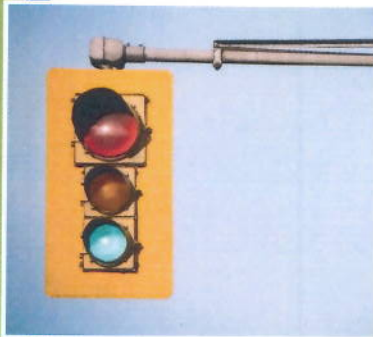


APPENDIX

inspire. connect. protect.

down
town.



Downtown Transportation and Streetscape Study

BrookMcIlroy/



1.0

Introduction

The Downtown Transportation and Streetscape Study (DTS) complements the Downtown Cultural Hub Study to produce a comprehensive plan for revitalization in the Downtown core. The DTS includes a Transportation Study, a streetscape plan for the downtown street network and a concept plan for the Towne Square.



BIA Members discuss the future of Lakeshore Road

2.0

Study Components

2.1 Transportation Study

The Transportation Study assessed traffic and operational characteristics in the downtown and produced recommendations for enhancements. It provided background data and analysis on traffic flows, parking demand, intersections, cycle routes, pedestrian movement, loading and transit movement. This study also assessed two alternative scenarios for modifications to the existing road network, including conversion of one-way roads to two-way and conversion of an existing street to a pedestrian-only mall. The Executive Summary of the Transportation Study is appended to this report.

2.2 Streetscape Master Plan

The Streetscape Master Plan provides clear direction for future development and enhancements to the public realm and streetscape in the downtown. It includes recommendations for revitalization that will reinforce the character of the downtown and its vibrant commercial environment. Key objectives are to increase connectivity, mobility and accessibility, create a balance between transportation modes, promote a pedestrian-oriented environment and integrate heritage conservation objectives. This work will guide the redesign and renewal of streets in the downtown into the future.

2.3 Towne Square Concept Plan

Towne Square is an important urban park in the centre of downtown Oakville and plays a key role in the public realm and character of the downtown. This Study will prepare a concept plan and implementation strategy in close coordination with the local Business Improvement Association (BIA) and the Heritage Oakville Advisory Committee. The concept plan will provide recommendations and designs for hard and soft landscaping, street furniture, programming and public art.

3.0

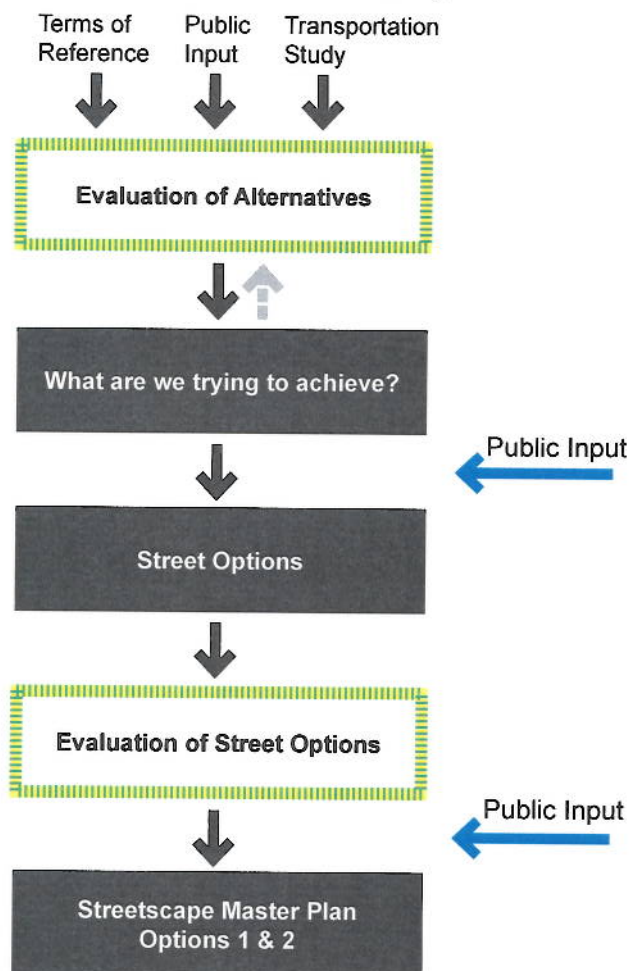
Project Process

Background analysis

Prior to beginning work on the DTS, the consultant team reviewed relevant background information and previous studies, including the:

