Report
March 2023

Transportation Demand Management Strategy for The Ottawa Hospital-New Campus Development

The Ottawa Hospital
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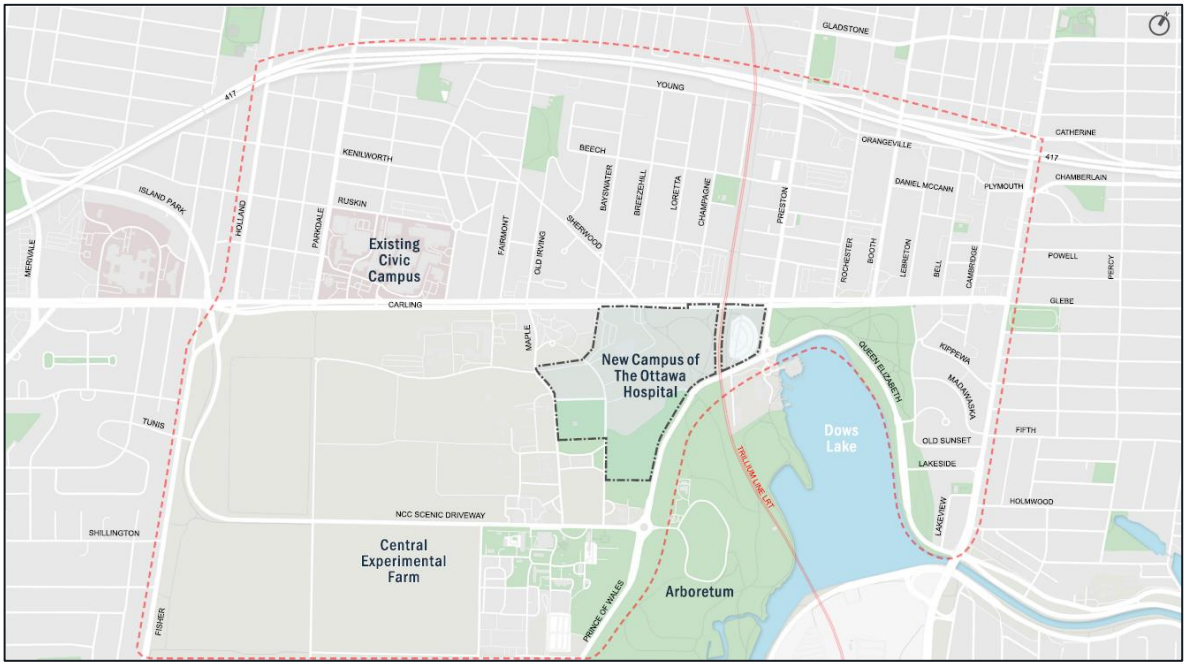
1 Introduction

The Ottawa Hospital (TOH) has initiated the development application process with the City of Ottawa to establish a New Campus Development (NCD) to replace the existing Civic Hospital Campus and become the major referral centre for Eastern Ontario, Western Quebec, and parts of Nunavut. It will be the home of the Eastern Ontario Trauma Centre with a range of specialized services, research, and education facilities, along with related ancillary uses such as resident care stay facilities, and retail service uses. The existing Civic Hospital Campus is located at 1053 Carling Avenue and the NCD will be located approximately 1km east on National Capital Commission land adjacent to the Dow's Lake Pavilion and Central Experimental Farm. The location of the NCD is identified in Figure 1-1.

Figure 1-1: Existing Civic Campus and Future NCD Location



Key approvals and Council motions to date include:

- Master Site Plan Approval (lifting of H) – October 2021
- Parking Garage Site Plan approved by Planning Committee - February 2022

The Master Site Plan approved by City Council stipulated the completion of the following supporting transportation studies – in addition to the overarching Transportation Impact Assessment (TIA) that is typically required to accompany a site plan control application – before the registration of the Site Plan Agreement for the future Hospital Building:

1. Off-site Parking Strategy (OPS)
2. Neighbourhood Traffic Management Strategy (NTMS)
3. Transportation Demand Management (TDM) Strategy
4. Transportation Monitoring Strategy (TMS)

This document covers the TDM Strategy, and its main purpose is to identify a series of recommended policies and measures to help achieve the mode share targets identified in the TIA and Mobility Study (July 2021) that supported the Master Site Plan Approval.

1.1 Opportunity Statement

When the doors of the NCD open in 2028, it is expected to have over 5,000 employees and over 200 emergency visits per day. In 2048, when it becomes fully operational to the extent of the Master Site Plan, there will be over 10,000 employees working at NCD, more than double the current employee population. Construction has started on a 2,870-capacity, 4 and a half-story parking garage at the NCD (heigh above ground and footprint has not changed since the *TIA and Mobility Study*, *July 2021*) that will ultimately accommodate the majority of anticipated employees and visitors and has 200 spaces reserved for NCC use. An approximate additional 600 surface parking spaces primarily located behind the main hospital building planned for opening day, with 100 of them reserved for snow storage in winters and 70 reserved for emergency surge event tents. The net minimum available parking remains as 3,097 NCD parking spaces.

Local community associations in the vicinity of the NCD have expressed concerns about traffic congestion and the lack of parking due to the anticipated increase in the number of employees, patients, and visitors to the site.

TOH has heard these concerns and have made a commitment to reducing Single Occupancy Vehicle (SOV) trips to help alleviate these concerns and to help meet its own vision and goals. This TDM Strategy will assist TOH to overcome these challenges and harness the various opportunities to:

- Adopt a **patient-first** approach by placing their entire travel experience at the forefront.
- Prioritize efficient and convenient employee access to make it a **top-choice employer**.
- Maximize **travel choices** for hospital users to travel to and from the campus.
- Promote alternative and sustainable travel modes to achieve a truly **multi-modal campus**.
- Promote **healthy communities** by encouraging active travel modes.
- Maximize the **efficient use** and return on investment of the campus's limited parking supply.
- Manage the risk of **undesired on-street parking** on adjoining City streets.

The TIA and Mobility Study (Parsons, July 2021), which was approved by the City Council in late 2021 in support of the Master Site Plan application for the entire NCD site, set mode share targets for the NCD by 2028 and 2048 which were developed with and agreed to by City of Ottawa staff. These targets aimed to achieve an aggregate SOV mode share (i.e., for all users) of 50% by 2028 and 35% by 2048, from a starting rate in 2022 of approximately 62% (as detailed in Table 1-1),

based on existing Civic Campus employees. The TIA and Mobility Study indicated that for these mode share targets to be met, a comprehensive TDM program will be required.

Table 1-1: Existing Civic Campus and Target NCD Mode Share

Mode	Existing 2022 * (Employees only)	Target 2028 (Visitors & employees)	Target 2048 (Visitors & employees)
Auto Driver	62%	50%	35%
Auto Passenger	11%	10%	14%
Transit	7%	30%	38%
Walk	8%	1%	2%
Bike	6%	6%	6%
Work from Home	6%	3%	5%

* *Based on September 2022 Employee Survey*

The existing mode share only includes employees and is based on responses from the 2022 employee survey. At the time this report was being developed, there was insufficient visitor travel data to make accurate estimations of the current trends. There are varying types of visitor trips being made to the hospital such as family visits, clinic appointments, etc. The lack of data classifying the type of hospital visits being made compared to the number of parked cars presented a challenge in estimating current visitor mode share.

Employees have more of an impact on the travel trends at the hospital site because they tend to drive alone and park for 8-12 hours at a time, while visitors tend to have a higher parking turnover and only tend to park for one hour at a time (See chapter 3.5 for more details). However, the mode share targets for 2028 and 2048 include considerations for both visitors and employees.

1.2 Overview of the TOH Transportation Demand Strategy

1.2.1 What is the Transportation Demand Management Strategy and why is it important?

Transportation Demand Management (TDM) is the application of strategies and policies to encourage the use of sustainable modes within a transportation network. A TDM Strategy is a plan for a region, neighbourhood or site that seeks to deliver sustainable transportation objectives. It is articulated in a document that is regularly reviewed by the implementing organization, usually on an annual basis. It involves identifying an appropriate package of measures aimed at promoting sustainable travel, with an emphasis on reducing SOV trips, Vehicle Kilometres Traveled (VKT), and parking demand. It can also assist in meeting other objectives such as increasing the accessibility of different transportation options, improving health and safety, attracting, and retaining staff, as well as reducing congestion, greenhouse gases, and noise pollution.

The TDM Strategy will support the development of the NCD by enabling hospital staff, visitors, and patients to make sustainable transportation choices given the suite of available options. The use of TDM strategies will reduce the demand for parking, not only at NCD but across The Ottawa

Hospital Network (TOH) and align with the City's sustainable development goals of encouraging sustainable modes of transportation and increasing the City's transit mode share.

1.2.2 What are the objectives of the Transportation Demand Management Strategy?

Given the opportunities, the main objectives of the TDM Strategy are:

- **Increase Travel Options:** Identify innovative and cost-effective solutions that encourage mode shift from SOVs to multimodal options to support a reduction in parking demand.
- **Optimize Parking**: Reduce demand for parking, especially during peak periods, and congestion in the neighbourhoods adjacent to NCD.
- **Integrated Approach**: Develop a plan that includes policies, measures and other initiatives that enable sustainable mobility by staff, visitors, and patients.
- **Maximizing Technology:** Capitalize on the use of technology to enable data collection, monitoring and evaluation to ensure the TDM Strategy can evolve effectively in the future.
- **Environmental Sustainability:** reduce VKT and GHG emissions to and around the Hospital site and promote a transit-oriented site that is safe and accessible for pedestrians and cyclists.
- **Customer Experience:** Make it convenient and easy for staff and patients to get to the hospital via sustainable modes, enhancing the reputation of TOH through workplace satisfaction and overall patient experience.
- **Overarching Framework:** Develop an overarching framework for the TOH network, including NCD, existing hospital campuses and affiliate medical facilities.

1.2.3 Who is involved in the Transportation Demand Management Strategy?

On the request of Ottawa City Council, a Community Advisory Council Transportation Subcommittee (CACTS) was created that included representatives from each of the five neighbouring community associations within the study area, including:

- Carlington Community Association
- Civic Hospital Neighbourhood Association
- Dalhousie Community Association
- Dow's Lake Residents Association
- Glebe Annex Community Association

It is important to note that the stakeholder consultation process supporting the TDM Strategy (as well as the other transportation supporting studies) was separate from the Site Plan Control process – and was done to ensure each study included public/stakeholder input from its inception and that these parties were an integral part of the planning process.

1.2.4 What happens after the Transportation Demand Management Strategy?

The TDM Strategy will accompany the SPC application submission for the main Hospital building (Phase 4 of the Master Site Plan) for City of Ottawa staff review, which will include additional public consultation as dictated by the City of Ottawa planning approvals process.

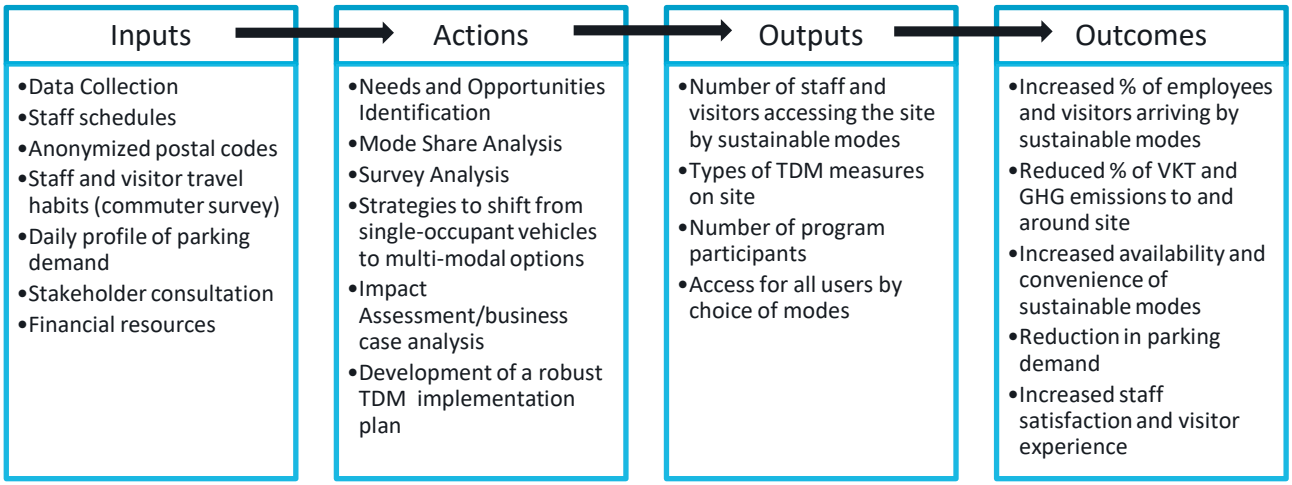
The recommendations made in the TDM Strategy are expected to be refined over the Site Plan Control process. In the time preceding the opening day of the main hospital building (currently scheduled for 2028) and the ultimate buildout of the NCD (2048), TOH will work with the City of

Ottawa, and other relevant stakeholders to implement the recommendations stated in the TDM Strategy.

1.2.5 How was the Transportation Demand Management Strategy developed?

The objectives of the TDM Strategy were developed to align with the overall operational and sustainability goals of the NCD. Once the objectives were established, they were then used to conceive desired outcomes. Figure 1-2 explains the methodology of the TDM Plan using a logic framework.

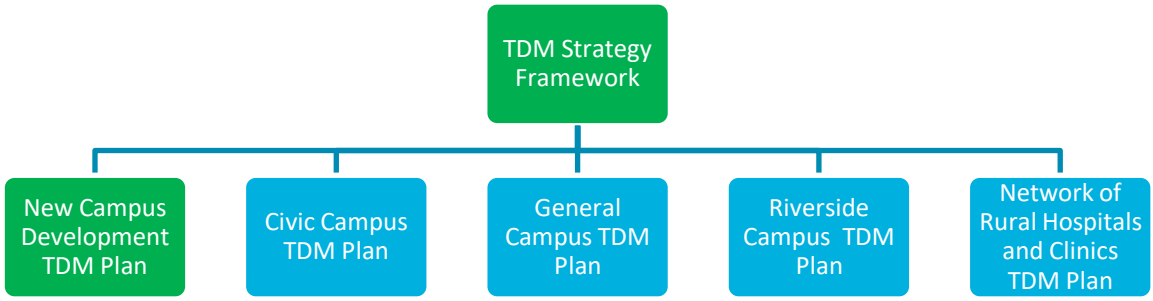
Figure 1-2: TDM Logic Framework



1.2.6 How is the Transportation Demand Management Strategy organized?

As part of the NCD TDMS process, TOH identified a commitment to not only use TDM strategies to promote sustainable travel at the NCD, but to expand the scope of the TDM Strategy to launch a process of using TDM strategies at all hospitals and facilities in the TOH network. As such, an overarching TDM Framework was developed for the entire hospital network, with the more detailed TDM Strategy developed for NCD to achieve its site-specific mode share target of 50%. The objective is to use the TDM Strategy at the NCD to establish TOH's core TDM measures, including organizational structures that will enable TDM to be implemented at the other sites.

Figure 1-3: TOH TDM Strategy Framework



2 Foundational Elements

The TDM Strategy has been developed within the context of previous and ongoing transportation planning initiatives governing the study area, undertaken by the City of Ottawa in collaboration with local community associations. This section will provide an overview of the existing policies and programs as it relates to TDM.

2.1 Existing Policy, Guidelines and Programs

Figure 2-1: City of Ottawa Official Plan

The City of Ottawa has several policies and Guidelines that support TDM, this includes the Official Plan, Transportation Master Plan, and the 2012 TDM Strategy. The 2021 Official Plan identifies connectivity and mobility as one of the City's strategic goals, specifically making cycling, walking and transit residents' first choice transportation options. The draft of the updated Transportation Master Plan builds on and supports the City's mobility strategies set out in the Official Plan. The plan outlines the City's vision for planning and developing active transportation, transit, and complete streets networks over the next 20 years. It provides support for other plans and strategies such as the Cycling Plan, and the Pedestrian Plan. Lastly, the 2012 TDM Strategy identified an overall framework and a three-year action plan for the implementation of the City's various TDM programs. Refer to Appendix C for more details on how these plans support TDM.

2.2 Existing TDM Programs and Initiatives in the Ottawa Region

- **TravelWise**: The City's main TDM program, TravelWise is delivered through EnviroCentre. TravelWise is an employee commuting program that provides workplaces with policies and programs that encourage employees to choose alternative modes of transportation to access their workplace[1].
- **Park-and-Ride Facilities:** To encourage more individuals to use the BRT and LRT, the City of Ottawa have built several park-ride facilities at the termini of the Transitways, allowing people to park for free and use transit.

[1] TravelWise Program - EnviroCentre

- **City of Ottawa TDM Checklist:** As a requirement by the City of Ottawa, developers are mandated to include a TDM plan as part of a Traffic Impact Assessment (TIA) Report, the TDM checklist created by the City guides developers on the development and implementation of TDM strategies. The Lansdowne TDM Report is a good example of an institutional TDM Plan, which was developed as part of the redevelopment of Lansdowne and TD Place. The TDM Plan provided a summary of TDM strategies to encourage the use of alternative transportation modes particularly transit and active transportation for day-to-day travel and special events. The TDM plan also requires that a yearly monitoring report be conducted to monitor the implementation of TDM strategies.[2]
- **Ottawa Taxi Reimbursement Program:** This program provides financial assistance to individuals living in rural communities who have limited access to public transportation and are unable to drive to attend non-urgent medical care.
- **Ontario Northern Health Travel Grant Program:** The Ontario Ministry of Health provides travel reimbursements to patients (who live in Northern Ontario) who must travel long distances to access medical specialist services. Travel grant amounts are based on the distance to the closest medical specialist. Those who use public transport in one direction may also qualify for a partial grant.
- **Existing TDM Programs at TOH**: TOH currently provides very minimal TDM amenities and programs such as bike parking and an inter-campus shuttle.

2.3 Data Collection

2.3.1 Employee Survey 2022

The project team conducted commute surveys for staff across all hospitals within the TOH network to help understand existing travel behaviours and motivations behind commute choices. The survey was aimed at:

- Understanding how people commute to the hospital;
- Perceiving what reasons influence people's current commute choices and behaviour;
- Exploring strategies that are most likely to shift travel behaviour toward sustainable options; and
- Gaining insight into how prepared people are to commute to the NCD.

2.3.2 Postal Code Data

Postal code analysis was used to determine how far employees live in relation to the existing Civic Campus and NCD, and the potential for mode shift based on transportation infrastructure and services close to their home residence.

2.3.3 Parking Data

The TOH parking dashboard was used to estimate overall and peak time parking demand for employees and visitors, as well as parking utilization.

[2] Lansdowne Transportation DEMAND MANAGEMENT REPORT (tdplace.ca)

2.4 Community Engagement

Engagement efforts to support the TDM Strategy focused on two streams: engaging the local community associations and engaging stakeholders.

2.4.1 Engaging the Local Community Associations

Public engagement in the NTMS was essential in assessing community values, and it helped the project team identify issues and opportunities from varying perspectives, specific to each neighbourhood. Community Advisory Council Transportation Subcommittee (CACTS) was formed to allow a representative from the adjacent community associations to be directly engaged by the project team in the form of "1-on-1" workshops to solicit feedback on behalf of its membership.

The key events and milestones in the public consultation process supporting the TDMS included:

- Community Advisory Council Transportation Sub-Committee Meetings:
  - **Kick-off Meeting [May 16, 2022]**: This meeting introduced the CACTS, TOH representatives and the project team, who collectively reviewed the terms of reference prepared by the project team for each of the supporting transportation studies for the NCD Main Building Site Plan Control application.
  - **Meeting #2 [June 23, 2022]**: This meeting had TOH, and the project team update the CACTS on the status of the supporting transportation studies, including a summary of the first round of 1-on-1 workshops with the Transportation Subcommittee members (discussed below).
    Meeting #3 [October 3, 2022]: This meeting had TOH and the project team update the CACTS on the status of ongoing work at the NCD, the main Hospital Building Site Plan Control application, and a summary of progress to date on the additional transportation studies.
- One-on-one workshops were held, where the project team met with individual representatives from the Transportation Subcommittee.
  - **Meeting #1 [August 26, 2022]**: This workshop introduced the project team, TDM Strategy objectives, and gathered initial feedback from participants. It also gave participants a chance to ask questions about the various TDM measures and make their own suggestions.

2.4.2 Engaging Stakeholders

Responses were sought from employees across the TOH network through a survey over a period of two weeks. Many of the responses related to the efficiency of transit, parking constraints, and improvement of infrastructure to the hospital. More details on the survey responses are provided in Chapter 3-Mobility Insights (Travel Behaviour and Metrics). In addition, a special meeting was held on January 10th, 2023 with rural network stakeholders to understand the specific transportation-related challenges for rural patients and employees.

2.4.3 What We Heard

Over the course of the study's public consultation process, several themes were identified by members of the public and key stakeholders, such as:

- **Congestion reduction:** Stakeholders expressed concerns about impact of increased vehicular traffic in surrounding neighbourhoods.
- **Parking:** Stakeholders expressed concerns about staff parking in residential neighbourhoods and long waitlists for parking at the current Civic Hospital.
- **Safety:** Stakeholders expressed a desire for improved safety for pedestrians and cyclists leading to and around the hospital.
- **Transit Reliability**: Stakeholders expressed a need for more frequent and consistent transit leading to hospital.
- **Rural Patients**: Stakeholders expressed the need to prioritize rural patients when formulating a parking policy at NCD.

3 Identifying Needs and Opportunities

This section provides an overview of the infrastructure conditions, user groups, and mobility insights as it relates to mode share targets.

