

# 4 MOBILITY AND CIRCULATION

The CDP corridor is a good candidate for sustainable transportation because of its proximity to rapid transit, pathway networks and direct connection to downtown. In order to reduce the reliance on automobile usage and promote alternative modes of transportation, the modal share increase of non-automobile uses needs to be strongly encouraged in the Bank Street CDP.

## 4.1 TRANSPORTATION MODAL SHARES

A transportation impact assessment study was carried out to estimate the impact of intensification (meeting the OP minimum density targets) in the study area. Future traffic conditions were estimated based on background traffic and new trips to/from new developments. The results demonstrated that future peak period traffic will exceed the existing roadway capacity.

Intersection capacity is represented by Level of Service (LOS) from A to F. LOS 'A' indicates that traffic is moving well with limited delay while LOS 'F' indicates the intersection volume exceeds the available capacity and high delay is expected. Under existing conditions, some of the intersections in the study area are operating at LOS 'E', such that vehicle progression is considered poor and not all queued vehicles get through the intersection on the first green light phase. In the urban core area LOS 'E' is considered acceptable to meet the City of Ottawa Transportation Impact Assessment Guidelines.

Based on the projected intensification over the next 20 years, there are several intersections in the study area that are expected to operate at LOS 'F' during the PM peak hour.

Approximately 50% of peak period trips within the corridor are through traffic, signifying that the trip's origin and destination are both outside of the study area. The traffic analysis has considered the future roadway projects identified in the TMP, specifically the widening of the Airport Parkway and Alta Vista Transportation Corridor as well as a planned rapid transit route along Heron Road and a new O-Train station at Walkley Road. These infrastructure projects are expected to alleviate the through traffic demand on Bank Street as development increases in the south end of the City, which will free-up roadway capacity for new vehicles associated with future intensification/redevelopment of the area.

In order to limit roadway congestion, at least 20% of future automobile drivers during the PM peak hour, and 10% during the AM peak hour will need to choose more sustainable modes of transportation to achieve LOS 'E' or better within the entire CDP corridor. Table 4.1 compares the existing and future LOS, without and with a change in the modal share.

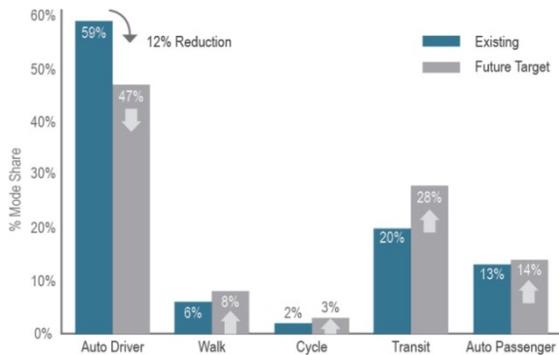
Table 4.1 | Automobile Level of Service (LOS)

Intersection	PM Peak Hour *		
	Existing	Future	Future - 20% Modal Shift
	Level of Service (LOS)		
Riverside Dr. N	E	F	E
Riverside Dr. S	D	E	D
Transitway	A	C	A
Belanger Ave	A	C	A
Randall Ave	A	B	A
Heron Rd	D	F	E
Erie Ave	A	C	A
Alta Vista Dr.	C	F	D
Walkley Rd	E	F	E
Kitchener Ave	D	F	E

\* The time of day when traffic conditions are the worst

This translates to a reduction from 50% and 59% to 45% and 47%, respectively, of trips made by auto drivers for the existing AM and PM peak hours. Figure 4.1 illustrates one scenario for modal share changes that would achieve a 20% reduction in future auto drivers during the PM peak hour. The modal share increases for walking, cycling, transit, and auto passengers were based on the existing proportion for each mode of transportation and a review of the TMP targets.

Figure 4.1 | Future Targets for Modal Shares during PM Peak Hour



Identifying measures to achieve a modal shift (and changes in travel behaviour) requires a comprehensive review of the travel patterns in a wider catchment area than the study area, which is addressed in the TMP. In addition, a Transportation Management Implementation Plan (TMIP) offers an appropriate framework to study how to increase sustainable modes of transportation specific to the Bank Street Corridor. Development within the study area and the surrounding communities along with proposed infrastructure changes will influence future traffic patterns. As intensification occurs, the City will continue to monitor the traffic flow along Bank Street and may choose to pursue a TMIP to alleviate congestion in the area.

In the remainder of the chapter, the CDP identifies opportunities to improve traffic operations and encourage a modal shift to sustainable modes of transportation: public transit, walking, and cycling.

