



City of Toronto

**NATHAN PHILLIPS SQUARE DESIGN COMPETITION
TRANSPORTATION STUDY**

FINAL REPORT

SEPTEMBER 2006 (REVISED)



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1. INTRODUCTION

The City of Toronto is launching an open design competition in the fall of 2006 to revitalize Nathan Phillips Square. In preparation for the competition, the City of Toronto commissioned an assessment of transportation elements related to current activities at Nathan Phillips Square and Toronto City Hall.

The objectives of this study are to:

- a) undertake a review and technical analysis of the transportation elements and activities related to the current programs and facilities at City Hall and its immediate environs; and
- b) make recommendations regarding transportation improvements at and around Nathan Phillips Square for consideration in the design completion.

In addition, it is noted that the guiding principles for the Nathan Phillips Square design competition as identified in the City of Toronto staff report of October 26, 2005 included the following principles with direct relevance to the transportation review:

- *“Retain the open and accessible qualities of the space that make it well-used and valued*
- *Improve the pedestrian accessibility of all areas of Nathan Phillips Square and its connections to the surrounding area*
- *Enliven and integrate the City Hall Podium roof, the elevated walkways and the PATH system*
- *Improve the capability of accommodating outdoor performance events in keeping with the overall design*
- *Re-establish Nathan Phillips Square as a pedestrian-only and vehicle-free public space”*

The results of this transportation review will be used as background and input into the design brief to be prepared for participants in the Nathan Phillips Square design competition.

1.1 Site Context

Nathan Phillips Square is located in downtown Toronto and is bounded to the south by Queen Street West, to the east by Bay Street, to the north by Hagerman Street and to the west by Osgoode Hall and the Ontario Superior Court of Justice.

From a transportation perspective, the key features of the site include a parking structure beneath the Square that contains approximately 2,400 parking spaces, the presence of Toronto City Hall on the northern portion of the site that generates a significant amount of employee and visitor trips, and the use of Nathan Phillips Square for special events. The Nathan Phillips Square parking garage is the largest parking facility in downtown Toronto. In addition to creating demand for automobile access, special events and other activities at the Square generate a requirement for truck loading and for access by maintenance vehicles.

Parking garage users include City Hall staff, other commuters and regular visitors to City Hall who are very familiar with the traffic operations. The garage also serves visitors who use the site infrequently, and therefore are less familiar with the access opportunities and operations. The site also accommodates visits by dignitaries, and a significant number of special events. In addition to daytime activity, the Square is also used during the evenings, and on weekends. A profile of existing parking, pedestrian and vehicular activities is provided in Section 2.

2. ACCESS TO SITE FROM TRANSPORTATION NETWORK

This section provides a review of access characteristics under five broad categories:

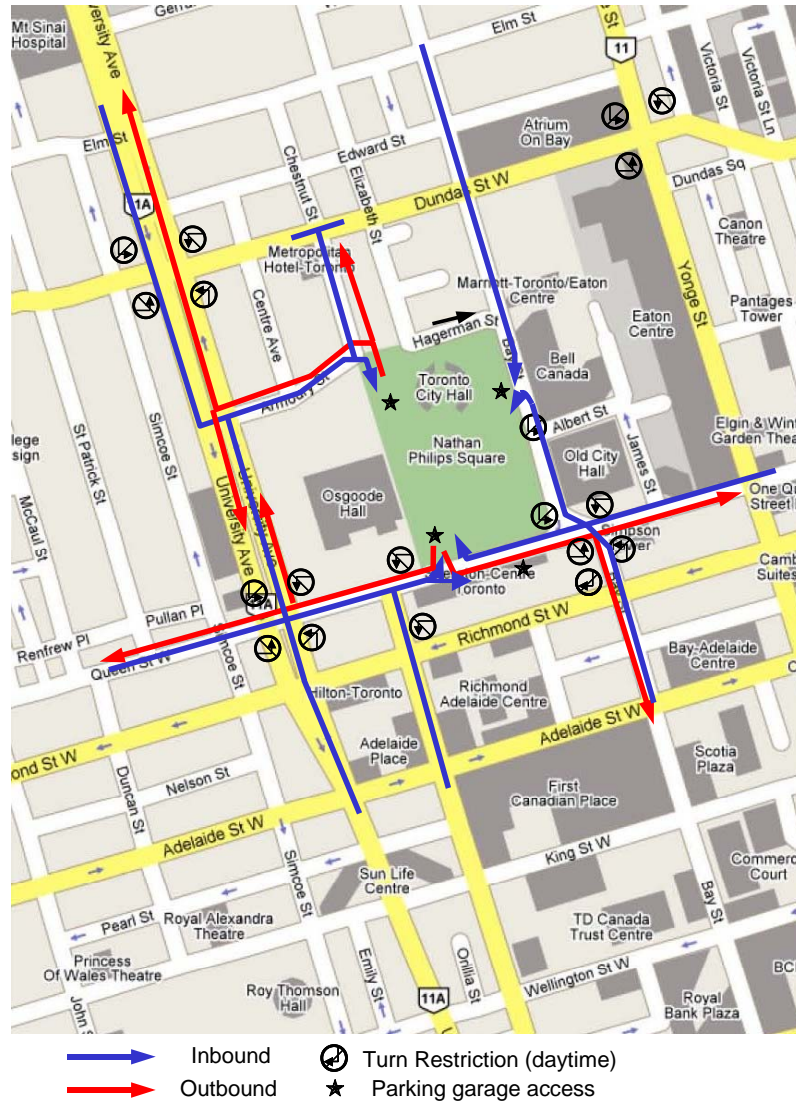
- Vehicle access to and from the parking garage;
- Vehicle access to and from loading areas;
- Pedestrian access;
- Cyclist access; and
- Emergency and other access requirements.

2.1 Vehicle Access to Garage

Queen Street West and Bay Street are classified as major arterial roads, while Chestnut Street and Armoury Street are collector roads that provide a connection to the arterial network at University Avenue and Dundas Street West respectively. Exhibit 2.1 shows how the site can be accessed by vehicle from the adjacent road network. As shown, a number of turn restrictions are in place at adjacent intersections during weekdays, typically from 7am to 7pm. These turn restrictions have an impact on traffic patterns to and from the site.

With the exception of loading and drop-off activities, all vehicle movements to and from the site are related to the underground parking garage. The existing parking garage provides approximately 2,100 parking spaces for the public managed by the Toronto Parking Authority (TPA). Approximately 330 parking spaces are reserved for City of Toronto staff, and approximately 60 parking spaces for councillors and other City officials. The staff and councillor parking areas are not controlled by the TPA. The TPA parking garage also contains a number of maintenance workshops that support the operation of the TPA in the downtown area.

Exhibit 2.1 – Adjacent Road Network



Entry to the parking garage under current conditions can be achieved from one of four entry ramps as numbered on Exhibit 2.2:

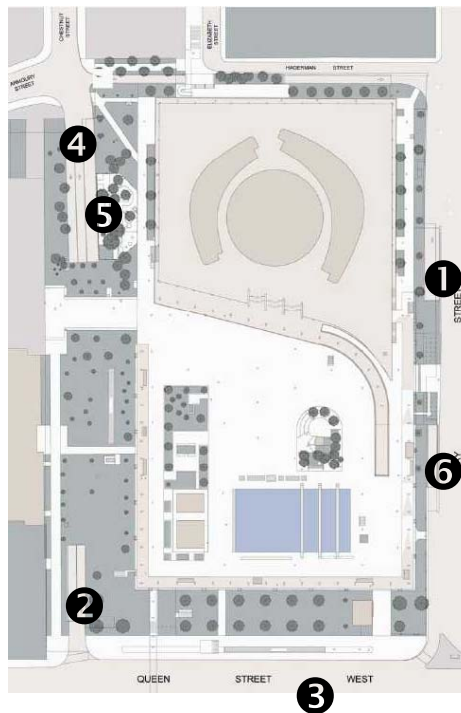
1. Bay Street entry ramp: from southbound Bay Street, also accessible from northbound Bay Street via a U-turn movement;
2. Queen Street West north entry ramp: from eastbound or westbound Queen Street;
3. Queen Street West south entry ramp: from eastbound Queen Street (ramp shared with Sheraton Hotel); and
4. Chestnut Street entry ramp: from either Armoury Street (linking to University Avenue) or Chestnut Street (linking to Dundas Street West).

In addition to the ramps listed above, there are two exit ramps from the garage that are not used for general public access:

5. A single lane ramp from P3 to Chestnut Street: currently used for access to TPA maintenance workshops; and
6. Bay Street exit ramp from P2: used for access to TPA maintenance workshops and back-up access under special circumstances, which may include blockages on other ramps due to construction or stalled vehicles. Stalled vehicles are a concern since excessive queuing within the garage can create serious air quality concerns.

The ramps noted 5 and 6 support TPA’s maintenance workshops that are located in various places within the parking garage. While the ramps do not have sufficient height clearance to permit entry by trucks, the current practice is to park trucks on the ramps and load or unload equipment and materials. Some special purpose vehicles can also use the ramps.

