

**Subject: OC Transpo Scheduling Process**

**File Number: ACS2024-TSD-TCSP-0001**

**Report to Transit Commission on 11 April 2024**

**Submitted on April 2, 2024 by Pat Scrimgeour, Director Transit Customer  
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**Ward: Citywide**

**Objet : Processus d'établissement des horaires d'OC Transpo**

**Numéro de dossier : ACS2024-TSD-TCSP-0001**

**Rapport présenté au Commission du transport en commun**

**Rapport soumis le 11 avril 2024**

**Soumis le 2 avril 2024 par Pat Scrimgeour, Directeur, Systèmes-clients et  
Planification du transport en commun**

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**Quartier : À l'échelle de la ville**

#### **REPORT RECOMMENDATION(S)**

**That Transit Commission receive this report for information.**

#### **RECOMMANDATION(S) DU RAPPORT**

**Que la Commission du transport en commun prenne connaissance de ce rapport  
pour information.**

#### **BACKGROUND**

At the December 14, 2023, joint Transit Commission and Light Rail Sub-Committee meeting, there were discussions regarding how OC Transpo bus operators' work is scheduled. Transit Services Department committed to return to a future Transit Commission meeting in 2024 with a report outlining how bus routes and bus operators' work are scheduled. This report responds to that request.

## **DISCUSSION**

The scheduling process at OC Transpo aims to provide customers with the best service possible, while meeting Council's policy directions, working within the budget established by Council, and remaining compliant with the provisions of the collective agreements with all employee bargaining units. These factors guide the way service is scheduled, which will be described in further detail in this report.

### **Scheduling: considerations and factors**

These factors first come together at the network planning stage. OC Transpo plans bus routes taking into consideration all customers' usage and travel patterns in combination with transit planning principles and policies, such as service frequency, service hours, and walking distances to transit to deliver the best possible service within the resources available.

Scheduling at OC Transpo is an ongoing and continuous process that repeats for each of OC Transpo's four service periods: winter, spring, summer, and fall. Staff regularly review service using Key Performance Indicators (KPIs) based on ridership demand and service delivery while making quarterly adjustments through the spring, fall, summer, and winter schedule adjustments. Select KPIs are shared with the Transit Commission regarding bus service delivery and regularity/punctuality, among others. The scheduling team works year-round to create, optimize, and deliver schedules that are compliant with all regulations and collective agreements, are feasible within the available operating budgets, and can be delivered with the available bus and bus operator resources, all while meeting level of service targets and the needs of customers across the network.

Because of the complexity outlined in this report and the scale of Ottawa's transit network, long lead times are required to schedule transit service. In many cases, six months or more is required between the time the need for any schedule or route changes are identified by staff and the time when the service begins for customers. While lead times can typically be manageable for planned service changes, such as route changes and station changes, this long lead time unavoidably introduces challenges for staff to provide quick, near-term solutions for issues with trip times or rapid fluctuations to auto traffic volumes, ridership volumes, or auto traffic congestion.

## Bus Types and Service Frequency

Once the route network has been defined (as happened most recently in the 2023 Bus Route Review, which is to be implemented in 2024), staff use the most recent ridership statistics to determine how frequently each bus route should operate. OC Transpo uses high-capacity buses (60-foot articulated buses or double-decker buses) on routes that warrant additional capacity as demonstrated by ridership volumes. The calculation of frequency based on bus type provides that at off-peak times most customers will have a seat available, and that at peak times there will be a reserve of space on board to allow for surges in ridership or for increased ridership to be accommodated until the next opportunity to make the route more frequent.

The scheduling process aims to ensure that the largest number of customers can be carried on each bus without requiring an additional bus and bus operator, allowing for lower overall operating costs, and ensuring that resources remain available to provide service across the network.

Staff can make changes to bus types as ridership levels require, however these changes often require additional deadheading and interlining and can result in an inefficient schedule requiring more buses overall. These factors must be considered whenever a change to a bus type is considered. Any changes staff make therefore aim to achieve the best balance of service for customers and resource availability.

### Interlining and deadheading

Interlining and deadheading are essential to delivering the most efficient scheduling solution.

The term “interlining” is used to describe the situation when a bus and bus operator change routes during a “block” of work. A block of work refers to the set of routes that a single bus operates on a given day between the time it leaves the garage and the time it returns to the garage.