#### 4.1.1 NEW ROAD INFRASTRUCTURE

The Airport Parkway has a northbound off-ramp and a southbound-on ramp at Walkley Road, which provides access to and from the southern portion of the CDP area. During stakeholder consultations, the study team was asked to consider the benefits of adding a northbound on-ramp constructed at Walkley Road to access the Airport Parkway. It would provide an alternative to Bank Street for north-south through traffic to take the Airport Parkway. Given that downstream conditions north on the Airport are already congested, this is unlikely to have any network level benefit during peak hours. During off-peak hours, however, this may provide some limited relief for Bank Street and provide a moderate improvement to accessibility to downtown. This concept should be reviewed at the next update of the City’s Transportation Master Plan.

#### 4.1.2 INTERSECTION MODIFICATIONS

Intersection modifications are recommended to handle existing and future traffic capacity at major intersections. They are:

1. Walkley Road at Bank Street intersection reconfigured to include a second northbound left turn lane.
2. Heron Road and Bank Street intersection reconfigured to include a second eastbound left turn lane.
3. Alta Vista Drive and Bank Street intersection be modified into a 4-way intersection when redevelopment of the southwest portion of the Bank Street and Alta Vista Drive intersection occurs (refer to Section 5.2.3). This modification would allow for improved local access to this proposed intensification area. Through traffic on Alta Vista Drive would be discouraged by restricting the through movement into and out of the developments at this intersection.

4. Ladder crosswalks (also known as zebra crossings) and 'yield to pedestrian' signs are recommended along Bank Street at Riverside Drive, Kilborn Avenue, Heron Road, and Walkley Road when the City's Traffic Department deems that the intersections warrant these measures.



Example of zebra crossings at Gladstone Avenue and Booth Street, Ottawa (Bing Maps, 2011)

#### 4.1.3 PUBLIC RIGHT-OF-WAY DESIGN

As identified in Section 2.3.2, the existing ROW varies throughout the corridor from 20 metres to 36 metres. The OP reserves a ROW of 37.5 metres for Bank Street within the CDP area; however, there are sections along the corridor where small lot properties front Bank Street making it difficult to acquire the full ROW allowance without having significant financial and land acquisition implications for the City.

Through the analysis and consultation process related to the cross-section design for the Bank Street corridor, key principles and components were determined to guide how the cross-section should ultimately be designed. The proposed cross-section will:

1. Achieve a consistent set of elements in the ROW throughout the corridor;
2. Achieve an overall consistent ROW width, whenever possible. If widths vary between blocks, the design should ensure transitions are well conceived to maintain traffic flow and minimize interruptions to users of the street;

3. Maintain flow of through traffic;
4. Provide on-street cycling lanes;
5. Improve quality of sidewalks;
6. Create a pedestrian-oriented streetscape and design for pedestrian and cycling comfort;
7. Landscaping in strategic locations to ensure viability and sustainability of the plantings given microclimate, soil conditions and salt impacts;
8. Recognize the need for dedicated locations for hydro poles, lighting, and street furniture, and attempt to provide some consistency in placement wherever feasible;
9. Minimize property takings at constrained locations by looking at reduced widths of individual elements provided that the minimum widths recommended in this CDP are achieved; and
10. Meet Ontario Traffic Manual (OTM), City of Ottawa, and Hydro Ottawa standards for component widths and setbacks.

From the options developed and presented to stakeholders during the CDP process, the compressed with median cross-section is the recommended cross-section throughout the corridor. It is a 'compressed' version of the Official Plan cross-section for arterial roads. The CDP provides a minimum and maximum width for each element of the ROW. In areas where the existing ROW is constrained, the design should strive to use a lower width in the range provided to minimize property takings. Given that site conditions are highly variable, the final decisions will need to be made in the engineering phase of the Bank Street reconstruction project (discussed further in Section 8.3).

Figure 4.2 illustrates by cross-section component the range of widths recommended. In some cases, there is only one recommended fixed width. The importance of this cross-section design concept is to show the key features that are to be integrated into the detailed design plan, such as:

- i. Lanes for traffic
- ii. Medians that also provide room to accommodate turns
- iii. Enhanced sidewalks
- iv. New cycling lanes

If there are opportunities and options in the detailed design plan to expand one or more of the cross-section components, the priority for additional space should be:

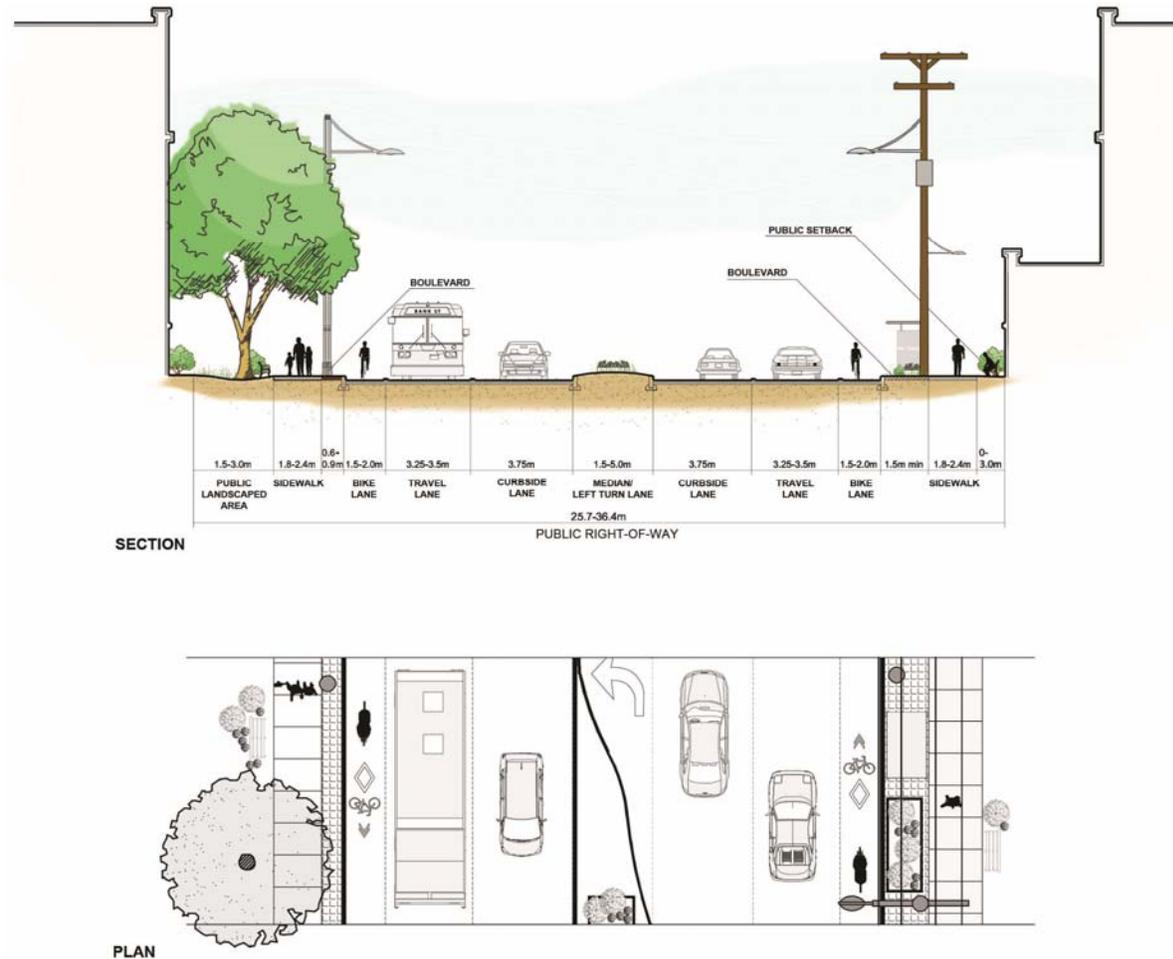
1. Cycling lanes to provide future ability to redevelop alternative cycling facilities (such as segregated cycling lanes or wider lane markings) and also to provide additional space between sidewalk and vehicle lanes to provide greater separation between pedestrian and vehicles;
2. Sidewalks to increase pedestrian capacity and comfort; and
3. Public landscaping area to increase space for tree planting and root storage to improve the survival rate of plantings.

The 4-lane road will be maintained throughout the corridor, with breaks in the median to provide left-turn access into local businesses. Over time, the goal is to reduce the number of accesses through consolidation and sharing between users, leading to less frequent one-way left turns and the eventual removal of the two-way left turn lanes. This will improve overall traffic flow as the area intensifies as well as minimize the number of conflict points among drivers, cyclists, and pedestrians.

Components of the compressed with median cross-section are:

1. Vehicle lanes are proposed to be at a compressed standard (between 3.25 to 3.75 metres);
2. Cycling lanes proposed on both sides of Bank Street at 1.5 to 2 metres wide;
3. Sidewalks are to be at least 1.8 metres and up to 2.4 metres wide where the City has enough property. The boulevard (area between sidewalk and curb) and the cycling lane will develop a buffer between pedestrians and vehicles;
4. A narrow boulevard (can be landscaped with pavers or with soft landscaping) will accommodate street lighting, utilities, and utility poles. To minimize clutter in the streetscape, lighting fixtures should be added to hydro poles.
5. Trees will be planted within the landscaped setback (1.5 to 3 metres) on the opposite side of the street where hydro poles are found. The maximum width for the landscaped area is set at a width to establish a row of mature trees on one side of the street, and improve the likelihood of tree survival. There are opportunities for expanded landscaping on abutting private property.
6. The median, ranging from 1.5 to 5 metres, is to be used for landscaping, pedestrian refuge, and community identification (i.e., banners, signs) and/or lighting. The location of the median is also where left turn lanes and mountable medians would be accommodated.