Exhibit 2.2 - Existing Parking Garage Access Ramps



See above text corresponding to numbered ramp

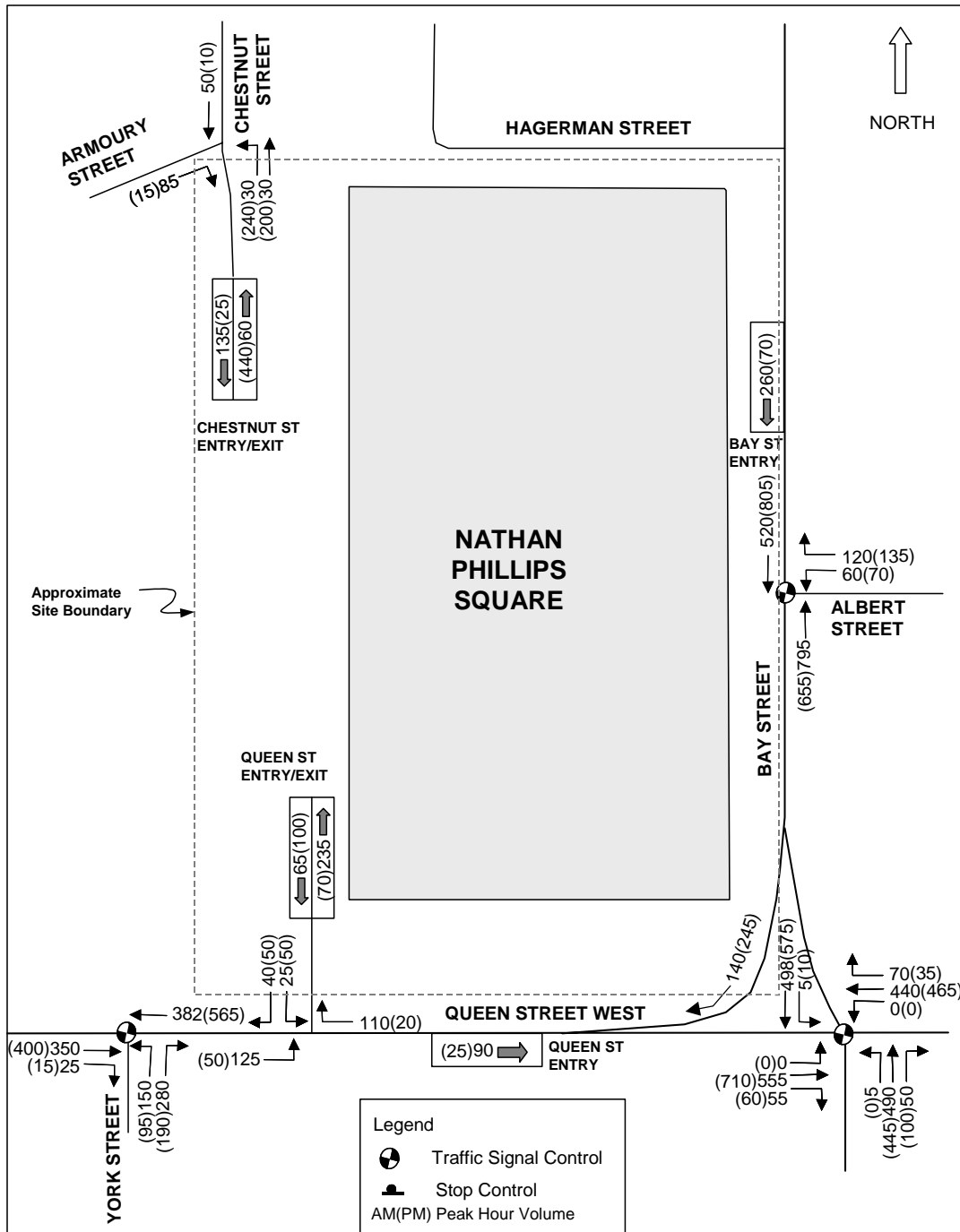
Exit from the garage is by way of two cashier plazas that are connected to the same access running between Chestnut Street and Queen Street West. The intersection of the parking garage access with Chestnut Street and Armoury Street is controlled by an all-way stop. The intersection of the parking garage access roadway with Queen Street West is controlled by a stop sign for vehicles exiting the parking garage.

2.1.1 EXISTING TRAFFIC VOLUMES

Exhibit 2.3 shows the number of vehicles entering and exiting the parking garage and using adjacent intersections during the morning and evening peak hours. In the morning, the highest

volume of traffic entering the site (i.e. garage) was observed to occur from 8:30 a.m. to 9:30 a.m. In the evening, the peak hour of traffic occurred from 4:45 p.m. to 5:45 p.m. and reflects the highest traffic volumes observed leaving the site. These peaks were determined for the site as a whole and there were minor variations by individual entry/exit ramp. The peaks generally correspond to the peak traffic times for the adjacent streets.

Exhibit 2.3 - Existing Traffic Volumes (Typical Weekday)



The volumes shown on Exhibit 2.3 are based on the following sources and dates:

- Turning movements to and from garage accesses are based on manual turning movement counts conducted by IBI Group on June 22, 2006, prior to the summer holiday season. Counts were taken during the hours of 7:30 AM and 9:30 AM, reflecting the morning peak, 12:00 PM – 2:00 PM, reflecting a mid-day peak and 3:30 PM – 6:00 PM reflecting the evening peak. Turning movement counts were verified with data provided by TPA for the public component of the garage.
- Traffic volumes for the adjacent signalized intersections were obtained from the City of Toronto based on the most recent counts available. Count dates were as follows: Queen/Bay (July 2003), Queen/York (Aug 2003), Bay/Hagerman (July 2000) and Bay/Albert (August 2005). Since these counts were not critical to the analysis, no adjustments were made to the counts to reflect the different years.

At the peak hours of operation of the parking garage, 720 vehicles arrived at the garage in the morning peak hour, and 540 vehicles left the garage in the evening peak hour. The total number of automobile trips arriving at and leaving the site in the peak hours is shown in Exhibit 2.4 below.

Exhibit 2.4 – Existing Parking Garage Trip Generation

Peak Hour	Inbound Trips	Outbound Trips	Total Trips
AM Peak (8:30-9:30)	720	130	850
Noon Peak (12:00-1:00)	220	280	500
PM Peak (4:45-5:45)	160	540	700

2.1.2 VARIATION IN DEMAND

Due to the frequency of large events on Nathan Phillips Square, and events in the vicinity such as at the Four Seasons Centre for the Performing Arts, it was considered that there is some potential for special events to influence the parking demand at the Nathan Phillips Square parking garage. To determine the impact of events on parking demand at the Nathan Phillips Square parking garage, data was obtained from the TPA for days on which special events occurred.

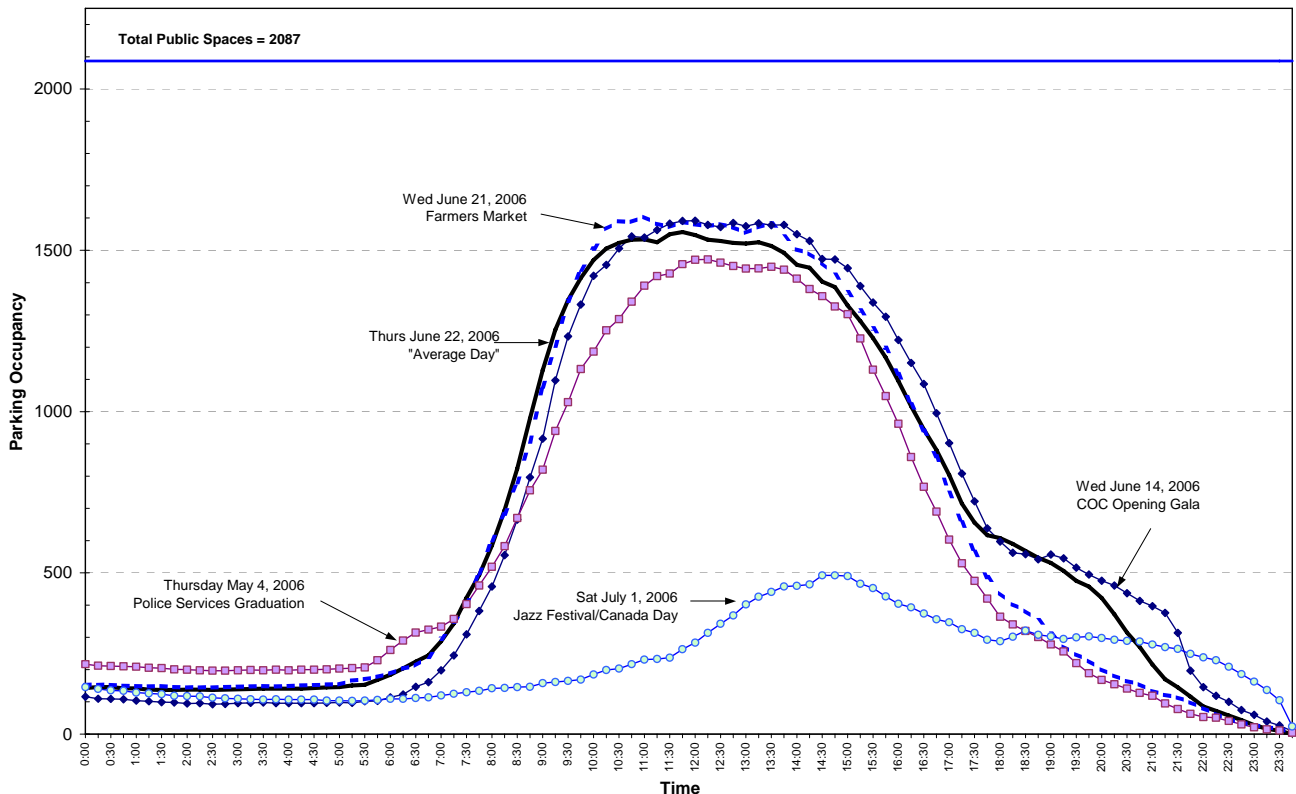
Data was requested for the following dates:

- Wednesday June 14, 2006, Farmer's Market, and Canadian Opera Company opening gala at Four Seasons Centre for the Performing Arts, with associated events on Nathan Phillips Square;
- Wednesday June 21, 2006, Farmer's Market;
- Thursday May 4, 2006, Police Services graduation ceremony: assumed typical small/medium event on Nathan Phillips Square; and
- Saturday July 1, 2006, Jazz festival concert/Canada Day: assumed typical major event on Nathan Phillips Square.

Exhibit 2.5 below shows the variation in parking demand at the Nathan Phillips Square parking garage on the days selected, compared with the parking demand on June 22, 2006, which has been assumed as the typical day for the purposes of the analysis in this report.

On the typical day, the garage had a peak occupancy of 1,600 spaces out of a total of 2,100 public parking spaces, or 76% occupancy.

Exhibit 2.5 – Parking Garage Occupancy Variation - Daily



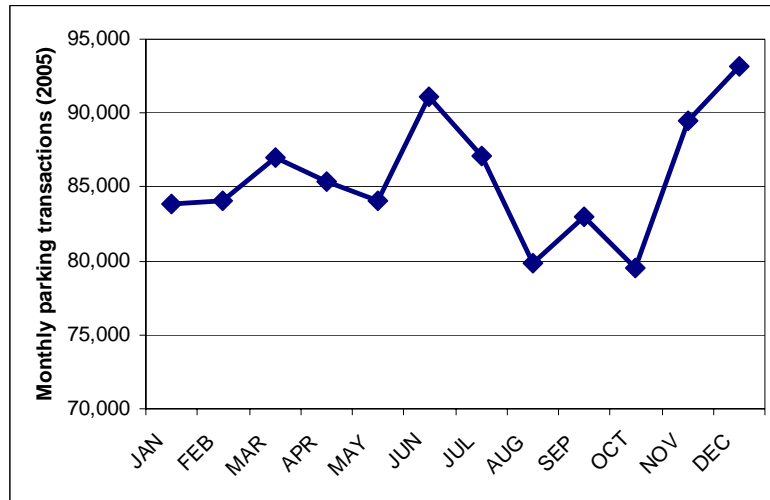
The opening gala at the Four Seasons Centre for the Performing Arts on Wednesday June 14, 2006 appeared to create an increase in parking demand over and above the parking demand evident on the subsequent Wednesday June 21, 2006. The TPA data indicated a peak of 200 vehicles per hour entering the parking garage on June 14, 2006 from 6-7pm, compared with approximately 90 entering vehicles on June 21, 2006. A peak of 260 exiting vehicles per hour was noted between 9-10pm.