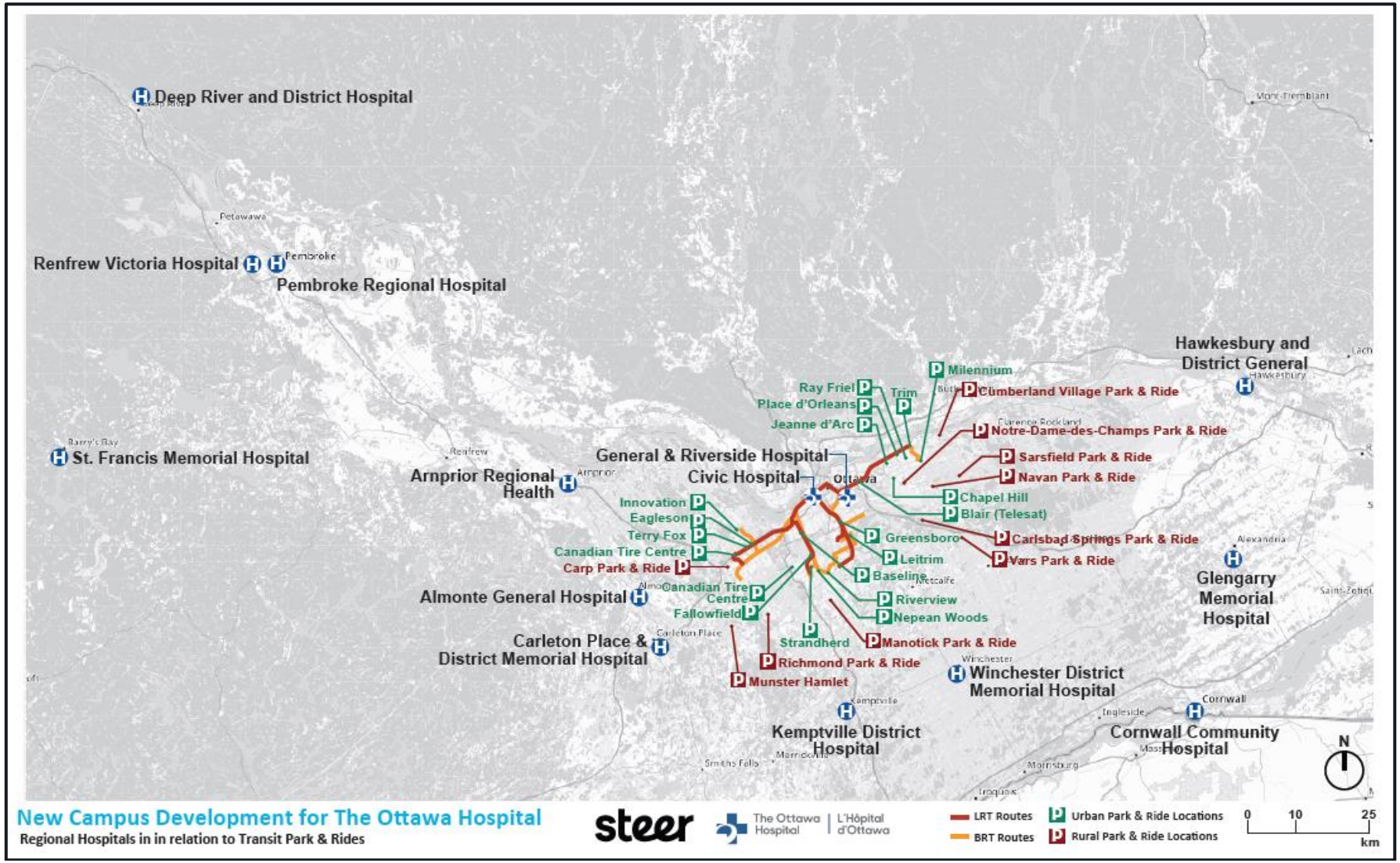
3.1 Regional Context

3.1.1 Existing Infrastructure

The Ottawa Hospital has three main campuses: General, Civic and Riverside and supports a network of satellite campuses and regional hospitals in collaboration with Champlain Local Health Integration Network across the Ottawa Region.

- The General Campus is in central Ottawa closer to amenities such as the Transitway, Highway 417, Lynda Lane Park, restaurants, and several transit routes leading to the site.
- The Riverside Campus is located on the South End of Ottawa with direct connections to the Transitway, and Rideau River Eastern Pathway.
- The network of rural hospitals on the edge of the city are in relative proximity to urban and rural park and rides that can be used to access transit and the core of the city (Figure 3-1).

Figure 3-1: Regional hospitals in relation to OC Transpo Park and Rides



3.1.2 Future Infrastructure

Stage 2 of the Ottawa LRT project will include the addition of 24 new stations and will bring 77% of the Ottawa population within 5km of rail by 2026. This expansion of the LRT and Transitway will include the rural areas of Ottawa as well. There will also be new Park and Ride facilities at the termini of LRT routes and Transitway lines.

Identified as part of the 2031 Affordable Network is a Transit Priority Corridor (continuous lanes) along Carling Avenue between the Dow's Lake LRT Station and the Lincoln Fields LRT Station to the west. City staff confirmed the section from Lincoln Fields to Sherwood are expected to be completed by 2023. This project has since been expanded and the City intends to introduce bus rapid transit (BRT) along this section of Carling Avenue by 2028.

3.2 NCD Context

The NCD will be centrally located in the City of Ottawa, contributing to a variety of destinations and amenities in its vicinity including the Dow's Lake Pavilion, the Central Experimental Farm, the Arboretum, Little Italy, Carleton University, Commissioners Park, among others.

Highway 417 is located approximately 700m from Carling Avenue, with interchanges to and from Parkdale, Kirkwood and Carling, Rochester, Bronson, and Metcalfe and O'Connor.

Table 3-1 details the existing and future multimodal infrastructure amenities that lead to the NCD site as well as commentary on existing and future accessibility to different modes of transportation for TOH/NCD employees.

Postal code data informed the analysis of transportation infrastructure and amenities available to TOH/NCD employees in accessing the future site.

Figure 3-2 and Figure 3-3 illustrate the transit routes and cycling amenities near the existing Civic Campus and NCD. Ottawa has an extensive bus network and has ambitious plans to expand its light rail network in the next 5 years. The initial segment of O-Train Line 2 (Trillium Line) connecting to NCD is set to open in late 2023 and the planned extension of both Line 1 and 2 will make rapid transit to NCD much more accessible and easier for a greater number of Ottawa residents. Transit access within 10 km of the NCD site is currently quite convenient and a network of park and rides offers access to the core of the city and urban areas.

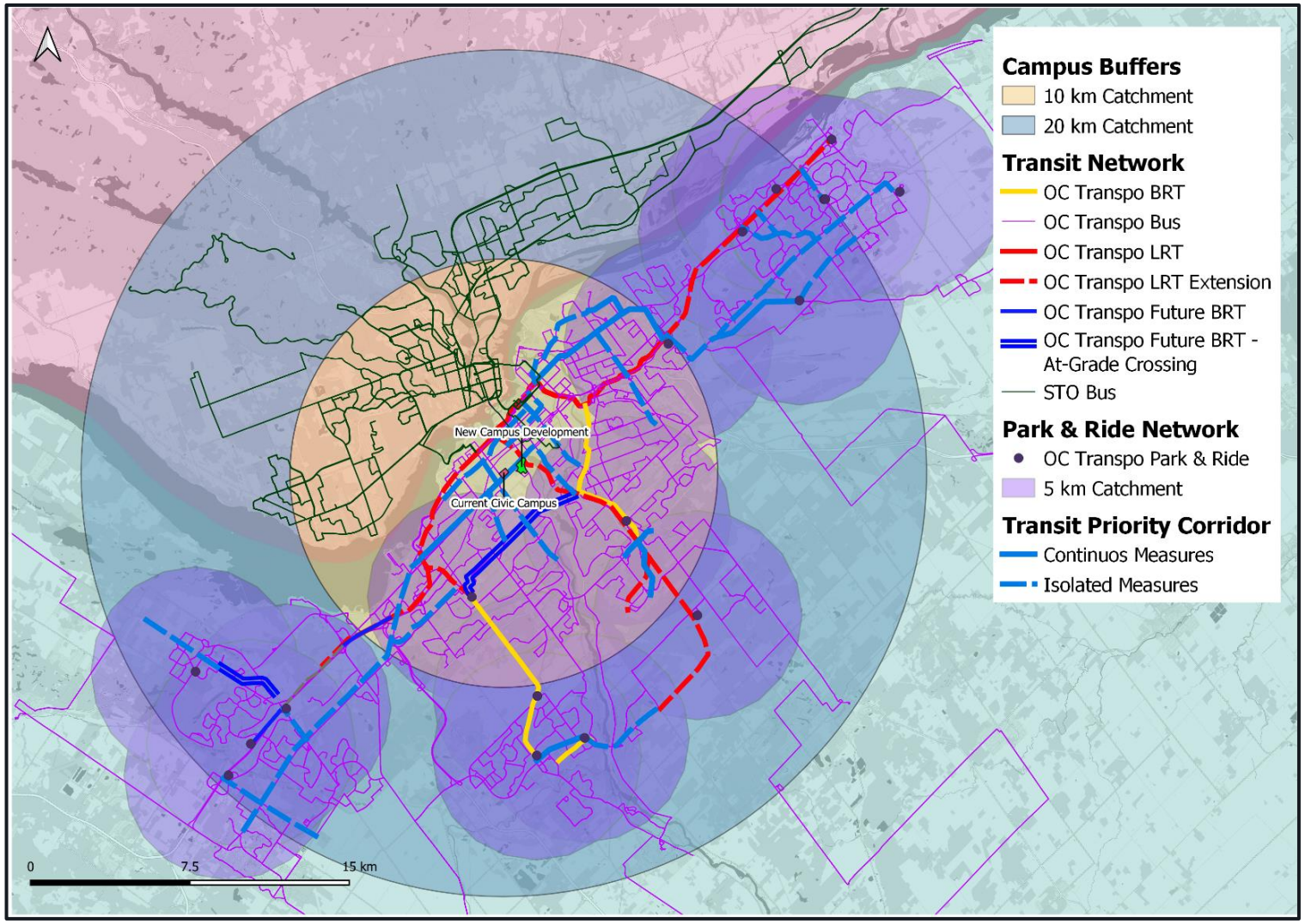
In terms of the current cycling network, NCD is much more accessible than existing Civic Campus, particularly via the adjacent Trillium and Rideau Canal Western Pathways. The main gap is east-west connections although the city is planning a protected cycling facility on Carling Avenue which would be a notable improvement. With increases in cycling, e-bike use and other e-mobility devices, protected or off-street paths for low-speed devices can be an important enabler for active transportation.

Table 3-1: Estimated NCD Multimodal Access Conditions based on 2022 Postal Code Data

Amenities	Existing Infrastructure	Future Infrastructure	Notes
Bus 	• R2 replacement bus service – while Trillium Line LRT inactive • Frequent bus service (#85, 53,80, 56, 55, 86,89,114)	• 15 minutes frequency Transitway (BRT) on Carling Avenue with priority signal between Lincoln Field Station and Dow's Lake Station-Affordable Network 2031	54% of current Civic Campus employees live within 800m of a transit stop according to postal code analysis.
Light Rail 	• Inactive as of Fall 2020 (Stage 2 of Trillium Line currently under construction) • R2 replacement bus service is currently being provided.	• Trillium Line extension to NCD to open in 2023	
Pedestrian 	• Trillium Pathway • Rideau Canal Eastern and Western Pathways	• Sherwood Drive traffic calming[3] • Improvements to pedestrian networks on Carling (2031)	10% of current Civic Campus employees live within walking distance (<2km) according to postal code analysis.
Bike 	• Central Experimental Farm Pathway • Trillium Pathway • Rideau Canal Eastern and Western Pathways	• Segregated cycling facilities on Carling Avenue (2031) • Sherwood Drive traffic calming[3]	30% of current Civic Campus employees live within cycling distance (<5km) according to postal code analysis.
Carpool 	• Network of 4 permit-only lots and 14 free lots	• Highway 417 carpool lots (Ottawa Rd 29 and Ottawa Rd 5)	17% of current Civic Campus employees only have carpooling as a sustainable alternative based on the employee survey.
Park and Ride 	• Minor and major park and ride • Total of over 9,000 parking spaces	• Expansion of park and ride to terminus of transit • Expansion of park and ride to more rural areas	24% of current Civic Campus employees live within 5 km of a park and ride facility that connects to transit according to postal code analysis

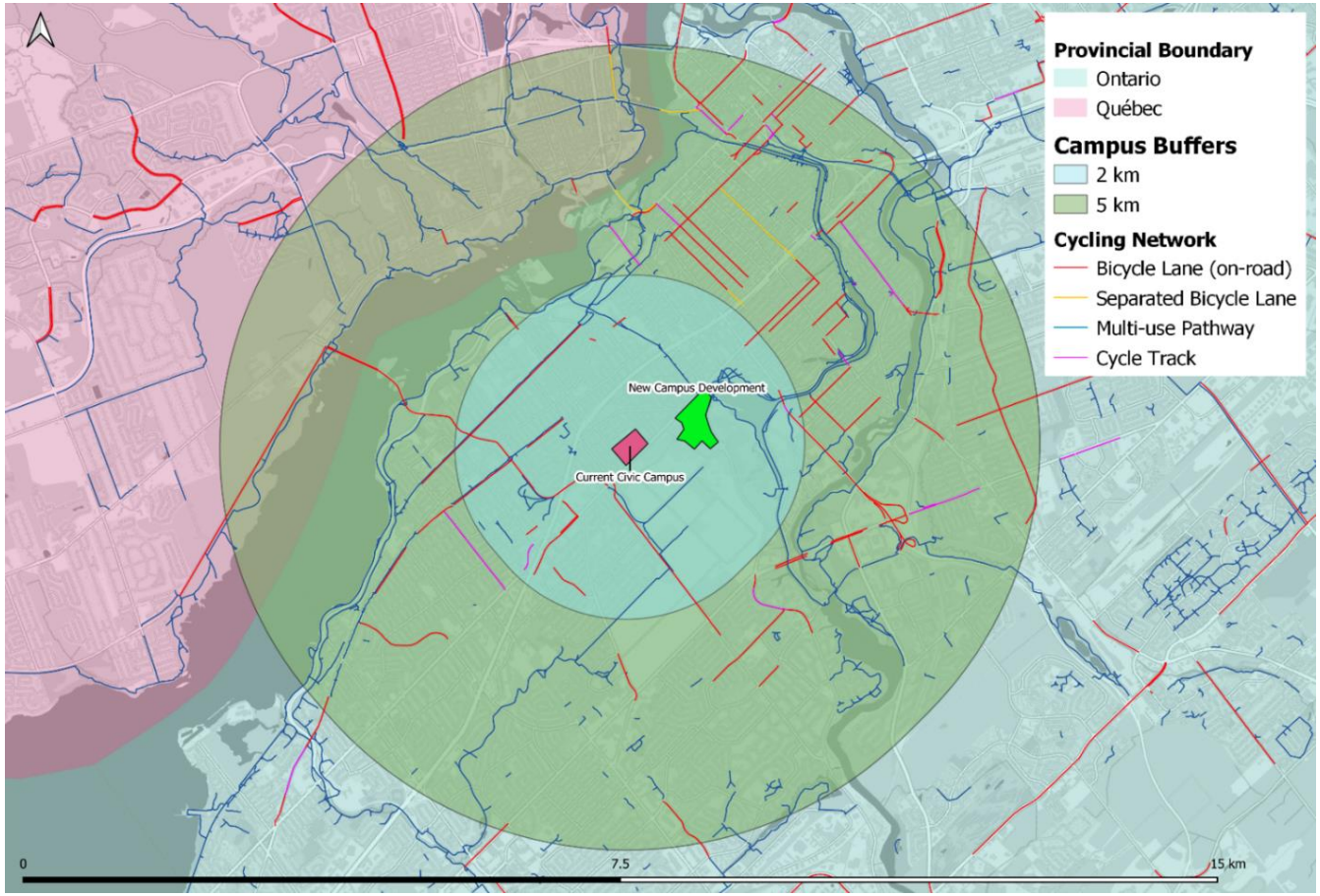
[3] Sherwood Drive Traffic Calming study- refer to Appendix BB

Figure 3-2: Current and Future Transit Network[4]



Source: City of Ottawa 2013 TMP

Figure 3-3: Current Cycling Network[5]



Source: GeoOttawa

[5] The map displayed is built based on the City of Ottawa's Existing Cycling Network (**Cycling Network | Cycling Network | Open Ottawa**). For details regarding the Ottawa Cycling Plan's (2013) Ultimate Cycling Network please refer to map found on City of Ottawa's geoOttawa (**geoOttawa**).

3.3 User Groups

Civic Campus is home to the region's only adult-care trauma centre, and it is also the regional centre for treating cardiac and stroke illness. Patients come from as far as eastern Nunavut, western Quebec, and eastern Ontario. In addition, it is affiliated with the University of Ottawa Medical School, with over 300 medical students and nursing students undergoing training at this facility. Civic Campus attracts a diverse range of users, and this section will explore each user group (Table 3-2) and their potential transportation challenges and needs.

Table 3-2: Key User Groups Summary

Key User Groups Summary	
Clinical Staff (CS) • High parking demand • Mainly work shifts (12-hour shifts) • Medical and nursing students	**Non-Clinical Staff (NSC)** • High parking demand • Can work from home • Sometimes shuttle between campuses
Physicians • Need to be at multiple sites, sometimes in the same day • Higher need to park	**Volunteers** • Not connected to payroll, which limits ability to provide incentives • Likely to be older
Visitors • Many visitors come from outside the Ottawa region, resulting in different travel behavior • Includes outpatient and other medical practitioners that do not work at the hospital	**Patients** • Major Trauma center in region • Patients come from rural Ottawa, Western Quebec, Eastern Ontario, and Nunavut

3.3.1 Hospital Staff

3.3.1.1 Staff Type

For the purpose of this TDM strategy, hospital staff will be divided into three major categories:

- **Physicians:** includes consultants, surgeons, and residents
- **Clinical Staff:** includes but not limited to nurses, midwives, medical students, technicians, technologists, researchers, nursing students and paramedic students
- **Non-Clinical Staff:** includes but not limited to administrative staff, food and nutrition services, environmental services, security, and laboratory services

3.4 Mobility Insights (Travel Behaviour and Metrics)

Due to the lack of detailed multimodal transportation data at TOH, mobility insights data were derived through postal code analysis, employee survey analysis, rural stakeholder engagement, and parking demand analysis. The postal code analysis was used to estimate how far employees live in relation to the NCD and mode share potential, whereas the employee survey informed how to refine the TDM strategies to encourage commuters to switch modes based on their travel behaviour and motivations. The survey was conducted over a period of two weeks between September 13th and September 30th, 2022, gathering a total of 2,481 responses (29% of TOH workforce) across the entire network. Lastly, parking demand analysis provided data on peak travel times for both staff and visitors.

3.4.1 Current Mode Share Analysis of Existing Civic Campus

Mode shares were derived using two methods: trip generation and employee commute survey. Mode share at the existing Civic Campus from the TIA and Mobility Study was initially estimated based on AM and PM peak trip generation in proximity to the existing campus, movement counts and transit ridership at nearby transit stops-Table 3-3.

Table 3-3: Initial Overall Mode Share Estimate at the Existing Civic Campus

Mode	TIA study
Auto Driver	85%
Auto Passenger	5%
Transit	5%
Walk	3%
Bike	2%

Source: TIA and Mobility Study

Mode shares at the existing Civic Campus were assessed in more detail in the 2022 Employee Commute Survey, which accounted for the increase in work from home and hybrid work schedules due to the COVID-19 pandemic and also delineates auto passenger mode into several categories including carpooling, drop-off and ride hailing-Table 3-4.

It is important to note that COVID-19 has had a widespread effect on travel behaviour across the city (such as increased work from home opportunities), which was not accounted for in the initial estimate developed in the TIA and Mobility Study. In addition, the initial estimate did not account for geographic spread. Based on the postal code analysis, explained further in the next section, about 30% of employees live within 5km of the hospital, which makes it more conducive for active transportation and transit. Furthermore, the 2022 Employee Survey did not include patients/visitor travel data, which is expected to have a higher auto-driver mode share. These elements may explain why the reported auto use from the employee survey is lower than originally forecasted in the TIA and Mobility Study.

Table 3-4: Refined Trip-based Employee Mode Share at the Existing Civic Campus

Mode	Survey data
Drive alone	62%
Auto Passenger	11%
Transit	7%
Bike	8%
Walk	6%
Work From Home	6%

Source: 2022 Employee Survey

3.4.2 Origin-Destination Postal Code Analysis

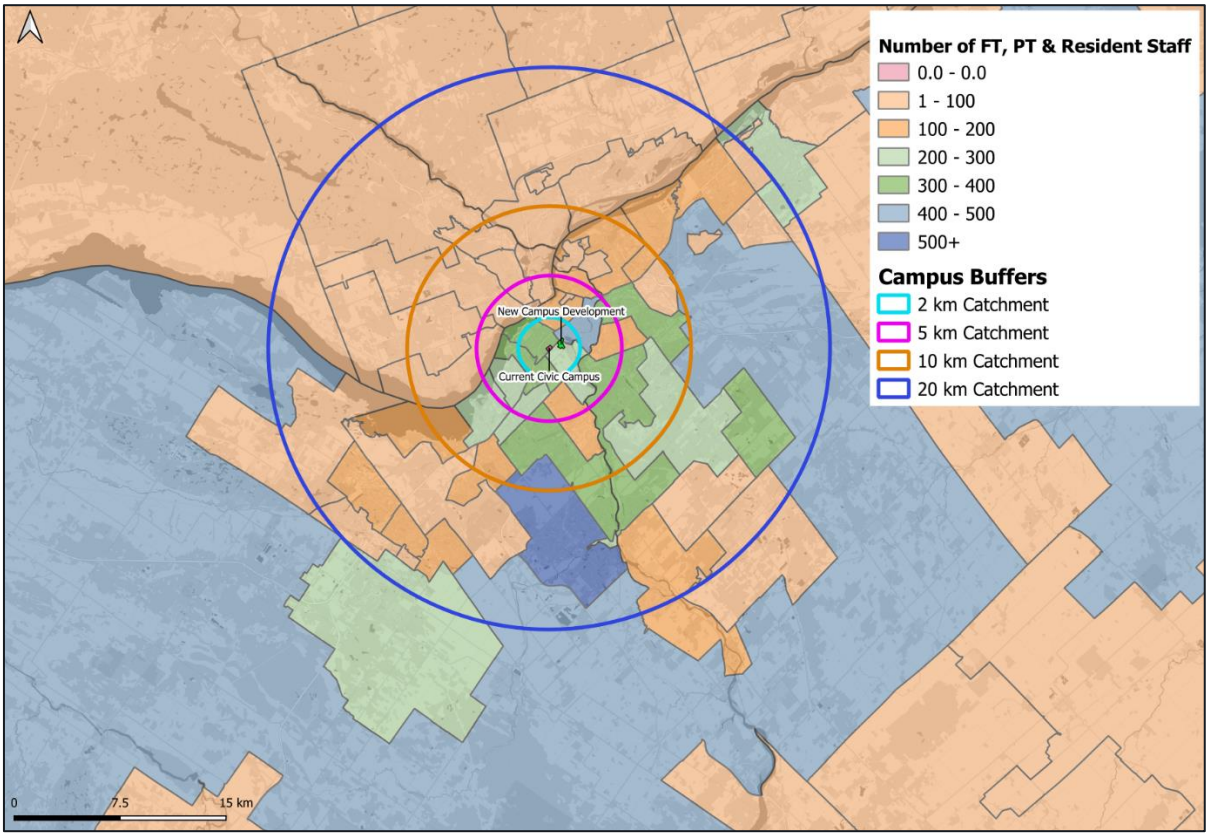
3.4.2.1 Existing Civic Campus

Understanding where employees commute from is foundational to recommending TDM strategies that can be impactful for mode change. The postal code analysis indicates that existing Civic Campus employee residences are evenly spread out across the city, with the highest proportions commuting from the east and west end of the city. The majority (54%) of employees live within 10km of the campus and a significant portion (30%) live within 5km of the campus, which makes cycling and transit viable commuting options for many-Table 3-5 and Figure 3-4. Moreover, with e-bikes becoming more popular, the range of distances considered viable for cycling commutes has expanded.