Whenever a bus is travelling out of service between the garage and the start point of a route, between trips, or travelling between the end point of a route and the garage, this is referred to as “deadheading.” While deadheading, buses are not in service and do not carry customers.

As an example, consider a block of work for a bus starting and ending at St. Laurent Garage:

The bus leaves the St-Laurent garage and travels out of service to St-Laurent Station	Deadheading
The bus starts a trip on Route 7 between St-Laurent Station and Carleton University	In service on Route 7
The bus travels out of service from Carleton University to Greenboro Station	Interlining from Route 7 to Route 6
The bus starts a trip on Route 6 between Greenboro Station and Rockcliffe	In service on Route 6
The bus travels out of service back to St-Laurent Garage	Deadheading

There are two main goals of interlining:

- To permit more flexibility from a vehicle type and capacity perspective. For example, high-capacity buses can be moved throughout the network to deliver service on specific trips that require those buses.
- To increase efficiency by reducing the overall number of buses and bus operators required to provide the service, which can help to reduce operating costs.

Interlining can be scheduled to take place within the same station/terminus point or may require deadheading to various locations across the network to deliver the most efficient network scheduling solution. Additional recovery time is added between the routes to absorb delays and is usually longer than the minimum time required by the collective agreement to increase the likelihood the following trip begins on time. This is one of the reasons why customers may see buses driving out of service and not stopping at bus stops.

More specifically, deadheading can occur for a few reasons:

- Travelling between points in the network for efficiency (interlining)
- Starting or ending the work blocks at a garage
- Travelling to/from a layup location/timepoint (such as for a mandated break)

Overall, there are 52,000 possible deadhead patterns in the network, and for any given schedule period there are approximately 2,000 in use. The number of possible deadhead patterns increases with road closures, construction, detours, and other

factors. Mandated breaks can add to the amount of deadheading in the network to accommodate breaks and break locations.

Currently, 27 per cent of all in-service trips are followed by a trip on a different route, and 40 per cent of all existing blocks include four or more different routes. Most (72 per cent) deadheads are short and have a duration of five minutes or less. A quarter of all deadheads are between five and 30 minutes in duration, and about three per cent of all deadheads are 30 minutes or more in duration, to or from the most remote parts of the system.

One of the goals of the ongoing scheduling work in 2024 for the new bus network is to improve upon these figures, and to reduce the average duration of deadheads to increase efficiency. This work is an important element of the ongoing work by the scheduling team to optimize the network and maintain continuous improvement in pursuit of OC Transpo's service delivery and service reliability targets.

### Collective Agreements

OC Transpo staff are represented by several bargaining units in a number of different trade unions. Amalgamated Transit Union Local 279 represents the largest number of OC Transpo workers and, in particular, represents bus operators. As such, the ATU Local 279 collective agreement that has the greatest influence on how service is scheduled.

The ATU Local 279 collective agreement includes several requirements in terms of how a schedule, and operator work, is developed. Some of these factors include:

- A bus operator's total hours of work on a given day.
  - An operator's workday consists of their "sign on and sign off" times, the times that they are on paid break, and when they are responsible for their bus.
- The "spread times", or the span of an operator's hours of work on a given day, from when they start their first shift to when they finish their last shift.
  - Spread time on a given day must not exceed 12 hours.
- Recovery time is the time built into the schedule to allow an on-time departure for the next trip and is calculated as a percentage of the total trip time.
  - The minimum recovery time permitted is five per cent of the total trip time.

- Time restrictions for “on-street operator reliefs” and relief points.
  - For example, after 9:00 p.m., operators who are taking over a bus from its previous operator will only do so at a garage, and not “on-street”.

Each of the requirements in the collective agreement must be met for each schedule that is produced, for every service period.

Changes in the collective agreement can come following bargaining or arbitration and can require changes in the processes and tools that the scheduling team uses.

### Canada Labour Code break requirements

OC Transpo bus service spans across two provinces and as a result, is subject to federal labour legislation. Under the Canada Labour Code (CLC), a minimum 30-minute break must be provided to all bus operators who have been driving for five consecutive hours. CLC breaks were integrated into OC Transpo schedules in April 2022 as part of the spring service change. When a bus operator is taking a CLC-mandated break, they must be given an opportunity to take the entire allocated break and cannot be assigned work during that time.