While no events were listed on Nathan Phillips Square for June 22, 2006 (when the manual turning movement counts were undertaken), the TPA data shows a similar but less pronounced evening parking demand pattern. This coincided with the premier ballet performance at the Four Seasons Centre for the Performing Arts.

While the Canada Day/Jazz Festival concert on Saturday July 1 was a significant event, data from the TPA indicates a peak parking occupancy of approximately 500 vehicles, and consequently low peak hour entry and exit volumes compared with the weekday data.

Parking demand also varies on a monthly basis, with the highest number of public parking transactions per month in 2005 occurring in June, November and December. Monthly parking transaction data supplied by TPA is shown in Exhibit 2.6 below.

Exhibit 2.6 – Parking Garage Occupancy Variation- Monthly (2005)



Based on a review of the above data, it is concluded that the peak entry and exit volumes counted on June 22, 2006 are representative of typical weekday peak conditions, and are significantly greater than the volumes recorded during a large weekend event. The June 22, 2006 traffic counts are therefore considered suitable for use as a base for analysis.

2.1.3 ESTIMATED GARAGE CAPACITY

Prior to making any changes to the transportation access system to the City Hall parking facility, it is important to quantify the extent to which there is surplus capacity, if any.

In order to be conservative, a 10% increase was applied the existing turning movement counts in order to examine the available capacity of the garage. This increase is reflective of the potential increase that is expected to occur when the Bay Adelaide Centre (a major downtown office building) is constructed. The resulting calculated future inbound and outbound trips are shown in Exhibit 2.7 below.

Exhibit 2.7 - Future Parking Garage Trip Generation

Peak Hour	Inbound Trips	Outbound Trips	Total Trips
AM Peak	790	140	930
Noon Peak	240	310	350
PM Peak	180	590	770

The future peak hour trip generation is compared against the theoretical capacity of the access points to and from the parking garage in Exhibit 2.8 below. Garage capacity is based on two factors:

- the capacity of the processing facilities (i.e. ticket machines/card readers on entry and attendant booths/card readers on exit); and,
- the capacity of the ramps themselves, which are influenced by the conditions of access to/from the adjacent streets.

Processing capacities are based on typical industry-accepted values¹, with adjustments to reflect the mix of access technologies at the City Hall garage. For example, the Queen/Chestnut access includes proximity card readers, credit card readers and attendants. Basic values of 300 vehicles per entry lane and 200 vehicles per exit lane were assumed. For the Bay Street entry, which includes a ticket machine for the public access and a proximity card reader for staff, a combined process capacity of 450 was used.

For ramps, a basic capacity of 600 vehicles per hour was used as the basic capacity. For the Queen Street south side ramp, this was reduced to 450 vehicles per hour to reflect the narrow ramp width. Similarly, the capacity of the Queen Street West (north side) ramp was reduced to 300 vehicles/hr inbound and 200 vehicles outbound to reflect the fact that vehicles must wait for gaps in traffic on Queen Street.

In determining the actual garage access capacity, the lower of the ramp and processing capacity was taken.

Exhibit 2.8 – Parking Garage Trip Generation and Capacity

Ramp	Processing Capacity		Ramp Capacity		Critical Capacity		Peak Hour Demand		Volume/ Capacity	
	In	Out	In	Out	In	Out	In	Out	In	Out
Bay Street Entry	450		600		450		290		64%	
Queen St (South Side)	300		450		300		100		33%	
Queen St (North Side) - ramp	-	-	300	200	300	200	260	110	87%	55%
Chestnut Street - ramp	-	-	600	600	600	600	150	480	25%	80%
Queen/Chestnut processing*	600	1200	-		600	1200	410	590	68%	49%
Garage Total					1350	800	800	590	59%	74%
Potential residual capacity									550	210

* There are two processing facilities on the west side that have access to/from both the Queen Street and Chestnut Street

The above exhibit indicates a theoretical residual capacity for future peak hour arrivals in the morning of approximately 550 vehicles, and a theoretical residual capacity for future peak hour departures in the evening of approximately 210 vehicles. This does not include the Bay Street exit ramp or Chestnut ramp from P3 which are not in regular use.

Based on the analysis, it is concluded that there may be some flexibility to close or modify existing entry ramps, but that there is a limited capacity to close or modify existing exit ramps that are currently open.

¹ Weant, R., Levinson, H., Parking, Eno Foundation for Transportation, 1990

2.2 Truck Loading Access

Loading for special events on Nathan Phillips Square takes place on a paved loading area southwest of City Hall that is accessed via Osgoode Lane. Access to Osgoode Lane from Queen Street West is controlled by a security gate at which vehicles must receive clearance from the security desk within City Hall before being allowed entry. Osgoode Lane runs approximately 100 metres north from Queen Street West to the paved loading area and is approximately four metres wide, which is insufficient to provide for two-way traffic movement.

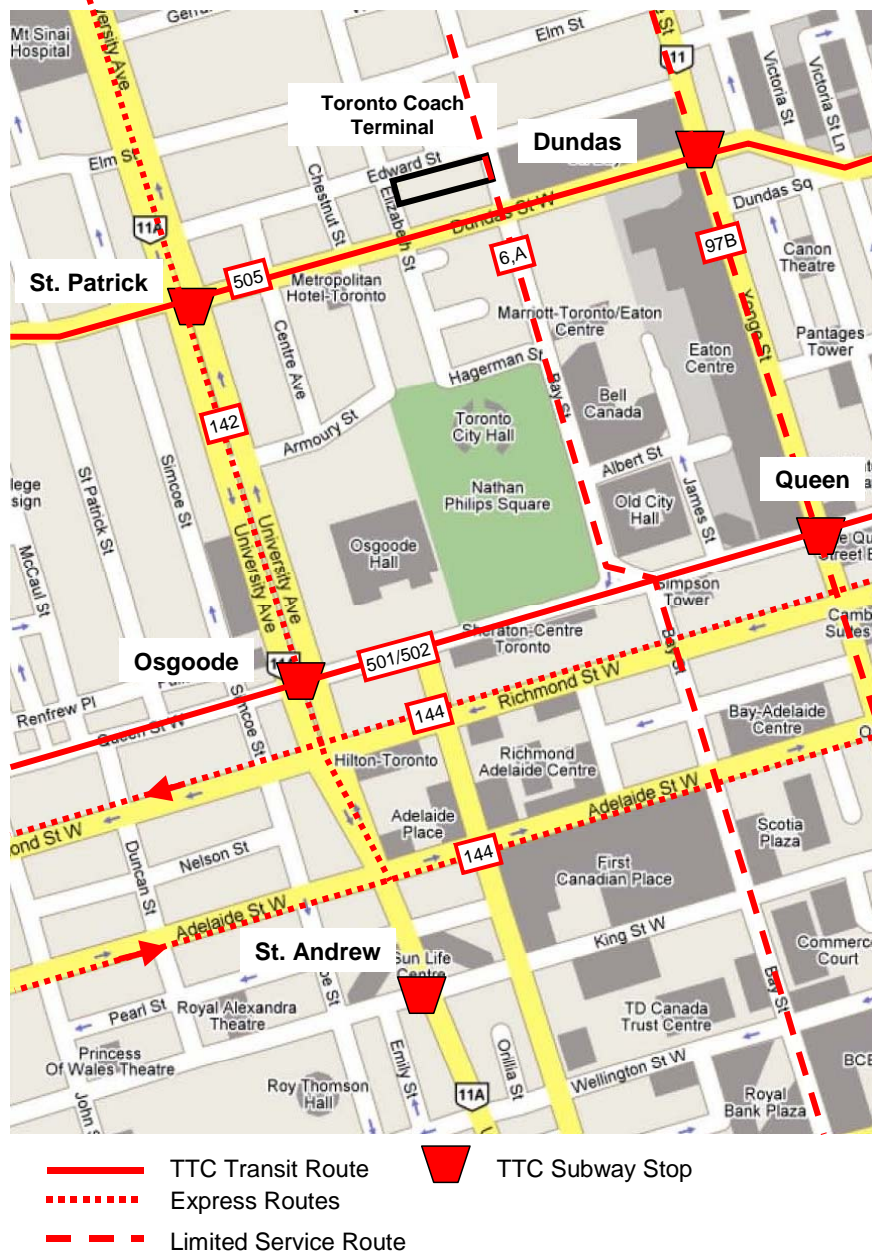
The structural capacity of the Square currently limits truck sizes. Any trucks in excess of the limit must unload from the loading area and use a forklift or other means to transfer materials to the Square. Vehicles less than the limit are able to drive onto the Square from the loading area, although security clearance is required to unlock the gate leading from the loading area to the Square, and the City's policy for vehicles on the Square requires a walking attendant to accompany the vehicle as it moves on the Square. It is understood that Special Events staff advise organizations staging activities on Nathan Phillips Square that material should be brought in on trucks weighing less than the weight limit whenever possible. Current policy also requires that applicants for a special event license for Nathan Phillips Square provide the City with a list of all vehicles that require access to the Square via Osgoode Lane, and the times at which access is required.

City Hall has separate below-grade loading docks entered from a one-way ramp from Chestnut Street down to the loading docks, and exited via the same one-way ramp through to Bay Street. Access to the City Hall loading docks is controlled by a security gate at the top of the ramps at Chestnut Street and Bay Street, and a set of roller doors on each side of the loading dock area that are closed overnight.

2.3 Transit Access

As shown on Exhibit 2.9 on the following page, the Toronto Transit Commission (TTC) provides a number of transit services in the vicinity of Nathan Phillips Square, including the 501/502 Queen and Downtowner streetcars on Queen Street, the 6 Bay bus on Bay Street, the 505 Dundas streetcar on Dundas Street, and connections to the Yonge-University-Spadina subway line at Osgoode, Queen, Dundas and St. Patrick Stations. The Toronto Coach terminal is located on the west side of Bay Street north of Dundas Street and serves as a departure and arrival terminal for a range of long distance motor coach services such as Greyhound and Coach Canada.