Table 3-5: Employee Home Postal Code - Distance to Existing Civic Campus

Distance	Percentage
0km-2km	9%
2km-5km	21%
6km-10km	24%
10-20km	29%
20km+	17%

Figure 3-4: Employee Home Postal Code - Density in Relation to Civic Campus and NCD

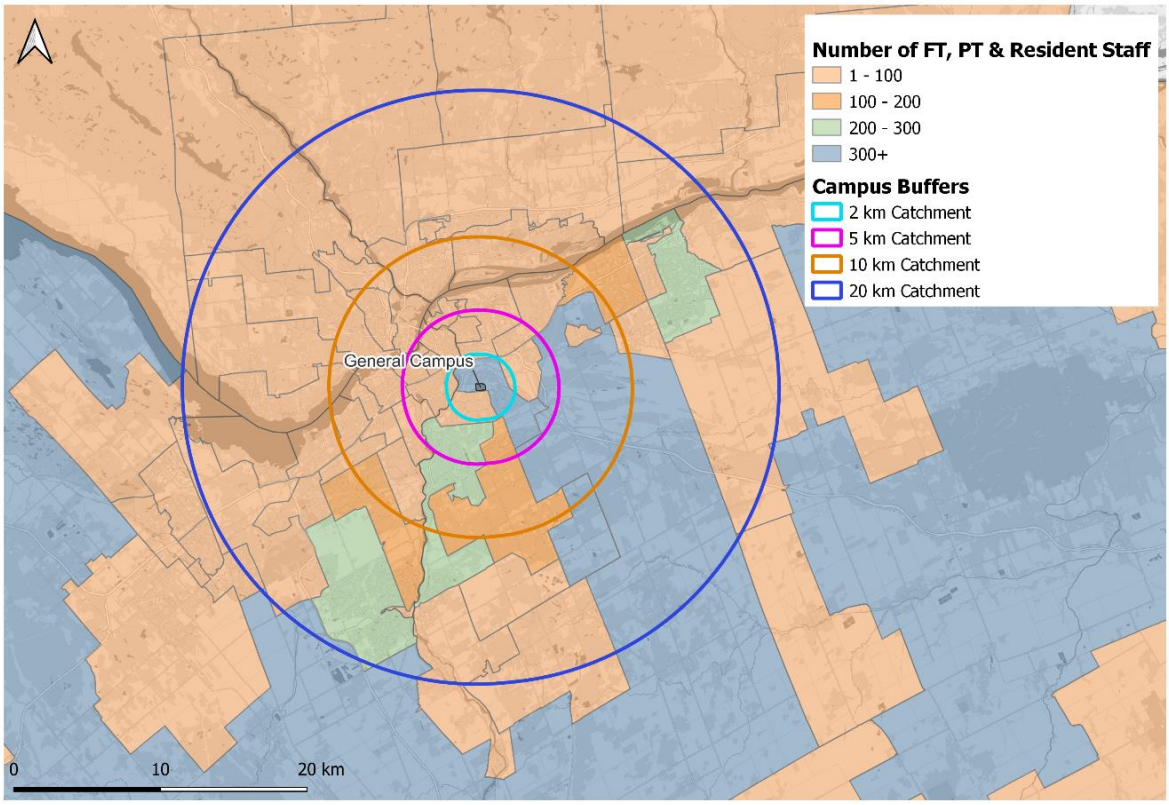


3.4.2.2 TOH Network of Hospitals

Across the region, employee's residences are widely distributed, both in the urban core and suburbs. There are a few employees that live in Gatineau with some living in Western Quebec. For medical students, their residences are more geographically spread out with some as far as Southern Ontario and the United States.

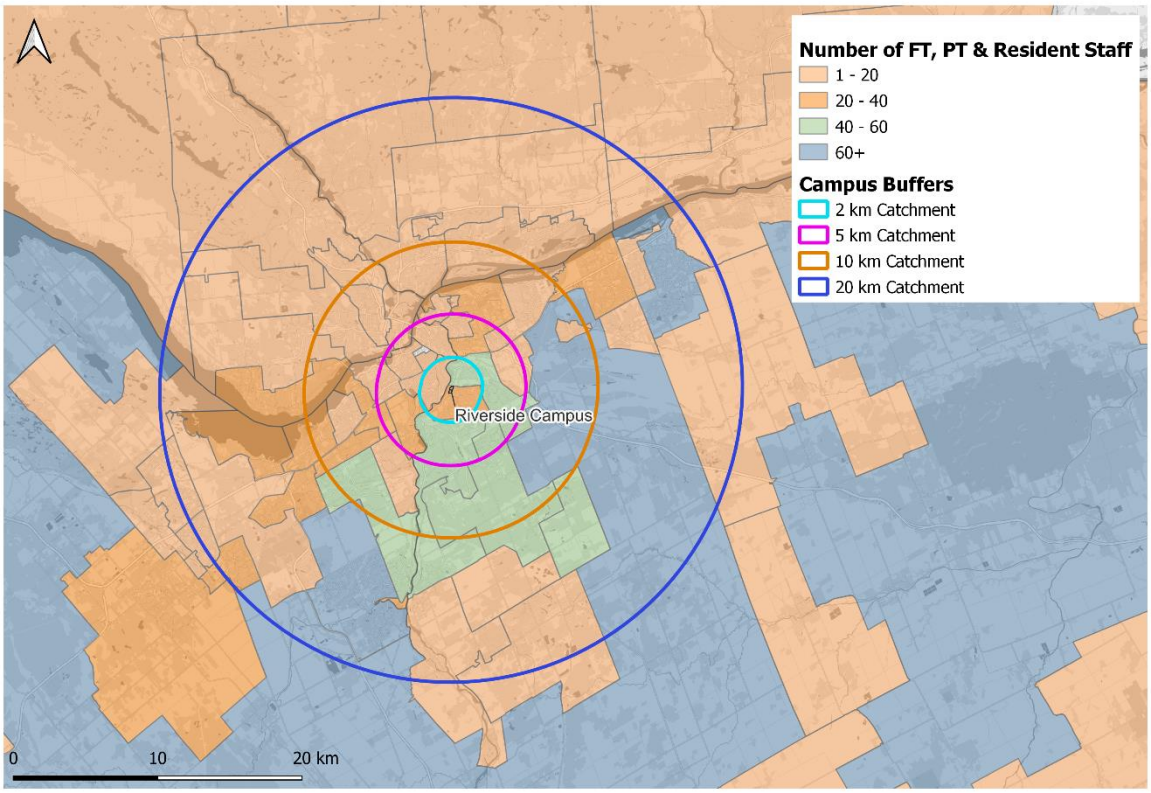
A postal code analysis was conducted for the two other large urban hospitals. For the General Hospital, 87.8% of employees live within 20km of the hospital, with most staff members living in the suburban areas on the southside of the Ottawa Region (Figure 3-5). The highest proportion of employees live within 2 to 5km of the hospital.

Figure 3-5: Employee Home Postal Code - Density in Relation to General Hospital



The postal code analysis indicates that at the Riverside Campus, 95.3% of employees live within 20km of the hospital, with many of them living on the south shore of the Ottawa River (Figure 3-6). The highest proportion of employees live within 10 and 20km of the hospital.

Figure 3-6: Employee Home Postal Code - Density in Relation to Riverside Hospital



3.4.3 Employee Survey

3.4.3.1 TOH Network of Hospitals

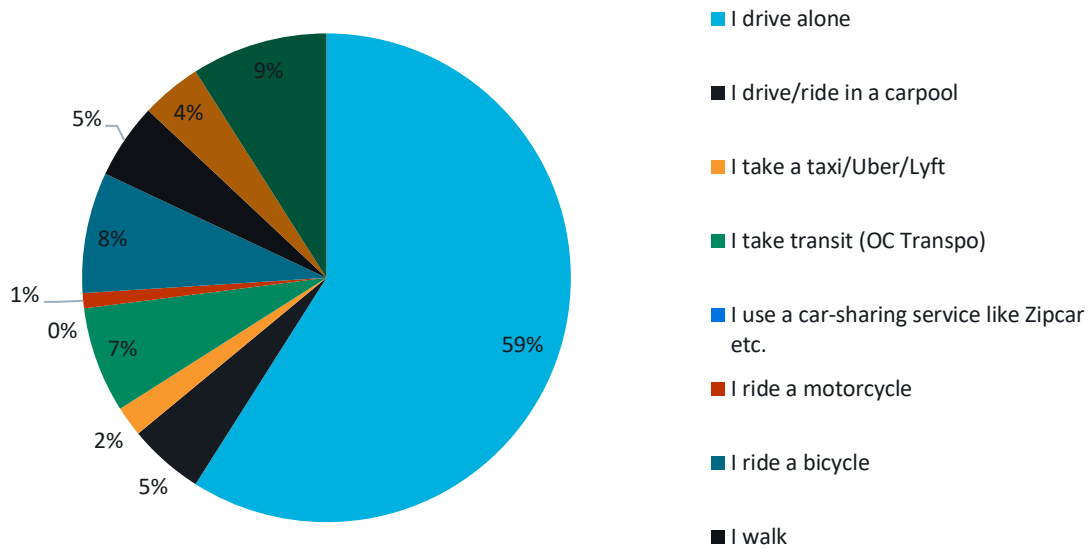
The breakdown of mode share according to the employee survey at the various hospitals is provided in Table 3-6. Across the combined TOH Network, 59% of respondents indicated that they drive alone to work (see Figure 3-7), with 72% indicating a willingness to try a new mode of transportation. Of all the modes respondents were interested in, drive/ride in a carpool was the highest at 18% followed closely by transit at 16%, and bike/e-bike at 13% (see Appendix B). The responses indicate that while there is a high willingness to try sustainable modes of transportation, this willingness is contingent on infrastructural upgrades, incentives, and awareness campaigns to encourage people to switch from their current drive alone mode.

"A bus pass discount would be a huge help in promoting greener transportation options. Biking and walking works, but it becomes difficult in these Ottawa winters. Please subsidize bus passes."

Table 3-6: Existing Employee Mode Share across TOH Network

Mode	Civic Campus	General Campus	Riverside Campus	Rural Hospitals	Unaffiliated Staff	Entire Network
I drive alone	62%	59%	68%	69%	19%	59%
I drive/ride in a carpool	6%	6%	7%	7%	0%	5%
I take a taxi/Uber/Lyft	2%	2%	1%	0%	0%	2%
I take transit (OC Transpo)	7%	9%	5%	2%	1%	7%
I use a car-sharing service like Zipcar etc.	0%	0%	0%	0%	0%	0%
I ride a motorcycle	1%	0%	1%	0%	0%	1%
I ride a bicycle	8%	9%	9%	7%	3%	8%
I walk	5%	5%	5%	1%	2%	5%
I get dropped off/picked up	4%	4%	4%	6%	2%	4%
I work from home	6%	6%	3%	6%	73%	9%

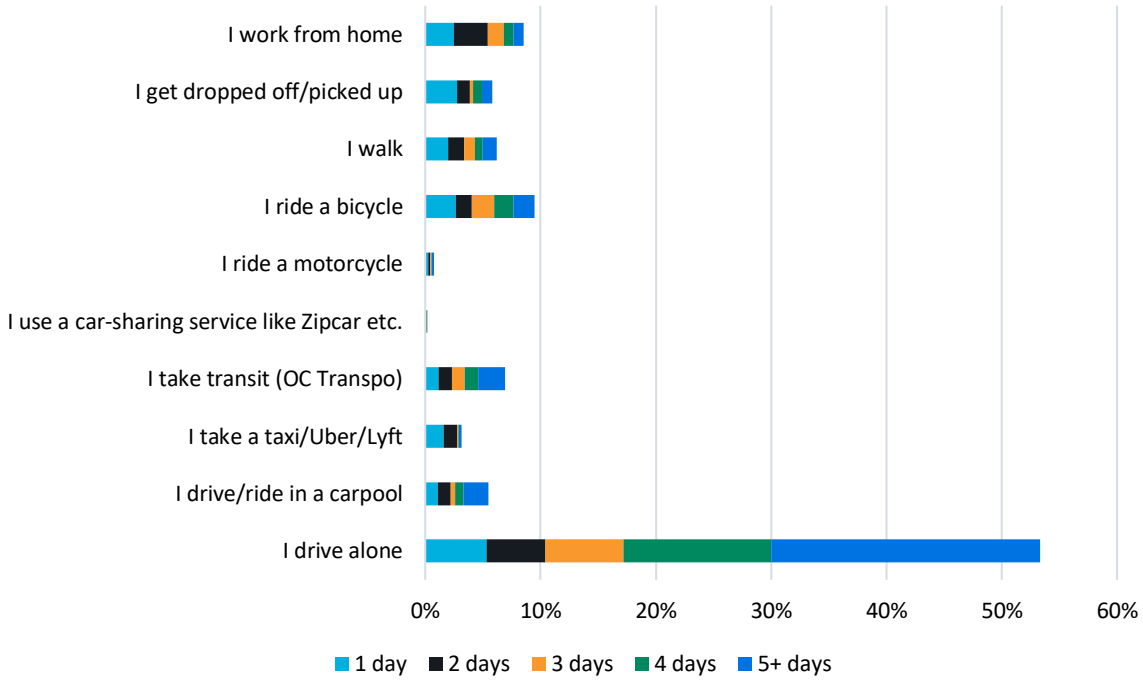
Figure 3-7: Entire TOH Network Mode Share



3.4.3.2 Existing Civic Campus

The current commute trend at existing Civic Campus is car-dependent with over 40% of respondents indicating they drive alone to work at least three days a week (Figure 3-8).

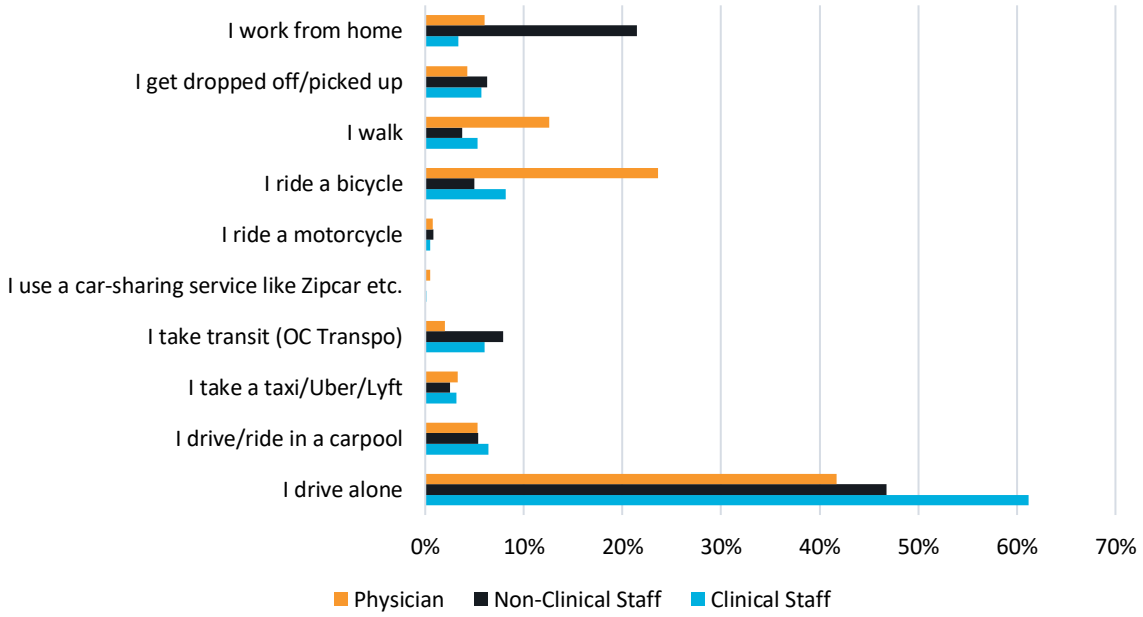
Figure 3-8: Existing Civic Campus-Mode Share Breakdown by Frequency



This is especially particular for clinical staff, of whom 63% indicated they drive alone to work compared to 47% of non-clinical staff and 42% of physicians (Figure 3-9). The higher rate of drive alone for clinical staff might be due to the nature of shift work with schedules that do not align with transit or other coworkers (for carpooling).

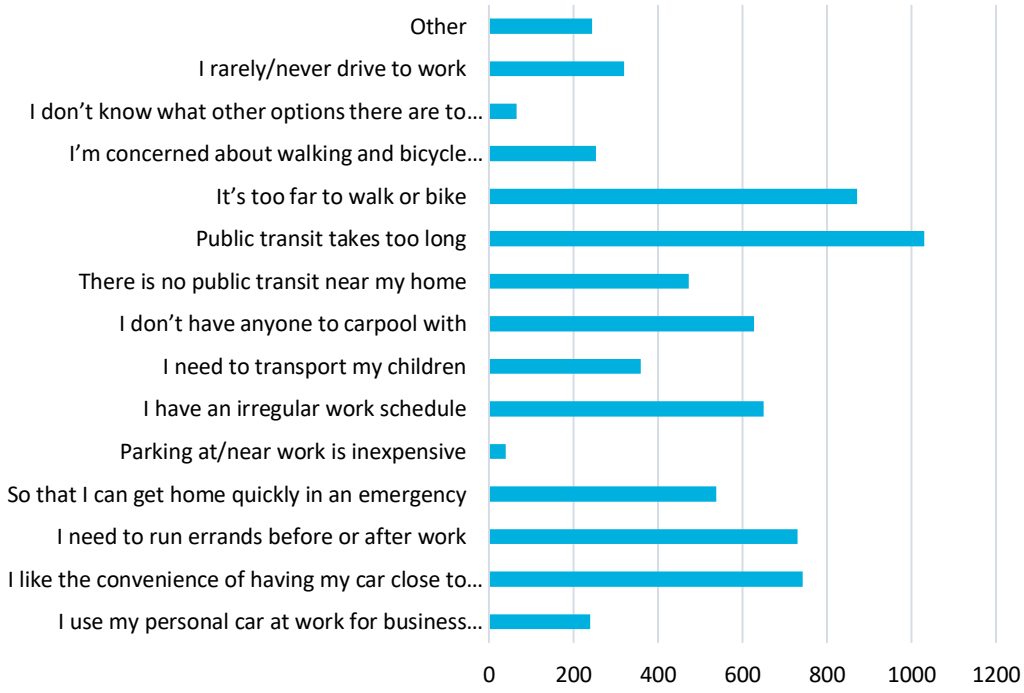
"Transit is an option I have seriously considered, yet I find the additional 1.5-2-hour commute time is untenable especially when considering a low work/life balance schedule to begin with. Additionally, working odd hours with a changing schedule makes carpooling impossible, and transit options are even more limited and difficult or feel unsafe at strange hours. Also, my work requires me to be on-site before the person I am replacing can leave; this requires prompt arrival times that transit does not offer".

Figure 3-9: Existing Civic Campus-Mode Share by Employee Group



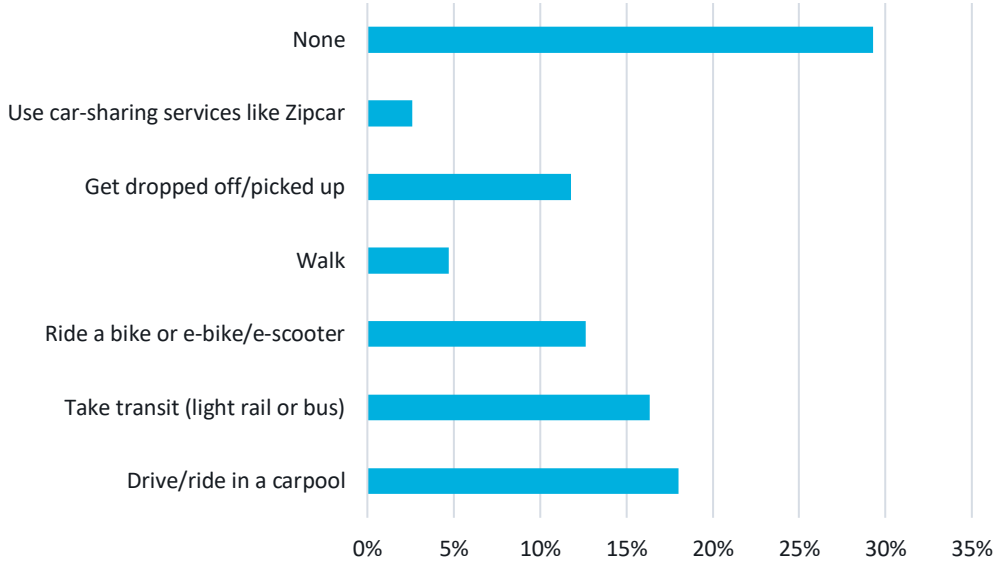
The main reasons cited for driving alone were public transit inefficiency, too far to walk or bike, and irregular schedule. In addition, childcare was also another reason why people opt to drive alone. A few respondents asked that TOH make considerations for people with children (accessible daycare) when planning the NCD.

Figure 3-10: Existing Civic Campus-Reasons for Driving Alone



In terms of willingness to try alternative modes of transportation, 70% indicated an interest in trying an alternative mode of transportation. Of all the modes of transportation, carpool had the highest interest rate at 18% followed closely by transit at 16%.

Figure 3-11: Existing Civic Campus-Willingness to use Alternate Modes



3.4.4 Deeper Dive into Rural Network Commute Patterns

The majority of rural hospital employees (69%) drive alone (shown earlier in Table 3-6). Carpooling and biking are the next most frequently cited modes for commuting to work, although they respectively each represent less then 10% of the overall mode share. Key challenges for rural employees and patients revolve around having limited travel options.

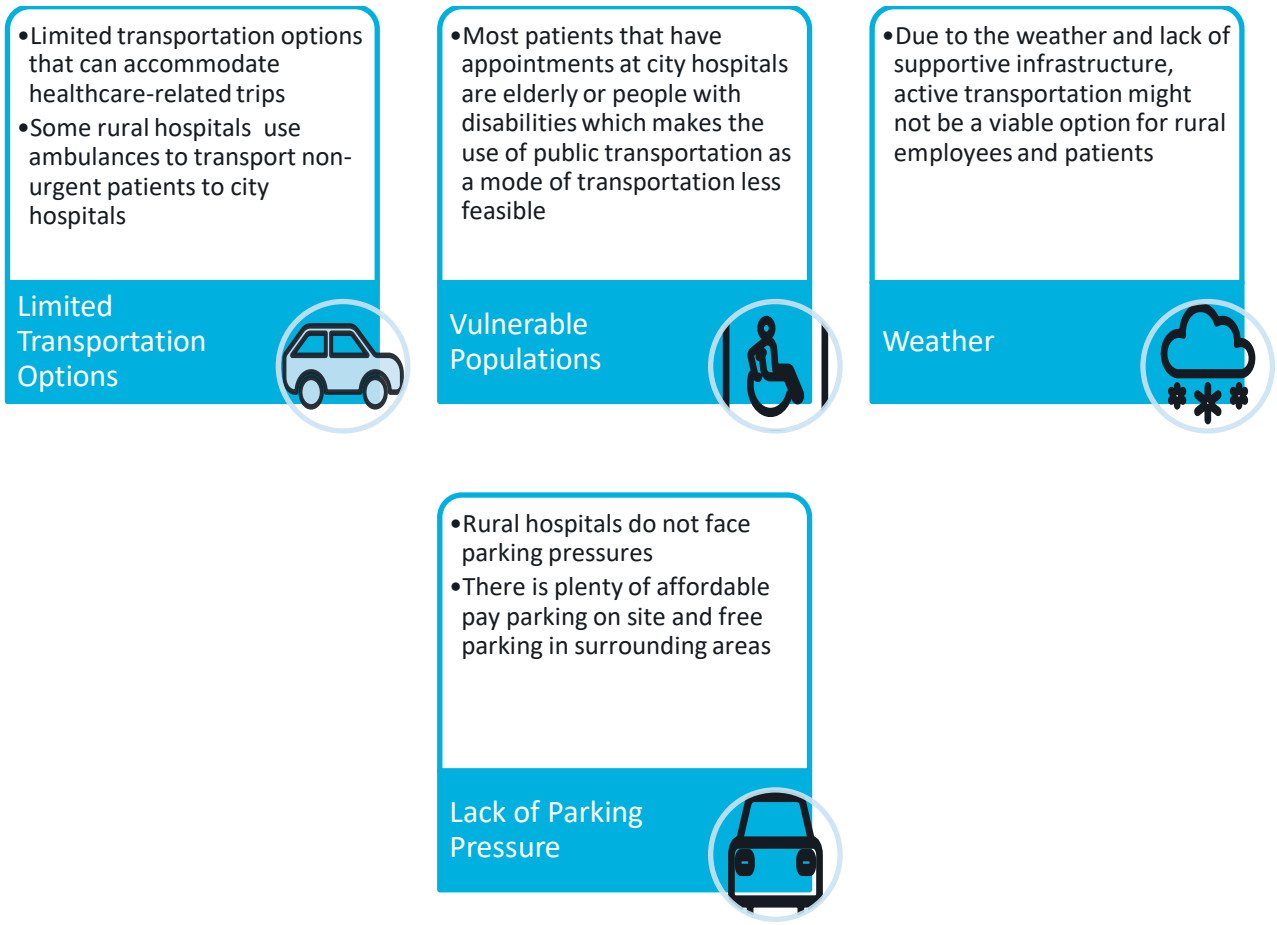
Commuting from a rural area 40 minutes away has limited travel abilities. Carpooling seems like a good idea but logistically does not seem like it will work due to last minute and mid shift floating to another campus. Also in the winter depending on the weather my time I depart changes frequently, so coordinating this would be difficult and possibly unreliable.

