ATTACHMENT 1

TRAFFIC SIGNAL CONTROL SYSTEMS

Transportation Services utilizes four traffic signal systems to control its 2250 traffic control signals. The four systems are:

Main Traffic Control System (MTSS)

MTSS was developed in-house in the 1960's and is the City's oldest system. It currently operates 587 traffic control signals using pre-determined traffic signal timing plans. There are a minimum of three signal timing plans at each signalised intersection - a morning peak plan, an off-peak plan and an afternoon peak plan. While it is capable of providing traffic signal coordination, the system has limitations due to its age and is subject to frequent maintenance which negatively affects the system's ability to ensure signal coordination. MTSS relies on second by second communications to maintain coordination i.e. a loss of communication results in a loss of signal coordination.

TransSuite Traffic Control System (TCS)

Recognizing that MTSS was coming to the end of its useful life in 2002, Transportation Services reviewed alternatives to MTSS and decided on the TransSuite TCS. After the completion of exhaustive testing in 2004, in 2005 Transportation Services embarked on a ten-year program to replace MTSS.   The replacement program, costing $32 million, is on schedule to be completed by December 31, 2014. When completed, the TransSuite TCS will control 1600 traffic control signals. The TransSuite TCS is more reliable in providing a coordinated signal system than MTSS. TransSuite relies on second by second communication to monitor signal operation but relies on the field equipment to maintain coordination i.e. the field equipment can maintain signal coordination for about 24 hours if there is a loss of communication.

The program includes the following:
  o Replacement of the MTSS computers and central software by the TransSuite TCS software computers and central software.
  o Redesign of the communications interface between the central system and the field since the existing MTSS communications were no longer being supported by the telecom provider.
  o Upgrading the field computers from legacy interval based to industry standard based capable on communicating via the most up-to-date communications protocol.
  o Upgrading the field cabinets to ensure compatibility with the TransSuite TCS.
  o Upgrading signal timings for all existing plans to comply with an overall pedestrian walk speed of 1.0 m/s and a pedestrian clearance walk speed of 1.2 m/s.

Urban Traffic Control (UTC)/Split Cycle Offset Optimization Technique (SCOOT)

UTC/SCOOT consists of two components – UTC and SCOOT. UTC provides pre-determined traffic signal timing plans and is used as a stop-gap measure if SCOOT is not available. SCOOT is an adaptive traffic control system that determines its traffic timing plans on real time information received from vehicle detectors located on the approaches to signalised intersections. SCOOT currently operates 338 traffic signals. The system is capable of providing traffic signal coordination as a by-product of SCOOT optimisation, but like MTSS, it has come to the end of its useful life and needs upgrading or replacement.

Aries

Aries is the system used to manage the eight traffic control signals along Queens Quay, specifically, to provide priority to streetcars that travel on the exclusive transit right-of-way on the Harbourfront LRT. The Aries system will be replaced by TransSuite as part of the Waterfront Revitalization Project. Vehicle detectors located within the streetcar track allowance are used to provide priority for streetcars. While signal coordination can be provided on Aries for mixed traffic, this feature was never used since the focus on Queens Quay was to serve transit vehicles as quickly and as efficiently as possible.