Exhibit 2.9 – TTC routes in vicinity of Nathan Phillips Square



Only the southbound 6 Bay bus has transit stops located directly on the frontage of Nathan Phillips Square, with stops on the west side of Bay Street at Albert Street and Queen Street West. As a result, most people using the TTC to travel to and from Nathan Phillips Square and City Hall must walk from the nearest transit stop or subway station. These stops and the number of daily riders boarding and exiting the surface transit routes in the vicinity of Nathan Phillips Square are shown on Exhibit 2.10 in the following section.

A designated Wheel-Trans pick-up and drop-off point is provided at the north side of City Hall, at the intersection of Elizabeth and Hagerman Streets. Ramp access is provided from Hagerman

Street to City Hall, and a waiting facility is provided on the north side of the City Hall with clear views to the Wheel-Trans loading area.

2.4 Pedestrian Access

2.4.1 GENERAL

A continuous sidewalk runs along Queen Street West on the south side of Nathan Phillips Square, providing access to the Square at several points, and to TTC stops and subway stations to the east and west along Queen Street. Pedestrian crossings on Queen Street West are provided at the signalized intersections of Queen Street/York Street and Queen Street/Bay Street.

There is no continuous sidewalk on the west side of Bay Street along Nathan Phillips Square, and the pedestrian route is provided within the Square itself, just west of the elevated walkway. Pedestrian crossings on Bay Street are provided at the signalized intersections of Bay Street/Queen Street and Bay Street/Albert Street, and at a signalized pedestrian crossing north of Hagerman Street.

From the north, pedestrian access is restricted by the presence of the ramps to and from the City Hall loading dock. Pedestrian access is only possible at Bay Street, from the intersection of Hagerman Street and Elizabeth Street, and from Chestnut Street. From the west, pedestrian access is possible at Queen Street, from Osgoode Hall, via a walkway through the Superior Court property and from Armoury Street.

Exhibit 2.10 below shows the pedestrian volumes available from City traffic count data, supplemented by additional surveys where required, and shown alongside vehicle volumes where pedestrian and vehicle paths cross. The number of daily riders getting on and off TTC's surface transit routes at adjacent stops is also shown on the exhibit.

It is interesting to note that pedestrian volumes are higher than vehicle volumes in many locations. For example, in the p.m. peak hour, there are 700 pedestrians crossing the sidewalk in front of the Queen Street West garage access on the north side of Queen Street, and approximately 565 westbound vehicles on Queen Street. This suggests that there may be a need to rebalance the available right-of-way space to favour pedestrians.

2.4.2 ACCESS FROM PATH SYSTEM

Nathan Phillips Square and City Hall are connected to the City's PATH system, an extensive underground pedestrian network connecting buildings in the downtown area. The PATH network in the vicinity of Nathan Phillips Square is shown on Exhibit 2.11 below. The TTC's Queen and Dundas Stations are linked via the PATH system as far as the Bell Trinity Square complex at the intersection of Bay Street and Albert Street, and this route is popular with City Hall staff. There are currently no direct PATH connections from the St. Patrick or the Osgoode subway stations to City Hall. The only direct PATH connection to Nathan Phillips Square and City Hall is via the underground garage to the Sheraton Centre, which in turn links to the wider PATH network to the south and to the east.

Exhibit 2.10 – Pedestrian volumes in vicinity of Nathan Phillips Square

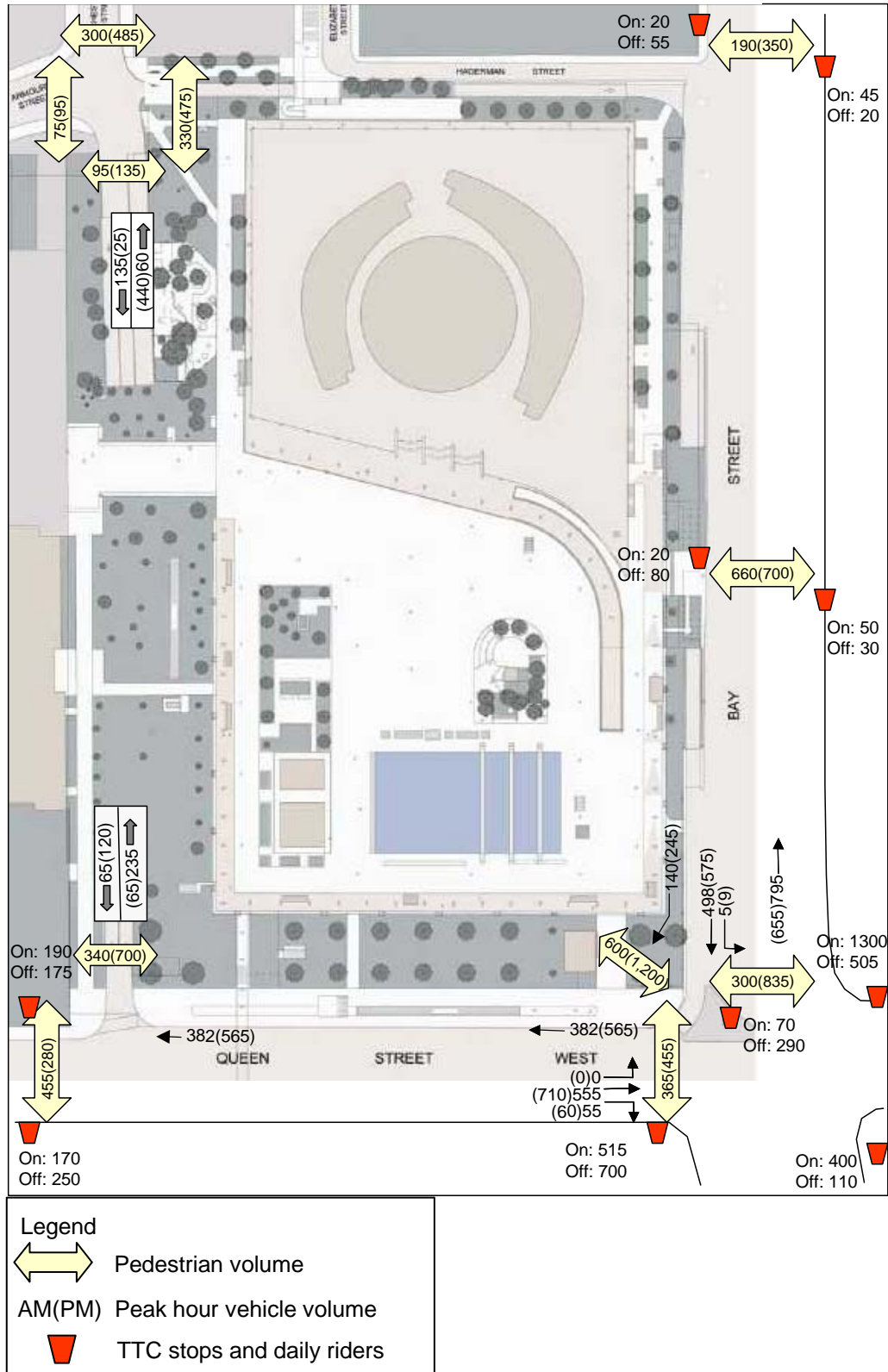
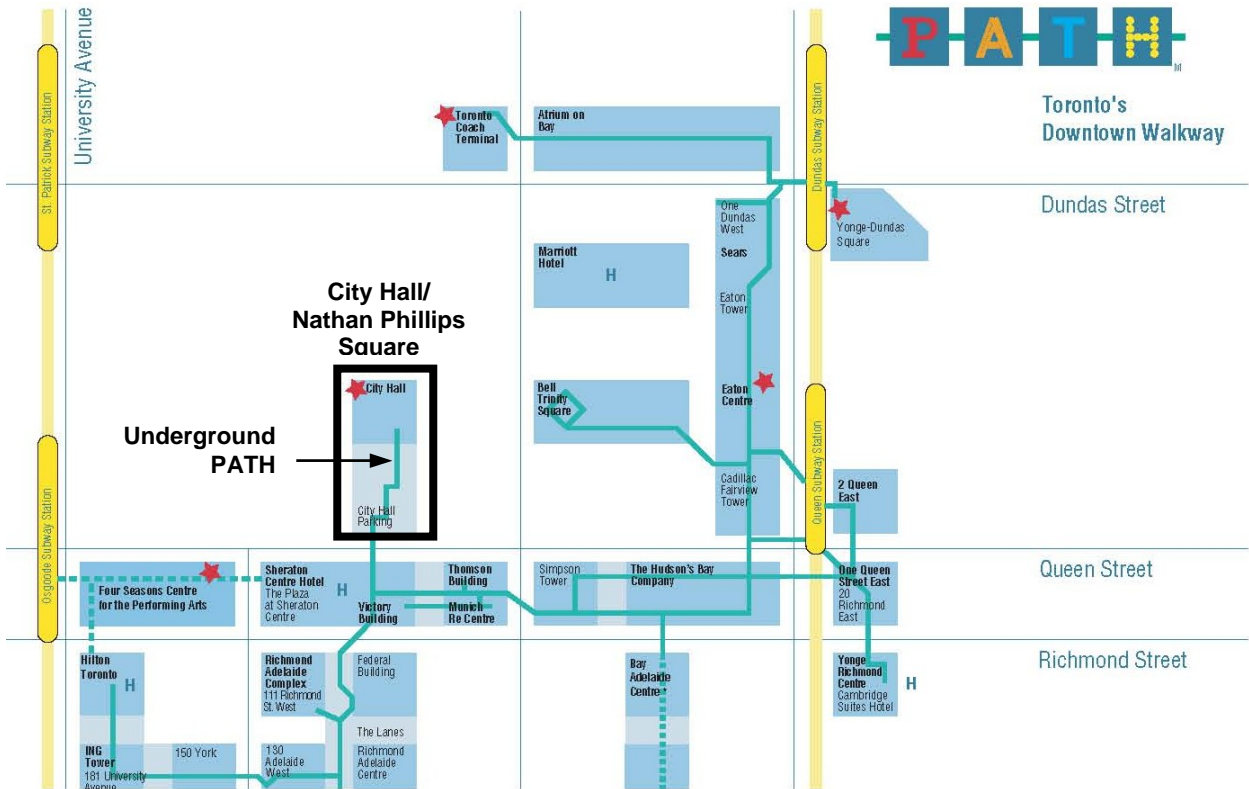