Rural Area Employee (via staff survey)

3.4.4.1 Rural Network Transportation Challenges

The stakeholder engagement session held with rural stakeholders highlighted the need to take into consideration the unique challenges of rural patients and employees when developing the transportation strategy for NCD. Hospital visitors/patients and staff in rural areas face unique challenges that can hinder their ability to be receptive to TDM programming and access healthcare services. These challenges are highlighted in Figure 3-12.

Figure 3-12: Rural Hospital Network Patients and Staff Transportation Challenges



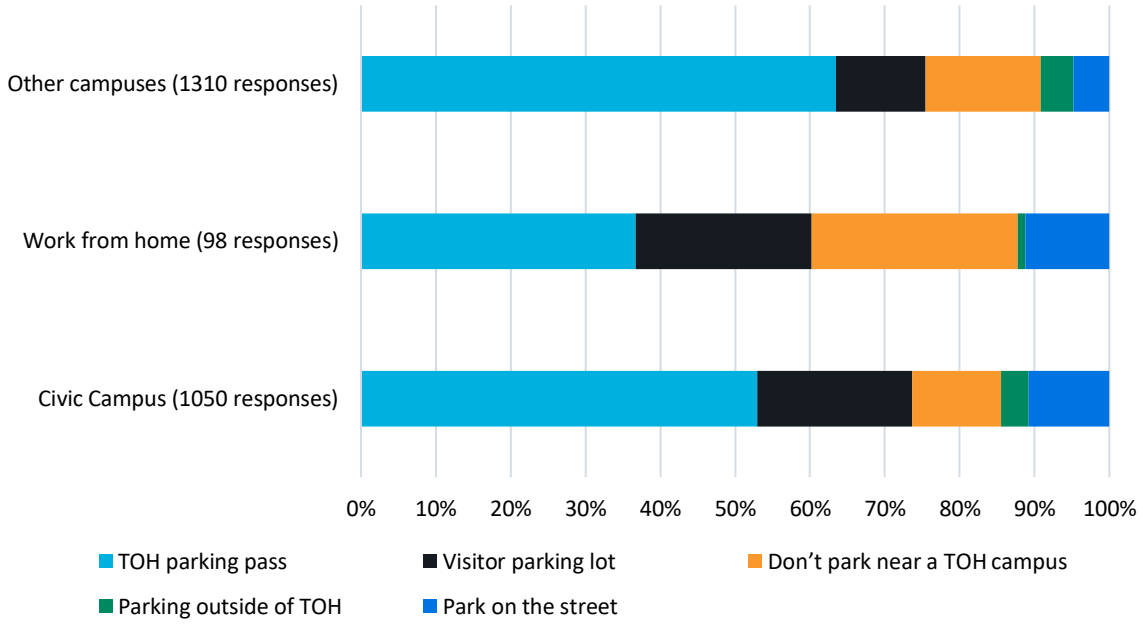
3.5 Parking Analysis

The TOH network parking system includes a network of gated lots that are accessed through key cards, offsite parking, and satellite lots. It also includes parking meters located at the main entrance of the hospitals. Staff are charged for parking on a biweekly basis as part of their salaries, the rates they are charged is based on the parking rates of each lot, shown in Appendix B. Visitors and patients have the option of paying for parking half-hourly, hourly, daily, or monthly.

3.5.1 TOH Network of Hospitals

Data from the parking database was reinforced by the employee survey and indicates that employees face some parking challenges. According to the parking database, parking lots were typically at capacity pre-pandemic, and on average, over 40% of the employees do not have access to employee parking (Figure 3-13).

Figure 3-13: Where Employees Park



3.5.2 Existing Civic Campus

3.5.2.1 Employees

The employee parking database at existing Civic Campus had 4,349 unique users and a total of 189,349 unique entries at the time this report was developed. The parking database is a snapshot of parking demand from August 2021 to February 2022. On top of that, not all the parking at the existing Civic Campus is connected to the parking database and it is estimated that approximately 20% of parking (~540 spaces) at the Civic is not accounted for. The existing Civic Campus has a total parking capacity of 2,700.

Before the COVID-19 pandemic, parking lot usage was regularly over 110% capacity, when combining staff and visitors. At the time the report was being developed, lot usage was, on average, at 65% of total capacity. In addition, accounting for a 5% drop due to summer vacations (not included in the data set), the usage was about 60% of the capacity it would likely be during pre-pandemic operations.

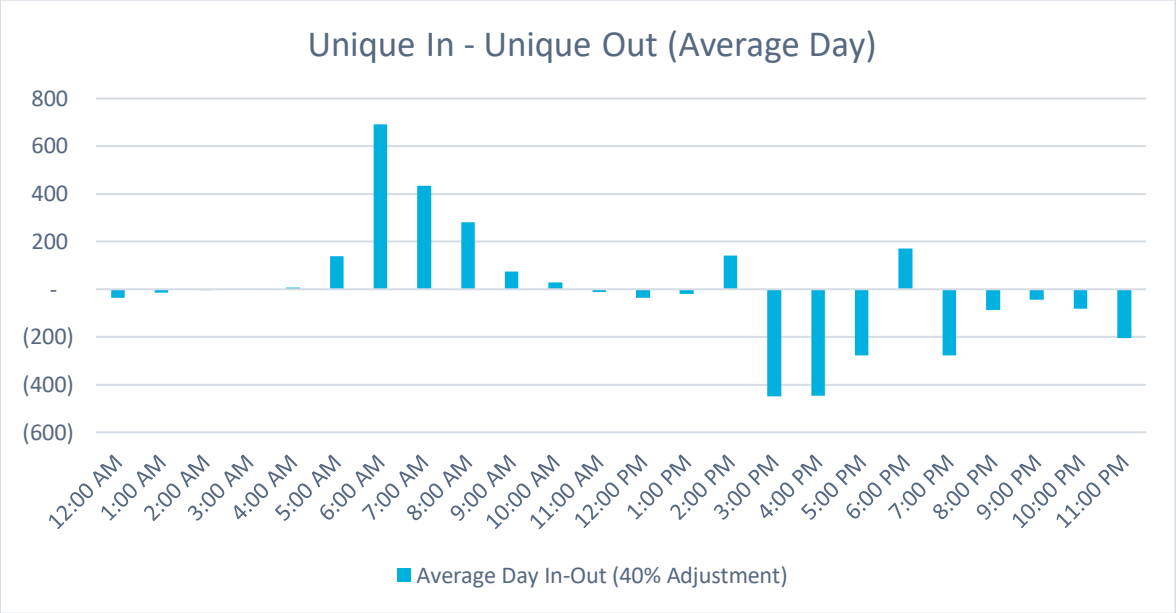
The parking dashboard data corresponds with the survey results which indicate that the parking management system experiences some challenges. Several responses from the survey noted that they have been waitlisted for a parking pass for long periods of time.

"Parking waitlist for staff resulting in taking up visitor parking. Maintenance of walking routes from designated parking spaces are slippery in winter and poorly maintained."

Demand by Time of Day

For the combination of In-Out ticket entries (i.e., number of entries minus number exits) at any given time, peak times for vehicle movements are at 6am, followed by 7am, then 3pm and 4pm- Figure 3-14.

Figure 3-14: Employee Parking Demand by Time of Day at Existing Civic Campus



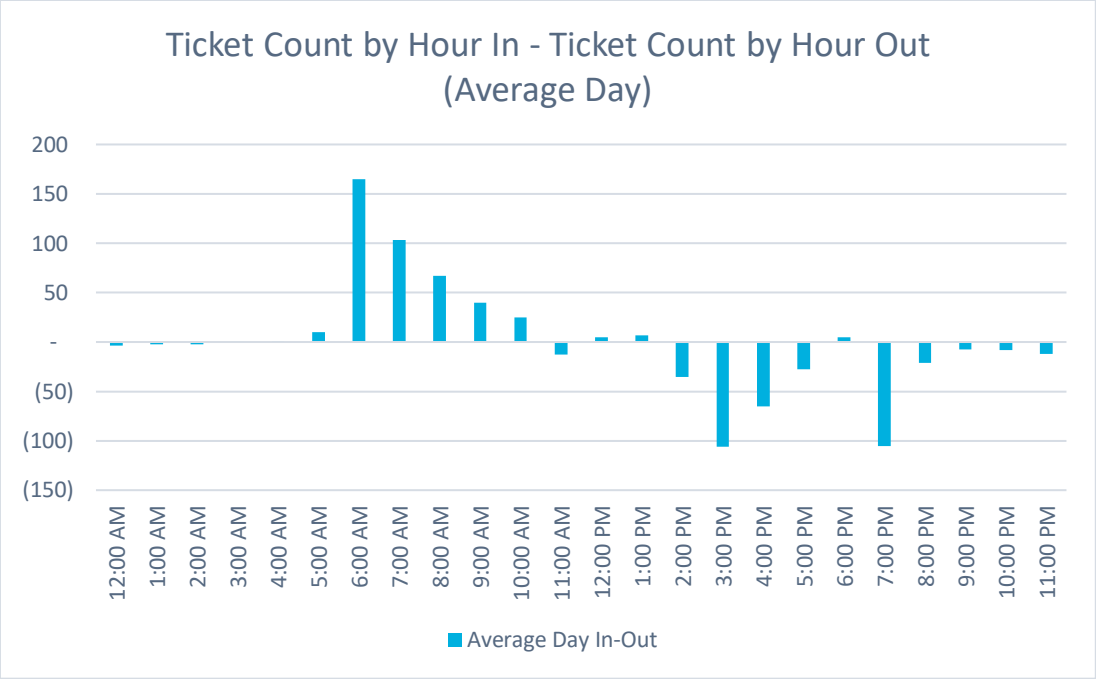
3.5.2.2 Patients/Visitors

The patient parking database at Civic Campus has a total ticket count of 433,615 and is a snapshot of parking demand from June 2021 to January 2022 (see Appendix B). The parking dataset represent conditions during the pandemic, and patient/visitor activity was estimated to be about 35%-40% lower than pre-pandemic conditions, meaning that parking was only at 60% overall capacity of pre-COVID conditions. In addition, the visitor and patient parking data also include some employee parking. To account for the inclusion of employee parking, only datasets between 8am and 5pm are analyzed, which matches the operating hours for various clinics (8am-5pm). The adjusted (excluding employee influence and COVID adjustment) total estimate of ticket counts for visitors and patients is 283,615, which is 2,325 daily ticket counts. This represents a parking demand of roughly 1,200 per day.

Demand by Time of Day

The parking database reports that the time with the highest number of unique entries is at 8am, followed by 3pm and 2pm respectively. In terms of parking duration, *Less than one Hour* accounted for 51% of the ticket count by "Duration of Stay", followed by 1 Hour, 10+ Hours, and 8 Hours at 13%, 10%, and 7% respectively. The highest number of exits is at 3pm, followed by 4pm and 2pm respectively. The 2pm-3pm hour accounts for the highest parking demand, with 54,823 tickets counted over the 40-week period, resulting in 196 parking counts per day. In terms of In-Out combination of entries, parking demand peaks at 6am and 7pm (Figure 3-15).

Figure 3-15: Visitor Parking Demand by Time of Day at Existing Civic Campus



3.5.2.3 Peak-time parking demand

As stated in Section 3.2.5.1, the parking database does not account for all parking at the existing Civic Campus. Based on available data, at peak parking demand hour (3-4pm), parking demand exceeds 2,200 on Wednesdays, which typically has the highest daily parking demand (Table 3-7)[6].

Table 3-7: COVID Adjusted + Accounting for 80% capacity Peak Parking Demand at Existing Civic Campus

Average Day Peak Demand (40% Adj. COVID + Day of Week Adj.)	3pm hour (Avg)	3pm hour (account for 80% capacity)
Current Employee (Adj by Day of Week):	2081	2497
Current Patient (Adj by Day of Week):	196	245
Total:	**2,277**	**2,742**

When adjusting for only 80% of the parking being available via the parking database, the parking demand exceeds 2,700 parking spaces. The adjusted parking datasets tend to suggest that parking demand might have been at capacity during the peak parking demand hour on a typical weekday before the pandemic.

3.6 NCD Context

The City has approved plans for the construction of a parking garage with 2,670-spaces allocated to NCD uses, with a possibility of additional 597 surface parking spaces located near the entrance

[6] Refer to Appendix B for unadjusted data

of the new site bringing the total parking capacity to 3,267. However, during winter and emergency events, the capacity may diminish to a minimum of 3,097 spaces.

3.6.1 Projected 2028 Parking Demand

When NCD opens its doors in 2028, there are forecasted to be 4,114 Full Time Equivalent (FTE) employees during the daytime and evening shifts. Throughout a 24-hour period, the site is forecast to see approximately 5,000 FTE (Appendix B), an increase from the current 3,500 employees[7]. The increase in NCD staff numbers will not be uniform across the board, it is estimated that clinical staff will increase by about 50% compared to about 10% for non-clinical staff. A higher proportion of clinical staff compared to non-clinical staff can have an impact on parking management because of their inability to work virtually.

At the existing Civic Campus during the peak hours between 3-4pm, there are estimated to be 245 visitor cars parked, with this number expected to increase by 30% (conservative estimate) in 2028.

Based on the current drive alone mode share of 62%, in 2028 at the parking peak hour between 3-4pm, the combined parking demand of staff and visitors is projected to exceed 2,700. NCD is expected to have more parking than the existing Civic Campus, so initially, there is projected to be just over 10% capacity available.

Table 3-8: Projected Peak Parking Demand in 2028 (assuming current travel behaviour)

Day + Evening Shift Peak Parking Demand	Typical Weekday
Employee FTE	4,043
Residents FTE	71
Visitors	321
Total Employees/Residents/Visitors	4,435
Peak Hour (3-4pm) Parking Demand without TDM (~62% Mode Share)	**2,750**
Minimum Parking Spaces Available at NCD	**3,097**
Parking Deficit/Surplus	**347**

[7] Refer to Appendix B for methodology and calculations.

3.6.2 Projected 2048 Parking Demand

In 2048, when the hospital is fully operational, there will be an estimated 8,500 FTE on site during the daytime and evening shifts with the addition of the University of Ottawa Heart Institute (UOHI) and research institute. When factoring visitor parking demand at a conservative estimate of approximately 532 in 2048, there will be a projected parking demand in excess of 5,600 during peak parking demand hour based on the current mode share of 62% drive alone. Without TDM interventions, NCD is projected to have significant more demand than available parking supply.

Table 3-9: Projected Peak Hour Parking Demand in 2048 (assuming current travel behaviour)

Day + Evening Shift Peak Parking Demand	Typical Weekday
TOH + UOHI Employee FTE	6,405
Residents + Researchers FTE	2,106
Visitors	532
Total Employees/Residents/Researchers/Visitors	9,043
Minimum Parking Spaces Available at NCD	**3,097**
Peak Hour (3-4pm) Parking Demand without TDM (~62% Mode Share)	**5,607**
Parking Deficit/Surplus	**2,510**

3.6.3 Summary

According to the current mode share analysis, in 2028 at the peak parking demand hour, parking will be almost at capacity and likely constrained with a surplus of 347 spaces.

In 2048, when NCD reaches full buildout, there will be a significant parking deficit of approximately 2,500 spaces if travel behaviour does not change. The implementation of TDM measures can help supplement parking management systems and reduce development costs of building additional parking.

Table 3-10: Summary of Projected Parking Demand (assuming current travel behaviour)

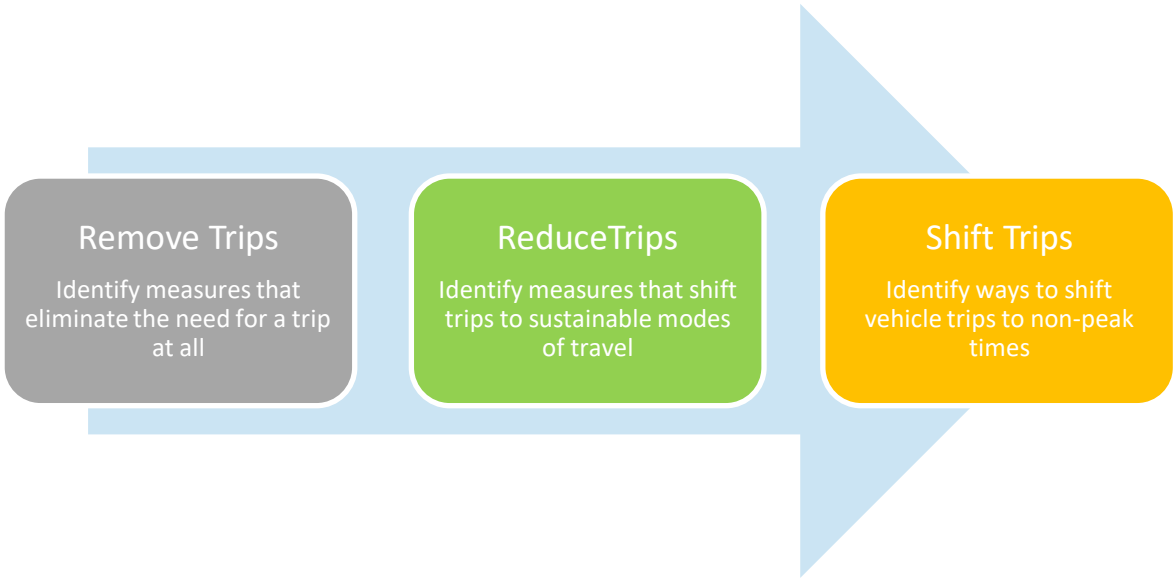
Average Weekday Peak Parking Demand (3-4pm)	Existing Civic 2022 (40% adj.)	NCD 2028	NCD 2048
Employees	2,497	4,114	8,511
Visitors	245	321	532
Total Parking demand without TDM (62% mode share)	**2,742**	**2,750**	**5,607**
Minimum Parking Supply	**2,700**	**3,097**	**3,097**
Parking Deficit/Surplus	**42**	**347**	**2,510**

4 TDM Strategies

4.1 TDM Toolkit

The TDM Toolkit focuses on three key goals: removing trips, reducing single-occupant vehicle trips, and shifting trips outside of peak hours (Figure 4-1). This section identifies the list of potential TDM strategies recommended for NCD and the wider TOH network within each goal category. A combination of strategies from each goal category will help to create a robust TDM Plan.

Figure 4-1: TDM Toolkit



4.1.1 TDM Strategies List

The list of potential TDM strategies (Table 4-1) was developed based on TDM best practices from other hospitals, industry insight, and the city's TDM checklist for non-residential developments[8]. The TDM strategies have not only been categorized according to the three goal categories, but they have also been divided based on administration and mode (carpooling, transit, active transportation, parking and supportive measures).

[8] TDM Measures Checklist (ottawa.ca)

Table 4-1: List of TDM Strategies

TDM Strategies	
Remove Trips	
Work From Home	Travelling Doctors/Mobile Health Clinics
Virtual Care	
Reduce Trips	
Administration	
Part-Time Transportation Coordinator	TDM Platform
Full-Time Transportation Coordinator	Annual Transportation Surveys
Carpooling	
Priority Carpool Parking	Carpool Subsidies
Transit	
Preloaded Presto Cards	On-Demand Employee Shuttle
50% Transit Subsidy	Employee Shuttle Program (Fixed Route)
100% Transit Subsidy	Transportation Screen
Active Transportation	
Bike Room	Shared Micromobility Subsidy
Bicycle Support Facilities	Bike Skills Training
Bicycle Loan and Repairs Program	
Parking	
Increased Staff Parking Fees	Daily Cash Incentive for Sustainable Travel
Daily Parking	
Supportive Measures	
New Hire Package	Carpool Matching Events
Emergency Ride Home	Real-Time Transportation Screens
Personalized Trip Planning	Contests and Promotions
Hospital Network Shuttle	Patient Mobility Support
Shift Trips	
Off-Peak Clinics	Flexible Operations

5 Action Plan

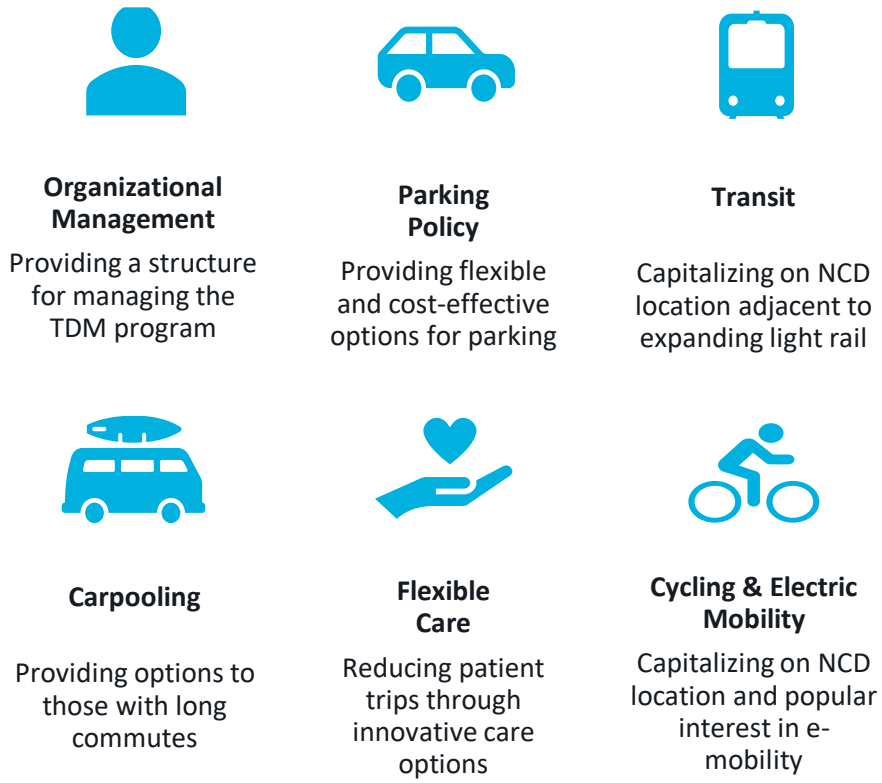
5.1 Assessment and Prioritization of TDM Strategies

To help understand the effectiveness and viability of particular TDM strategies, an evaluation framework was used to analyze a long list of over 50 TDM measures to identify those that have the potential to be most impactful for mode shift at NCD, but also the most cost-effective. The evaluation criteria included:

- Requirement for behavioural motivation
- Cost of implementation
- Potential impact

Data and insight from the employee survey, parking data, and other data sources helped to inform the analysis. What emerged was a focus on six key components, as illustrated in Figure 5-1.