Figure 4.2 | Compressed with Median Cross-section



To improve traffic flow and address community concerns with the two-way-left-turn-lanes, which exist through most of the corridor, the existing two-way-left-turn-lanes will be generally removed and replaced by a median with occasional midblock left turn access. During the detailed design of the Bank Street Reconstruction project, the City will need to discuss shared access opportunities with property owners as well as during redevelopment of sites.

While left turns are ultimately recommended to be removed except at high volume turn locations, the City will need to consult with landowners during the engineering process. The City may need to accommodate continued left turns in some instances through a mountable median. Although less preferable, the City may need to consider retaining some shortened segments non-continuous two-way left turn lanes until the land uses on either side of the road convert to less auto-dominant uses.

## 4.2 PUBLIC TRANSIT

Changing the overall modal shares is highly dependent on increasing the mode share of public transit. The corridor has access to rapid transit and local bus routes as well as park and ride lots. These transit features provide the CDP area with a comparative advantage to promote public transit usage and reduce reliance on the automobile.

The majority of the increase in transit ridership in the study area is likely to be achieved through improved access to the Transitway at existing stations (Billings Bridge and Walkley) and Heron Road when it becomes a supplementary intensive bus route. In addition, a future LRT station is proposed at Walkley as part of the O-Train line.

The exact location of the future Walkley LRT station has not yet been confirmed but is shown conceptually on the south side of Walkley Road on Figure 4.4 based on the possibility of integration with the proposed development of the adjacent site. The station design and location will be discussed during the next review of the OP and TMP and as part of the North-South Corridor LRT Project. The future Walkley LRT station will be designed to be accessible to the existing Walkley bus station to ensure that the stations are well connected.

The City plans to expand the park and ride lot at Leitrim in the future. The Greenboro Park and Ride is regularly full and should also be expanded. Increased transit ridership from users of the park and rides will help alleviate the through traffic along the corridor.

As intensification and redevelopment occurs within the CDP area, it is recommended that OC Transpo look into increasing the frequency of local buses along Bank Street. Bus routes and frequency are currently based on existing passenger demand.

### 4.2.1 TRANSIT PRIORITY SIGNALS

Transit priority signals can detect buses as they approach an intersection. When a bus is detected, the signal can extend the green by a few seconds to ensure the bus clears the intersection or if the bus arrives on a red, the signal can shorten the red phase to reduce transit delay. Transit priority signals are recommended and would be most effective at intersections with long red phases for the transit movements. Recommended locations are at Walkley Road, Heron Road, and Alta Vista Drive intersections.

### 4.2.2 QUEUE JUMP LANES

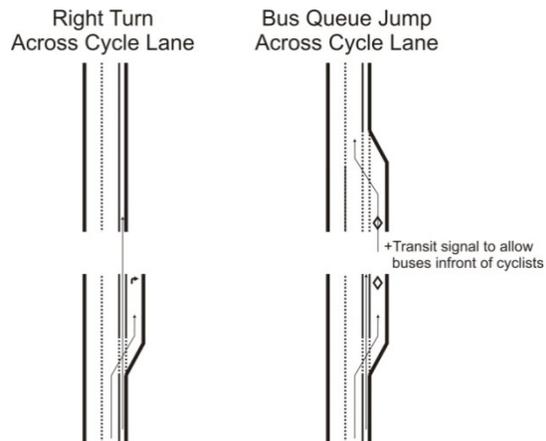
The queue jump allows transit vehicles to pull ahead of regular traffic that is stopped at an intersection. This queue jump can be provided by an advanced stop bar or by a transit-only signal. To provide an advanced stop bar, stop lines are located further back from the intersection, which allows transit vehicles the opportunity to pull in front of the traffic. To provide a transit-only signal, transit vehicles would require a short transit-only through lane in the right-most lane. Transit vehicles would be given a short green phase in which to move through the intersection in advance of the general purpose traffic.

The Bank Street corridor has existing right turn lanes which could be used by buses as queue jump lanes, avoiding the widening of the intersection to provide an additional queue jump lane.

Queue jump lanes are most appropriate at the Bank Street intersections which are expected to operate near or over capacity considering the full build out of the proposed intensification areas. As the intersections approach capacity, all vehicles may not clear the intersection on the green signal. These queue jump lanes will allow the buses to move to the front of the queue and minimize their delay at the intersection. It is proposed that Walkley

Road (east and north approach) and Heron Road (east and north approach) be considered for queue jump lanes.