Exhibit 2.11 – PATH network in vicinity of Nathan Phillips Square



Underground PATH through Parking Garage



Elevated walkway from Sheraton

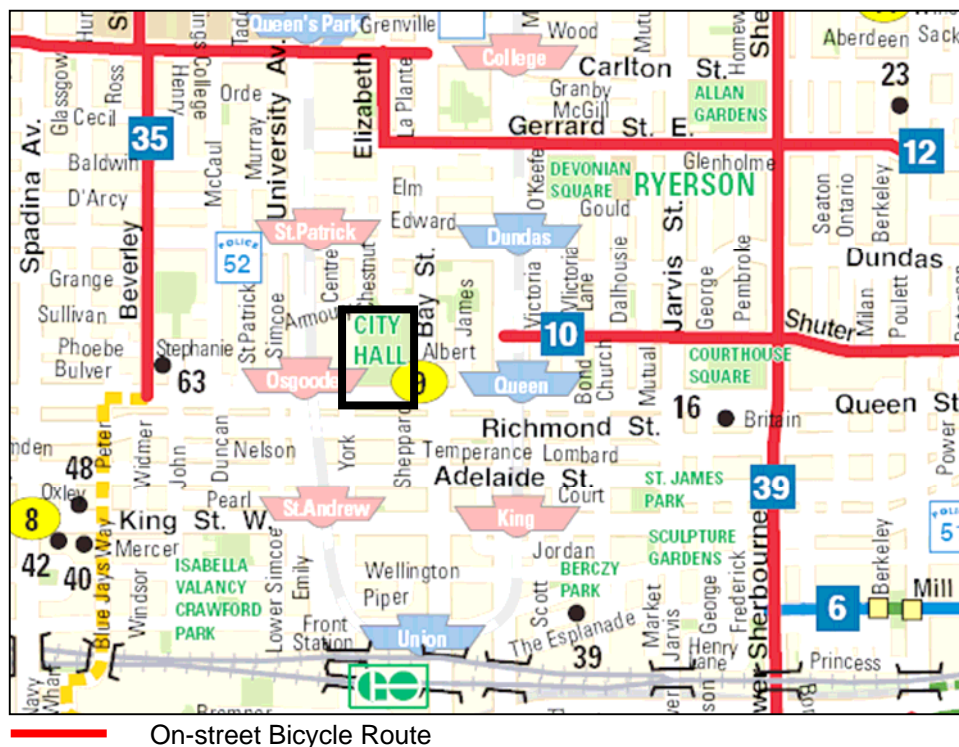
In addition to the surface and PATH routes, elevated walkways exist around the Square. The elevated walkway extends around the east, south and west sides of the square, from approximately Albert Street southward. None of the elevated walkways connect into City Hall. The walkway along the west of the square terminates about 20 metres short of the southwest corner of the building. A sloped ramp provides access from the Square level to the podium level on the east side of the Square, but this connection has been locked for a number of years.

Two connections are provided from the Square to external buildings, one from City Hall to the University of Toronto Residence on Elizabeth Street and one over Queen Street West to the Sheraton Hotel. Gates for these facilities have also been locked for some time.

2.5 Cyclist Access and Parking

With the exception of the Bay Street Urban Clearway, there are no City of Toronto bike routes that provide direct connections to Nathan Phillips Square. The Bay Street urban clearway comprises the curb lanes of Bay Street from Bloor Street to Front Street and is designated for use by bikes, buses and taxis. Bike routes in the vicinity of Nathan Phillips Square are shown on Exhibit 2.12 below.

Exhibit 2.12 – Bicycle route network in vicinity of Nathan Phillips Square



Bicycle parking is provided in a number of locations and a variety of ways on Nathan Phillips Square and in the parking garage. Bike racks and storage lockers are provided on the north side of City Hall. There is presently parking for approximately 25 bicycles on bike racks and 16 lockers. The City launched a Bicycle Locker Pilot Project in July 2006 that provides enclosed bicycle parking lockers for improved protection from theft, vandalism and weather in key locations around the city, including north of Toronto City Hall. Members of the public can rent the bicycle lockers for \$10 (+GST) per month for a minimum four-month term.

In the underground parking garage, parking for approximately 50 bicycles is provided on P1 near the entrance to City Hall. Access to these bicycle parking spaces is from the Bay Street entrance ramp to the parking garage, which may be a deterrent to some potential users. Alternatively, cyclists may use the stairs to the garage, again a potential deterrent.

On the east side of Nathan Phillips Square, just west of the Bay Street/Albert Street intersection, parking for approximately 20 bicycles is provided, along with a Bikeshare hub with parking for four Bikeshare bikes. Bikeshare provides members with access to a fleet of bicycles, available at a number of hubs located in downtown Toronto, including Nathan Phillips Square. Bikeshare members can sign out a bike from one of several hubs in the downtown area, use the bike for up to three days at a time, and return it to their choice of hub location.

2.6 Emergency Access and Other Considerations

Emergency access

Emergency vehicles make use of adjacent streets since the structural capacity of the Square currently limits truck sizes. Access to the square for ambulances can occur via Queen Street, Bay Street, Chestnut Street or Osgoode Lane, depending on the location and type of incident.

Accessible parking and loading

In addition to designated accessible parking spaces within the Nathan Phillips Square parking garage, and the designated Wheel-Trans loading zone on Hagerman Street, an on-street loading zone for disabled persons is designated on Bay Street south of Hagerman Street. The loading zone is intended for vehicles displaying a valid disabled persons parking permit to stop while picking up or dropping off a disabled person. A shelter and a wheelchair ramp are provided on the west side of Bay Street at this location.

Tour buses and vending on Queen Street West

Due to the unique design of City Hall and the nature of Nathan Phillips Square as a tourist attraction, there is a demand for tour bus parking while tourists are unloaded for photo opportunities and participation in Square events. Westbound Queen Street along the frontage of Nathan Phillips Square provides two traffic lanes and a wide lay-by that is used for tour bus loading and for licensed food vendor trucks.

Changes to on-street parking by-laws were made in April 2006 to allow buses to park in an area formerly designated as a motor coach loading area in which no standing was permitted, i.e. buses could pick up and drop off passengers but could not park. The section of Queen Street from Bay Street to York Street accommodates 5 vendors trucks and 4-5 tour buses on the north side of Queen Street West along the Nathan Phillips Square frontage. Two sections of 41.5 metres and 33.0 metres length were created to allow 60 minute bus parking on Queen Street.

Daycare pick-up/drop-off

An area for approximately five cars is provided on the west side of Bay Street between Hagerman Street and the entrance to the TPA garage. Two zones are signed for use as a daycare pick-up/drop-off area, and 15 minute parking between 7:30-10:00 am and 4:00-6:00 pm is permitted.

Additional daycare drop-off/pick-up parking spaces are provided on the P1 level of the staff parking area, although card access is required.

3. ASSESSMENT OF ACCESS OPERATIONS

Operational issues at access points to Nathan Phillips Square are reviewed under four key headings:

- Loading access;
- Queen Street West frontage (including Queen Street parking garage access/Osgoode Lane, and Bay/Queen intersection);
- Bay Street frontage; and
- Chestnut Street access.

3.1 Truck Loading Access

3.1.1 OSGOODE LANE

The primary issue with the existing access to Osgoode Lane for trucks is that access to the lane crosses a busy pedestrian route along Queen Street West and truck movements conflict with pedestrians on Queen Street and also pedestrians accessing Nathan Phillips Square via Osgoode Hall.

The weight restriction on Nathan Phillips Square is a further issue, and without structural work to strengthen the Square, a staging area for loading will continue to be required in the future.

Another issue with the existing loading access using Osgoode Lane is that the access is too narrow for two-way operation. During busy events, control is often required at both ends of Osgoode Lane to prevent two vehicles driving in opposing directions meeting in the lane. When such control is required due to high loading demands, special events staff perform this function manually using a staff member with a two-way radio at each end of the lane to instruct one approaching vehicle to wait until the lane is clear.

Deliveries to Osgoode Hall are permitted to use Osgoode Lane through an agreement with the City of Toronto. However, trucks occasionally block the lane while unloading and, because of the one-lane nature of Osgoode Lane, prevent all access to and from Nathan Phillips Square during those times.

An additional problem occurs when trucks or other vehicles attempting to gain access to Osgoode Hall are denied access and must reverse across the Queen Street sidewalk. This occurs relatively infrequently and only when unauthorized vehicles arrive, such as a delivery driver arriving at the wrong location, but the resulting conflicts between reversing trucks and pedestrians are highly undesirable.

The design competition presents a significant opportunity to improve access to surface loading for Nathan Phillips Square while reducing pedestrian conflicts, in particular, by closing the Osgoode Lane access and replacing it with a new access from Chestnut Street.

This major undertaking is discussed further in Chapter 4.

3.1.2 CITY HALL LOADING ACCESS

The opportunity to make significant changes to the City Hall loading dock and ramps is limited.

Overall, the City Hall Loading access functions well and is not a major area of concern.

3.2 Queen Street West Frontage

Observations made at the site and comments made by stakeholders have identified a number of issues related to traffic operations on the Queen Street West frontage of Nathan Phillips Square. In addition to visual observations, data on collision for the three year period ending December 31, 2005 was reviewed to determine whether there was any collision experience that indicated existing traffic safety problems at the garage access points and at the key pedestrian entrances to Nathan Phillips Square.

For the portion of Queen Street West from York Street to Bay Street, a total of 31 collisions were reported in the three year period, including six collisions that resulted in injury. The most common type of collision was sideswipe (9), followed by turning movements (7), collisions involving cyclists (6), and collisions involving pedestrians (3). Where apparent driver action was listed in the collision reports, failure to yield right of way, improper lane change, improper turn and improper passing accounted for most of the injury collisions. The number of existing collisions involving U-turns and lane changes suggests that improvements to the Queen Street West may be warranted.

3.2.1 QUEEN STREET WEST GARAGE ACCESS

At the west end of the Queen Street West frontage, the area including the parking garage access and the access to Osgoode Lane was identified as being of particular concern. The proximity of the parking access to Osgoode Lane exacerbates the conflict that would be created by the parking access only.

Under unsignalized traffic control, the Queen Street West parking access intersection does not give any priority to vehicles turning to and from the parking access. This leads some drivers to be aggressive in order to make their turn. In particular, eastbound drivers wishing to turn left into the parking access were observed to be watching oncoming traffic to select a gap in which to make the left turn and are often not paying full attention to pedestrians crossing in front of the parking access. In this situation, conflict can occur and either the turning vehicle or pedestrians on Queen Street must stop to avoid a collision.