Figure 5-1: TDM Priorities for TOH and NCD



5.2 TDM Strategy Approach

Building from the assessment and prioritization process, an overall approach to TDM for the NCD and TOH was identified. Key elements of the approach are:

- **Building a foundation:** A complex site like NCD needs personnel to oversee TDM planning, implementation, and data collection, which contributes to data-driven decision making.
- **Changing hospital culture:** While current travel behaviour is encouraging, a shift away from car dependency will be needed to meet NCD's future mode share goals, which will require education, timely and effective information, transparency in program goals and implementation, and flexibility in both employee working and patient care.
- **Improving access for all:** With such a large NCD site envisioned, all modes of transport will need to be considered as viable options, but investment in the TDM program should reflect a targeted approach that maximizes effectiveness and efficiency.
- **Providing cost effective incentives:** As a publicly funded organization, TOH should maximize public funds and focus them where they will have the most impact, recognizing that past approaches investing primarily in parking will be unsustainable for NCD.
- **Monitoring and evaluation:** Understanding travel behaviour through regular monitoring and revising TDM measures based on performance will be an important part of achieving NCD's mode share targets, while technology can potentially play an important role in monitoring and assessing the progress of the TDM program.

To support the TDM Strategy approach, a three-tiered program of implementation was created, which will enable the hospital to grow its program effectively and efficiently. The tiers include:

- **BASIC**: Covers the bare minimum of what should be expected in a TDM Strategy and will provide a good basis for multimodal travel
- **RECOMMENDED**: These measures will have a higher impact and will be necessary to achieve the mode share targets identified for NCD
- **RESERVE**: These measures will have an even higher impact but may not be necessary if the other measure perform well; they will only be implemented if necessary

Several measures are labeled **EARLY ACTION** and are recommended to be implemented at the existing Civic Campus to begin the shift away from auto-dependence as soon as possible.

5.3 Opportunities for Technology in TDM Implementation

As further described in this Action Plan, there are many opportunities to leverage advanced technology to increase the effectiveness of the TDM Strategy, including:

- **Improving efficiency of TDM**: The implementation of parking management technologies across all TOH parking facilities and the use of TDM software applications provides the opportunity for advanced data collection, analytics, and management which could reduce administration time needed to manage the TDM program.
- **Reduce Cost**: Technology can reduce the need for human intervention, for example, it could reduce the need for multiple employees to manage TDM program across all TOH campuses.
- **Improve Experience of Users**: The provision of seamless technology can make it more convenient and easier for staff and patients to access TDM amenities and programs, thereby improving the user experience and enhancing the reputation of TOH.

5.4 Impact

If implemented as proposed, the TDM Strategy outlined in Section 5.5 is forecast to result in the following reduction of employee and visitor vehicle trips (with a detailed breakdown in Table 5-1 and Figure 5-2):

- From 62% drive alone to 60% in 2028 and 54% in 2048 with the Basic Program; or
- From 62% drive alone to 50% in 2028 and 35% in 2048 with the Recommended Program.

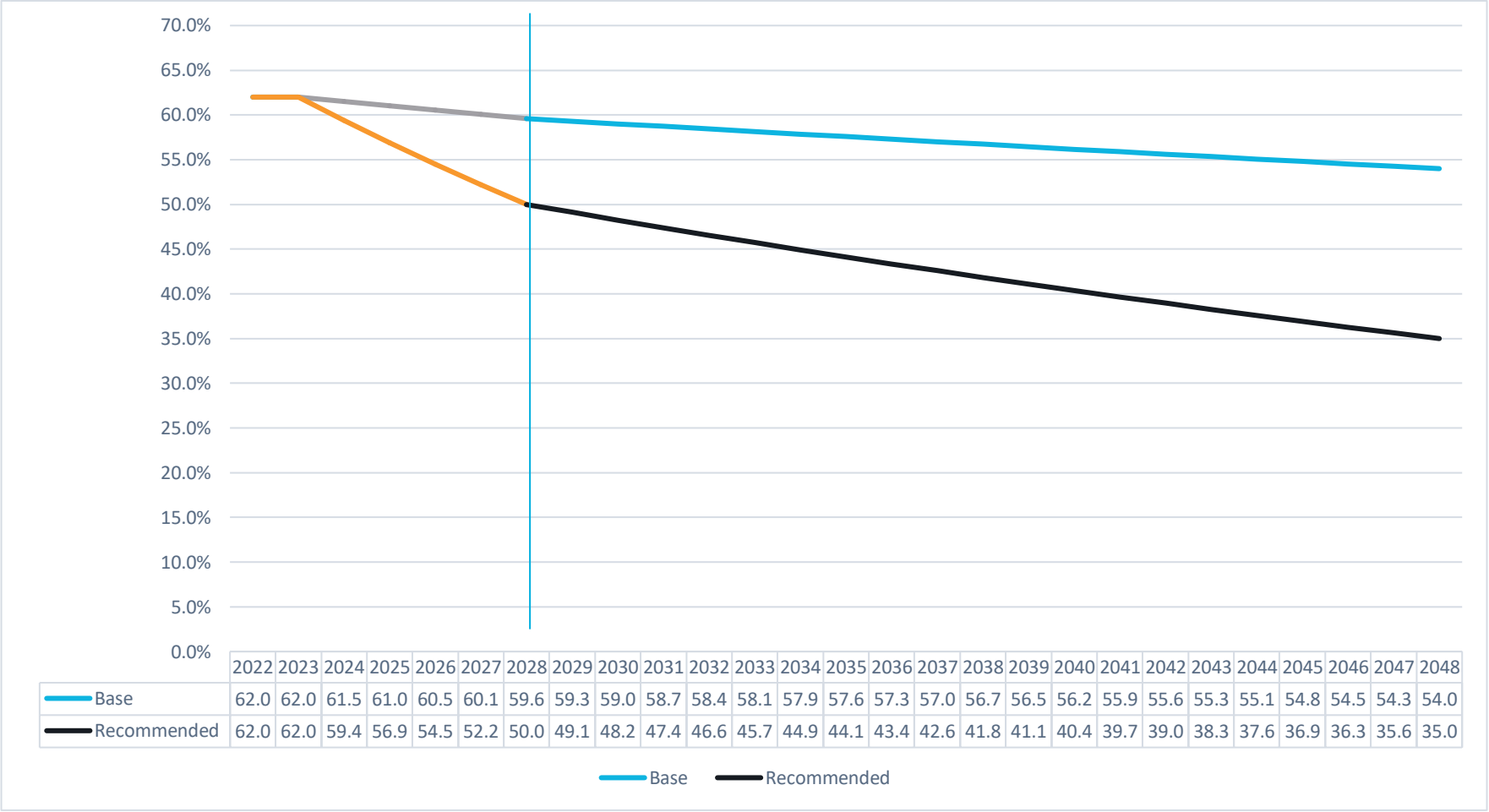
Across all of the TDM measures, the bulk of the mode shift is projected to occur through a shift to more transit use. The Ottawa region is investing heavily in expanding and improving the transit network, and by 2026, Stage 2 of the LRT will be online, with further expansions expected by 2031. In addition, the transit mode share projections also include individuals that will have access to transit via bike with improved cycling facilities throughout the city, providing an even greater opportunity for mode shift.

Table 5-1: Estimated Impact of TDM Programs on Future Mode Share at NCD

Mode	Existing Civic (2022) *	NCD 2028		NCD 2048	
		Base	Recommended	Base	Recommended
Auto Driver	62%	60%	50%	54%	35%
Auto Passenger	11%	9%	10%	8%	14%
Transit	7%	23%	30%	27%	38%
Walk	8%	1%	1%	1%	2%
Bike	6%	5%	6%	5%	6%
Work From Home	6%	3%	3%	5%	5%

**Represents employee mode share only*

Figure 5-2: Estimated Yearly Mode share at NCD



	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048
Base	62.0	62.0	61.5	61.0	60.5	60.1	59.6	59.3	59.0	58.7	58.4	58.1	57.9	57.6	57.3	57.0	56.7	56.5	56.2	55.9	55.6	55.3	55.1	54.8	54.5	54.3	54.0
Recommended	62.0	62.0	59.4	56.9	54.5	52.2	50.0	49.1	48.2	47.4	46.6	45.7	44.9	44.1	43.4	42.6	41.8	41.1	40.4	39.7	39.0	38.3	37.6	36.9	36.3	35.6	35.0

2022-2028 represents aspirational targets.

5.4.1 Impact Methodology and Calculations

Steer developed a localized impact analysis based on employee home postal codes, existing and planned availability of multimodal infrastructure, and future availability of basic/early action/TDM recommended TDM measures. This was then cross-referenced against insight from best practice case studies and research (as described below).

Industry experience demonstrates it is difficult to isolate the impact of individual TDM measures but through the analysis completed, each TDM measure has been assessed within a small range including High, Medium, and Low impact strategies. Table 5-2 **Error! Reference source not found.Error! Reference source not found.**details the estimated vehicle reduction impact ranges that fall into each category. As stated, these impacts were estimated through various sources of best practices industry research including the Victoria Transportation Policy Institute (VPTI), TDM ROI Calculator[9] *(*developed by the U.S. Federal Highway Administration) and the Handbook for Analyzing Greenhouse Gas Emission Reductions developed by the California Air Pollution Control Officers Association (CAPCOA)[10] as well as Steer's internal analysis. For TDM measures outside of the scope of these sources, estimated trip reductions were based on the Steer analysis.

Table 5-2: Ranges in Estimated Vehicle Trip Reductions for Each Impact Level

Impact Category	Estimated Vehicle Trip Reduction Range	Example Strategies
Administrative	n/a	*Part-time/Full-time Transportation Coordinator, TDM Platform*
Low	0%-2%	*Bike Room, Bike Skills Training, Flexible Operations, Ridematching Events/Portal, Various Supporting Measures*
Medium	2%-5%	*Work From Home, Travelling Doctors/Mobile Health Clinics, Off-Peak Clinics, Priority Carpool Parking, Bicycle Support Facilities, Bicycle Loan + Repairs Program, Shared Micromobility Subsidy, Various Supporting Measures*
High	5%-10%	*Virtual Care, Carpool Subsidies, Transit Subsidies, Daily Parking, Increased Staff Parking Fees, Daily Cash Incentive for Sustainable Travel*

[9] https://mobilitylab.org/calculators/download-tdm-roi-calculator/

[10] https://www.airquality.org/ClimateChange/Documents/Final%20Handbook_AB434.pdf

5.5 NCD TDM Strategies

The recommended package of TDM measures has emerged based on the outcome of the TDM assessment/prioritization and includes the most effective ways to reduce parking demand and congestion at the NCD to meet the proposed mode share targets. The learnings via this exercise have also informed a high level TDM Framework for the wider TOH network. TDM Strategy measures are described using these key criteria:

- **Strategy**: why the measure was chosen.
- **Implementation**: how the measure should be implemented.
- **Expected Impact**: how effective the measure is expected to be at reducing drive alone use based on survey results, data analysis and industry research.[11]
- **Performance Measurement**: which criteria should be used to evaluate performance.

Remove Trips

This section focuses on strategies that can eliminate trips made to the site. Six percent (6%) of staff currently work from home and the employees surveyed identified enthusiasm for further working from home as appropriate, indicating there may be other opportunities to reduce the number of work trips made to TOH hospitals.

"Working from home meant a huge boost in my work/life balance. I have a more comfortable, more private space; I save about 2 hours a day in commuting time (some of which I donate to the hospital as free labour); and, my productivity is much higher than before, while I am eating better and saving on gas/food/clothes. I think WFH should be the norm for everyone whose job allows it.

Work From Home (WFH)	**BASIC (EARLY ACTION)**
Strategy	COVID raised the need for working from home and illustrated the opportunity it provides for reducing vehicle trips to TOH. Within a hospital context, not all staff can WFH so ongoing hospital policies will dictate which employees are eligible. With the onset of the new campus, about 25% of the staff will be administrative staff, providing the opportunity for at least 25% of these administrative to work from home. Providing a work from home policy that encourages employees that have the option to WFH will further improve the non-SOV mode share potential.
Implementation	Continue developing WFH policy which maximizes the ability for as many staff as possible to WFH, even if only 1 day/week. Current expectations and staff desire appear to show eligible staff will WFH 2-3 days per week.
Expected Impact	Medium
Performance Measurement	Reporting managed by the TDM Software Platform • Number of eligible WFH staff, by department • WFH days per week per eligible employee • Employee satisfaction with WFH

[11] Refer to **Error! Reference source not found.** for Impact Ranges

Virtual Care	**RECOMMENDED**
Strategy	Virtual care has expanded during COVID and should become a key element of future hospital operation for medical services that can be effectively delivered in this way. With increasing popularity of virtual care, the trips reduction and cost savings by moving to a telework model can be significant.
Implementation	Continuing to develop virtual care services and increase those services wherever possible during construction.
Estimated Impact	High
Performance Measurement	• Number, type, and department of virtual care 'visit' • Physician and support staff conducting the care • Time spent in virtual care visits
Travelling Doctors/Mobile Health Clinics	**RECOMMENDED**
Strategy	Partnership with rural network hospitals that allows city hospital doctors to travel to the rural areas to provide major healthcare services. This eliminates the need for patients from rural hospitals to travel to Ottawa for medical care.
Implementation	Develop policy that allows doctors to travel to patients, especially for remote/rural hospitals. Thereby allowing doctors to visit multiple patients at a time. This will assist in reducing parking demand at VKT and number of trips made to NCD.
Estimated Impact	Medium[12] [13]
Performance Measurement	Reporting managed by the administration/software system. • Number, type, and department of travelling 'visits' • Physician and support staff conducting the care • Time spent on visits

[12] https://nasemso.org/wp-content/uploads/CommunityParamedicineCanada.pdf

[13] Based upon the estimated percentage of ED visits in Canada due to non-urgent complaints. This estimate does not include the avoidable hospital visits resulting from better health outcomes. (https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8225686/#:~:text=Approximately%2017%25%20of%20Emergency%20Department,managed%20in%20primary%20care%20settings.)

Reduce Trips

This section focuses on strategies that can reduce single-occupant vehicle trips and increase other more sustainable and higher capacity modes of travel.

Organizational Management

To successfully manage and deliver a comprehensive TDM program, it's important to have an internal champion and a source of high-quality transportation data.

Part-Time Transportation Coordinator	**BASIC (EARLY ACTION)**
Strategy	As the central coordination point for the TDM Program, the part-time Transportation Coordinator (working 3-days a week) will liaise with leadership and relevant department directors, manage and collect data, manage incentives, and evaluate impacts. This will be integral to the success of the program
Implementation	With the first phase of the hospital planned for 2028, it would be most effective to identify and fill the Transportation Coordinator role in 2023 to begin to enable a culture change ahead of staff moving to the NCD. It can take several months or years to plan and execute the various TDM measures effectively and work with leadership to communicate the changes to staff, physicians, volunteers, and visitors in advance of opening day.
Expected Impact	N/A- but without a transportation coordinator, impact of TDM measures is unlikely to be achieved.
Performance Measurement	Reporting managed by TOH TDM Program Manager through personnel review processes.
Full-Time Transportation Coordinator	**RECOMMENDED**
Strategy	The advantage of having a full-time transportation coordinator (TC) is having a dedicated resource to implementing TDM strategies at the site. This should be a TDM professional or team that have specific skills in behaviour change, who can focus on the goals and objectives of the TDM plan and coordinate across TOH to achieve them. Ideally, the TC would greatly benefit from comprehensive data collection, monitoring and evaluation technologies such as the TDM platform (below) and an integrated, advanced technology parking management system.
Implementation	One year before move (2027) to NCD, employee a full-time transportation coordinator
Expected Impact	N/A- but without a transportation coordinator, impact of TDM measures is unlikely to be achieved.
Performance Measurement	Reporting managed by TOH TDM Program Manager through personnel review processes.

TDM Platform	**RECOMMENDED (EARLY ACTION)**
Strategy	TDM Platforms are primarily focused on tracking multimodal commute data (mode share), providing rewards and incentives, and serving as a resource/communications hub. These systems can be integrated into parking management systems to provide an overachieving tool for monitoring transportation. These software tools such as RideShark help to effectively manage TDM programs such as ride matching portal, incentives, and communications, as well as easily integrate with advanced technology parking management systems and General Transit Feed Specification (GTFS) data. This will be the key mode share tracking tool. The Transportation Coordinator can oversee the platform and utilize it to perform their duties.
Implementation	To support the Transportation Coordinator and to begin collection data in advance of the move, implementing a TDM platform should be a top priority. It will also be a key tool in making a smooth transition to daily parking, introduction to smaller incentives, and acting as a focal point for transportation and commute information for staff and physicians. An initial step should be to understand the third-party parking operator's existing tools and software and any potential overlap or integration with a TDM Platform, which may be a useful task for the TC.
Expected Impact	N/A-however it is needed to record, monitor and report the impact of the TDM measures.
Performance Measurement	This is the key performance measurement tool that will support tracking of mode share, parking use, and incentive eligibility.

Carpooling

As per the employee survey data (Chapter 3.4), strategies that garnered the most interest for potential mode shift were carpooling strategies. Below are the strategies that can be used to shift single-occupancy trips into shared vehicle trips, i.e., carpooling and vanpooling. Over 20% of the staff population lives in the outer suburbs of the city where carpooling is one of the most accessible and convenient options.

Priority Carpool Parking	**BASIC (EARLY ACTION)**
Strategy	Dedicated parking spots reserved only for carpools and vanpools that will prioritize these modes over single-occupant car trips.
Implementation	Should be implemented as part of the hospital parking policy and designated spaces should be clearly marked with signage in the parking lots or through a priority reservation system. Staff can find potential carpool partners through the TDM Platform or Ride-match portal. Staff who carpool will be required to obtain or apply for a carpool parking permit to park in those spots. Allocating, enforcing and cost-splitting carpool parking can often be challenging, and the use of advanced parking management systems can be an excellent opportunity to improve the carpooling experience for staff.
Expected Impact	Medium
Performance Measurement	• Mode share • # of active carpoolers • # of active carpool groups • # of daily carpool trips

Carpool Subsidies	**RESERVE**
Strategy	Cost subsidies will encourage existing drivers to offer carpooling and reduce single occupancy trips. This also includes facilitating a carpool cost sharing incentive.
Implementation	Offer and promote a daily parking subsidy to employees who choose to carpool to work. This can be done as a reimbursement or applied directly at the time of booking. For example, those who carpool to work could receive a $2 to $5 subsidy on parking fees with a 25% bonus for carpooling a minimum of 15 days in a month. This can become complicated without supporting technology. In addition, the cost savings gained from splitting parking fees among carpoolers may serve as a big enough incentive in itself and negate the need for this reserve measure.
Expected Impact	High
Performance Measurement	• # of subsidies • # of registered/active carpool users

Transit

According to the survey data, transit strategies that garnered the most interest include transit pass incentives and expanded transit networks. Below are the strategies that can be used to shift single-occupancy trips to transit trips. Transit is an option feasible for about 64% of the workforce.

50% Transit Subsidy	**RECOMMENDED**
Strategy	Given that there will be an LRT connected to the new site, and approximately 40% of staff live near the current and future expanded LRT network and extensive bus network, providing 50% transit subsidy can encourage staff to take transit.
Implementation	It is recommended to provide a 50% transit subsidy worth about $60/month to all full-time employees that use transit to access the site. The goal of subsidies is to subsidize all staff transit trips; however, currently, OC Transpo's fare structure favours monthly passes, TOH will aim to liaise with OC Transpo to identify the most effective incentive approach. The incentive approach should be flexible based on employee usage-cash fare versus monthly passes. If the fare structure, payment methods and TOH technology systems are advanced enough to manage cash value subsidies in addition to monthly passes, then expansion to part-time staff should be considered. Future technology opportunities might allow data sharing between TOH and OC Transpo to automatically verify employee transit use. To administer, and manage the program, a full-time transportation coordinator is needed to ensure effective program promotion, education, eligibility and implementation.
Expected Impact	High
Performance Measurement	• Transit mode share • # of passes provided

100% Transit Subsidy	**RESERVE**
Strategy	The provision of fully subsidized transit passes can encourage staff that live further away from transit to use transit, particularly staff that live near park and ride stations in the suburbs of the city. For a successful transit pass incentive, the hospital will have to effectively partner with the transit agency to provide a discount on purchasing bulk OC Transpo passes to make the incentive more cost-effective.
Implementation	A 100% subsidized transit to any full-time employee that uses transit to access the site (as opposed to providing for all employees with a pass).
Expected Impact	High
Performance Measurement	• Transit mode share • # of passes provided

Active Transportation

Below are the strategies that can be used to shift single-occupancy trips into active transportation trips, i.e., biking, walking, and rolling. As per the data, 30% of the workforce live within biking distance of the hospital site.

Active transportation strategies can potentially be targeted at physicians since amongst all employees, they have the highest bike and walk percentages at 24% and 13% respectively. Additionally, they also tend to live closer to the hospital than other employees.