- 2009 Oakville Transportation Master Plan
- 2010 Downtown Oakville Strategic Action Plan
- 2010 Reconstruction of Water Street and Navy Street – Design Approval
- 2013 Downtown Commercial Parking Study
- 2013 Transportation Master Plan

This existing background information was augmented by the Transportation Study, which assessed network and operational characteristics of the downtown, produced functional designs, costing and an evaluation of service impacts. This work directly informed study recommendations and decision-making.



4.0

What We've Heard

4.1 Stakeholder Consultation

The study team has conducted two major rounds of interviews with key stakeholders, including the BIA, Chamber of Commerce, Transit, Parks & Open Space, Resident Groups, Emergency Services, Region, Utility Providers, Heritage Advisory Committee, Accessibility Committee, Mayor & Councillors and Water Street Stakeholders. In addition, on-going consultation has taken place with the BIA and the Downtown Focus Group. This consultation was critical to identifying opportunities and constraints, as well as prioritizing design options for Lakeshore Road.

On April 9, 2014, a modeling workshop was held with members of the BIA, in which five groups of participants used a scale model of Lakeshore Road, along with streetscape model pieces, to design a preferred street section and intersection. Though there was no full consensus on all street elements, most groups preferred removal of the centre lane, introduction of a bike lane, parallel parking on both sides of the street, no angled parking, a wider boulevard and consideration of curbless street design. BIA members were concerned with impacts on parking and retail access, as well as the impacts of major construction on Lakeshore Road and throughout the downtown.



Participants in stakeholder meeting

4.2 Public Consultation

In addition to stakeholder consultation, two major public consultation events took place as part of the study. The first took place on January 30, 2014 and the second on April 12, 2014.

Community Workshop #1

The goal of the first workshop was to provide a project overview and generate discussion and feedback on what is working well, what is not working and priorities for renewal for downtown streets and the Towne Square.

Workshop discussion groups prioritized Church Street, Randall Street and Water Street as those most in need to change, and recommended that they should become more pedestrian and cycling friendly by slowing down traffic, adding seating, introducing two-way traffic, and even considering closing streets to vehicle traffic (Water Street). Priorities for renewal on Lakeshore Road included designated loading areas and/or times to free up the street, better parking management, support for small businesses including wide sidewalks, opportunities to close the street for events, cycling facilities, patios, cafes and landscaping, as well as better access to the waterfront and improved signage. Priorities for Towne Square included improving accessibility, enlarging the size of the square and adding landscaping and seating. Participants also desired enhanced flexibility in the use of the space to increase the number and variety of year-round events and activities.

Community Workshop #2

The second public workshop focused on the same modeling workshop described previously for the BIA meeting. Sixteen workshop groups designed a street section and intersection for Lakeshore Road. In addition, 28 participants completed worksheets prioritizing a series of boulevard elements, street elements and miscellaneous design features. Groups generally agreed that they would like to see removal of the centre lane, parallel street parking on one or both sides of the street, no angled street parking, a wider boulevard and consideration of curbless street design. There was mixed feedback on bicycle lanes; although most groups would like to see bicycle infrastructure, some felt that it should be located on parallel streets, including Church and Robinson, rather than Lakeshore Road.



Workshop participants create a model depicting their ideal Lakeshore Road design

5.0

Precedent Discussion

Throughout the study, the consultant team introduced a variety of relevant streetscape examples to illustrate the design of the following key elements:



Curbless Streets

Curbless streets prioritize pedestrian and cyclist movement by removing the grade-separation between the sidewalk and the roadway to create a shared space for all modes of transportation. This technique, along with traffic calming measures, results in reduced traffic speeds and a more lively and pedestrian-oriented environment. These streets are often finished with pavers instead of asphalt, which further helps to reinforce the character of main streets. Curbless streets also facilitate street closure and access for town events and festivals.