During normal weekday traffic, westbound queues often form at the intersection of Queen Street West and York Street and can extend back to block the parking access. When this occurs, drivers wishing to turn left to or from the parking garage try to turn through the queued vehicles, which creates additional conflict and can limit driver's views of pedestrians crossing the access. In addition, drivers waiting to make a left turn into or out of the parking garage can block the eastbound or westbound streetcar tracks on Queen Street and cause delays to streetcar operations.

In the vicinity of both the parking garage and Osgoode Lane access, the curbs are low and can be easily driven over by vehicles, resulting in the sidewalk and boulevard area fronting on this part of Queen Street being frequently used for short-term parking, pick-up/drop-off and turns/U-turns. Vehicles making these manoeuvres appear to be attempting to pull off Queen Street out of the way of vehicular traffic, resulting in these vehicles blocking the sidewalk. This creates a poor pedestrian environment and pedestrian conflicts.



Taxi dropping off passenger on sidewalk



Pick-up truck reversing while making turn

For westbound traffic making a right turn into the parking access, the curb radius is relatively generous and allows higher speed entries. Observations during morning peak hour operations indicted a number of drivers making this right turn manoeuvre at speeds that are not considered appropriate given the volume of pedestrians crossing the access. Observations also indicated that vehicles parked illegally on Queen Street just east of the parking garage access can block westbound sight lines between drivers and pedestrians.

There is a significant need to improve pedestrian conditions around the Queen Street garage access including reducing conflicts between pedestrians and turning vehicles, and eliminating the unacceptable practice where by cars and other vehicles use the sidewalk area as a drop-off zone.

3.2.2 WESTBOUND CURB LANE

The primary issue with the westbound curb lane and adjacent lanes is the lack separation or distinction between travel lanes and parking areas. For example, when buses are not parked in the curb lane, westbound vehicles often use portions of this lane as a right turn lane, or for passing cars in the westbound queue. Cars often overtake cyclists on the right to access the parking garage.

Observations of parking activity on the westbound curb lane on the Queen Street West frontage identified a significant amount of illegal parking activity, in part due to the width of the existing lay-by and curb lane. Vehicles can double-park without significantly impacting traffic flow on Queen Street. It is understood that the food vendor trucks may be removed from Queen Street and replaced with on-site food services, which will free up additional area for tour buses. Given the attractiveness of a Queen Street drop-off for tour buses, it is expected that tour bus operators will continue to gravitate towards the Queen Street West frontage of Nathan Phillips Square for photo

opportunities for passengers. Eliminating tour buses completely from Queen Street would be difficult.

Both of the above problems reduce the attractiveness of Queen Street West from a pedestrian and cyclist perspective.

Options to improve the environment for pedestrians and cyclists along the Queen Street sidewalk, in addition to better defining the bus loading areas, should be considered as part of the design competition. As discussed in the next chapter, this could be achieved by extending the sidewalk into Queen Street through the use of “bump-outs” (i.e. curb extensions).



Tour bus activity on Queen Street West



Tour bus activity on Queen Street West

3.2.3 QUEEN STREET AND BAY STREET INTERSECTION

At the east end of the Queen Street West frontage, a southbound right turn slip lane runs from Bay Street to Queen Street, and the pedestrian route along the north side of Queen Street crosses the right turn lane to a traffic island before crossing Bay Street. The approach to the southbound right turn lane is relatively wide and can allow vehicles to enter the turn lane at relatively high speeds.



Pedestrians crossing southbound right turn lane



Southbound approach to right turn lane

While the pedestrian crossing is uncontrolled, high pedestrian volumes during lunchtime and the evening peak hour in particular were observed to restrict the vehicular movement. Once past the marked crosswalk area, vehicles were observed to wait to enter the westbound traffic stream on Queen Street West and often queued back across the crosswalk, forcing pedestrians to walk around vehicles in order to cross. Overall, when high numbers of pedestrians are present, the crosswalk was observed to operate reasonably well for pedestrians. This is not the case when pedestrian volumes are low.

The most direct method of reducing pedestrian vehicle conflicts at this location would be to simply close the right turn lane and extend the sidewalk to join with the existing traffic island. If the southbound right turn lane were to be fully closed, existing peak hour traffic counts indicate a need to re-route approximately 250 right turning vehicles per hour to other intersections. As previously shown on Exhibit 2.1, existing turn restrictions at adjacent intersections limit the opportunity to provide for these right turns in the immediate vicinity. If the right turn were to be removed, it is likely that an existing right turn ban at the intersection of Bay Street with Richmond Street would have to be removed. However, this would create adverse impacts at that location, such as delays to southbound buses in the Bay Street Urban Clearway, and conflicts with the high number of pedestrians crossing Richmond Street at Bay Street.

Considering the implications of completely closing the southbound right turn lane on Bay Street, measures such as reducing the width or tightening the radius for the southbound right turn should be considered in order to reduce vehicle speeds and the potential for conflict. Sufficient turning radii would need to be maintained for tour buses and other large vehicles consistent with City of Toronto Road Design practices.

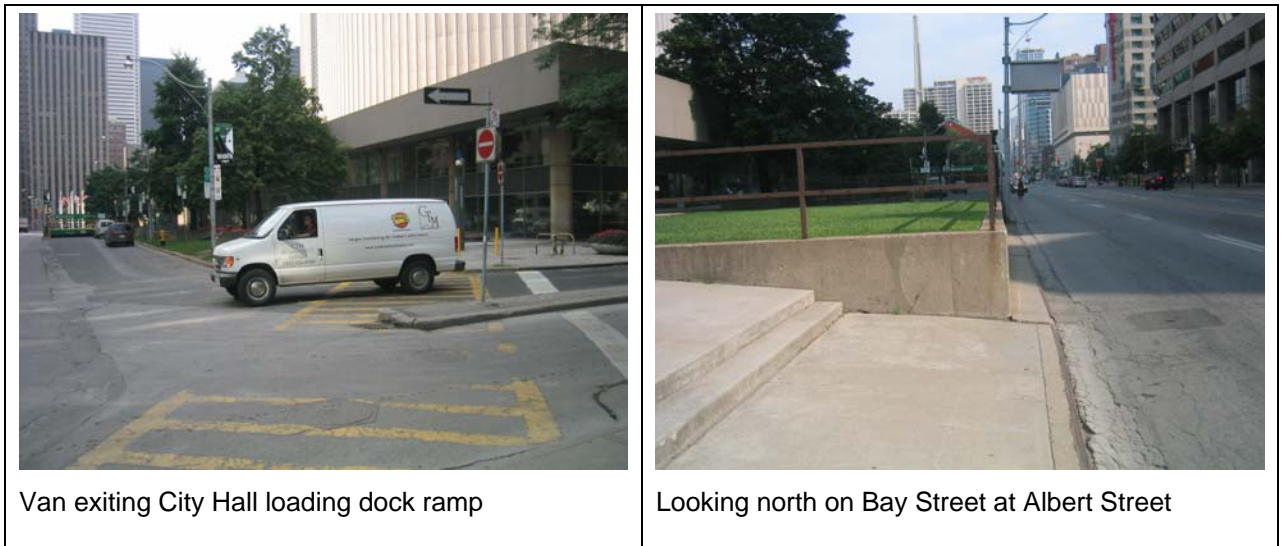
3.3 Bay Street Frontage

A review of collision data for Bay Street did not reveal any significant problems. For the portion of Bay Street from Queen Street to Hagerman Street (excluding the intersections with Hagerman Street, Albert Street and Queen Street) a total of eight collisions were reported on Bay Street between Queen Street and Hagerman Street in the three year period, including two collisions that resulted in injury. The injury collisions were a pedestrian and a cyclist collision. Due to the number of reported collisions, it is not possible to determine any existing collision trends along Bay Street.

Visual observations did, however, reveal some pedestrian access issues. In particular, while a pedestrian route is provided within the Square itself, pedestrian accessibility to Nathan Phillips Square from Bay Street is poor. On Bay Street, pedestrian access is only possible at the signalized intersection of Bay Street/Albert Street, and at a crosswalk across Hagerman Street. The existing parking garage entry and exit ramps on Bay Street present a barrier to pedestrian access for large portions of Nathan Phillips Square's Bay Street frontage.

At Hagerman Street, the crosswalk is bisected by a traffic island that separates Hagerman Street from the City Hall loading dock exit ramp, and pedestrians and people with strollers and wheelchairs must divert into Bay Street to cross between Nathan Phillips Square and Bay Street to the north. Due to the poor sightlines to the north for vehicles exiting Hagerman Street and the City Hall loading dock, vehicles pull out onto Bay Street and block the crosswalk, creating conflict with pedestrians.

At Albert Street, a signalized pedestrian crossing of Bay Street is provided, but there is a change in grade between the street level and Nathan Phillips Square. A wheelchair ramp is provided but it may be too narrow to accommodate some mobility scooters.



Van exiting City Hall loading dock ramp

Looking north on Bay Street at Albert Street

A basic objective for the design competition should be to provide a continuous public sidewalk along the west side of Bay Street from Queen Street to Hagerman Street.

One of the major barriers to establishing a continuous sidewalk along Bay Street are the entry and exit ramps. As discussed in the previous chapter, the Bay Street exit ramp is not utilized on a regular basis and as a result could be closed to allow for sidewalk improvements. This ramp is used for access for maintenance vehicles and to bring equipment to and from workshops in the parking garage.

Given the TPA's current workshop activities within the parking garage, provision of at least one access independent of the public accesses to the garage is required. If the Bay Street exit ramp is removed, it will be important to maintain access to the other ramp at Chestnut Street to support TPA's maintenance operations.

Maintaining full functionality of the Bay Street entry ramp is considered essential, however, it may be possible to reduce the width of this ramp in order to expand sidewalk facilities, as discussed in the following chapter.

3.4 Chestnut Street Access

Observations at the Chestnut Street access indicate that vehicle access functions well in terms of the ability to enter and exit the parking garage, but that the pedestrian environment is generally poor. The poor pedestrian environment is in part due to the physical definition of crossing areas, but is also due to the high proportion of vehicles observed to largely ignore the stop signs and roll through the intersection.

In addition to the potential for a new access for surface loading, minor changes that could improve the pedestrian environment around the Chestnut Street access include paving treatments to better define the crosswalks and the roadway at the intersection.



View east on Armoury Street



Chestnut Street Ramps

4. POTENTIAL IMPROVEMENTS AND ASSESSMENT OF IMPACTS

Based on the previous discussion and analysis of existing access conditions, this section presents a number of recommended changes to physical infrastructure to improve transportation conditions for all modes around Nathan Phillips Square. The recommendations should be considered flexible and would depend on other changes that are contemplated for the Square as part of the design competition. Similarly, illustrations of potential changes should be considered as conceptual examples, as opposed to proposed functional plans.