Figure 4.3 | Bus Queue Jumps Across a Cycle Lane



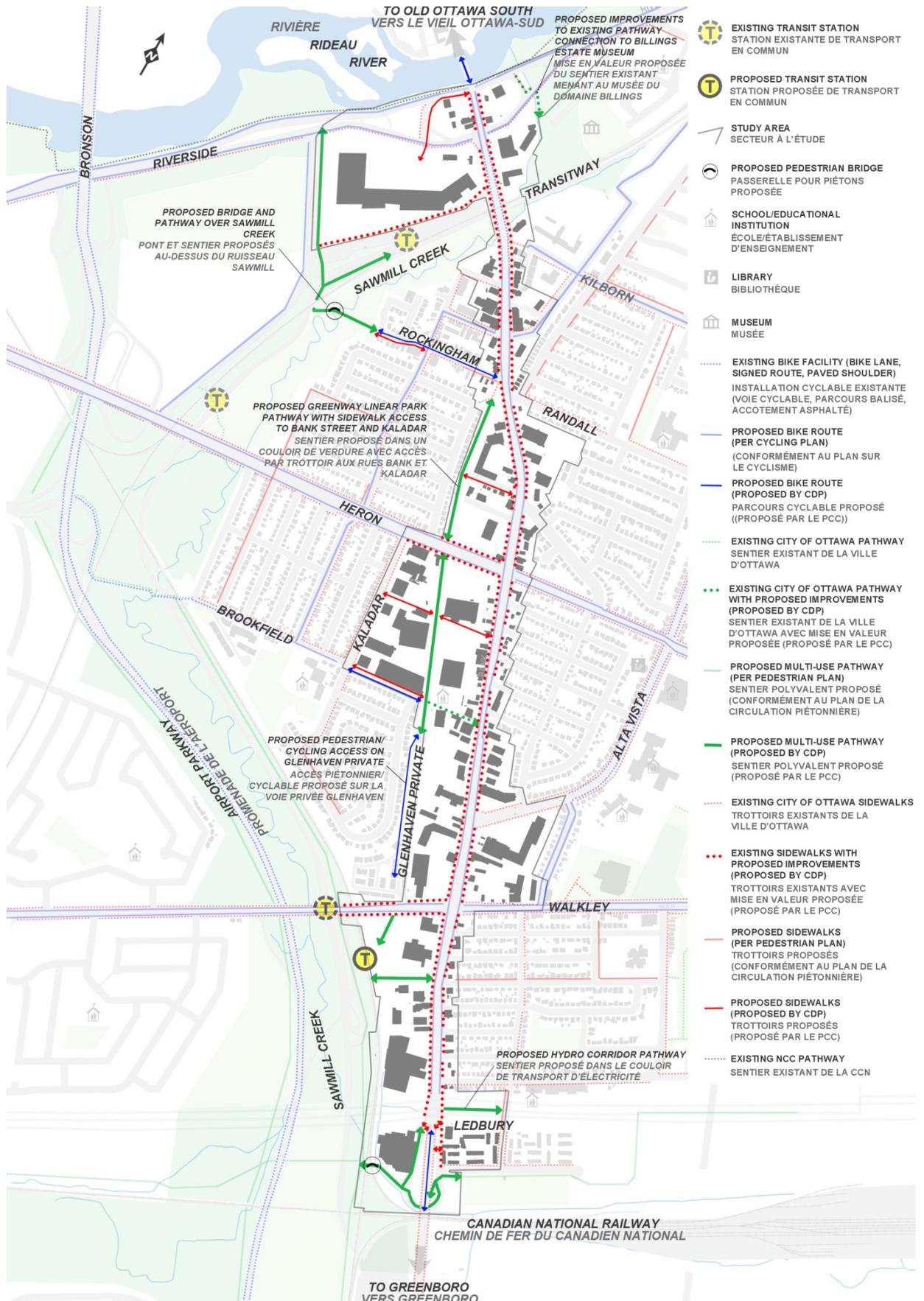
### 4.3 PEDESTRIANS AND CYCLISTS

The City's Pedestrian Plan and Cycling Plan were consulted when developing the recommendations to improve pedestrian and cycling conditions in the study area as well as to promote increased modal shares of both. Cycling lanes along the entire corridor is proposed in the Cycling Plan and further supported by the CDP.

Figure 4.4 shows the existing and proposed pedestrian, cycling, and multi-use pathway connections in and around the study area. The remainder of the chapter describes the recommended pedestrian, cycling, and multi-use pathway improvements. In addition, Chapter 6 describes public improvements which include improvements to pedestrian and cycling amenity areas.

