Construction Update

SUBWAY SYSTEMS – WHAT IT TAKES TO RUN A SUBWAY

Six new subway stations and connecting tunnels, which form the Toronto-York Spadina Subway Extension project (TYSSE), will extend the TTC’s existing Line 1 Yonge-University north into York Region and the City of Vaughan. Tunneling was completed in late 2013 and now the station entrances and bus terminals are all clearly visible above ground and finishing work underground is advancing. Some of the most important work underway includes installing a series of complex operating systems in the tunnels and stations.

Track Installation

The first subway systems work involved installing 17.4 kilometres of double track in the stations and tunnels. Four sections of special track work, including crossovers and a pocket track allowing trains to park off the main line underground, have been installed in the tunnels. This project milestone was completed in the spring of 2016.
Power Systems and Substations

Installing power to the new extension is underway. Four power substations will provide electricity to the stations and tunnels for traction power (used to operate trains), lighting, ventilation, escalators, elevators, and fare equipment, among other station systems. Three of four substations are now powered-up at Downsview Park, Pioneer Village and Vaughan Metropolitan Centre (VMC) stations, providing permanent power supply to five of six stations. The fourth substation is under construction and is located on the second floor of the Finch West Station TTC Bus Terminal. Toronto Hydro (in Toronto) and Powerstream (in York Region) provide two redundant power supplies to each substation. The power is reduced to 600 VDC (volts direct current) to supply the power to the subway trains by way of the contact rail.

Communications

Thousands of metres of fibre-optic cable are now installed in the tunnels and stations to provide the backbone for connecting with the TTC’s various subway communication systems. Connections for SCADA (Supervisory Control and Data Acquisition), fire, IT network, radio, public address systems, passenger assistance intercoms, and closed circuit television. Additional antennae and radiating cable are being installed for tunnel and station Wi-Fi so that future subway passengers will be able to use their mobile phones and the internet.

A two-way radio communication system is being installed between the stations and tunnels and TTC Transit Control to provide radio communications for running subway trains, as well as emergency radio services for police, fire and ambulance for both Toronto and York Region. Radio coverage is now operational from TTC Transit Control through the Downsview Station (to be renamed Sheppard West) to the new Downsview Park Station. Stations along the TYSSE will be connected progressively so that all stations to the end of the line at VMC Station will be connected to TTC Transit Control.
Automatic Train Control (ATC) Signal System

The ATC is a modern signalling system that uses Communication Based Train Control (CBTC) that allows for the exact position of the train to be known, which increases subway system capacity and passenger safety. About 60 per cent of the equipment required to run the signals in the tunnels and stations is already installed in the TYSSE tunnels.
Fire and Life Safety Systems

To protect customers, each station has an Uninterruptible Power Supply (UPS), which provides back-up power to ensure life safety and emergency systems are operational should there be a power disruption.

Another key component of the fire and life safety systems in the subway are fans and ventilation systems, which are installed in each station. These massive fans (see front page) pull air into or push air out of the tunnels and stations, should fire or smoke enter the subway system. The operation of the fans and vents will be controlled through TTC Transit Control, the nerve centre of all TTC operations. The fans connect to vent shafts, which in turn come up to the surface through vent structures or grates in sidewalks.

RECENT SYSTEM MILESTONES REACHED

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<th>Radio Communications - August 2016</th>
<th>Successful test from Downsview Park to TTC Transit Control.</th>
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<tr>
<td>Fibre-Optic Connection - August 2016</td>
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UPCOMING MILESTONES

| Traction Power On - April 2017 | Will allow start of testing of trains in new tunnels and stations. |

The TYSSE project is an 8.6-kilometre extension of the Toronto Transit Commission’s Yonge-University subway line from its present terminus at Downsview Station (to be renamed Sheppard West Station when the extension is complete) to the Vaughan Metropolitan Centre Station at Highway 7. It will have six new stations. The expansion of the subway will bring the line into The Regional Municipality of York. The new line is scheduled to open by the end of 2017.

For More Information

Web: spadina.ttc.ca
Call: 1-800-223-6192
Email: tysse@ttc.ca to receive regular construction notices.
YouTube: Visit the Official TTC YouTube Channel http://www.youtube.com/officialttcchannel to view our project videos.

The Toronto-York Spadina Subway Extension project is jointly funded by the Government of Canada, the Province of Ontario, the City of Toronto and The Regional Municipality of York.