Bike Room	**BASIC (EARLY ACTION)**
Strategy	Given that new LRT and BRT lines will be approximately 800m from the front entrance, the provision of safe, secure, convenient, and comfortable bike parking at the existing Civic Hospital to make cycling a viable first/last mile option to access the site. Providing improved facilities at the existing Civic will create opportunities to cycle in advance of NCD opening.
Implementation	Given that the bike room will be short term (move in 2028 to NCD), the bike room should be located in a safe, secure, and easily accessible location. It should also be of good quality to encourage individuals to use them.
Expected Impact	Low
Performance Measurement	Reporting managed through the TDM Platform and potentially key card access system: • Bicycle facility use • Cycling mode share
Bike Skills Training	**BASIC (EARLY ACTION)**
Strategy	Cycling courses teach employees basic cycling skills such as road safety to build confidence riding on the road, and basic bike maintenance. This education and training can be done in partnership with a pre-established curriculum from a private or non-profit educator.
Implementation	Partner with local bike advocacy groups or internally organize a bicycle safety training webinar, in-person workshop, and group ride bi-annually.
Expected Impact	Low
Performance Measurement	• Cycling Mode share • # of new cyclists • Contests and promotions participation

Bicycle Support Facilities	**RECOMMENDED**
Strategy	With a new building comes a perfect opportunity to build a high quality, secure, indoor facility for staff, physicians, and volunteers that meets current and future needs to set a culture and foundation for cycling at the hospital. The facility should include safe, indoor parking and storage, including easy access bike stalls, lockers, e-bike/scooter charging, shower, changing facilities, and a repair station.
Implementation	The facility is likely to be constructed as part of the new hospital expansion. The facility should be provided at the ground level of the parking garage to increase visibility and access. It should also be close to the multi-use path as possible to limit conflicts with vehicles onsite. Any improvements that can be made to the existing campus in the interim would be a good step towards making cycling more attractive in the interim. Technology hardware could identify users as they enter the bike room to understand who is biking, manage and administer further active transportation, and link it to a rewards/incentives system. For reference, the current plans for Phase 2, 3 and 4 of the NCD include the following facilities: • Near west entrance: 168 long-term covered and secured; 104 short-term covered. • Near front door of NCD: 48 short-term outdoors. • Parking garage structure: 184 long-term covered and secured; 126 short-term outdoors. Additionally, shower and locker facilities are proposed: • West Entrance/Tower A – Showers/change facilities located on Level E1 adjacent to the public elevator core nearest to the West Entrance as well as on Level 1 adjacent to the nearest service elevator core closest to the West Entrance. • Main Entrance and Pavilion Entrance – Showers/change facilities located on Level 1 adjacent to the Tower B public elevator core.
Expected Impact	Medium
Performance Measurement	Reporting managed through the TDM Platform and potentially key card access system: • Bicycle facility use • Cycling mode share
Bicycle Loan and Repairs Program	**RECOMMENDED (EARLY ACTION)**
Strategy	The hospital can purchase or lease a fleet of bikes and e-bikes that can be loaned out to employees on an annual basis for minimal cost. The bike loan program could also include providing repair services at a reduced cost. This encourages people to cycle without the added burden of bike repairs and purchasing a bike outright. The provision of a bike loan program can be useful in encouraging people who are contemplating active travel but are still undecided on including active travel in their commute.
Implementation	Can partner local bike shops to provide bicycles at a discount or loan to employees.
Expected Impact	Medium
Performance Measurement	• Cycling mode share • # of new cyclists • # of bike loan applications • Contests and promotions participation

Shared Micromobility Subsidy	**RESERVE**
Strategy	Providing access to shared bikes and scooters is an excellent way to further encourage bike ridership and active transportation by improving convenience and lowering the barrier to entry. Bike trips could easily replace short trips under 5 kilometers. Use of e-bikes can increase the bike-shed even further to around ten kilometers. Most bike share programs have a 30-minute threshold per ride, therefore increasing the possibility of biking longer distances. The provision of micromobility subsidies also provide an added incentive for the uptake of shared micromobility, particularly to support first/last mile connections to and from transit.
Implementation	The hospital can provide subsidies for memberships with publicly or privately owned micromobility programs. Ottawa does not currently have a program, but if one were to start up, the hospital should identify places on the campus for shared micromobility parking to support its use. The hospital should then assess the reach of the program to determine whether it would help increase sustainable commute trips and identify cost-effective pricing for subsidies.
Expected Impact	Medium
Performance Measurement	• # of registered users • Cycling/scooter mode share

Parking

As stated earlier, the TOH network has experienced several parking-related challenges. Although pre-pandemic parking lots were regularly over capacity, currently there is a surplus of available parking on- and off-site which may hinder the adoption of sustainable modes of transport. However, as the new campus induces more visitor and employee trips, parking constraints will be exacerbated over time, augmenting the need to reduce and manage parking demand. For employees that do not drive to the site everyday, there are opportunities to develop alternative parking or daily parking policies. These policies would benefit from an integrated parking management technology system to enable seamless and convenient staff and patient experience. Below are the strategies that aim to reduce the parking usage on site and will dissuade SOV travel.

"I would prefer to have the option of having a monthly parking pass vs paying the whole year. I would likely be inclined to ride my bike more over the summer if I didn't also pay for parking."

Parking Policy Management	**BASIC (EARLY ACTION)**
Strategy	Due to the varying types of audiences that TOH attracts, the hospital can adopt a dynamic parking policy that prioritizes rural patients, carpoolers, and pick up/drop off patients/employees. Essentially, the provision of dynamic parking stalls can help to reduce parking supply as some stalls can have a multi-purpose function. These types of spaces can facilitate a high parking turnover and incentivize people to travel together (carpool).
Implementation	Develop a robust parking management policy that incorporates Ministry requirements, TDM strategy recommendations, parking efficiency measures and patient experience improvements.
Expected Impact	Medium
Performance Measure	Parking lots utilization Parking fees collected. Non-SOV mode share
Daily Parking	**RECOMMENDED (EARLY ACTION)**
Strategy	Monthly or annual parking passes incentivize staff to drive to gain maximum value from their 'investment'. Daily rates would reflect daily choices and promote sustainable modes for more trips.
Implementation	As part of the parking policy, charge for parking only on a daily basis which allows employees to think about their commute options on daily basis. In terms of patients, while the hospital is required to offer 5, 10 and 30 day passes due to Provincial legislation, parking could be administered on a daily basis to the pass price 'cap', helping patients get the best "price" for needs without spending a lot of money up-front.
Expected Impact	High
Performance Measurement	• Parking fees collected • Parking lots utilization • Avg parking days per employee/visitor
Increased Staff Parking Fees	**RECOMMENDED**
Strategy	To reduce the incentive to drive, increase daily parking charges for employees of at least $7.50/day to match the cost of transit ($3.75 x 2 trips). Increasing parking rates can also provide a new revenue source to support the ongoing costs of the TDM program.
Implementation	Additional revenue should be reinvested in the TDM program to provide or subsidize administration, incentives and education.
Expected Impact	High
Performance Measurement	• Parking fees collected • Parking lots utilization • Avg parking days per employee/visitor

Daily Cash Incentive for Sustainable Travel	**RESERVE**
Strategy	To support staff in choosing alternatives to driving along, employees will receive a daily cash incentive (e.g., $2 per day) in addition to transit subsidy. By offering cash instead of a subsidy or other measure, this provides the most value and flexibility for employees and is a highly attractive incentive. An incentive like this would set a very costly precedent, especially considering almost 40% of staff already commute using SOV alternatives. Therefore, this would be a last-resort reserve measure if the hospital was unable to meet its mode share goals by other measures.
Implementation	Offer an incentive of $2/day for employees who choose to not to drive alone and park. This can be added to their biweekly paycheques.
Expected Impact	High
Performance Measurement	• Non-SOV mode share • Cash value spent by mode used • Parking lot utilization

Supporting Measures

These are several supporting measures that can be applied in sync with the other strategies that will help to improve the overall effectiveness of the TDM Strategy.

Supportive Measures	
Strategy	• **New Hire Package (EARLY ACTION):** This package would provide details of local transportation options to new staff, physicians and volunteers and summarize the incentives and resources available to them. Collaboration with the HR department will be important to understand existing onboarding processes. • **Emergency Ride Home (EARLY ACTION):** This incentive provides an option to employees in case of emergencies. If employees commute without using a vehicle, but need to get home in an emergency, TOH will provide a free or subsidized taxi/ridehailing trip at times when no other alternative might be available. This could be linked to the TDM Platform to enable uniformity in administration. • **Real-Time Transportation Screens**: The provision of transportation screens at major access points of the hospital showing real-time transit information including information on arrivals and departures. • **Personal Trip Planning (EARLY ACTION):** The hospital, with the support of the transportation coordinator, will offer one-to-one counselling sessions to the employees about the commute options available to them customized for their travel route. • **Carpool Matching Events (EARLY ACTION):** The Transportation Coordinator can set up ride-matching rosters and biannual events to connect employees with the same travel route and times.

	• **Contests and Promotions (EARLY ACTION):**: Contests, promotions, and prizes can be used as a strategy to provide awareness about transportation options available to the staff, physicians, volunteers, and visitors. Contests and campaigns can include "cycling challenges" whereby individuals are encouraged to cycle to and around the hospital site or "Bike Walk Roll Challenges" where individuals are encouraged to use all types of active travel to access the site. Contests can also focus on the health and wellness angle of active travel. Contests and promotions should be administered via the TDM Platform to track and manage it effectively. • **Hospital Network Shuttle:** There is already a Hospital Network shuttle in place at TOH, however the hospital shuttle service can be expanded to pick up and drop off at Carling Station as part of its route to support those who can't or don't want to walk to the hospital. The parking management system can integrate online shuttle space reservation potentially improving employee/patient experience. • **Patient Mobility Support:** Disperse information and council patients on the specialized mobility incentives that are already available to them. These can include information on Para Transpo, Taxi Reimbursements, Ontario Travel Grants *(for Northern Ontario patients only)* and other general information about mobility options. Information should also be available to patients/visitors through the parking management system.
Implementation	The bulk of the supporting measure should be implemented prior to the move to NCD in order to develop a solid foundation for sustainable commuting and hospital access.
Expected Impact	Low-Medium
Performance Measurement	Reporting via Uber/Lyft corporate account, event attendance reporting, website analytics, manual counts, and the TDM Platform: • Emergency Ride Home usage and cost • Event attendance • Personal trip planning consultations • Transportation web page hits • Carpool usage (via TDM Platform and manual counts)

Shift Trips

This section focuses on strategies that can shift car trips from peak periods to non-peak times.

Off-Peak Clinics	**RECOMMENDED (EARLY ACTION)**
Strategy	Clinics can be identified as a potential opportunity to shift patient and staff/physician trips outside of the peak period, primarily from weekday days to weekday evenings.
Implementation	Further analysis should be carried out in the short-term to aim for implementation at least a year before NCD opening to begin shifting trips and getting patients and staff used to new schedules.
Expected Impact	Medium
Performance Measurement	Reporting would be managed by hospital HR reporting and observation: • Total clinics within 4 hours timeframes (6-10am, 10-2pm, 2-6pm, 6-10pm) • Total & percentage of patients attending clinics by timeframe • Total & percentage of staff/physicians supporting clinics by timeframe
Flexible Operations	**RECOMMENDED**
Strategy	While hospital environments are challenging, there may be opportunities to facilitate flexibility in some areas. In addition to Virtual Care and Off-Peak Clinics, other hospital operations may have potential to be moved outside of peak hours.
Expected Impact	Low
Implementation	In the short term, investigate further opportunities to support new areas that flexible working arrangements could be accommodated.
Performance Measurement	• Presence of supporting hospital policy • Self-reported flexible working • Parking Database: In-Out Times

5.5.1 Implementation Schedule

The timing of TDM strategy implementation can have an impact on how successful the TDM program is. The implementation of the TDM measures have been divided into 4 phases: Early Action, Basic Measures, Recommended Measures and Reserve Measures. Figure 5-3 describes the timeline of TDM implementation. Please note that the implementation of Reserve measures is dependent on the monitoring and evaluation of the TDM program, thus Reserve measures might not need to be implemented at all.

Figure 5-3: Implementation Schedule

	2023				2024				2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038
Implementation Schedule	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4											
Early Action Measures																			
Work From Home																			
Off-Peak Clinics																			
Transportation Coordinator																			
TDM Platform																			
Priority Carpool Parking																			
Bicycle Support Facilities																			
Bicycle Loan + Repairs Program																			
Bike Skills Training																			
Daily Parking																			
Emergency Ride Home																			
New Hire Package																			
Parking Policy Management																			
Basic Measures																			
Bike Room																			
Personal Trip Planning																			
Carpool Matching																			
Contests and Promotions																			
Hospital Network Shuttle																			
Recommended Measures																			
Virtual Care																			
Flexible Operations																			
Travelling Doctors																			
Flexible Operations																			
50% Transit Subsidy																			
Increased Staff Parking Fees																			
Transportation Screens																			
Patient Mobility Support																			
Reserve Measures																			
Carpool/Vanpool- Subsidies**																			
100% Transit Subsidy**																			
Shared Micromobility**																			
Daily Cash Incentive for Sustainable Travel**																			

***Implementation is dependent on monitoring and evaluation of TDM program*

5.6 Wider Hospital Network TDM Strategies

Table 5-3 provides a list of potential TDM strategies that could be implemented at the other TOH sites beyond NCD. The strategies were selected for each site based on location, size, and surrounding amenities. The list also includes strategies for visitors and patients that could be implemented at all the sites, taking into consideration that visitors and patients have different transportation challenges. A separate study will have to be conducted to determine the potential for mode shift at the other sites.

Table 5-3: Potential TDM Strategies for the entire TOH Network

TDM Strategies	General Campus	Riverside Campus	Rural Network	Visitors	Notes
Work From Home	✓	✓	✓		Large site, has potential to eliminate 10% of trips
Virtual Care/Remote Nursing Station	✓	✓	✓	✓	Virtual care technology can be purchased via NCD and used at all sites, reduces cost
Travelling Doctors			✓		Allows doctors to travel to patients, especially for remote/rural hospitals
Off-Peak Clinics	✓	✓		✓	See virtual care
Flexible Working		✓	✓		Shifts trips from peak times
Transportation Coordinator	✓	✓			Might not be needed for smaller sites, but one of the other Coordinators could oversee these sites
TDM Platform	✓	✓			TDM platform is the overarching program that ties the TDM strategies together
Carpool/Vanpool Subsidies	✓				Currently not a priority due to limited staff density
Priority Carpool/ Vanpool Parking	✓	✓	✓		Easy to implement policy across entire network
Transit Pass Incentive	✓	✓			Can induce mode shift in urban areas
Employee/Visitor Shuttle Program	✓	✓		✓	Can potentially use the current shuttle to LRT stations and encourage more transit ridership
Bicycle Support Facilities	✓	✓	✓	✓	Can facilitate the uptake of active transportation
Shared Micromobility	✓	✓			Partnership with the City can encourage active transportation
Bike Training and Education	✓	✓			Supporting measure with easy implementation
Dynamic Parking Policy	✓	✓	✓	✓	Easy to implement policy across entire network
Daily Parking	✓	✓	✓	✓	Easy to implement policy across entire network
Increased Parking fees	✓	✓			Easy to implement policy across entire network
New Hire Package	✓	✓	✓		Individuals tend to change their commute behaviour when they start a new job
Transportation Screens	✓	✓		✓	Provision of real-time transit information that can encourage transit ridership
Emergency Ride Home	✓	✓	✓		Supporting measure with easy implementation
Personal Trip Planning	✓	✓	✓		Supporting measure with easy implementation
Carpool Matching Events	✓	✓	✓		Supporting measure with easy implementation
Contests and Promotions	✓	✓	✓		Supporting measure with easy implementation

5.6.1 Deeper Dive into Rural TDM Opportunities

Given the vast reach of the rural hospital network, TDM strategies targeted towards rural network users/staff can best be administered through partnerships among nearby rural hospitals, clinics, and other social services as well in collaboration with TOH. The need for partnerships is required by the inter-hospital/clinic travel among patients and staff to access specialty equipment/care. It was noted during the stakeholder engagement session that patients and staff sometimes travel between sites for specialist treatments.

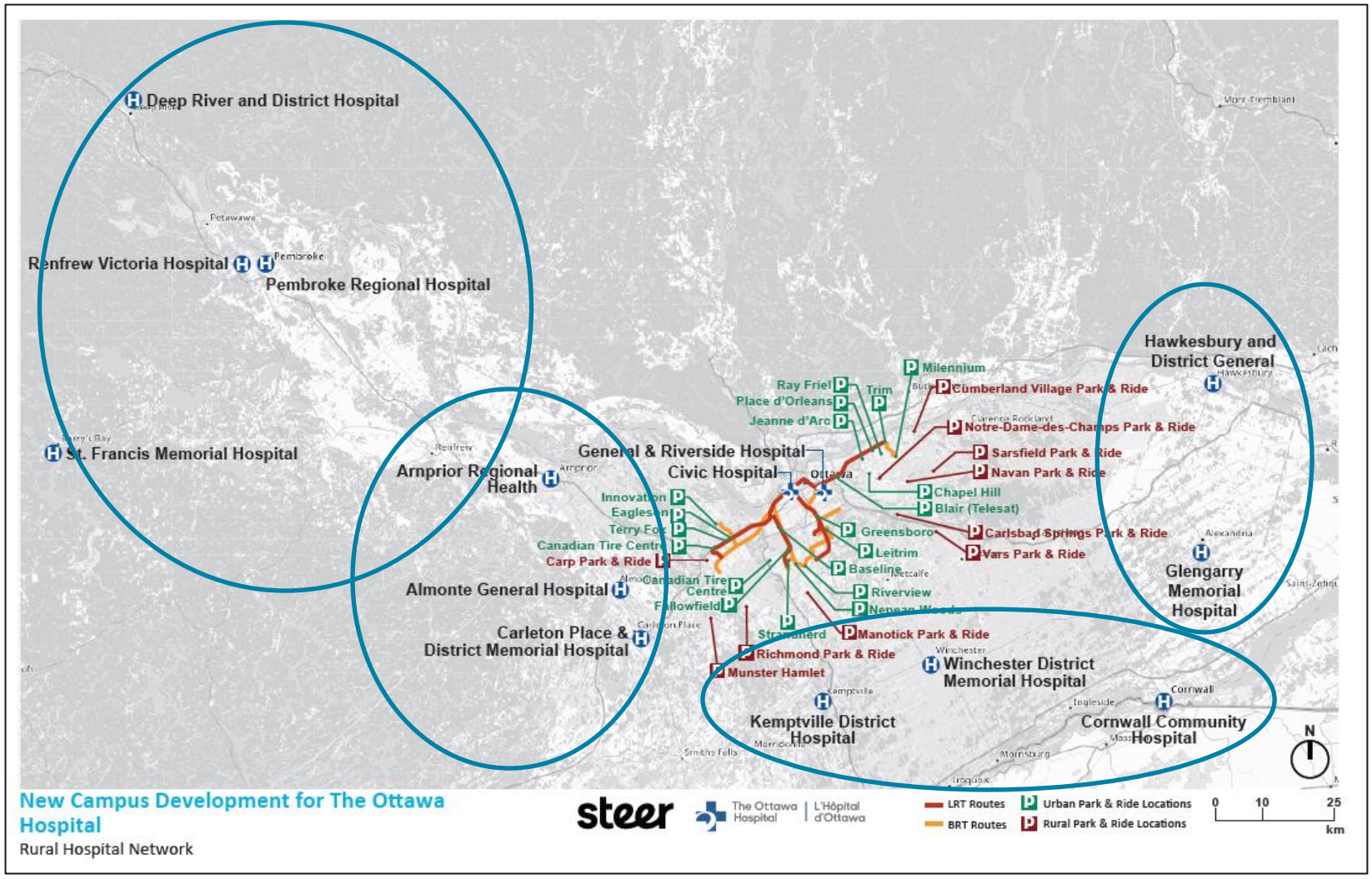
Additionally, some rural Ottawa hospitals have had staffing issues (mainly nursing shortages), which has led to challenges delivering rural medical services. It is therefore essential that hospitals/clinics work together to facilitate the movement of staff/patients to locations where they are most needed/could benefit most. Some partnerships are already in place; all of the rural hospitals and the three Ottawa campuses are part of the Champlain Local Health Integration Network (CLHN). Furthermore, some rural hospitals have also formed partnerships with each other, including:

- St Francis Hospital (SVH) and Renfrew Victoria Hospital (RVH)
- Almonte General Hospital and Carleton Place District Hospital as part of the Mississippi River Health Alliance
- Arnprior Regional Health and Arnprior Senior's Home

To analyze and allocate the resources needed to facilitate the rural TDM program, the rural hospital network has been divided into 4 quadrants based on counties according to the CLHN and local proximity[14] (see Figure 5-4).

[14] **Hospitals - Stormont/Dundas/Glengarry - champlainhealthline.ca**

Figure 5-4: Rural Hospital Network with Groupings



5.6.1.1 Key TDM Strategies

- **Travelling Doctors:** The Ottawa Hospital Network can allocate a designated number of Travelling Doctors to the rural hospital network to spend a week attending to rural patients within each rural hospital grouping to reduce the number of inbound patient trips to the city. Hospitals such as Renfrew Victoria Hospital (RVH) already have a program/partnership in place whereby doctors from The Ottawa Hospital perform general surgeries at RVH[15]. There is a possibility for an expansion of the program.
- **Shuttle Program:** Arnprior Regional Health currently has a partnership with Arnprior Senior's Home to provide volunteer and community shuttle transportation to The Ottawa Hospital. The Ottawa Hospital in collaboration with the rural hospitals can work towards expanding the shuttle program to other regional hospitals. In addition, there is a potential to extend The Ottawa Hospital's campus shuttle program to the regional areas as well.
- **Remote Nursing Station/Virtual Care:** Hospitals in proximity could partner with The Ottawa Hospital as well as each other to provide Remote Nursing Stations that include virtual care for post operative/surgical monitoring and evaluation. This reduces the need to travel to the City hospitals for post-op check ups.
- **Dynamic Parking Policy:** There are approximately 27 rural patients visits per day at the existing Civic Campus. The hospital can develop parking policies that include the provision of dynamic parking for rural patients at NCD, designated stalls for carpoolers, and demarcation of staff versus visitor parking. The Parking Management system can incorporate a reservation system to enable patients and employees to reserve parking ahead of their visit to the hospital, which would eliminate the stress that rural patients have reported feeling about the availability of parking.

5.7 Parking Management and TDM

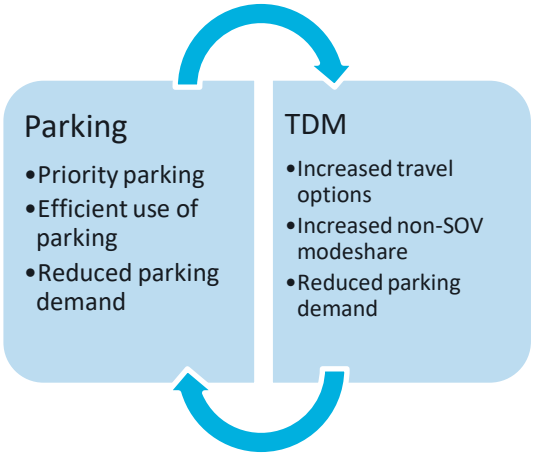
Due to the unique challenges of the rural hospital network, parking management and parking policy must work in tandem with TDM measures to reduce the demand for parking. On average, rural patients commute over 50km to the city to access the Civic Hospital. In addition, due to the lack of public transportation systems in rural regions, often the most feasible option for rural patients is driving. The parking policies must therefore prioritize rural patients as well as maximize the parking systems. Below are parking strategies that TOH can use to improve parking at NCD:

- **Parking management technology:** Reduces the time spent searching for parking, which can typically account for a loss of 4.5% of parking occupancy.
- **Priority parking**: Designated parking for carpoolers, drop off/pick up and rural patients.
- **Payroll deductions:** The deduction of daily parking costs directly from payroll to remove the need for daily cash/credit transactions.

The integration of parking management and TDM measures will help to decrease the demand for parking as well as increase the non-SOV mode share at NCD-Figure 5-5.

[15] Renfrew Victoria Hospital - Surgical Services (renfrewhosp.com)

Figure 5-5: Relationship between Parking and TDM



5.7.1 Parking Demand

The implementation of the Recommended TDM Program has the potential to reduce parking demand from a marginal surplus to a healthy surplus in 2028 and a significant deficit to a marginal deficit in 2048. The implementation of the Reserve TDM Program is anticipated to further reduce parking demand in 2048 to a better surplus position, although taking early action before 2028 may create future conditions where the Reserve TDM Program does not need to be fully implemented.

Despite the demand projections, there are many unknowns regarding transportation infrastructure and travel behaviour in 2048. As such, the ongoing monitoring, evaluation, and program review will be an important factor in identifying travel trends and optimizing the TDM program to reduce SOV use and parking demand to necessary levels. Monitoring and evaluation of the TDM program on an annual basis will assist in determining what Reserve Measures, if any, need to be implemented to account for any parking deficit.

Table 5-4: Estimated Parking Demand with and without TDM in 2028 and 2048

Peak Parking Demand (3PM Hour)	**Existing Civic 2022** (40% adj.)	**2028**	**2048**
Employees	2,497	4,114	8,511
Visitors	245	321	532
Total Employees/Visitors	2,742	4,435	9,043
Minimum Available parking	**2,700**	**3,097**	**3,097**
Parking Demand without TDM	*2,742 (62% SOV)*	*2,750 (62% SOV)*	*5,607 (62% SOV)*
Parking Surplus/Deficit	*42*	*347*	*2,510*
Parking Demand with Recommended TDM Program	-	**2,218** (50% SOV)	**3,165** (35% SOV)
Parking Surplus/Deficit		**879**	**68**

As described in Section 3.6, NCD proposes a minimum of 3,097 parking spaces. While 2048 suggests a minor shortfall in parking quantities, there are additional parking spaces designated for snow storage and surge capacity that may be utilized when these use cases are not triggered. Further parking spaces may be considered at the time the University of Ottawa Heart Institute is built. This will be reviewed during the appropriate NCD construction phase.