**BANK STREET COMMUNITY DESIGN PLAN: RIDEAU RIVER TO LEDBURY PARK**

Figure 4.4 | Existing and Proposed Pedestrian, Cycling, and Multi-use Pathway Connections



### 4.3.1 MULTI-USE PATHWAYS

Pathways are intended for pedestrian and cycling use. The design of the pathway should adhere to the principles of Crime Prevention through Environmental Design (CPTED) in order to create a safe and enjoyable environment for the public. This includes making provisions for appropriate lighting and high visibility of the pathway. Furthermore, the pathway should be universally accessible and meet Accessibility for Ontarians with Disabilities Act (AODA) standards. Figure 4.5 illustrates proposed locations for multi-use paths.

#### 1. Greenway Linear Park

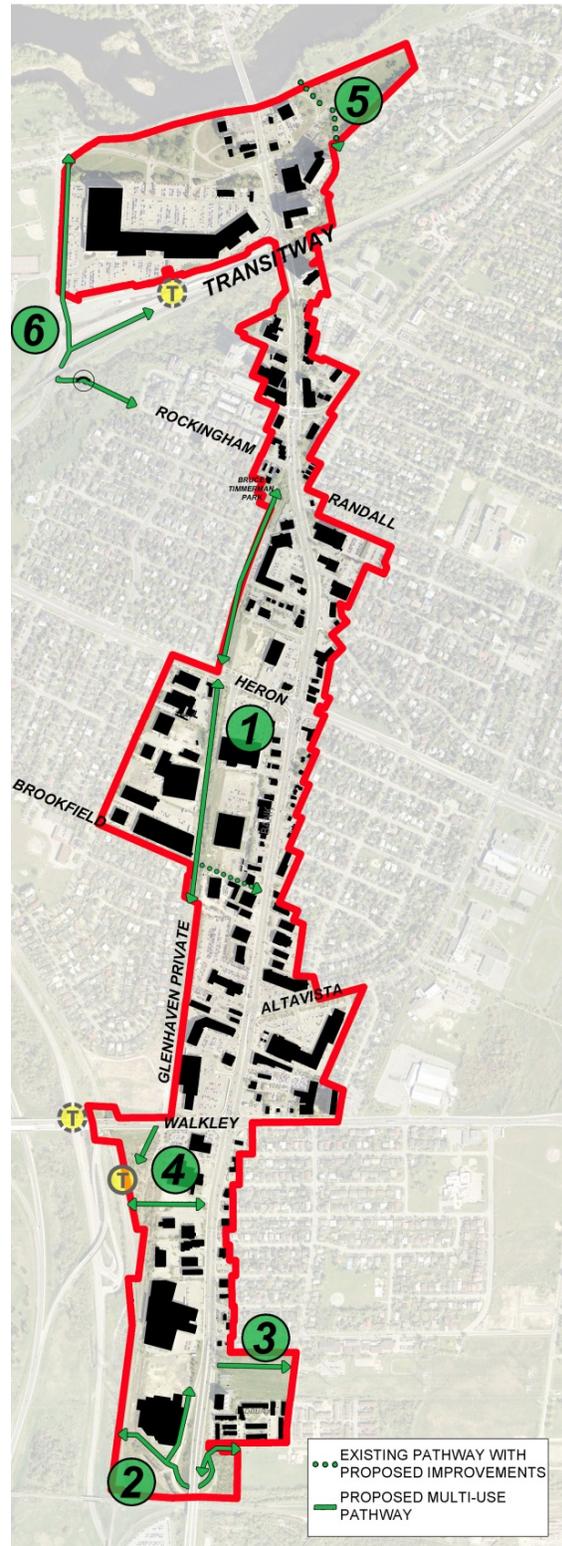
A former CN Rail line runs parallel to Bank Street. The land is currently a mix of private and public property. Most of the land is unused and vegetated; however, some of the sections are being used as informal pathways. This area can be developed as an urban greenway and linear park as a new off-street multi-use pathway from Bruce Timmerman Park to Brookfield Road.



Conceptual rendering of Greenway Linear Park (photo overlay of existing informal trail along portion of proposed Greenway Linear Park)

The existing pathway connection from Brookfield Road to Bank Street should be improved with provisions for seating, additional lighting and widening of the path to accommodate cyclists and pedestrians.

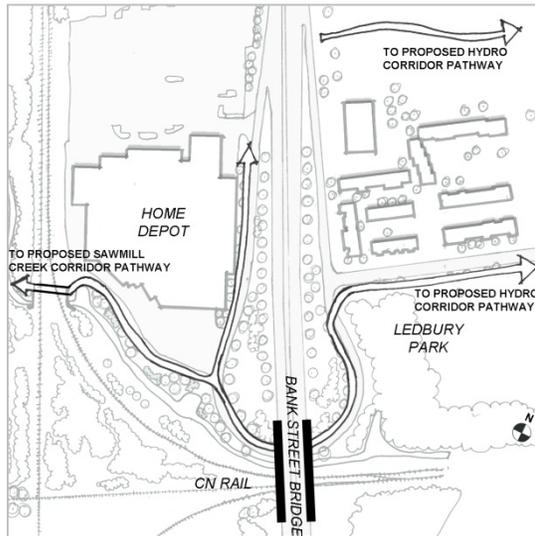
Figure 4.5 | Proposed Multi-Use Pathways



## 2. Pathways in the Ledbury Park Area

Figure 4.6 illustrates new multi-use pathways should be developed in the Ledbury Park area near the Home Depot. This would connect pedestrians and cyclists to the proposed Sawmill Creek Corridor Pathway to the west and the proposed hydro corridor pathway to the east. Appropriate connection across the existing rail line to this proposed pathway should be considered in conjunction with its development. This may be an underpass or an overpass depending on local site engineering conditions.