Soil Cells

Soil cells promote mature and healthy street tree growth, while also treating stormwater on-site. They provide a larger space for soil that is lightly compacted and can extend under the sidewalk and roadway, facilitating large tree growth. Tree canopies will also grow taller and more full, which is advantageous for retail exposure and for providing shade to promote building energy efficiency and comfort for pedestrians. This technology also accommodates underground utilities, making it ideal for enhanced streetscapes.



High Quality Materials

The prominence of Lakeshore Road can be elevated with the use of high quality streetscape materials, such as those used for paving, benches, lighting standards, and landscaping. High quality materials are both aesthetically pleasing and cost effective over the long term. They will be more robust, better withstand the impacts of decades of heavy urban use, will require less maintenance and will last longer before requiring replacement. Furthermore, materials like granite curbs and unit pavers can be removed and replaced an infinite number of times, if access to below grade utilities is required, unlike concrete which must be demolished and replaced.



Bike Lanes

Dedicated bicycle infrastructure that is well-marked provides safety and predictability for all users of the road. Dedicated bike lanes are recommended for downtown Oakville, where higher volumes of traffic, pedestrian and cyclist movement is expected. These lanes should be marked with paint, signage and buffer space or separated from traffic movement by a row of parking, bollards or grade-separation. Sharrows are an alternative that provides additional width in the outside lane for shared use by vehicles and bicycles, used in cases where the width of the right-of-way does not permit dedicated lanes.



Parking

On-street parallel parking is important in mixed-use, pedestrian-oriented downtown Oakville. It supports local commercial activity and services by providing convenient access to businesses. It also promotes more efficient use of land by reducing the need for off-street parking and increases safety on the street, as it tends to reduce vehicle speeds, which is particularly important in an environment where there are higher numbers of pedestrians and cyclists.

6.0

Lakeshore Road Options

6.1 Introduction

Lakeshore Road is in a poor state of repair and must be reconstructed in the short-term to ensure continuity of traffic and retail operations. As the road will need to be entirely demolished, reconstruction provides the opportunity to promote safer and more efficient vehicle, pedestrian and cyclist movement, as well as improved servicing and loading functions. This opportunity can also be used to create a more comfortable, animated and attractive public realm. In addition to renewing surface materials, many below grade utilities are also in need of renewal.



Lakeshore Road today, showing on-street parking and centre lane being used for loading

6.2 Option 1 – Reconstruct/Streetscape Lakshore Road in its Current Configuration

Option 1 retains the centre lane, two travel lanes, and two parking lanes in the same configuration that exists today. Boulevards remain at 4.55m wide but materials, street trees and furnishings would be renewed to give new life to the street. The practice of delivery vehicles using the centre lane would end - as recommended by the Transportation Study - and a system of Commercial Loading Zones would be installed (see discussion in the report). The primary purpose of the centre lane would then be to provide a dedicated left-turn lane at every intersection. Cyclists travelling east-west would divert to Church to use sharrows or Robinson, which would have bike lanes. Option 1 can be constructed as a curbless or curbed street.