The scheduling team must take into consideration when and where these mandatory breaks are scheduled for operators and how buses can continue to be used effectively to provide service while operators are taking their breaks.

The requirements above set the parameters within which the scheduling team must work to create schedules that provide the best possible service for customers.

### **Feedback loops**

The scheduling process is iterative, and improvements and adjustments are made continuously to improve the quality of the work schedules for bus operators and the quality of the service schedules for customers. These improvements and adjustments are typically based on feedback received through various channels throughout the year.

Specifically, staff receive feedback and input from the following sources:

- Customers (via OC Transpo’s customer service channels)
- Councillors, from a policy level or as casework on behalf of their constituents
- Transit operations staff (supervisors, superintendents, etc.)

- Bus operators (through submitted service improvement requests, scheduling clinics, Union representatives and working groups)
- Data analysis by OC Transpo's service planning team
- Field observations and run time checks
- Community and advocacy groups
- School boards and school transportation authorities

All of the information gathered is fed back into the scheduling process to improve and update schedules. It is important to note information cycle times; for example, understanding that a comment submitted by a customer in September may only be fully evaluated by later in the fall or winter, for implementation in the customer-facing service and schedules for the spring service change starting in April.

### **Scheduling timelines and processes**

Throughout the year, there are several important deadlines that must be met to ensure that the scheduling team has all the information they need to complete the scheduling process on time.

The scheduling process for a given service period starts with a summary of service changes and adjustments that arrives to OC Transpo's scheduling team from their network service design colleagues. That team is responsible for developing the set of changes for a given service period, including adjustments to address requests for service improvements or service adjustments, service requirements for major special events, and details for special service including school service.

For example, the scheduling process for a spring service period starts the previous October or November, when the service change details are finalized by the network service design team. These details are handed over to the scheduling team in mid- to late-December. With this information in hand, the scheduling team can start their work for a spring service change by the first week of January.

With the information package received in late December, the scheduling team enters a critical six-week period starting early in January, when all work for the spring service period must be completed. Within this six-week period, there is a set of unique tasks that occur in the first three weeks compared to in the second three weeks.

## Schedule Inputs, Analysis & Adjustments

During the first half of the scheduling cycle, the scheduling team inputs the changes received from the network service design team, which typically includes details such as route changes, service level adjustments, special event service details, and construction and detour information. This information is used to create timetables for each route, which contains information about trip times and the span of service from the first trip in the morning until the last trip of the day. Next, the scheduling team has a short window of time to complete run-time analysis for a small subset of routes.

Run-time analysis may include on-street checks or desktop reviews, consisting of scheduler reviews aided by scheduling software. The number of routes that can be reviewed depends on the scope of the service change and how many other adjustments and changes are necessary. As part of the run time reviews, new routes are reviewed with ATU Local 279 to provide input to the scheduling team, to help inform schedule creation.

The final piece of work in the first three-week period involves adjusting individual trip times, including adjustments for school service and other special service types, inputting and addressing vehicle type changes (to assist with providing the appropriate capacity to a specific trip), accounting for bus fleet and operator resource availability, and establishing service details for major events (RedBlacks, Bluesfest, etc.).

## Schedule Creation

During the second half of the six-week scheduling cycle, the primary task is to create the schedules for bus operators, electric rail operators, and diesel rail operators. There are different schedules produced for different types of service, including for regular weekdays, Saturdays, Sundays, reduced days (such as during the Christmas holidays and March Break), Severe Storm Service (during the winter booking), and for special event days and holidays (such as for Canada Day or the Civic Holiday in August).

During this period there is not a lot of flexibility for iterative reviews or adjustments after the service changes have been input into the system. It is important to have all the details finalized before this period starts to minimize the need to make changes and re-run the scheduling software that is used to generate and optimize the schedules. The inputs to the scheduling software are very complex and contain large amounts of data and details, and can take several hours, or even days, to run on the very fastest



computers the City has. The time to run the software models must be accounted for in the timelines, and if there is a need to repeat the process, this can create delays for other groups within OC Transpo who use the schedule information downstream in the process.

#### Schedule review with ATU Local 279

The first deliverable of the scheduling cycle after the first draft of the schedules are developed is to meet with representatives of ATU Local 279 to present the schedules and provide an opportunity for union representatives to review the schedules and provide their comments on operators' work schedules. Based on the union representatives' feedback, the scheduling team will work to make changes and optimize the schedules further. This is an important step in the process, as it provides an opportunity for union representatives to provide input on the schedules and operators' work.