Figure 4.6 | Proposed multi-use pathways in the Ledbury Park area



## 3. Hydro Corridor

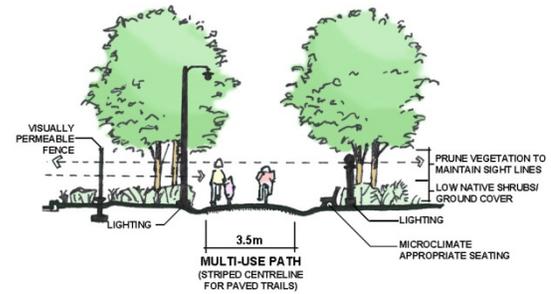
There is a proposed pathway (shown in the Cycling and Pedestrian Plans) along the hydro corridor further to the east of Bank Street. However, the proposed pathway corridor does not extend to Bank Street. This pathway should continue along the corridor and connect to Bank Street.

## 4. Future Walkley LRT Transit Station

A multi-use pathway should connect from Bank Street and Walkley Road to the future Walkley LRT transit station. A design concept for the multi-use pathway is shown in Figure 4.7. The connection to

Walkley Road can become part of a much longer pedestrian/cyclist spine extending along the Greenway Linear Park.

Figure 4.7 | Multi-Use Pathway Cross-Section



## 5. Billings Estate Museum

To improve the access from Bank Street to the Billings Estate Museum the existing pathway should be enhanced with new signage from Bank Street and improved surface conditions (e.g., stabilized gravel path with universally accessible grades, width, and materials). Figure 4.5 identifies the location of the existing pathway.

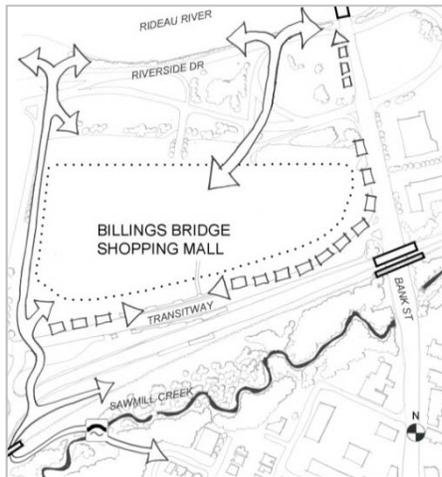
## 6. Billings Bridge Plaza/Transitway

A system of multi-use pathways should be developed to improve connections from Old Ottawa South and NCC Rideau River pathways to Billings Bridge Plaza, RA Recreation Centre, Billings Bridge Transit Station and communities south of Sawmill Creek. Figure 4.8 illustrates the proposed locations and connections for these pathways. The pathways should be developed in partnership with Billings Bridge Plaza.

A direct pedestrian connection between Billings Bridge Transitway Station and the community to the south was examined; however, it was not recommended due to the high costs and the potential environmental disturbance. Between the two areas, there is an approximate 10 metre drop down to Sawmill Creek. Due to the very steep embankments and environmental constraints, a long pedestrian bridge would be required to span the

distance. A less direct route informally exists to the west which can be formalized. The slopes are moderate, and a shorter bridge could cross the creek and connect to other amenities, including the mall.

Figure 4.8 | Proposed Connections around Billings Bridge Mall Site



#### 4.3.2 CYCLING IMPROVEMENTS

There are several locations that cycling facilities should be added to complement the future cycling lanes in the CDP area. Two main locations are on the bridges at either end of the study area.

1. It is important that the City add cycling lanes to Billings Bridge over the Rideau River notwithstanding the heritage attributes of the bridge. Sensitive architectural/engineering design can be achieved to respect the age and style of the bridge.
2. 'Share the road' signage should be installed and/or use of sharrows (shared use lane markings) on the bridge over the CN rail line south of Walkley Road. The bridge cannot be retrofitted to accommodate bike lanes due to width and structural constraints. It is recommended that bike lanes be added when the bridge is slated for reconstruction.

