

BRINGING DATA TOGETHER FOR MORE INFORMED DECISION MAKING

Resilient, Equitable, and Sustainable Futures

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CREATING REAL WORLD ENVIRONMENTS

We know no single source of data has all the information people need to make informed decisions. How do we create our Synthetic Twins if we know that data sources aren't perfect?

Imagine that each source of data — a survey, a census, or a research article — is like a slice of swiss cheese: it's got plenty of holes. Each of those holes represents an issue with the data, whether it is outdated, incomplete, or insecure. But the data we use to make our Synthetic Twins isn't limited to a single slice.

If you arrange multiple and different data sources together, each hole has a massively increased chance of being covered by another slice. We also use data sources that are often overlooked, such as local knowledge and oral histories. We combine all of this research, these different data sources, and interactive maps to create these virtual replicas we call Synthetic Twins.

From there, we utilize our own proprietary technology system to navigate the present and explore potential futures. We don't rely on other AI platforms like ChatGPT: ours is wholly original and uses a fraction of the water and energy of other AI tools.

INTRODUCING RWI

RWI Synthetics' work is exceptional because we value, invest in, and focus on the diversity of our staff, whether it's their backgrounds, education, or experience. This also takes many forms at the foundational level.

An example of how we focus on diversity at a foundational level, RWI is a Certified Indigenous Business, which means that we are majority owned by Indigenous People. It's not just a rubber stamp: Indigeneity influences everything from our company values to our day-to-day activities. We are a woman-led company, with women comprising over half of our leadership positions.

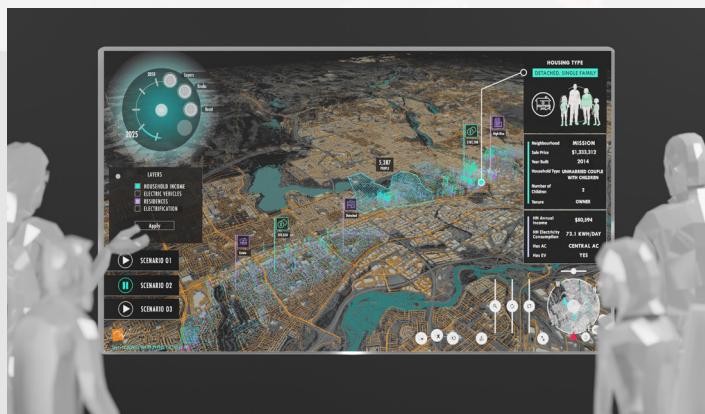
Every employee undergoes "Gender-based Analysis Plus" training, ensuring all staff understand their role in promoting gender equality, respect for intersectionality, and equity in the workplace. Together, we create a workplace culture that promotes cooperation and equality. These inclusive practices help us to be creative and strategic with the services we offer clients, making sure every decision-maker we assist is given a complete picture of how best to achieve a visibly better future.

THE WORK OF RWI

RWI utilizes data in innovative and exciting ways to help businesses and communities make informed decisions about complex issues.

Our technology is called Synthetic Twinning, where we create a virtual copy of a city or region that includes everything from buildings and roads to utilities and weather, and most importantly, virtual people. Once we have our virtual replica, we can use it to adjust different factors and then observe the results within the Synthetic Twin. We take those results and then provide that data to the people who can use it.

It's like a weather forecast. However, instead of forecasting the weather, we can demonstrate how people might utilize roadways during an evacuation, how the local economy would respond to policy changes, or how supporting public transit could help engage young people in their communities. **The possibilities are endless.**



RWI TECHNOLOGY IN ACTION

Learn more about each project by scanning the QR code.

PREPARING FOR CATASTROPHE IN NASHVILLE

Communities around the world are facing uncertainty as floods, fires, and other disasters are on the rise due to climate change.

RUNWITHIT Synthetics, in collaboration with the Electric Power Research Institute (EPRI) and the Tennessee Valley Authority (TVA), utilized Synthetic Modelling in a pilot project to better prepare the city of Nashville for climate-related catastrophes.

