Future Ready
Case Study

Union Station Rail Corridor Signalling System

Project Overview

Undertaken with Alstom Transport Canada and PNR RailWorks, this $336M design-build project will accomplish the resignalling of Toronto's Union Station rail corridor from Strachan Avenue in the West to the Don River in the East, and to Queen Street, replacing old relay-based interlockings with modernized microprocessor-based systems. The modernization of signalling equipment and infrastructure for Union Station and its adjacent rail corridor will provide a flexible, reliable, and efficient system capable of servicing high volumes of train movements and passengers at Union Station for the next 30 years. The new signalling systems will be controlled by the GO Train Control System, which is also being developed and installed by the team composed of Alstom, PNR and WSP.

What innovations and future trend(s) did we consider?

- Increase in popularity and use of electric vehicles in urban areas
- Growing demand for design automation to improve efficiency and productivity in many industries
- Changing climate due to increasing greenhouse gas emissions
- Rapid increase in population and employment over the next 25 years

How were they considered?

Electrification

The infrastructure and systems in the USRC project have all been designed to be compatible with future electrification. Signal bridges are designed at a height to provide clearance for overhead catenary systems and the grounding system has been designed to support electrification.

Design Automation

Design automation has been employed on the project through the Cable Routing Plan Excel spreadsheet. An opportunity was seen by WSP to automate the checking and verifying of the signal system Cable Routing design and a spreadsheet was developed to drastically reduce the time to develop the design and perform design optimizations.

Urban Growth

The new computerized signalling systems installed within the USRC project will provide greater efficiency and reliability of the rail network, thus allowing for greater capacity of trains running on the network. The project considers 30% growth by providing spares for future conduits, backup power, and additional inputs for systems.

Climate Change

The project considers climate change by providing electrification compatibility. Future electrification systems will replace the current diesel trains and reduce greenhouse gas emissions. The system is equipped with a feature to detect slippage in anticipation of climate extremes. Additionally, Novec™ 1230 is used as the fluid for the fire suppression system due to its low global warming potential.

How was our approach better?

The design of USRC provides flexibility and more options for the future. The compatibility with electrification systems will eliminate the need for costly reconstruction if either electrification or Hydrail are chosen. This ultimately provides more opportunity for revitalization of the outdated diesel train network.

With the rapid population increases expected over the next 25 years, the future-oriented approach of this project is critical to ensure the system not only benefits the present, but also the future by ensuring the system is equipped to support travel demands of the future population.

The outcome

By delivering this critical project for the GTHA commuter system, the integrated project team will have prepared the Union Station Rail Corridor for future system upgrades. The completion of this project will support the all day frequent service that is planned for the future. The project is expected to be completed in 2018 and in service by 2019.

For more information:

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