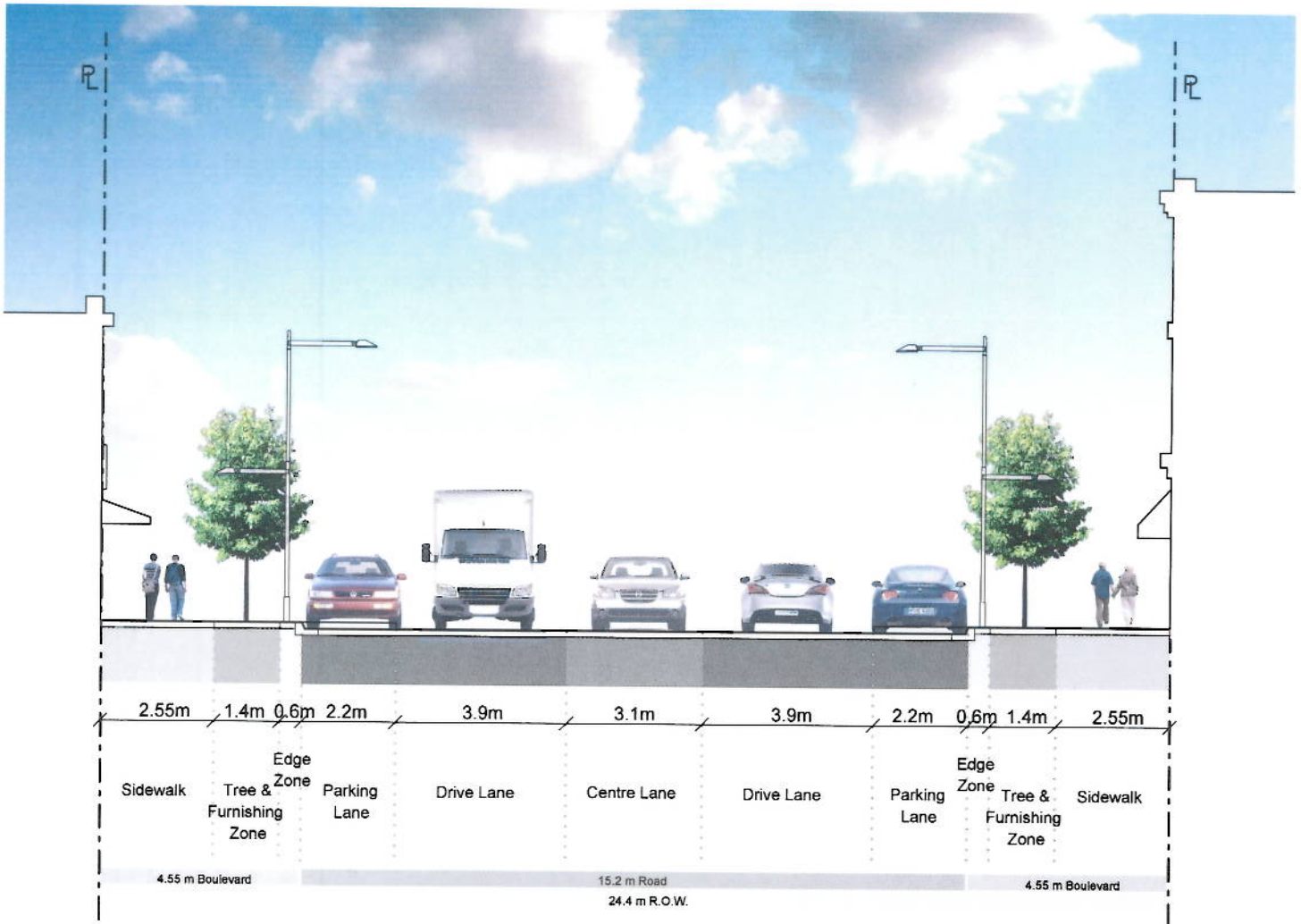


Plan view of Option 1



Image depicting Option 1





Section showing Option 1

Option 2



Option 2 removes the centre lane and gives that space over to the boulevards, expanding their width by 30%, from 4.55m to 6.0m. Wider boulevards allow for the creation of a 2.1m wide dedicated “Marketing Zone” for the exclusive use of retailers. The “Marketing Zone” is used for restaurant/café patios or as a place for shop owners to display their wares. In addition to the “Marketing Zone”, the boulevard also accommodates an area for street trees and a sidewalk. Left-turn lanes will be provided at signalized intersections (Navy, Trafalgar, Allan) and parallel on-street parking is retained on both sides of the street. Cyclists travelling east-west would divert to Church to use sharrows or Robinson, which would have bike lanes. Option 2 can be constructed as a curbless or curbed street.