5.8 Monitoring and Evaluation

To ensure that the TDM strategy is meeting its target, the hospital, via the TDM Coordinator, should conduct annual surveys to understand commute patterns and the modes by which employees and visitors commute. During the first year of TDM plan implementation, an initial survey should be conducted to establish a baseline to which future surveys will be compared. While the 2022 Employee Survey could act as a baseline for employees, a more robust visitor survey is needed.

The baseline survey and the subsequent annual surveys should ask questions to understand how employees and understand barriers to sustainable travel. To gain insight into travel characteristics and attitudes, the survey should identify the following key topics:

Employees

- Mode of travel
- Home Postal Code
- Daycare or school pick-up/drop-off location, if applicable
- Flexible working arrangements, if applicable
- Car ownership
- Level of awareness of the hospital's TDM amenities
- Feedback on amenities and services currently available to the employees
- Current barriers to sustainable travel modes
- Other services or amenities that are not currently offered which would encourage employees to try a different mode of travel

Visitors

- Mode of travel
- Home Postal Code
- Reason for hospital visit
- Level of awareness of the hospital's TDM amenities
- Current barriers to sustainable travel modes
- Other services or amenities that are not currently offered which would encourage employees to try a different mode of travel

The survey results allow the hospital to not only track program progress but also identify ways to adjust the program and further shift travel behavior towards more sustainable modes (transit, bike, walk and carpool) over time. The TDM Coordinator could use the data to understand which amenities are popular and should remain, which are not effective and should be adjusted, and identify additional measures to implement in their place.

The TDM monitoring program will form part of the TOH Transportation Monitoring Strategy that will support all transportation related strategies for the NCD. Further details on the various TDM monitoring elements will be expanded upon in that study.

5.9 Next Steps

The Key Processes and Actions that can be accomplished within the next 6-12 months are:

Process

- Informing the Site Plan and TIA Addendum
- Liaison with NCD consultants and TOH to incorporate TDM recommendations into future development plans
- TDM Plan Review
- Final TDM Plan

Actions

- Begin implementation of Early Action measures
- Identify opportunities to implement TDM measures across the TOH network
- Identify opportunities to implement part-time TDM Coordinator role
- Identify potential vendors for TDM Platform

Appendices

A Data and Calculations

Survey Questions

Q.1. What is your home postal code? _ _ _ _ _ _

Q2. What campus do you spend the most time at?

a. Civic Campus
b. General Campus
c. Riverside Campus
d. Satellite Campus
e. Other location
f. I work from home most or all of the time

Q.2. What department are you based in?

a. X
b. Y
c. Z

Q.3. What is your role at The Ottawa Hospital?

a. Physician
b. Staff (Clinical)
c. Staff (Non-Clinical)
d. Research
e. Volunteer
f. Other (please specify) _____

Q.4. Does your role allow you to work from home?

a. Yes, I currently work from home
b. Yes, I have the option to work from home but choose to go to the site
c. Yes, my role allows me to work in on a hybrid schedule (partly work from home)
d. No, my role does not allow me to work from home.

Q.5. On average, how many **days per week** do you normally commute by each option in a week? If you used more than one option in a typical week, select multiple options (e.g., drove 3 days, rode a bicycle 2 days).

	1 day	**2 days**	**3 days**	**4 days**	**5+ days**
I drive alone	☐	☐	☐	☐	☐
I drive/ride in a carpool	☐	☐	☐	☐	☐
I take a taxi/Uber/Lyft	☐	☐	☐	☐	☐
I take transit (OC Transpo)	☐	☐	☐	☐	☐
I use a car-sharing service like Zipcar etc.	☐	☐	☐	☐	☐
I ride a motorcycle	☐	☐	☐	☐	☐
I ride a bicycle	☐	☐	☐	☐	☐
I walk	☐	☐	☐	☐	☐
I get dropped off/picked up	☐	☐	☐	☐	☐
I work from home	☐	☐	☐	☐	☐
Other (please specify below) _____	☐	☐	☐	☐	☐

Q.7. Do you currently park at or near a TOH campus? (Select up to three)

a. Yes, I have a TOH parking pass
b. Yes, I park in the visitor parking lot
c. No, I don't park near a TOH campus
d. Yes, I have arrangements for parking outside of TOH
e. Yes, I park on the street

Q.8. How often have you experienced the following issues at the hospital due to parking constraints?

	Never	Less than 25% of my shifts	25 - 50% of my shifts	More than 50% of my shifts
Late for shift/work	☐	☐	☐	☐
Missed shift/work completely	☐	☐	☐	☐
Parked in an undesignated/ unofficial space onsite	☐	☐	☐	☐
Parked offsite (please specify) _____	☐	☐	☐	☐
Other (please specify) _____	☐	☐	☐	☐

Q.9. When you drive alone to the hospital, what are your main reasons? (Select up to three reasons)

a. I use my personal car at work for business purposes
b. I like the convenience of having my car close to me
c. I need to run errands before or after work
d. So that I can get home quickly in an emergency
e. Parking at/near work is inexpensive
f. I have an irregular work schedule
g. I need to transport my children
h. I don't have anyone to carpool with
i. There is no public transit near my home
j. Public transit takes too long
k. It's too far to walk or bike
l. I'm concerned about walking and bicycle conditions/safety along my route to work
m. I don't know what other options there are to get to work
n. I rarely/never drive to work
o. Other (please specify) _____

Q.10. What other commute options would you be willing to try? (Select up to 3)

a. Drive/ride in a carpool (skip to question 11)
b. Take transit (light rail or bus) (skip to question 12)
c. Ride a bike or e-bike/e-scooter (skip to question 13)
d. Walk (skip to question 14)
e. Get dropped off/picked up (skip to question 11)
f. Use car-sharing services like Zipcar (skip to question 11)
g. None (skip to question 15)
h. Other (please specify) _____ (skip to question 15)

Q.11. What would encourage you to try carpooling? (Select all that apply)

a. Help finding people to carpool with
b. Priority parking for carpools or car-sharing
c. Carsharing discount
d. Cheaper parking for carpools
e. Prizes or contests
f. A guaranteed ride home (e.g., taxi/Uber/Lyft) in the event of an emergency or unexpected issue
g. Other (please specify) _____

Q.12. What would encourage you to try transit? (Select all that apply)

a. Public transit subsidy/discount
b. Information about transit routes and schedules
c. Expanded transit network
d. Prizes or contests
e. A guaranteed ride home (e.g., taxi/Uber/Lyft) in the event of an emergency or unexpected issue
f. Other (please specify) _____

Q.13. What would encourage you to try cycling/e-bike? (Select all that apply)

a. Maps and information about bicycle/trail routes
b. On-site secure bike parking and changing rooms/showers/lockers
c. Support/loan to purchase a bike
d. Prizes or contests
e. A guaranteed ride home (e.g., taxi/Uber/Lyft) in the event of an emergency or unexpected issue
f. Other (please specify) _____

Q.14. What would encourage you to try walking to the TOH Campus? (Select all that apply)

a. Prizes or contests
b. A guaranteed ride home (e.g., taxi/Uber/Lyft) in the event of an emergency or unexpected issue
c. Other (please specify) _____

Q.15. What would encourage you to try a new commute? (Select up to three choices)

d. Help finding people to carpool with
e. Priority parking for carpools or car-sharing
f. Cheaper parking for carpools
g. Transit: Public transit subsidy/discount
h. Transit Information about transit routes and schedules
i. A guaranteed ride home (e.g., taxi/Uber/Lyft) in the event of an emergency or unexpected issue
j. Bike/E-bike/E-scooter: Maps and information about bicycle routes
k. On-site secure bike parking and changing rooms/showers/lockers
l. Support/loan to purchase a bike
m. Prizes or contests
n. Nothing/not interested
o. Other (please specify) _____

Q.16. To the best of your knowledge, do you anticipate travelling to the New Campus Development site once it opens?

a. Yes, I will be primarily based in the new site
b. Yes, I might be frequently travelling to the new site
c. Yes, I might be occasionally travelling to the new site
d. No, I will not be travelling to the new site
e. I am not sure yet
f. Other (please specify) _____

Q.17. Please feel free to share any other comments or insights you have regarding commuting or transportation to/from the hospital in the space provided below.

[open-ended]

Public Transit	Having a direct transit line to the hospital is the most important thing for me. I spend over 300 dollars a month on parking alone, not to mention the price of gas. Taking the bus/train would be PREFERABLE to me, but there are no direct bus lines to either the Civic or the General currently. It should be top priority to ensure the new site is easily accessible by public transit.
	New Campus - transit concerns: longer commute, less reliable bus service and train service, unsure of locking station availability for e-bike or e-scooter
	OC transpo should not cancel trips for busses that service the hospitals. The route 55 does not run late enough for those working evening or night shift, so this would prevent those shift workers from using public transit along that route.
	If light rail goes to the suburbs and has a station at Civic maybe more staff would take public. However if they break down and don't work in the winter like they currently do, no nurse is going to be able to/ want to take it. Otherwise you could have half your staff late or no shows
	Transit is an option I have seriously considered, yet I find the additional 1.5-2 hour commute time is untenable especially when considering a low work/life balance schedule to begin with. Additionally, working odd hours with a changing schedule makes car pooling impossible, and transit options are even more limited and difficult or feel unsafe at strange hours. Also, my work requires me to be on-site before the person I am replacing can leave; this requires prompt arrival times that transit does not offer.
	I rely on OCTranspo buses, but they are frequently late or don't show up at all. There are times I've had to jog all the way from my home at Gladstone/Lyon to Civic because the GPS system on the bus routes was reading a 55 minute wait for the next bus and I would have been late if I tried to wait for it. Those times were around 7:30 am, when there should be no more than 20 minutes between buses. Anyway, this is just to say that transportation to the hospital is difficult due to poor service from OCTranspo.

	A bus pass discount would be a huge help in promoting greener transportation options. Biking and walking works, but it becomes difficult in these Ottawa winters. Please subsidize bus passes.
	If LRT station is directly connected (via indoor route) to New Campus, and if Park & Ride option were to exist close by, then I would consider taking transit
	subsidy for transit for staff as parking is expensive and far
	Hope hospital will provide pick up and drop off.
	The transit system needs to be significantly improved before I would consider using it. The transit time is too long, the buses are too full, there are no washrooms on along the way, the stops are unsafe at night, the buses are unreliable during the winter months I was once left on campus with no ride home during a snow storm, the park and ride parking are sometimes full, it's just not s good system.
	The Ottawa Hospital (TOH) shuttle service has been an excellent way to commute. For example, I live near the General campus; so I plan to take the shuttle to the New Campus when needed.
Active Transportation	Currently I have to pay for a Good Life membership just to rent a locker to use when riding bike to General site. This is ridiculously expensive and a blot on the hospital's claim to encourage cycling.
	I am hoping to buy an eBike, and would be on campus more if I knew the bike would be safe from theft. I am really hoping that the new campus allows for safer bike parking, especially for those who are planning to eBike from further distances. I live in Manotick, so I would consider driving to Huntclub, and biking the rest of the way to work. Thank you!
	Having access to showers and winter cycling routes would make a difference
	Bike locker should be situated near staff entry doors. Larger campuses should having more than 1 bike locker for easy access to different areas of hospital. To encourage more active transportation, biking or walking, can we put parking passes on hold during summer months.
	Anything to help people with bike have more secure location to store their bike would be amazing. I would definitely bike 50% of the time. I work full time. Too many people I know have had their bikes stolen from the current CIVI C Campus
	I use an e-scooter to get to work and there's very little room to store it in the office. Unfortunately it's not really possible to lock it on the bike rack securely due to its shape. It would be nice to have a storage space for this kind of equipment.
	i would love to ride my bike but i have to ride on main roads and its dangerous. I would take public transit but my 20 min drive would take 2 hours both ways....
	More secure bike racks that are easily accessed please! A safe ride down Carling Ave please! More showers in the ORs please! Well lit pathways and hospital access please!

	Weather is a barrier in Ottawa. I live pretty close to Civic but it is a dangerous walk in winter. I pay for a parking pass so I can park in winter/poor weather. As you currently need to either "in" or "out" of parking for the year, I feel I may as well use the parking lot if I am paying for it. Would there ever be an option to park for the months you need to drive(other than the daily rate which is not affordable for the whole winter)? Some kind of defrayed pay per use?
	My primary route to the Civic when I ride my bike is to go along Carling, but I take a bit of a longer route to avoid it because it is a busy street and there is no dedicated bike lane. Something to consider would be dedicated bike lanes along the routes to the new campus and on campus (I know bike lanes to the new campus is a City of Ottawa responsibility but wanted to bring it up).
	Biking is an option for me in the warmer months. I would love to be able to put my parking pass on hold for those times but reinstate it when the weather turns cold.
Parking	NEED designated Staff parking. These wait times are ridiculous to get a day parking pass. Also Pregnancy parking would be nice for pregnant patient and workers. I recently requested accommodations for closer parking for my last 4 weeks of work before mat leave and was told " I cannot jump the line for day parking". we truly do not care about our staff here at TOH.
	Parking waitlist for staff resulting in taking up visitor parking, increased rate for parking pass/daily uses. Maintenance of walking routes from designated parking spaces are slippery in winter abs poorly maintained
	I will be driving an electric car, charging stations are poorly displayed and very limited at the current campus parking garage, it would be ideal if there were more electric car charging stations and priority parking spots.
	I would prefer to have the option of having a monthly parking pass vs paying the whole year. I would likely be inclined to ride my bike more over the summer if I did jut also pay for parking.
	Given where I live it's very challenging to find people to car share with. I also need a flexible schedule for family reasons. I'd appreciate cheaper parking though for a hybrid WFH/at work approach where parking isn't always needed.
Work from home	Working from home meant a huge boost in my work/life balance, I have a more comfortable, more private space; I save about 2 hours a day in commuting time (some of which I donate to the hospital as free labour) and my productivity is much higher than before while I am eating better, saving on gas/food/clothes. I think WFH should be the norm for everyone whose job allows it
	I would prefer to work from home more often if that was an option.
	I would be happy to work from home 5 days a week to avoid commuting/parking but a 3 day minimum on campus was implemented.
	Preference for working from home at the new campus (administrative based position), with 1 to 2 days/week in office.
Carpooling	Commuting from a rural area 40 minutes away has limited travel abilities. Carpooling seems like a good idea but logistically does not seem like it will work due to last minute and mid shift floating to another campus, also in the winter depending on the weather my time I depart changes frequently, so coordinating this would be difficult and possibly unreliable.

	Please consider taxi chits, discounted car sharing, discounted corporate Uber/Lyft accounts for those who must go on site infrequently or a temporary parking pass.
	It would be nice to have carpooling discount for the parking
	I have to be on call for strokes and aortic aneurysm ruptured. There is a 30 minute response time. With the location of the new site and my home, I am not within that time frame. Very concerned with on-call expectations given how far the new campus is from the highway.
Park n ride	Thank you for sending out such a survey. Living in a more rural area, the OC transpo bus service would mean 2-3 buses from here so not feasible. There is a park n ride on Eagleson road, near Kanata, however, I am not aware of a bus that goes directly to the Civic campus for example. I surrendered my Dow's Lake parking pass finally recently this year and now have the option of the 9 bucks a day rate for the external champagne street TOH parking lot to use on the occasion I am going to be onsite and then using the TOH shuttle etc.
General	Please factor in the staff that has kids, i have no choice to take my car because my daycare closes early and i have to rush to get my kids after my shift.

Parking Dashboards

Figure A.1: Employee Parking Dashboard

Figure A.2: Visitor Parking Dashboard

Table A.1: Visitor Ticket Count by In and Campus

Ticket Count by Hour In	Tickets	Accounting for 60% capacity	Weekly	Daily	Accounting for only 80% of database
12:00 AM	3,980	6,633	165.83	23.69	29.61
1:00 AM	2,281	3,802	95.04	13.58	16.97
2:00 AM	1,170	1,950	48.75	6.96	8.71
3:00 AM	1,285	2,142	53.54	7.65	9.56
4:00 AM	1,425	2,375	59.38	8.48	10.60
5:00 AM	5,297	8,828	220.71	31.53	39.41
6:00 AM	57,530	95,883	2,397.08	342.44	428.05
7:00 AM	79,638	132,730	3,318.25	474.04	592.54
8:00 AM	35,078	58,463	1,461.58	208.80	261.00
9:00 AM	29,650	49,417	1,235.42	176.49	220.61
10:00 AM	28,065	46,775	1,169.38	167.05	208.82
11:00 AM	21,078	35,130	878.25	125.46	156.83
12:00 PM	26,671	44,452	1,111.29	158.76	198.44
1:00 PM	28,227	47,045	1,176.13	168.02	210.02
2:00 PM	30,792	51,320	1,283.00	183.29	229.11
3:00 PM	32,894	54,823	1,370.58	195.80	244.75
4:00 PM	28,086	46,810	1,170.25	167.18	208.97
5:00 PM	23,074	38,457	961.42	137.35	171.68
6:00 PM	25,016	41,693	1,042.33	148.90	186.13
7:00 PM	27,760	46,267	1,156.67	165.24	206.55
8:00 PM	10,366	17,277	431.92	61.70	77.13
9:00 PM	8,005	13,342	333.54	47.65	59.56
10:00 PM	18,846	31,410	785.25	112.18	140.22
11:00 PM	20,883	34,805	870.13	124.30	155.38
Total:	547,097	1,367,743	34,193.56	4,884.79	6,105.99

Table A.2: 2027/28 Projected FTE

27/28	Estimated Shift Start Hour	Mon FTE	Tues FTE	Wed FTE	Thu FTE	Fri FTE	Methodology
Day	7:00am - 9:00am	3128	3128	3128	3128	3128	0.95 = (assumes 5% absence day) 20% of admins working hybrid and admins equal 25% of all day staff. This number was taken using a 5% absence day
Evening	3:00pm - 5:00pm	498	498	498	498	498	0.95 = (assumes 5% absence day
Night	11:00pm - 12:00pm	152	152	152	152	152	
12 hrs Day	7:00am - 8:00am	417	417	417	417	417	
12hrs Night	7:00pm- 8:00pm	295	295	295	295	295	

Table A.3: Project Parking Demand at 62% mode share

27/28	Estimated Shift Start Hour	Mon FTE	Tues FTE	Wed FTE	Thu FTE	Fri FTE
Day	7:00am 9:00am	1939	1939	1939	1939	1939
Evening	3:00pm 5:00pm	309	309	309	309	309
Night	11:00pm 12:00pm	94	94	94	94	94

12 hrs Day	7:00am 8:00am	259	259	259	259	259
12 hrs Night	7:00pm-8:00pm	183	183	183	183	183

Table A.4: 2048 Projected FTE

2048	Estimated Shift Start Hour	Mon FTE	Tues FTE	Wed FTE	Thu FTE	Fri FTE	Methodology
Day	7:00am - 9:00am	4050	4050	4050	4050	4050	0.95 = (assumes 5% absence day) 20% of admins working hybrid and admins equal 25% of all day staff. This number was taken using a 5% absence day
Evening	3:00pm - 5:00pm	645	645	645	645	645	0.95 = (assumes 5% absence day
Night	11:00pm - 12:00pm	198	198	198	198	198	
12 hrs Day	7:00am - 8:00am	540	540	540	540	540	
12 hrs Night	7:00pm - 8:00pm	381	381	381	381	381	
12 hrs Day	**75% Resident Days**	92	92	92	92	92	

Table A.5: 2048 Projected Parking Demand at 62% mode share

2048		Estimated Shift Start Hour	Mon FTE	Tues FTE	Wed FTE	Thu FTE	Fri FTE
TOH	Day	7:00am - 9:00am	4050	4050	4050	4050	4050
TOH	Evening	3:00pm - 5:00pm	645	645	645	645	645
TOH	Night	11:00pm - 12:00pm	198	198	198	198	198
TOH	12 hrs Day	7:00am - 8:00am	540	540	540	540	540
TOH	12 hrs Night	7:00pm - 8:00pm	381	381	381	381	381

Table A.6: Hospital departments at NCD in 2027/28

			Current	Projected	Increase
Functional Program Section				2027/28	**%**
CHAPTER A - NEW CIVIC HOSPITAL					
A-01	Acute Inpatient Units		395.0	553.3	40%
A-02	Critical Care		214.2	291.2	36%
A-03A	MNC: Ambulatory Care and Diagnostic Imaging		14.5	19.8	37%
A-03B	MNC: Mother Baby and Birthing Units		105.1	140.4	34%
A-03C	MNC: Special Care Nursery		41.9	50.5	21%
A-04	Medical Day Care		4.4	12.2	177%
A-05A	Surgical Specialty Clinics		35.2	41.9	19%
A-05B	General/Multisystem Clinics		49.2	69.3	41%
A-05C	Musculoskeletal (MSK) Clinics		15.9	24.0	51%
A-05D	Neurosciences (incl. Neurodiagnostics)		22.5	33.3	48%
A-06A	Mental Health Inpatient Services		42.5	70.2	65%

A-06B	Mental Health Outpatient Services	8.3	20.5	146%
A-07	Nephrology	39.1	170.3	335%
A-08	*Intentionally Left Blank*	--	--	--
A-09	Ambulatory Procedures Unit	32.4	38.9	20%
A-10A	Emergency Department	158.6	214.8	35%
A-10B	Psychiatric Emergency Services (PES)	9.4	16.8	79%
A-11	Laboratory Medicine	121.0	171.5	42%
A-12	Medical Imaging	145.8	212.0	45%
A-13	Other Health Professionals	132.1	159.5	21%
A-14	Pharmacy	76.6	138.0	80%
A-15	Respiratory Therapy and Cardiac Diagnostics	40.3	51.8	29%
A-16	Surgical Suite	180.8	257.0	42%
A-17	Central Medical Student and Resident Facilities	--	--	--
A-18	Communications	--	14.0	--
A-19	Corporate Education	112.3	5.0	-96%
A-20	Health Records	28.7	6.1	-79%
A-21	Human Resources	21.0	25.0	19%
A-22	Infection Prevention and Control	14.0	22.0	57%
A-23	Information Services	27.0	49.0	81%
A-24	Legal, Privacy, Governance & Risk Management	9.0	20.0	122%
A-25	Medical Affairs, Patient Advocacy and Ethics	20.5	26.0	27%
A-26	Medical Staff Facilities	762.5	959.0	26%
A-27	Nursing Professional Practice	11.0	12.0	9%
A-28	Patient Registration	23.0	20.7	-10%
A-29	Senior Administration	214.5	39.0	-82%
A-30	Spiritual Care	9.0	10.0	11%
A-31	Volunteer Resources	3.0	5.0	67%
A-32	Biomedical Engineering	57.8	31.0	-46%
A-33	Business Development, Foundation, Retail & Parking	115.0	10.0	-91%
A-34	Capital Projects, Facilities & Engineering and Planning	71.5	88.0	23%
A-35	Command Centre	28.0	44.6	59%

A-36	Emergency Management	8.2	--	--
A-37	Environment Services & Care Environment	229.9	425.5	85%
A-38	Materials Management	22.7	32.6	44%
A-39	Medical Device Reprocessing (MDRD)	47.9	76.6	60%
A-40	Nutrition and Food Services	76.5	135.3	77%
A-41	Public Areas & Staff Amenities	--	--	--
A-42	Radiation and Laser Safety	10.2	15.0	47%
A-43	Safety Office	6.0	7.0	17%
A-44	Security Office	70.2	74.4	6%
Subtotal - TOH		**3,884.0**	**4,909.8**	**26%**
CHAPTER B - THE OTTAWA HOSPITAL REHABILITATION CENTRE				
B-01	Inpatient Rehabilitation Services	95.1	168.6	77%
B-02	Outpatient & Therapy Services	86.8	150.7	74%
B-03	Rehab Engineering, Labs and Prosthetics and Orthotics	25.5	37.5	47%
B-04	Centre for Rehabilitation Research and Development	3.7	3.7	0%
B-05	CanVent Program	7.8	10.6	36%
Subtotal - TOH		**218.8**	**371.1**	**70%**
Total FTEs		**4,102.8**	**5,280.9**	**29%**

[a] Currently at the General Campus.