In addition to the proposed cycling lanes along Bank Street and the Greenway Linear Park, it is recommended that signed routes be established to improve overall cycling connections in the study area. Figure 4.4 shows locations for proposed signed cycling routes, which are along: Rockingham Avenue, Brookfield Road, Glenhaven Private and Bank Street Bridge over the CN rail line.

Additional improvements for cycling are:

1. If elephant feet pavement markings are recommended in the Ontario Traffic Manual Book 18 (cycling design guidelines currently being developed), it is proposed they are used at Walkley Road, Heron Road, and Riverside Drive North where the proposed multi-use pathway crosses Bank Street.
2. Provide bicycle racks throughout corridor at public park locations or private developments as a condition of site plan approval.

#### 4.3.3 IMPROVEMENTS FOR PEDESTRIANS

The pedestrian environment will be improved in the recommended roadway cross-section, which consists of medians to provide for pedestrian refuge when crossing Bank Street and improved sidewalk conditions that are consistent in width throughout the corridor. Additional improvements for pedestrians are:

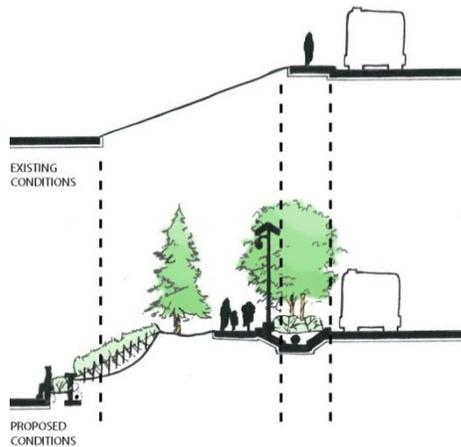
1. Zebra stripes and 'yield to pedestrian' signs at Walkley Road, Heron Road, Kilborn Avenue, and Riverside Drive (immediately or when City deems warranted);
2. Improved landscaping on public ROW and during redevelopment of private properties to make walking environment more appealing;
3. Improved pedestrian linkages to areas west of Bank Street (using the proposed Greenway Linear Park); and
4. Improved linkages to existing and future transit stations (Billings Bridge and Walkley Transit Stations and future Walkley LRT station).

### Access to Transitway at Billings Bridge

The existing pedestrian environment next to the Billings Bridge Transitway is poor. There is no separation between pedestrians and the Transitway. Furthermore, the sidewalk is at the top of a steep slope and is exposed to cold winter winds and the hot summer sun.

The slope can be extended so that there is more space for plantings and sidewalk improvements. Specifically, as illustrated by Figure 4.9, the pathway should be moved away from the roadway to provide room for the planting of deciduous trees, which will shade the path in the summer and provide a buffer from the Transitway. Coniferous trees and shrubs should be planted on the slope to provide a barrier from north westerly winter winds and improve the aesthetics of the area.

Figure 4.9 | Section of the slope and pathway adjacent to the Billings Bridge Transitway



### Ledbury Park Area

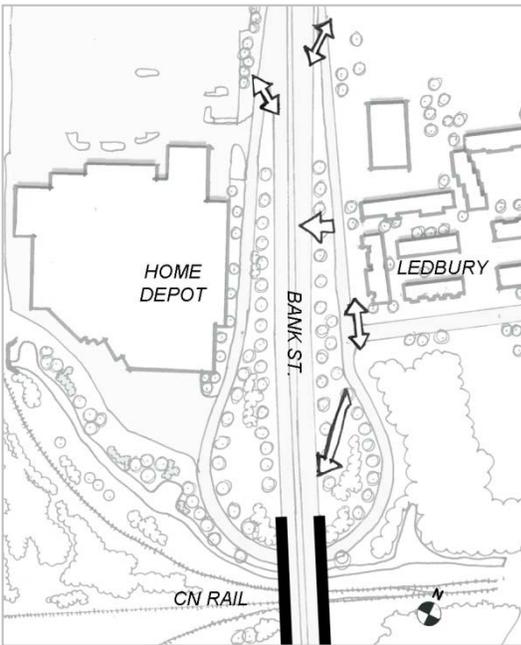
There are no existing formal pedestrian connections up the bridge embankment from Ledbury Community to the Bank Street Bridge to connect to the Greenboro Transit Station. The next photo illustrates an informal pathway that pedestrians have made up the steep slope to the roadway and bridge. Figure 4.10 highlights the proposed locations for formal pedestrian connections to Bank Street.

An accessible path can be built up the slope to provide a proper connection between Ledbury community and Bank Street.



Existing informal path up the steep slope to the bridge from Ledbury community

Figure 4.10 | Locations of Proposed Pedestrian Connections



Fieldwork drawings: preliminary design ideas for pedestrian access up/down Bank Street bridge embankment

Chapter 6 highlights additional public improvements which will enhance the pedestrian environment in the study area.

