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To: Stephen Buckley, Scott Fraser, Myles Currie, Jesse Coleman & James Yu,
City of Toronto Transportation Services Division
From: Matthias Sweet & Carly Harrison, McMaster Institute for Transportation and Logistics
Date: August 27, 2015
Subject: City of Toronto Corridor Report Cards 2011-2014

Please find the corridor report cards in the linked folder which has been sent to you by email. Each corridor has been documented in both directions and reflects the methods documented to date in the study with one exception: unreliability at the corridor level is measured using a multilevel model in which the expected speeds are estimated (and transformed to travel times) for all unique 15-minute intervals during the particular hour of interest within the study timeframe (e.g. during the months of September-November of a given year or during the full year of 2014). This is in contrast to the city-level or downtown-level metrics of unreliability which use sampling to estimate a distribution of travel speeds for the simulated trip distance.

Findings
Overwhelmingly, the findings are consistent with what we have found in the city and downtown report cards. As foreshadowed in the downtown report card, several of the downtown arterials, particularly those running east-west, became significantly slower and less reliable between 2011 and 2014. There are big differences between the arterial daily profiles and freeway daily profiles. Arterial profiles are generally flatter and get worse in the course of the day, while more urban freeways (e.g. the Gardiner Expressway and Don Valley Parkway) have both significant morning and evening peaks and more suburban freeways (e.g. the 409, 404, and 400) have a more significant peak in just one direction.

The biggest surprise to us is the change between 2011 and 2014 during peak periods on the Gardiner Expressway – particularly in the westbound direction. In short, the peak shoulders on the Gardiner are slower in all cases between 2011 and 2014 (fall to fall) but speeds increased during three of the peaks themselves (westbound AM and PM and eastbound AM). We've checked this using a number of different approaches to verify this finding. Were there operational mitigations which were in effect during the fall which alleviated traffic during the core peak hours despite the construction? Behaviorally, it may be consistent with users overcompensating to avoid the peak hours. By that fall, users would have had almost six months of experience with Gardiner construction activities. Speeds on potential alternative routes don't show the same pattern. The Lake Shore Road's daily profile shows that speeds decrease at all times of the day – especially the westbound PM, when the Gardiner's speeds actually increase from 2011 to 2014. The Queensway similarly has lower speeds at all times of the day in 2014 compared to 2011.

Background Definitions
Please note that some of the graphs have been simplified for purposes of interpretation. The definitions corresponding to the *Key Performance Indicators* table can be seen below the table. AM peak represents activity between 8-9AM, and the PM peak represents 5-6PM. Travel time index is the ratio of average travel time to the uncongested travel time. Peak delay is the average vehicular delay per weekday (in hours), for that peak hour. Planning time index is the ratio of 95th percentile slowest travel times to the free-flow travel times, during the PM peak hour. Buffer time index is the ratio of the 95th percentile slowest travel time to the average travel time, again during the PM peak hour. The network unreliability graphs have been simplified, particularly when describing variables in the legend. Looking at *Travel Speed Variations, 2014*, slowest speeds represents the 5th percentile slowest speeds, while free-flow speeds are the 95th percentile fastest speeds. Looking at *Corridor Congestion & Travel Time Uncertainty, 2014*, uncongested conditions represents the free-flow travel time to travel the length of the corridor, typical congestion represents additional normal (average) congestion in travel time for that corridor, and severe congestion represents the additional travel times under 5th percentile slowest travel time conditions for that corridor. For each corridor, we showed the best and worst months in terms of travel time for 2014, as well as an average month for the year.