Table A.7: TOH Lots and parking rates

Title	Campus	Lot	Full Time or Part Time	Rate/Pay	Rate/Month
FC3	Civic	Civic P3	Full Time	$100.00	$200.00
PC3	Civic	Civic P3	Part Time	$70.00	$140.00
FC1	Civic	Civic P1	Full Time	$56.00	$112.00
PC1	Civic	Civic P1	Part Time	$39.50	$79.00
FC9	Civic	Civic 1095 Carling	Full Time	$51.00	$102.00
PC9	Civic	Civic 1095 Carling	Part Time	$36.00	$72.00
ACD	Civic	Dow's Lake (fixed rate)	Full Time	$48.50	$97.00
FCB	Civic	CSB Lot	Full Time	$41.00	$82.00
PCB	Civic	CSB Lot	Part Time	$28.50	$57.00
FCY	Civic	Civic Courtyard	Full Time	$41.00	$82.00
PCY	Civic	Civic Courtyard	Part Time	$28.50	$57.00
FC6	Civic	Civic P6	Full Time	$41.00	$82.00
PC6	Civic	Civic P6	Part Time	$28.50	$57.00
FCU	Civic	Civic Church	Full Time	$38.50	$77.00
PCU	Civic	Civic Church	Part Time	$27.00	$54.00
FC4	Civic	Civic Farm 40	Full Time	$38.50	$77.00
PC4	Civic	Civic Farm 40	Part Time	$27.00	$54.00
FCF	Civic	Civic Farm 110	Full Time	$35.00	$70.00
PCF	Civic	Civic Farm 110	Part Time	$25.00	$50.00
FC5	Civic	Civic P5 Champagne	Full Time	$35.00	$70.00
PC5	Civic	Civic P5 Champagne	Part Time	$25.00	$50.00
FCE	Civic	Civic Evenings	Full Time	$26.00	$52.00
PCE	Civic	Civic Evenings	Part Time	$21.00	$42.00
FGD	General	Doctor's Lot	Full Time	$61.50	$123.00
PGD	General	Doctor's Lot	Part Time	$43.00	$86.00
FGG	General	Parking Garage	Full Time	$56.00	$112.00
PGG	General	Parking Garage	Part Time	$39.50	$79.00
FGS	General	South Lot	Full Time	$41.00	$82.00
PGS	General	South Lot	Part Time	$28.50	$57.00

FGM	General	Main Lot	Full Time	$41.00	$82.00
PGM	General	Main Lot	Part Time	$28.50	$57.00
FGA	General	Tempo Lot A	Full Time	$38.50	$77.00
PGA	General	Tempo Lot A	Part Time	$27.00	$54.00
FGB	General	Tempo Lot B	Full Time	$38.50	$77.00
PGB	General	Tempo Lot B	Part Time	$27.00	$54.00
FGL	General	OLSTP	Full Time	$35.00	$70.00
PGL	General	OLSTP	Part Time	$25.00	$50.00
FGR	General	Lot R	Full Time	$32.50	$65.00
PGR	General	Lot R	Part Time	$23.00	$46.00
FGE	General	General Evenings	Full Time	$26.00	$52.00
PGE	General	General Evenings	Part Time	$21.00	$42.00
FTR	General	Rehab Front Lot	Full Time	$41.00	$82.00
PTR	General	Rehab Front Lot	Part Time	$28.50	$57.00
FTB	General	Rehab Back Lot	Full Time	$38.50	$77.00
PTB	General	Rehab Back Lot	Part Time	$27.00	$54.00
FRA	Riverside	Riverside Lot A	Full Time	$41.00	$82.00
PRA	Riverside	Riverside Lot A	Part Time	$28.50	$57.00
FRB	Riverside	Riverside Lot B	Full Time	$38.50	$77.00
PRB	Riverside	Riverside Lot B	Part Time	$27.00	$54.00
FWC	Prince of Wales	Cover	Full Time	$56.00	$112.00
PWC	Prince of Wales	Cover	Part Time	$39.50	$79.00
FWS	Prince of Wales	Surface	Full Time	$41.00	$82.00
PWS	Prince of Wales	Surface	Part Time	$28.50	$57.00
FWB	Prince of Wales	Church	Full Time	$32.50	$65.00
PWB	Prince of Wales	Church	Part Time	$23.00	$46.00
FQG	Queensway Carleton Hospital	Cover	Full Time	$56.00	$112.00
PQG	Queensway Carleton Hospital	Cover	Part Time	$39.50	$79.00
FQS	Queensway Carleton Hospital	Surface	Full Time	$41.00	$82.00
PQS	Queensway Carleton Hospital	Surface	Part Time	$28.50	$57.00
FSK	South Keys	Surface	Full Time	$34.00	$68.00

PSK	South Keys	Surface	Part Time	$24.00	$48.00
AVF	Vertefeuille		FullTime/Part Time	$15.00	$30.00
FW1	West End Villa		Full Time	$32.50	$65.00
PW1	West End Villa		Part Time	$23.00	$46.00

Table A.8: Monthly Rural Patient Visits Estimate to Civic Campus

		Actuals	Estimate	Estimate
FSA	Hospitals in FSA	Total Number of Unique Patients From Out of Ottawa	Yearly Number of Unique Patients From Out of Ottawa	Monthly Number of Unique Patients From Out of Ottawa
K0A	Almonte General Hospital	24,639	7,040	168
K0C	Glengarry Memorial Hospital, Winchester District Memorial Hospital	17,961	5,132	122
K0G	Kemptville District Hospital	12,751	3,643	87
K0J	Deep River and District Hospital, St Francis Memorial Hospital	11,777	3,365	80
K6H	Cornwall Community Hospital	9,303	2,658	63
K8A	Pembroke Regional Hospital	8,124	2,321	55
K7C	Carleton Place and District Memorial Hospital	7,952	2,272	54
K7V	Renfrew Victoria Hospital	6,105	1,744	42
K7S	Arnprior Regional Health - Arnprior and District Memorial Hospital	5,526	1,579	38
K6A	Hawkesbury and District General Hospital	4,883	1,395	33

Start Period:	Jun-19
End Period:	Dec-22
Number of Months:	42
Number of Years:	3.5

B TDM Policies and Guidelines

City of Ottawa Official Plan

The City of Ottawa Official Plan (OP) provides a vision for the future growth of the city and a policy framework to guide the city's physical development through 2046. An updated OP was passed by City Council in fall, 2021. The OP divides the City into concentric policy areas called "transects", which help determine broad categories of built form and urban design. The NCD site and its surrounding neighbourhoods fall into the Downtown Core and Inner Urban transects.

Connectivity and Mobility, specifically making cycling, walking and transits residents' first choice transportation options have been identified as one of the City's strategic goals through the OP. The plan supports and works in parallel with other policies such as Environmental Strategy plan and Transportation Master Plan, and Climate Change Master Plan in achieving this goal.

City of Ottawa Transportation Master Plan

The City of Ottawa is in the ongoing process of updating its Transportation Master Plan (TMP), which supports the mobility objectives of the Official Plan through a detailed blueprint for the development of the City's transportation network. Part 1 of the updated TMP, containing draft transportation policies, was released in December 2021.

The Ottawa Transportation Master Plan is currently being updated. The 2013 master plan builds upon the previous plans from 2003 and 2008. The plan is part of the *Building a Liveable Ottawa 2031* initiative that includes the completion of a five-year update of the City's Official Plan. The plan outlines the City's vision for planning and developing active transportation, transit and complete streets networks over the next 20 years. It provides support for other plans and strategies such as the Cycling Plan, and the Pedestrian Plan.

Other Guidelines

The following additional City of Ottawa documents were consulted in the development of the NTMS for the areas surrounding the NCD site:

City of Ottawa TDM Strategy (2012) – Noxon Associates Ltd	The 2012 TDM strategy was developed to identify an overall framework and a three-year action plan for the implementation of the city's various TDM programs.
Zoning Bylaw	Sets minimum and maximums for vehicle and bicycle parking based on location and land use in City (e.g. Transit Oriented Developments)
Transportation Impact Assessment (TIA) Guidelines	Ottawa's TIA Guidelines assist land developers and transportation consultants in the preparation of TIA studies, which are a sub-requisite of the City's development approvals process aimed at ensuring consistency of the development with the City's planned transportation network. TDM is a required section of the TIA. TDM Checklist developed by City of Ottawa
2013 Cycling Plan	The 2013 Cycling Plan is an update of the 2009 Cycling plan and was developed as part of the City's Official Plan Update and Transportation Master Plan. The plan provides the vision for cycling in Ottawa and sets objectives for the City to achieve including building and improving the cycling network, and providing supportive operational activities and policies to guide cycling in the region. The City has a target of increasing the city-wide cycling mode share to 5% by 2031. In an effort to meet this target, the City has marked certain roads for building or improving cycling lanes. Carling Avenue, where the current and future site of Civic Hospital are located, is one of those roads. The City plans to build bike lanes on Carling Avenue by 2031[16].

[16] Ottawa Cycling Plan

2013 Pedestrian Plan

Like the Ottawa Cycling Plan, the Pedestrian Plan is part of the City's strategy to improve the walkability of the City and increase the walking mode share by 2031 by improving the pedestrian network and providing supportive policies. The City has divided the pedestrian plan into three phases,

- Phase 1: 2014-2019
- Phase 2: 2020-2025
- Phase: 2026-2031

Improvements to pedestrian networks on Carling Avenue have been marked for phase 2. This includes improvements along Carling to Hindley, Georgina to Carling, and Carling to Woodward[17].

[17] Ottawa Pedestrian Plan

C Maps

Figure C.1: Current Park and Ride Facilities

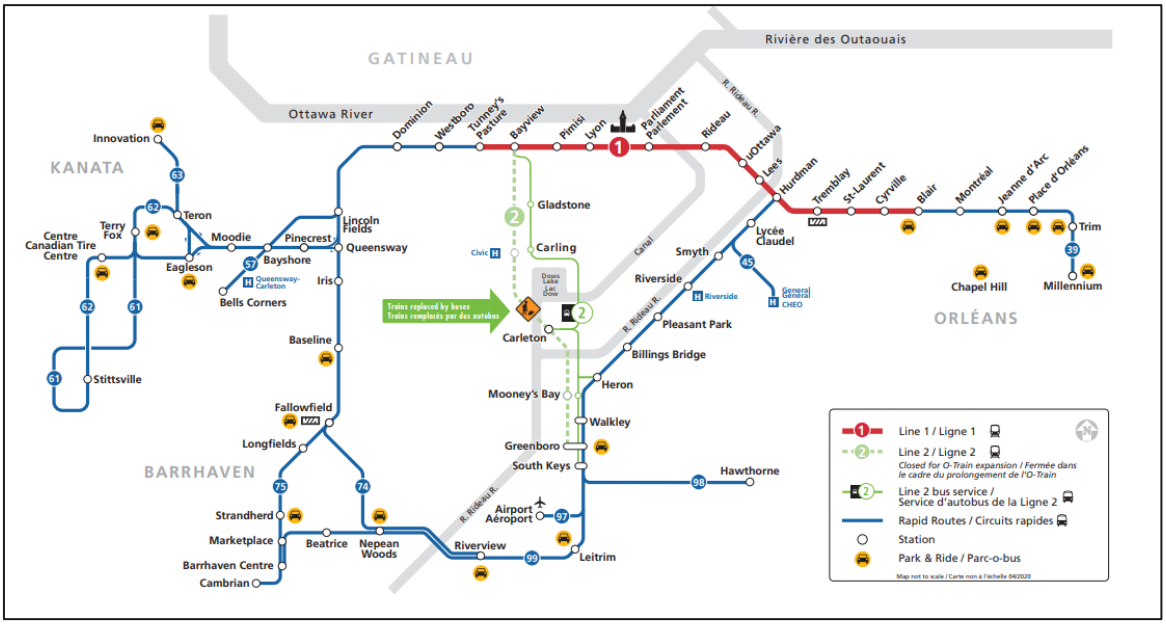


Figure C.2: Future Park and Ride facilities including rural areas

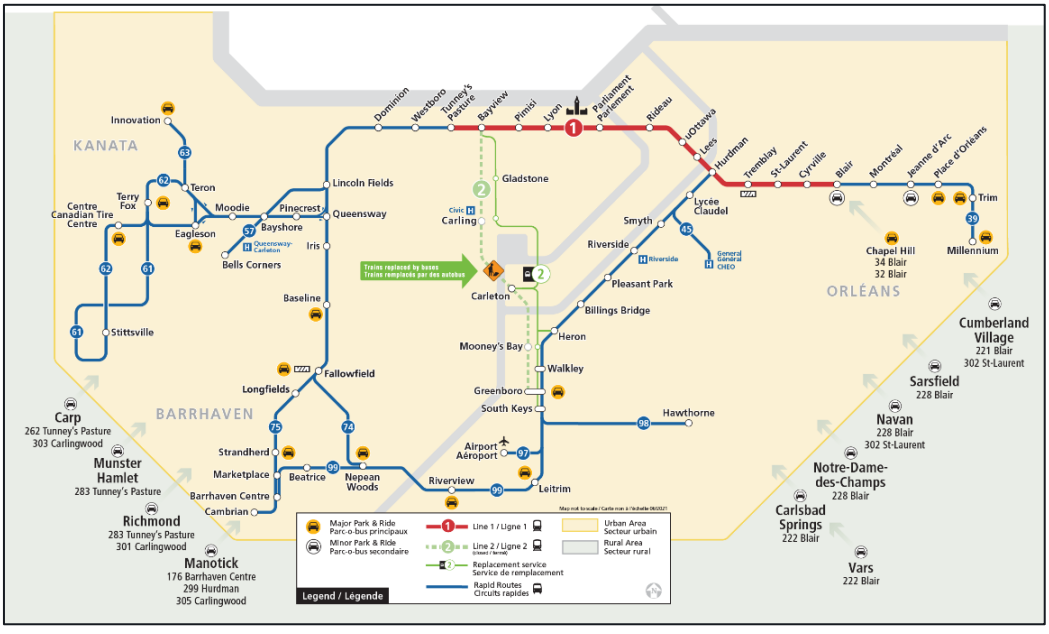


Figure C.3: Future Transit network 2031

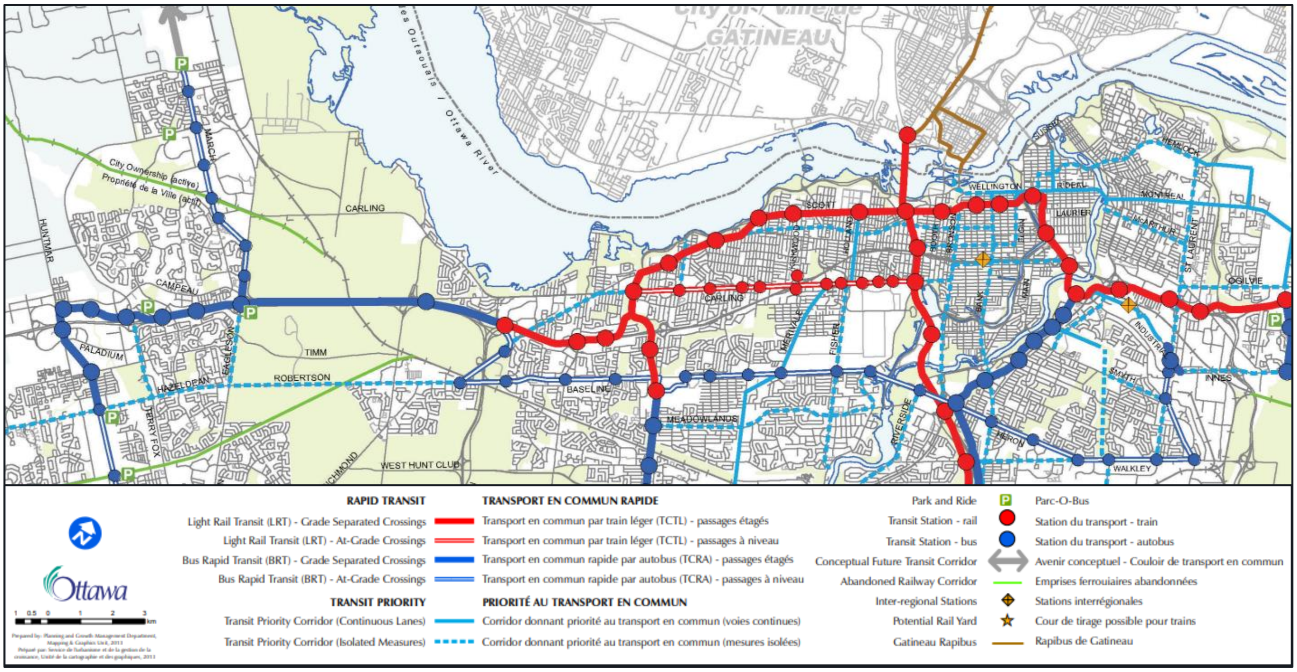


Figure C.4: Future Cycling network 2031

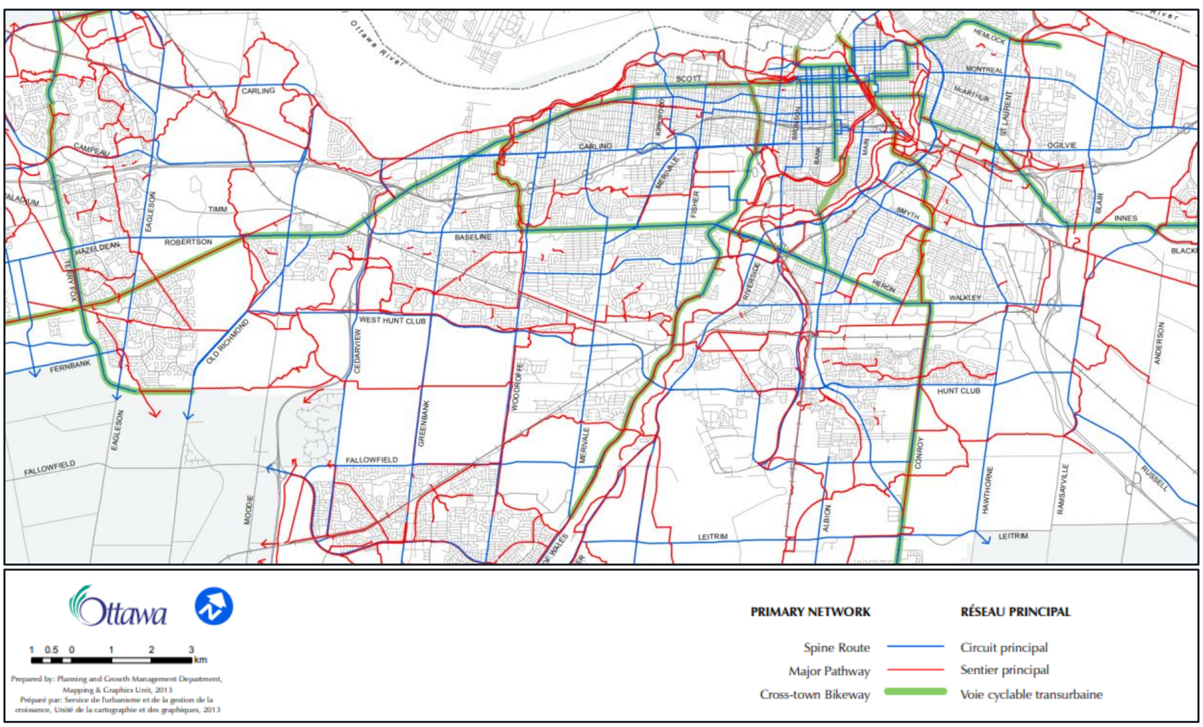
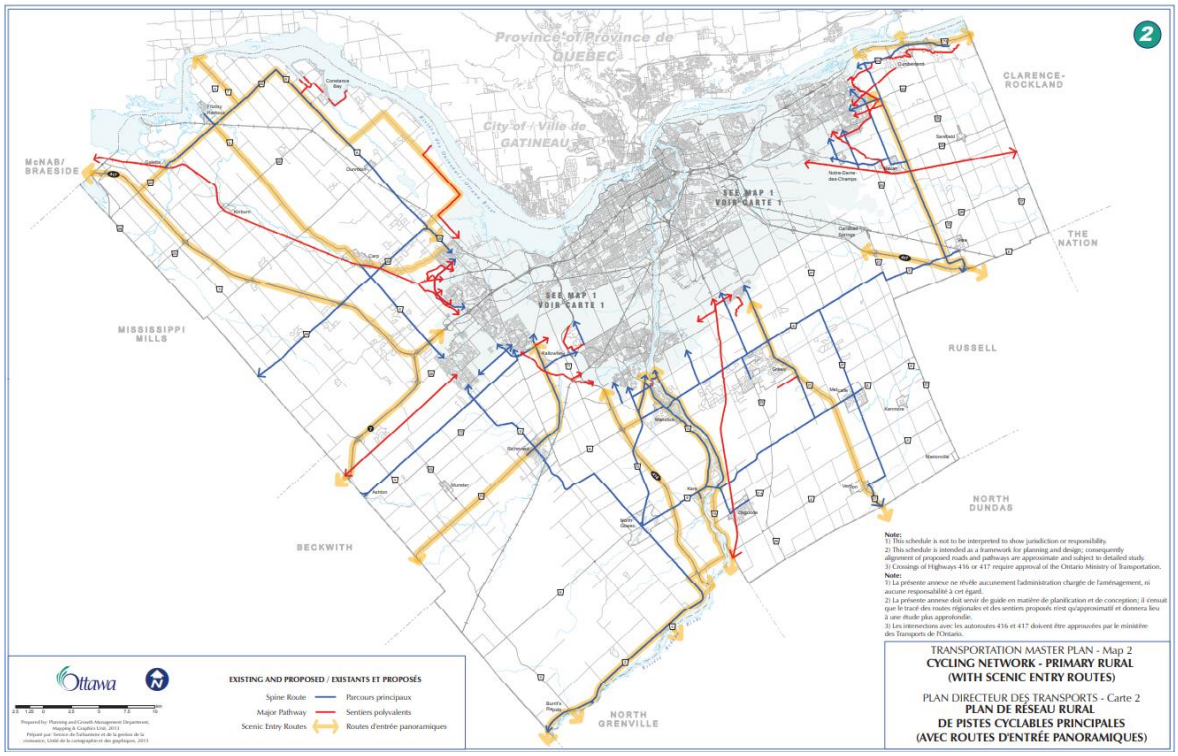


Figure C.5: Future rural cycling network



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