4.1 Loading and Related Access

In general, the existing underground loading facility for City Hall functions adequately and changes to this facility beyond normal operational improvements are not considered necessary. However, as discussed in the previous section, the present surface loading access (i.e. loading for the Square and related facilities) from Osgoode Lane is considered to be substandard both from a pedestrian environment perspective and from an operations perspective. The preferred option is to reconfigure the loading access so that all loading takes place from the north end of the Square. As shown on Exhibit 4.1, this could be accomplished by creating a new surface loading area north of the current area at the north end of Osgoode Lane in conjunction with a new driveway from Armoury Street/Chestnut Street.

One of the advantages of this option is that it reduces the total length of driveway required to access the square from 100 metres (one-way) on Osgoode Lane to approximately 75 metres from Armoury Street to the proposed loading area. Another key advantage is that it consolidates loading access to one location at the rear of the site. This would free up the area currently occupied by the Osgoode Lane access for other uses while minimizing the current conflict issues with pedestrians on Queen Street West. Access to Osgoode Hall would be maintained via the new access from Chestnut Street.

Various design options could be considered for the new loading access, including:

- Constructing a new driveway between the Chestnut parking access and the west property edge;
- Constructing a new driveway through the area currently occupied by the playground; or
- Filling in the ramp to P3 and building a new driveway on the space created.

Of the three options, the first is considered most feasible. One potential challenge is that the area is currently green space and includes several medium-sized trees that would be impacted. The available width for a driveway would be approximately 8.0 m, which could accommodate a two-way driveway. A variation would be to construct two single lane driveways on either side of the Chestnut Street ramps thereby creating a one-way loop to and from the loading area on the Square. Vehicles would enter the loading area from a new single lane driveway on the west side of the Chestnut Street ramps and exit via a new single lane on the east side of the ramps. Though best from a transportation perspective, other considerations such as impacts to green space and impacts to the playground would need to be considered.

Exhibit 4.2 provides a summary of the benefits and impacts of relocating the loading access to the Square to the north end of the site.

Exhibit 4.1 – Proposed Changes to Loading Access

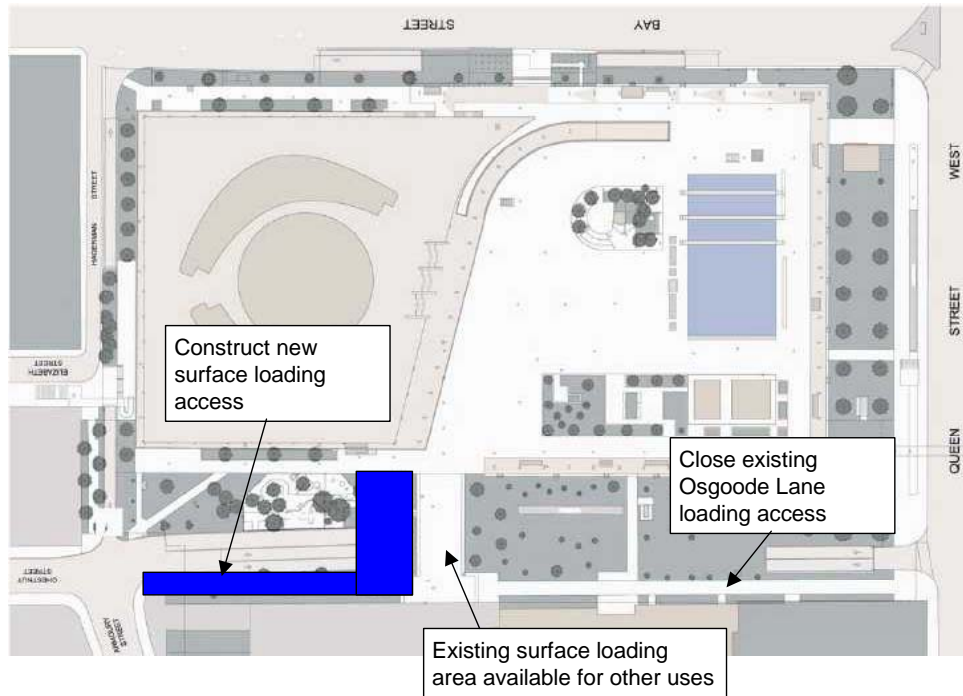


Exhibit 4.2 – Assessment of Reconfigured Loading Access

Benefits	Impacts
<ul style="list-style-type: none"> • Consolidates all loading access to one location • Removes some pedestrian conflict potential at Queen Street • Opens up options for southwest quadrant of the Square • Potential for two-way access 	<ul style="list-style-type: none"> • Significant cost for new access • Potential for increased pedestrian conflicts at northwest corner • Potential for vehicle conflicts given multiple accesses • Potential impacts on playground • Impact on trees

4.2 Queen Street West

At the present time, there are many elements along Queen Street West that detract from the pedestrian environment including pedestrian-vehicle conflict points, tour bus parking and poor pedestrian connections between the north and south sides of Queen Street and to transit stops. A key objective of the design competition is to improve the pedestrian environment along the frontage of Nathan Phillips Square and to make Queen Street West more “porous” for pedestrians. At a minimum, the following changes are should be considered to help achieve this objective:

- Physically restrict left turns to and from the parking garage access by installation of a traffic island at the throat of the Queen Street West parking garage access. The island would also provide a refuge for pedestrians crossing the access;
- Provide barrier-type curbs at the Queen Street West parking access and on the proposed island to prevent vehicles from parking on the sidewalk;
- Restrict the westbound right turn entry manoeuvre by reducing the curb radius to prevent high-speed entries;
- Provide a series of curb extensions along the north side of Queen Street to define the tour bus drop-off area, to reduce illegal parking, and to eliminate the use of the drop-off area as a right turn lane when it is not occupied by vehicles. A curb extension located approximately mid-block between Bay Street and York Street could also form part of a mid-block pedestrian crossing, or special pavement feature (subject to a detailed safety review); and,
- Potentially reconfigure the southbound right turn lane from Bay Street onto Queen Street to eliminate the channelized right turn lane.

A concept plan showing the proposed improvements is included in Exhibit 4.3 below while Exhibit 4.4 outlines the benefits and impacts of the proposed package of changes.

Most of the changes shown are relatively easy to implement and would not have a significant impact on access for vehicular traffic while providing significant benefits for pedestrians and cyclists. The most significant change would be the restriction of left turn access to/from the Queen Street ramp. Observations made at the site indicate that the parking garage access on the south side of Queen Street has unused capacity that could be used to provide access for eastbound vehicles on Queen Street if the left turn into the parking garage access on the north side of Queen Street was restricted. During the morning peak hour when parking garage entries are highest, approximately 125 eastbound left turning vehicles would have to be re-routed to the south Queen Street entry ramp, which would result in approximately 215 vehicles entering the parking garage at that location. During the evening peak hour, approximately 50 left turns from the parking garage access would be affected, which would either turn right to westbound Queen Street or divert to the Chestnut Street exit. In either case, sufficient capacity exists at the parking garage exits to accommodate the diverted traffic.

It is also noted that with the exception of removing the island, this proposed change would be fairly easy to reverse should undue impacts to TPA access occur.

Exhibit 4.3 – Proposed Changes to Queen Street West Frontage

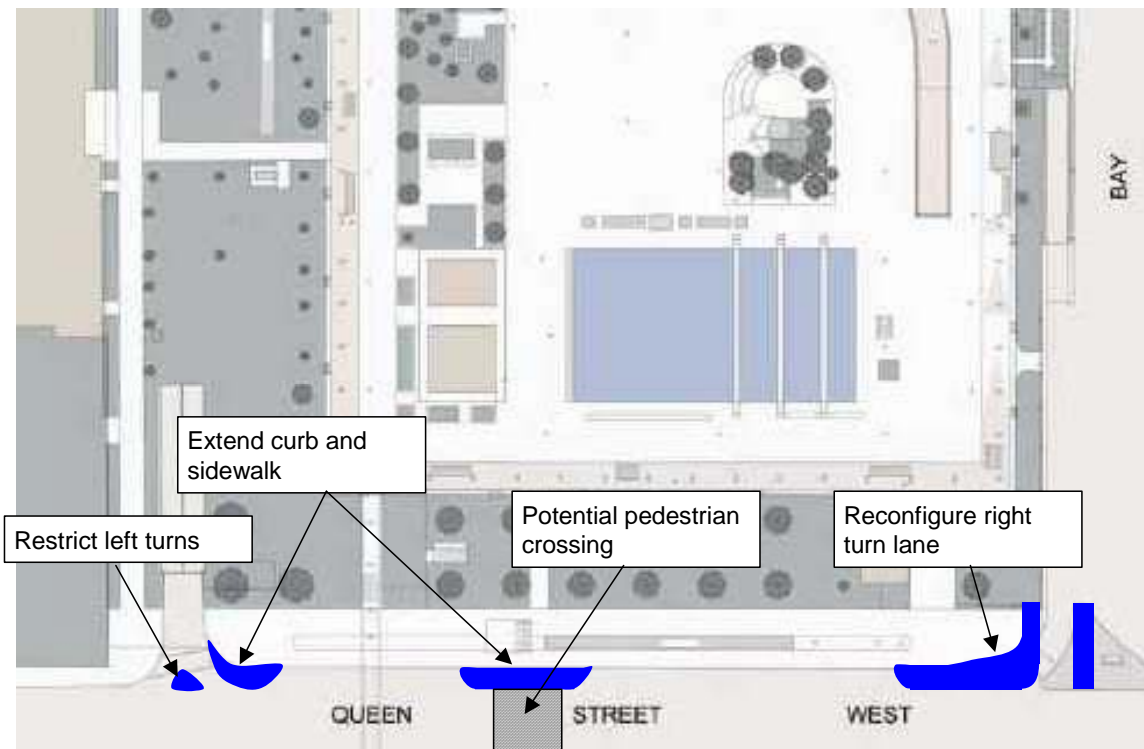


Exhibit 4.4 – Assessment of Queen Street West Improvements

Benefits	Impacts
<ul style="list-style-type: none"> • Distinguishes vehicle travel lanes • Removes some pedestrian conflict potential • Better defines tour bus drop-off/pick-up locations • Reduced delay to Queen streetcars from left turning vehicle 	<ul style="list-style-type: none"> • Reduced flexibility for garage access • Potential for increased vehicle queuing at vehicle Bay Street/Queen Street intersection

4.2.1 OTHER QUEEN STREET WEST OPTIONS CONSIDERED

As part of this study, and in consultation with stakeholders, several other options for improving the pedestrian environment on Queen Street West were considered. These are discussed below along with the reasons why they are not considered feasible.

