

The Siemens logo is displayed in a white rectangular box in the upper left corner of the image. The background of the entire page is a photograph of a modern light rail transit station with a glass and steel facade and a brick building in the background. A sign for 'Central Station Innovation District' is visible on the right side of the image.

SIEMENS

Powering sustainable growth in Kitchener-Waterloo

Siemens Mobility delivers DC traction power for new light rail system in Ontario's technology hub

[siemens.ca/mobility](https://www.siemens.ca/mobility)

Electrification is at the heart of ION, an integrated public transportation network in the Regional Municipality of Waterloo in Ontario, Canada. This new 19-station light rail transit (LRT) system connects the twin cities of Kitchener and Waterloo, two of the region's principal cities that are about 114 kilometers west of Toronto. ION forms the core of the municipality's master plan for sustainable mobility.

Selecting a partner

When it came time to select an electrification partner who could help develop an LRT for the future, the municipality's team turned to Siemens Mobility. Siemens Mobility has served the needs of cities across North America for more than 30 years. It is the only North American company who provides both traction power supply and overhead catenary solutions.

Siemens Mobility worked closely with the ION team to develop a customized, sustainable electrification solution. The turnkey solution included 14 fully assembled modular DC traction power substations, Sitras[®] DSG DC switchgear, a Sitras PRO DC protective unit and controller, Siprotec[®] AC Protection, Simatic[®] PLC automation, and overhead lines.

"The \$1 billion investment (in ION) has generated \$3 billion of development. It's a success story that's been talked about throughout the country. As a result, the reliability of the system cannot be overemphasized."

Vincent Patterson
General Manager
Keolis Grand River LP

Innovative, pre-fabricated substations simplified testing, installation, and commissioning on-site

The Waterloo Region was the ideal location for the first new-start LRT in Canada in over 30 years. With a population just over half a million – the fourth largest in Ontario, Canada’s most populous province – the region is projected to grow by 200,000 residents in the next 20 years.

Kitchener and Waterloo’s growth is part of a rapid expansion that has made the Toronto-Waterloo Corridor the second-largest technology cluster in North America. In Kitchener and Waterloo alone, there are more than 1,500 tech-related businesses, including Google, SAP, Blackberry, OpenTex, D2L, Vidyard, and Honeywell Aerospace, as well as a top-ranked engineering school and computer science program.

ION provides the efficient, emissions-free public transportation that helps this technology hub attract sustainability-minded newcomers and meet the needs of long-time residents. A critical component is the traction power system. According to Keolis, the firm charged with operating ION, the right power system helps ensure a high level of reliability that is crucial to the success of a new LRT launch.

Siemens Mobility’s solution

The ION team selected Siemens Mobility’s transportable traction power substations that are powerful, reliable, low-maintenance, and compact. Siemens Mobility integrates its state-of-the-art equipment in a single container and conducts rigorous off-site testing so it can deliver fully built and tested modular substations. Easy to install and commission, these innovative pre-fabricated substations only need to be set up and connected to an external supply. They eliminate the need to construct new buildings, can be adapted to the urban environment, and are easily moved to a new location.

State-of-the-art equipment

The transportable substations include all of the necessary equipment in one container. The three-phase AC supply is fed in and distributed via the medium-voltage switchgear. The rectifier transformer and rectifier Sitras REC unit transforms the voltage and frequency of the power supply. The Sitras DC switchgear distributes the power to the track sections. The Sitras SCS station control system performs all the control functions as well as protection and communication tasks in the AC and DC traction power supply. A low-voltage distribution board is used for the substation auxiliary supply.

The equipment has also entered the digital age with a focus on the highest standards for networking and communication, such as IEC 61850. The Sitras MDC protection device builds on over 20 years of experience in digital protection relays. The Sitras SCS uses remote link-up to the central control room to provide the operating staff with a quick and reliable overview of the system’s operating state. Siemens Mobility also offers cloud connectivity for all of its traction power equipment.

Contact-line systems

Siemens Mobility uses its state-of-the-art Sicat Master and Sicat Dynamic IT systems and software tools to simulate and analyze the efficiency of the entire system in advance. Sicat contact-line systems feature connections that are reliable and corrosion-resistant and low-maintenance components that ensure maximum efficiency. The Sicat systems are economical and well known for long service lives and consistently high quality.

Network control technology

Siemens Mobility network control for rail electrification enables railway personnel to quickly restore substation functionality in the event of malfunctions. Highly available and proven, these advanced operational control systems feature automation, field equipment, hot standby, and intelligent multi-monitoring solutions. The Sitras RSC integrated RailSCADA system also offers tremendous potential for optimizing costs.

Benefits today and tomorrow

Siemens Mobility’s rail electrification solutions lead the way in cost-effectiveness, quality, and environmental protection. From start to finish, Siemens Mobility transportable traction power substations helped the Waterloo Region save time and money. They eliminated the need for costly new-construction buildings, arrived fully assembled for easy installation and commissioning, and will be easy to maintain. Siemens Mobility is the single source for rail electrification technology and services.

“The key thing for us specifically during the first two years of a brand new system is that everything works well and as expected. What Siemens Mobility has provided as a key supplier helps us rest easy,” said Vincent Patterson, General Manager, Keolis Grand River LP.

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