



To: Metrolinx Board of Directors
From: Greg Percy
Chief Operating Officer
Date: September 9, 2016
Re: **GO Transit Review – June 25, 2016 Schedule Changes**

Recommendation

That this report be received for information.

Executive Summary

The latest stage of Union Station construction that began on August 10, 2016 required two heavily used GO tracks to be closed, effectively resulting in 25% less Union Station throughput train capacity. This required us to plan and operationalize the largest schedule changes in our history.

Planning began in November of last year to accommodate construction within the original timeframe while protecting service levels for our customers and incurring no additional costs. However, to accomplish this required a significant adjustment to scheduling, particularly along the Lakeshore east and west lines. The plan presented potential problems that included less overall platform space and increased train congestion at Union Station.

On June 27, 2016, the first weekday of the new service changes, we experienced multiple IT issues, defective crossings/switches, engine failures, and other equipment issues that created delays, cancellations and overcrowding. The compacted schedule and the reduced space to maneuver trains within Union Station allowed no room for normal recovery time. Our external train operators (Bombardier) and dispatch managers (Canadian National Railways, or CN, and Toronto Terminal Railways, or TTR) had difficulties adjusting to the magnitude of the schedule changes, contributing to several operational errors that resulted in service disruptions and delays.

As we moved into July, we continued to encounter a number of service issues over which we had no control. Multiple medical emergencies, a trespasser fatality, grass fires, freight congestion, trespassers and heat-related failures/delays all occurred within the first three weeks of the new schedule. In that time, on-time performance was 88%. While the number of 12 and 10-car coaches had remained the same, some trains were assigned to serve different trips, which resulted in overcrowding on some trips as customers adjusted to the new schedule.

We immediately launched a comprehensive cross-functional review that clearly identified trips that experienced chronic delays, equipment that was driving the delays, and stations, trips and platforms that had repeated crowding issues.

Remedial actions have included:

- ▶ Adding eight coaches to alleviate crowding on three trips that were changed to 10-car trains from 12-car trains
- ▶ Numerous working sessions with Bombardier and other rail companies to strengthen service monitoring and rail recovery
- ▶ A “health check” of all IT systems governing train movements and digital schedule boards
- ▶ Adjusted departure/arrival times for September so customers can plan their day with more accurate trip times, and to reduce delays caused by conflicts with freight, VIA and GO traffic
- ▶ Posting more Transit Safety Officers on Union Station platforms to enhance passenger safety

Acting on this review, Metrolinx started to stabilize GO service reliability and is steadily moving on-time performance back to 94%, our target, and a level that customers have come to expect from us.

Why did Metrolinx change the GO schedule?

The service changes that started on June 25, 2016 were needed to continue moving forward with the Union Station revitalization. Before the revitalization, the almost century-old facility was in poor condition with damaged floors along with small, outdated and inefficient concourses. The 30,000-square-metre Union Station train shed that was constructed in 1929 was also in disrepair. The shed had problems with water leakage to the areas beneath the track slab, the roof was deteriorating and the smoke vents needed to be repaired and, in some cases, replaced. Operating at capacity during rush hour of every weekday, the shed covers 12 tracks and 10 platforms, and is critical to GO train service. For these reasons, the Union Station train shed rehabilitation project was initiated. The new train shed will also accommodate increased passenger volume for our ever-increasing service and allow us to operate our Regional Express Rail (RER) plan that will deliver all-day, 15-minute, two-way service to much of the GO rail network.

Since construction on the train shed began in 2010, roof rehabilitation has been completed while the majority of the train shed remained operational. The number of trains passing through the shed also increased since the project began, making construction and scheduling of trains even more difficult. In order to offer the service that customers expect from GO, we scheduled the work to be completed in stages, with each stage requiring the closure of two tracks and their adjacent platforms. The construction that began on August 10, 2016 required the closure of tracks 6 and 7, which primarily impacted schedules on the Lakeshore East and West lines. By closing these two tracks, we could continue to prepare the train shed

Construction-Related Track Closures

- ▶ **2010:** Tracks 11 and 12 (one VIA track and one GO track)
- ▶ **2013:** Tracks 1 and 2 (two GO tracks, but there was less GO service at the time. Track 1 also only fits 10-car trains, and when it returned to service, UP Express inherited the track)
- ▶ **2015:** Tracks 10 and 11 (two VIA tracks)
- ▶ **2016:** Tracks 8 and 9 (two VIA tracks)
- ▶ **August 10, 2016:** Tracks 6 and 7 (two highly used GO tracks)

Future construction stages will continue to affect other heavily used GO tracks

for the installation of a new roof, which involves rehabilitating the steel structure and replacing expansion joint seals to minimize water penetration through the track slab. Once this work is completed, a new roof will be installed over the tracks. The entire project, including roof installation, will take roughly two more years to complete.

Closing these tracks effectively resulted in 25% less capacity within Union Station, and it challenged our organization to create new schedules that could accommodate over 120 trips, carrying over 200,000 passengers during the morning and afternoon weekday rush hours.