Remove lay-by on Queen Street West: It would be desirable to remove all drop-off activity along the north side of Queen Street, including tour buses. This would require an alternative location for tour bus pick-up and drop-off. It is possible that tour bus drop-off could occur on Armoury Street or Chestnut Street; however, pedestrian access from these areas is less desirable than from Queen Street, particularly if the truck loading access is relocated to the north of the site. It is also expected that tour bus operators would still continue to drop passengers off on Queen Street, which would create congestion on Queen Street and perhaps worse conditions for pedestrians than if tour bus drop-offs were formalized. Continuous enforcement would also be required.

Close Queen Street West parking entry/exit ramp: To reduce the barrier effect created by the Queen Street entry/exit ramp, one option would be to simply close this ramp and require all exits to occur via Chestnut Street, or the now closed Bay Street exit ramp. It is not considered feasible to provide only one exit for a 2,400 space parking garage. Closing this ramp would also require re-routing of approximately 120 exiting and 230 entering vehicles/hour in peak hours, which increases traffic circulation around the site and could cause congestion at other entry/exit points. Re-opening the Bay Street exit ramp would also reduce opportunities to improve the pedestrian environment in that area.

Close southbound right turn lane Bay Street to Queen Street: One option to reduce pedestrian vehicle conflicts in this area would be to close the right turn lane entirely. This would require re-routing 250 right turning vehicles/hour in the peak hour with limited opportunities to turn right at adjacent intersections.

Make Queen Street West a transit and pedestrian mall: Closing Queen Street entirely to auto traffic would be a substantial change with impacts well beyond the immediate vicinity of Nathan Phillips Square. This change would require extensive analysis and consultation and would be subject to Environmental Assessment processes.

4.3 Bay Street

The west side of Bay Street is one of the few streets in the downtown core without a public sidewalk. The limited facilities for pedestrians that are in place do not meet modern-day accessibility standards. It is therefore recommended that the Bay Street frontage be totally redesigned to provide a continuous sidewalk within the street right of way (R.O.W.), or what would be the street R.O.W. on a traditional City street. The redesign could be achieved through the following changes, as shown on Exhibit 4.5:

- Modifying or filling in the Bay Street parking exit ramp and using this area for pedestrian space and potentially an accessible transit pick-up and drop-off area;
- Narrowing the Bay Street entry ramp, potentially by cantilevering a sidewalk over portions of the ramp; and
- Providing a curb extension or other features to define the pedestrian crossing at Hagerman Street.

In order to accommodate these changes, the Bay Street exit ramp from the TPA garage would likely need to be permanently closed. This would have an impact on TPA's operations since this ramp is used to access the workshops on level P2 and for various purposes related to the maintenance of the garage, as discussed previously. Loading for all maintenance activities would need to be relocated to the Chestnut Street ramp, or alternatively to another site. While this change is recognized as significant, it must be weighed against the option of leaving the Bay Street frontage with sub-standard pedestrian access.

In designing the improved Bay Street frontage, consideration needs to be given to ensuring that the existing Bay Street entry ramp maintains its current functional capacity, which includes the ability for councillors and dignitaries to by-pass the queue for entry to the public parking area. The use of a cantilevered sidewalk on the west side of Bay Street above the parking garage entry ramp could be explored, provided sufficient space at the bottom of the ramp is maintained for vehicles to enter the appropriate access gate. On Bay Street, the existing daycare drop-off parking spaces and the loading zone for disabled persons between the parking entry ramp and Hagerman Street must be maintained, but could be provided within a reconfigured lay-by.

Exhibit 4.6 provides a summary of the benefits and impacts of the proposed concept for Bay Street.

Exhibit 4.5 – Proposed Changes to Bay Street Frontage

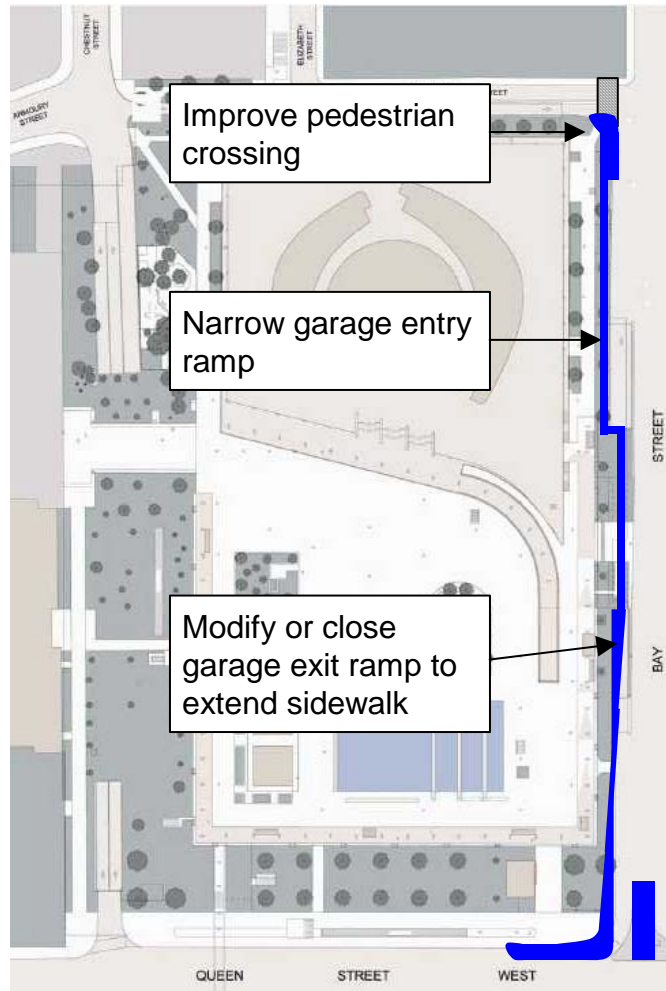


Exhibit 4.6 – Assessment of Bay Street Improvements

Benefits	Impacts
<ul style="list-style-type: none"> • Provides continuous sidewalk from Queen Street to Hagerman Street • Maintains entry from south on Bay Street to the parking access ramp • Reduces barriers for disabled persons 	<ul style="list-style-type: none"> • Need to consolidate all TPA maintenance access to Chestnut Street ramp • Reduces “back-up” exit options from parking garage • May direct pedestrians around the Square rather than through the Square

4.4 PATH Connections

The current underground PATH connection to City Hall through the parking garage was essentially created by way of pavement markings on some P1 drive aisles combined with overhead signage.

Design competitors will be requested to look at ways to improve this connection. At a minimum, it will likely be necessary to remove one row of parking to provide a defined pathway through the parking garage. Preliminary estimates are that 18 staff parking spaces and 16 public parking spaces would need to be removed. This is not considered significant given that there are approximately 2,400 spaces in the garage.

A major advantage of removing parking spaces to provide the PATH connection is that it avoids the need for cars to back out over the pathway. It also allows for the inclusion of a physical barrier between the PATH connection and vehicles where this would not impact the drive aisles.

4.5 Cycling Access and Parking

Currently all cyclists wanting to access the Square must dismount and walk to their final destination (although many do not dismount) or use the parking ramps if they are accessing the long-term bicycle parking in the parking garage. As part of the design process, opportunities may become available for improving connections for cyclists to access the Square and bike parking. For example, if Osgoode Lane is closed, this space could be used for a dedicated bike path, or a combined bicycle/walking path to a relocated bike parking area, or to the stairs to underground

parking. The stairs themselves could be improved to make it easier and safer for cyclists to access the underground parking facility.

Other improvements recommended to improve amenities for cyclists include:

- Expand bike parking options including additional lockers (subject to results of pilot project), additional above grade bike racks and additional below grade bicycle parking stalls as demand warrants;
- Consideration of a full-service bike station for commuter cyclists.

4.6 Supporting Measures

The analysis throughout Sections 3 and 4 assumes that the parking facility will generally operate as it does today, with the exception of a 10% increase in peak volumes assumed to take place due to increased occupancy of the parking facility. There are a number of operational and physical initiatives that could be undertaken to reduce peak hour single occupant vehicle travel, such as:

- Reduce traffic peaking characteristics by offsetting office/business hours for individual City employees or divisions, i.e., City employee and visitor arrivals and departures would be staggered;
- Improvement of pedestrian connections to adjacent TTC subway, streetcar and bus stops may increase transit usage by City employees, other commuters and visitors, thus reducing vehicle travel;
- Provision of TTC Metro passes in lieu of a parking space to those employees currently using reserved staff parking spaces;
- Promote carpooling amongst City employees through preferential parking or promotional incentives; and/or,
- Consider alternative parking processing technologies to increase processing capacity.

5. SUMMARY AND KEY RECOMMENDATIONS

This report provides a summary of the existing transportation conditions within and around Nathan Phillips Square together, with a description of issues and opportunities that could be addressed through the design competition. It should be noted that in general, the transportation system functions quite well given that this is a downtown location and the fact that Nathan Phillips Square is situated on top of the largest parking facility in the downtown. However, the design competition provides the opportunity to improve the existing transportation system and give due consideration to access by all modes including pedestrians, persons with mobility limitations, cyclists, transit riders, commercial vehicles and automobiles.

Any proposals that are identified through the design process should attempt to reflect a balanced perspective with respect to transportation modes. In particular, caution must be observed in making radical changes to vehicular access since impacts such as increased congestion, undue traffic circulation or increased traffic at other locations around the Square may have unintended impacts on the overall pedestrian realm.

Several strategic changes to the transportation system could have a significant impact on creating improved conditions for non-vehicular traffic or selected modes while maintaining an overall balanced transportation system. Potential strategic changes include:

- Closing the existing Osgoode Lane loading access and replacing this with a new access and loading area at the northwest corner of the site;
- Closing or modifying the Bay Street exit ramp to allow for improvements to the pedestrian environment along Bay Street;
- Restricting left turn movements to/from the Queen Street West parking access to minimize pedestrian-vehicle conflicts in this area; and
- Limiting pick-up and drop-off activity on Queen Street West to a small number of tour bus spaces and providing features along the full length of the Queen Street frontage to improve the porosity of Queen Street West for pedestrians.

In addition to these major changes, there are numerous minor changes that will have a significant impact on improving pedestrian, cycling and transit access. These changes include improvements to ensure that the Square and City Hall are accessible by persons with mobility limitations, additional bicycle parking and related amenities, and improvements to the underground PATH system.