#### Handover to the booking and timekeeping team

Once the review with ATU Local 279 is complete, the scheduling team makes any required adjustments and finalizes the schedule. The next deliverable is to share the schedules with the bookings and timekeeping team, who prepare the schedule information for the operator booking. Operator booking refers to the process through which bus operators select their preferred blocks of work, in seniority order, for a specific service period, which are made up of a series of trips on one or more routes that the operator will drive on a regular basis. The handover from the scheduling team to the booking team must happen by a specific date to provide enough time to complete the bus operators' work selecting booking. Typically, the handover occurs eight weeks prior to the start of the actual service period. Any delays in the handover of the schedule could compromise staff's ability to complete the booking process prior to the start of the actual service period, which could further compromise the ability to deliver the service to customers.

The scheduling process cannot account for any "on-the-fly" or "real-time" changes once the schedules have been posted to be booked by operators. In most cases, changes received after this point can only be implemented with the following service period.

For example, schedules for the winter service period are turned over to the booking and timekeeping team in late August or early September. Accordingly, any changes identified in mid- to late September can only be integrated into the scheduling process for the next service period, which in this case would be the spring service period, starting in late April. In this scenario, there could be approximately seven months between the time that a need is identified and when it could be implemented for schedules for customers. When travel needs are identified that cannot be built into a current schedule, OC Transpo staff take other courses of action to provide the best service for customers, such as assigning a standby spare bus to provide an additional trip or offering overtime to operators to stay at work longer to drive an additional trip.

Another important consideration in the scheduling cycle is that there are limited opportunities throughout the year when the team's other work can be completed. This other work would include tasks such as supplemental reviews, analysis, investigations, or optimizations to the schedules or the scheduling process, or even implementing process changes based on changes in the law or changes in the collective agreement. These periods typically land in mid-July and for a few weeks mid-fall. These limited periods are when staff can implement enhanced run time adjustments and route improvements over and above the typical scope of changes for a service period.

## **New Ways to Bus**

The new bus route network for 2024, defined through the 2023 bus route review and now being communicated to customers under the label New Ways to Bus, makes use of the expanded O-Train network, improves connections to new and existing O-Train stations, and leverages the increased capacity and reliability of rail service. Staff are currently developing the new bus schedules for the route network changes that will be implemented with, or shortly after, the opening of O-Train Lines 2 and 4.

Work on the new network considers many sources of new data and input collected during the 2023 bus route review. Feedback from customer consultations, Councillors, internal staff and union representatives is being used to ensure that new bus schedules represent the best service for our customers within the available budget and with the available bus fleet and operator resources, with the goal of achieving improved service delivery and service reliability targets. The level of detail outlined in this report is only one of the components of the work that OC Transpo staff are undertaking continuously to move closer to 99.5 per cent service delivery.

As noted at the March 2024 Transit Commission meeting, staff expect that there will be significant improvements in run times, and in the management of these ongoing challenges with the implementation of the new bus network. Optimization of run times will continue beyond the implementation of the new network, as the management of run times for a transit network is ongoing work that requires consistent management and ongoing improvement by the scheduling team.

## **FINANCIAL IMPLICATIONS**

There are no financial implications to receiving this report for information.

## **LEGAL IMPLICATIONS**

There are no legal impediments to receiving this report for information.

## **CONSULTATION**

OC Transpo staff continuously consult with bus operators, unions, customers and Council regarding bus route schedules for current and future service changes.

## **ACCESSIBILITY IMPACTS**

One of OC Transpo's mission statements, as outlined in the 5-Year Roadmap is: "We promise to deliver safe, clean, dependable and accessible public transit." All components of the transit system, including buses, Para Transpo, O-Train Line 1, and future Stage 2 O-Train extensions, meet or exceed all applicable accessibility legislation and standards.

## **TERM OF COUNCIL PRIORITIES**

The 2023-2026 Term of Council Priorities include:

- A city that is more connected with reliable, safe and accessible mobility options. Specifically, to improve transit reliability.
- A city that is green and resilient. Specifically, to improve key infrastructure through asset management.

## **DISPOSITION**

Transit Services will implement any direction arising from considerations of this information report, as appropriate.