How did Metrolinx create the new schedule?

Work on the new schedule began late in 2015, and three options were developed after our rail operations and planning teams analyzed a wide variety of data sets. The first recommendation that was developed would close one track at a time with no changes to service, but the plan was rejected because it would incur additional construction costs (over \$2 million) and it required two more years of construction and related customer impacts.

The second option would maintain the same construction costs and timelines as originally planned, but all express trips would need to be converted to all-stop trips. The customer impact was believed to be too significant and this option was also disqualified — with 30 Lakeshore express trains removed, customers would have longer travel times and there was a risk of insufficient train capacity during key peak periods (8:00 to 8:30 a.m. and 5:00 to 5:30 p.m.).

Key Analysis for Schedule Design

- ▶ Ridership
- ▶ Trip separation
- ▶ Travel time
- ▶ Equipment cycling
- ▶ Train yarding
- ▶ Equipment fueling
- ▶ Crew hours
- ▶ Union Station platform occupancy
- ▶ Train routing

The third option also had no additional construction costs and maintained the original construction timeline, but introduced a significantly modified Lakeshore service. The recommendation reduced some express trains to accommodate for the two track closures, but the majority of express service was not affected. The plan also offered additional service during non-peak periods that would help deliver on our plans under the GO RER program. This plan was ultimately chosen for its balanced approach, but it was noted that there would be less overall platform space, reduced time for trains to dwell at platforms, and less recovery time between trips.

Crowding Action Plans

We conducted several risk assessments and developed mitigation strategies to manage potential crowding issues at Union Station. Plans were developed to have staff and Transit Safety Officers at key locations to help with wayfinding, direct traffic and to keep customers safe.

Because the plan added two more trips to our network, additional equipment was also required, which results in fewer spare trains to help with service disruptions.

After being presented and approved by our Senior Management Team, the third option was tested in our simulator and it performed favourably in controlled, typical conditions. Our simulator is an exact model of our system and includes station, equipment, signal and switch specifications. After successful testing with our simulator, we vetted the plan with our contractors as well as local transit providers. After their approval, we began developing plans to communicate the change to our customers.

How did we keep our customers informed?

Two weeks before the new service changes started on June 25, we made the new schedules available on gotransit.com and began communicating the upcoming service changes. We used a variety of communications to help customers become aware and familiar with their new schedules, and to reduce confusion during the first few days of the changes. For example we:

- ▶ doubled the number of Transit Safety Officers at platform level — we had six in the morning and up to 12 for the afternoon, compared to three and six, respectively; and
- ▶ placed 55 additional support staff at key locations to assist customers, distribute handouts and answer questions.

Communication Focus Points

- ▶ Schedules were available early on our website
- ▶ Customized onboard announcements to highlight changes to a specific trip or corridor
- ▶ Targeted communications to trips affected with train-car reduction
- ▶ After the changes took effect, staff was situated at strategic locations around Union Station to help customers
- ▶ Staff was located at first stops to assist customers who boarded the wrong train
- ▶ Q & A was prepared for front-line staff to help customers and to answer questions
- ▶ Acknowledge the short-term pain for long-term gain and express appreciation to customers for their continued patience while we expand and build a better GO

To prepare for the platform changes on August 10, we also:

- ▶ tripled the number of Transit Safety officers on platform level to 10 officers during the morning commute and 20 during the afternoon commute; and
- ▶ placed 110 additional support staff at key locations to assist customers.

Across both the June 25 service changes and the August 10 platform changes, staff distributed over 100,000 printouts that included schedule information, maps, wayfinding tips and safety reminders.

What happened when the schedules started and what went wrong?

June 27, 2016 was the first weekday of the new service changes and we experienced frequent problems throughout the day. Some problems were out of our control, and some were issues related to our own staff's adjustment to the extent of the changes, which were the largest in GO's nearly 50-year history.

GO Transit Control Centre

Located in Union Station, the GO Transit Control Centre is a high-tech, integrated service monitoring and communication centre. The GTCC provides an efficient way of monitoring our rail and bus services together, alongside customer communications employees. When service interruptions occur, our employees can easily send information to each other and to customers quickly and consistently.

The GO Transit Control Centre (GTCC) experienced numerous IT issues during the morning rush hour of June 27. Our system that monitors train location and speed experienced an issue where its supporting database server was unable to respond to a higher than normal volume of requests. While a permanent

fix was ultimately put in place to ensure capacity and stability going forward, the high volume of requests associated with the new schedules did result in intermittent tracking issues that required us to manually conduct this work, resulting in delays. At the same time, the service change data uploaded to our real-time schedule information (RTSI) system contained errors. Customers were affected by this upload error with gotransit.com and

station signage displaying incorrect schedules, which led to additional confusion and crowding.

