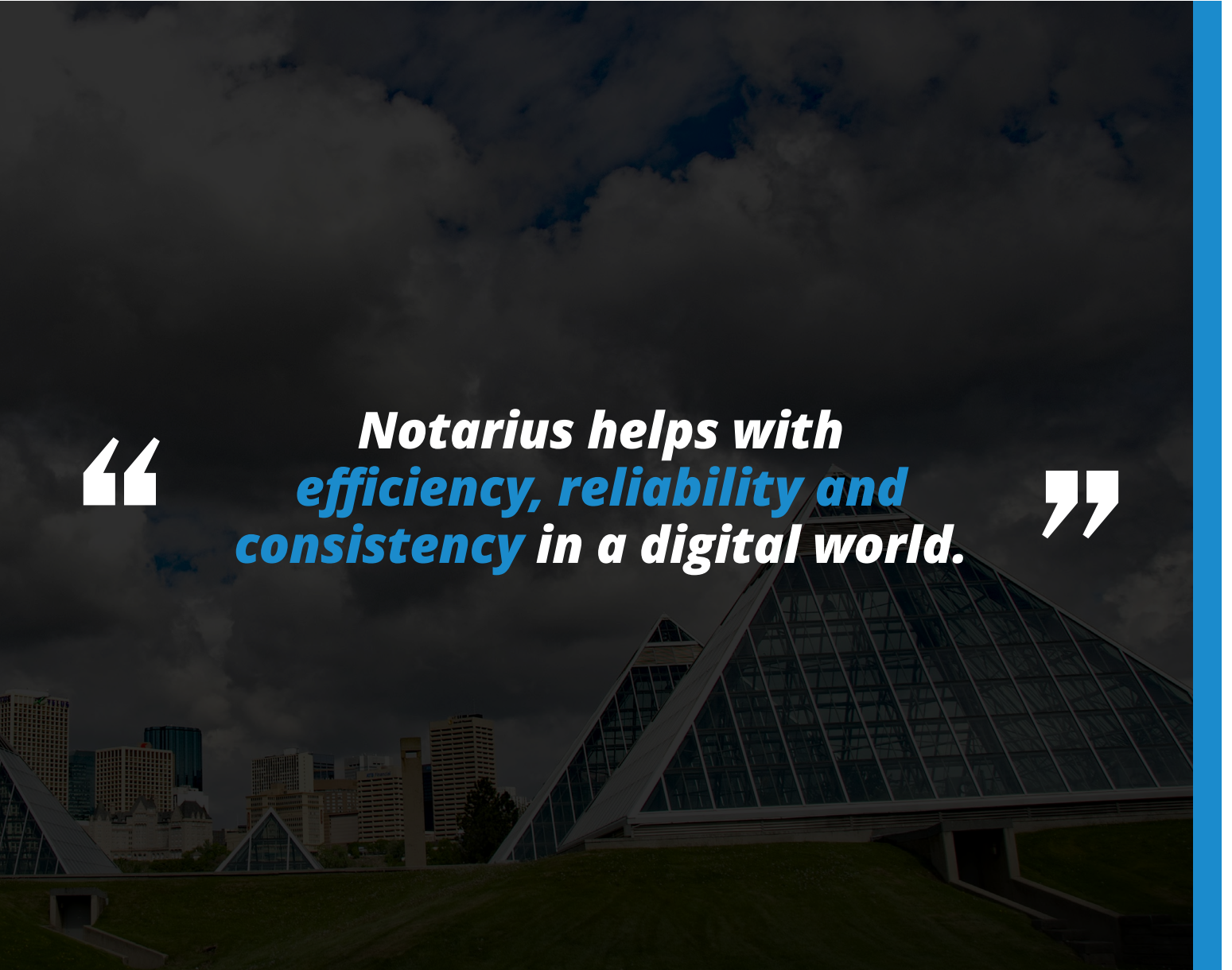
Using their digital signatures with advanced ConsignO Desktop features, they can create templates, sign and validate documents in batches.

“It’s nice to have that templating ability when you have 20 pages of documents or if you are always authenticating the same type of report over and over again. You can template it and make that quicker. That’s a nice feature!”

By combining identity reliability with technological efficiency, Notarius’ solutions make Daryle, his department and the City of Edmonton more agile as an institution.

“Notarius helps with efficiency, reliability and consistency in a digital world.”

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Innovating is no longer optional

"We are going to face climate change, climate resilience and budgetary challenges. There's no doubt about it. And there's going to be a constant push to do more with less."

City governments will be at the forefront of increasingly intense and recurring weather events, and Daryle predicts that the people finding solutions will innovate as much in the way they do things as in the way they deliver. And, according to him, engineers will be the leading players.

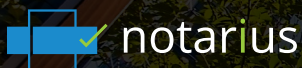
"Engineers can help us face climate change by being innovators and thinking outside the box. We need to be creative and flexible and embrace new ways of thinking."

Daryle admits that some of the work they thought they would be doing several years from now has already begun.

"COVID forced us to rethink what transportation and human infrastructure looks like in a city with a hybrid work environment and analyze how this situation would change our city's vibrancy."



As a result, the pace of transformation in cities is accelerating, and so are citizens' expectations. These challenges are forcing cities like Edmonton to embrace new ways of working. Edmonton is a digital leader today, but Daryle mentions that, like other cities, it will need to continuously reinvent itself and deploy new, more powerful, and efficient tools to ensure climate resilience.



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