We created a virtual copy of Nashville and then ran a scenario inside of it. Specifically, we looked at what would happen if the city experienced an unprecedented cold snap, how it would impact utilities and the over 680,000 residents of Nashville as temperatures fell and energy demand rose, resulting in a widespread power failure.

Our virtual copy let us see how that event might play out: we could see where power systems failed, which households were most vulnerable to the cold, and which people needed the most help. Our findings were extremely valuable to decision-makers in the region, as we identified vulnerabilities and areas of need before a disaster happened.



RWI's Synthetic Twins can help you forecast tomorrow when tomorrow is beyond the ordinary and different than today.



We are unique in our ability to use proprietary Synthetic Modelling data to provide information where no historic data is available.

ASSESSING YOUTH BELONGING IN WATERLOO

Consider our young people and how much they feel connected to their communities. How would you put a number on that, or a percentage? How would you even survey a demographic as difficult to reach as young people?

To help diagnose community health, RWI created a virtual population of youth in Ontario's Waterloo region and developed a method to assign a numerical value to measure their "sense of belonging" based on various social and economic factors.

From there, we tested different ways to improve their sense of belonging and see what would work better. Was it making sure they had better access to parks and support systems? Or was it helping make transit free for young people?

The latter scenario revealed data indicating that thousands of students could move out of an at-risk category if they had access to subsidized transit. These kids are more likely to become productive, well-adjusted, and happy adults who choose to build their lives and livelihoods in the Waterloo Region.

Building a Synthetic Twin allows us to test and evaluate different solutions: we build a system that allows us to test and evaluate different solutions, and identify the ones that will best benefit our communities.

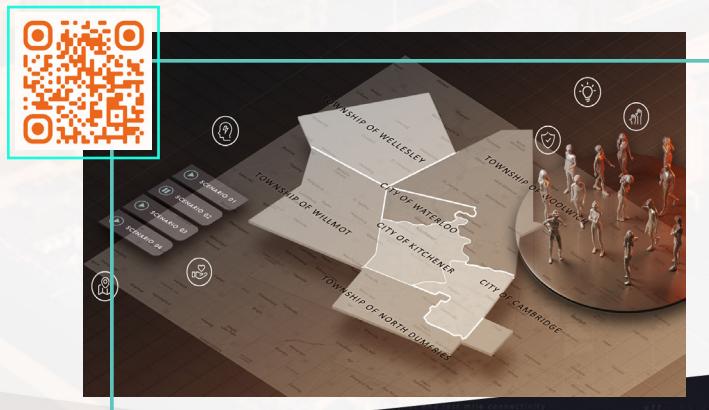
DEVELOPING STANDARDS FOR INCREASED HYDROGEN DEMAND IN ALBERTA

The face of energy is changing, with regions pushing towards new sources based on their needs, whether they're related to cost, independence or the environment.

It's estimated that by 2027, the number of employees working on hydrogen in Alberta will have quadrupled. RWI utilized our Synthetic Twin technology to help prepare the risk management data required for the safety standards to facilitate the growing hydrogen economy. These standards would help prepare both individuals working with hydrogen and the brave first responders who may be called upon in hydrogen-related incidents.

RWI created a virtual Alberta of the future in 2030, where the province had more hydrogen-powered trucks, hydrogen-heated homes, and fueling stations compared to the present. We created a comprehensive risk assessment, including potential equipment failures, truck collisions, and the likelihood of hydrogen leaks, and found that many of these hazards have an annual occurrence rate of less than 1%.

Our findings were relevant to different parts of Alberta as well, allowing us to identify areas with higher risks than others, such as locations where trucks would be refueling or hydrogen would be concentrated. Our role was one of many helping prepare Alberta for the growing hydrogen economy, alongside partners like Edmonton Global, the CSA Group, and the Alberta Motor Transport Association.



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