On the first day of the schedule changes, we also experienced routing issues from CN Rail and TTR along with equipment failures. Due to the unprecedented scale of the changes, rail traffic controllers and USRC train movement directors mistakenly routed trips to incorrect platforms, which resulted in cancelled trips and trip delays to ensure customer safety and to prevent further congestion. Defective crossings and switches, an engine failure, and other equipment issues further affected service reliability.

Even though there were some issues that were out of Metrolinx's control, we were accountable for the poor performance on June 27. A post-incident review revealed that the extent of the changes had been underestimated and that strengthened procedures and more preparedness by staff who needed to be familiar with the new schedules should have been in place so that staff didn't have to continually reference new trip times and new trip numbers. Tighter schedules and less maneuverability within Union Station led to an increase in procedural errors which caused significant cascading delays that staff could have easily recovered from in the past. In total, on June 27, we experienced 72 delays with only 74% of trains arriving on time (in the past fiscal year 94% of trains arrived within five minutes of the scheduled time). The Lakeshore corridors had the majority of the day's delays (56), with only 70% of trains arriving on time.

As we moved into July, GO encountered a number of service issues that were beyond its control: multiple medical emergencies, a trespasser fatality, grass fires, freight congestion, trespassers and heat-related speed restrictions. The extreme weather alone resulted in over 40 heat-related delays, compared to zero in 2014 and 2015. In conjunction with delays from slow orders, we also experienced numerous equipment failures from the extreme heat: failing circuit boards/software, sticking/binding leafs that prevented doors from opening and engine failures due to defective fuel pumps. The fuel pump has an expected life of 20 years, but we experienced premature failures at six to eight years due to high fuel temperatures from the extreme heat. Staff performance also did not meet customer or corporate expectations, with rule violations, procedural failures and platform overshoots causing numerous delays and cancellations.

What did Metrolinx learn, and what is being done going forward?

Despite the confluence of issues that affected our performance as staff and customers adjusted to the largest schedule changes in GO's history, overall on-time performance started to improve within three weeks of the changes, rising from 74% overall to 88%. On-time performance for the Lakeshore West corridor rose from 72% to 86% and the Lakeshore East corridor rose from 68% to 87%.

At the same time, we conducted a comprehensive, cross-functional review that clearly identified process failures, trips that experienced chronic delays, equipment that was driving the delays, and stations, trips and platforms that had repeated crowding issues. Once identified, Metrolinx began developing mitigation and action plans to help restore our service and to rebuild the confidence of our customers.

As a result, on-time performance continues to improve with our preliminary August numbers indicating that GO reached 92% overall and on both Lakeshore corridors.

Crowding on trains/platforms continues to abate, and the improvements below should further help recover our customer's trust.

Schedule planning and day one improvements

- ▶ Install a permanent fix to the train location database server to improve stability and ensure consistent functionality during times of high volume.
- ▶ Begin using a newly developed tool to validate data uploaded to RTSI to reduce the potential for human error and prevent future schedule upload errors.
- ▶ Ensure IT works onsite at the GTCC during schedule changes to immediately manage and correct issues if they arise.
- ▶ Engage the GTCC and Bombardier, CN and TTR earlier in the planning process to develop stronger schedule and trip familiarization.
- ▶ Deliver new schedules to CN in a new preferred format to better enable them to confirm accuracy and ensure correct trip routing.
- ▶ Include delays and service recovery options in the schedule simulator.
- ▶ Deploy GO and Bombardier supervisors to train outposts and onsite in the GTCC to address problems during schedule changes.
- ▶ Develop a specific Lakeshore corridor plan to recover service more efficiently when delays occur.
- ▶ Create a stakeholder committee to oversee the development of schedule creation and include a broader risk assessment as part of the process.

On-time Performance and Process Improvements

- ▶ Deploy equipment and schedule train crews earlier to ensure operational readiness on day one of schedule changes.
- ▶ Implement regular risk assessments for significant schedule changes.
- ▶ Adjusted departure/arrival times for September so customers can plan their day with more accurate trip times, and to reduce delays caused by conflicts with freight, VIA and GO traffic.
- ▶ Modify or replace current fuel pump systems to prevent heat related engine failures.
- ▶ Add more spares for service recovery by returning four bike coaches to regular coaches.

Crowding Improvements

- ▶ Added two additional coaches to three overcapacity Lakeshore West trips. Trip 706 (7:23 a.m. Aldershot), Trip 904 (7:35 a.m. from Oakville) and Trip 475 (16:30 p.m. from Union) all benefit from over 300 additional seats. The new schedule now has more trains and more 12-car coaches than ever before.
- ▶ Increased staff and Transit Safety Officer (TSO) presence at Union Station platforms to help guide heavy passenger traffic and to keep customers safe.

As we continue with these improvements during the course of the Union Station train shed revitalization, Metrolinx will continue to find ways to reduce delays/crowding along with improving the planning and preparedness for future service changes. Along with our partners, we will continue to rebuild confidence in our service and to deliver on the promises of our GO's Passenger Charter.

Respectfully submitted,

Greg Percy
Chief Operating Officer