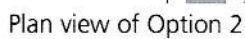
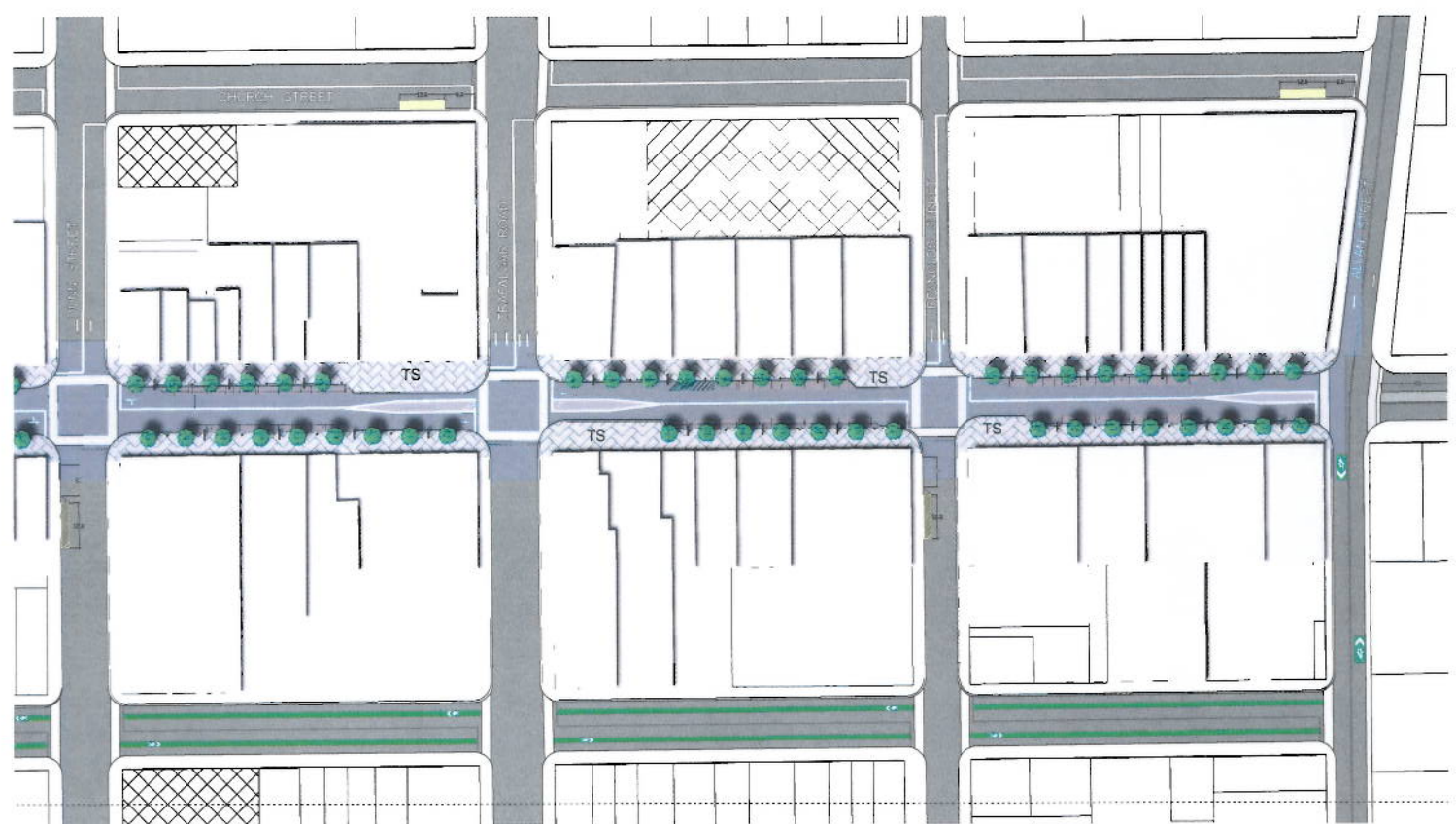
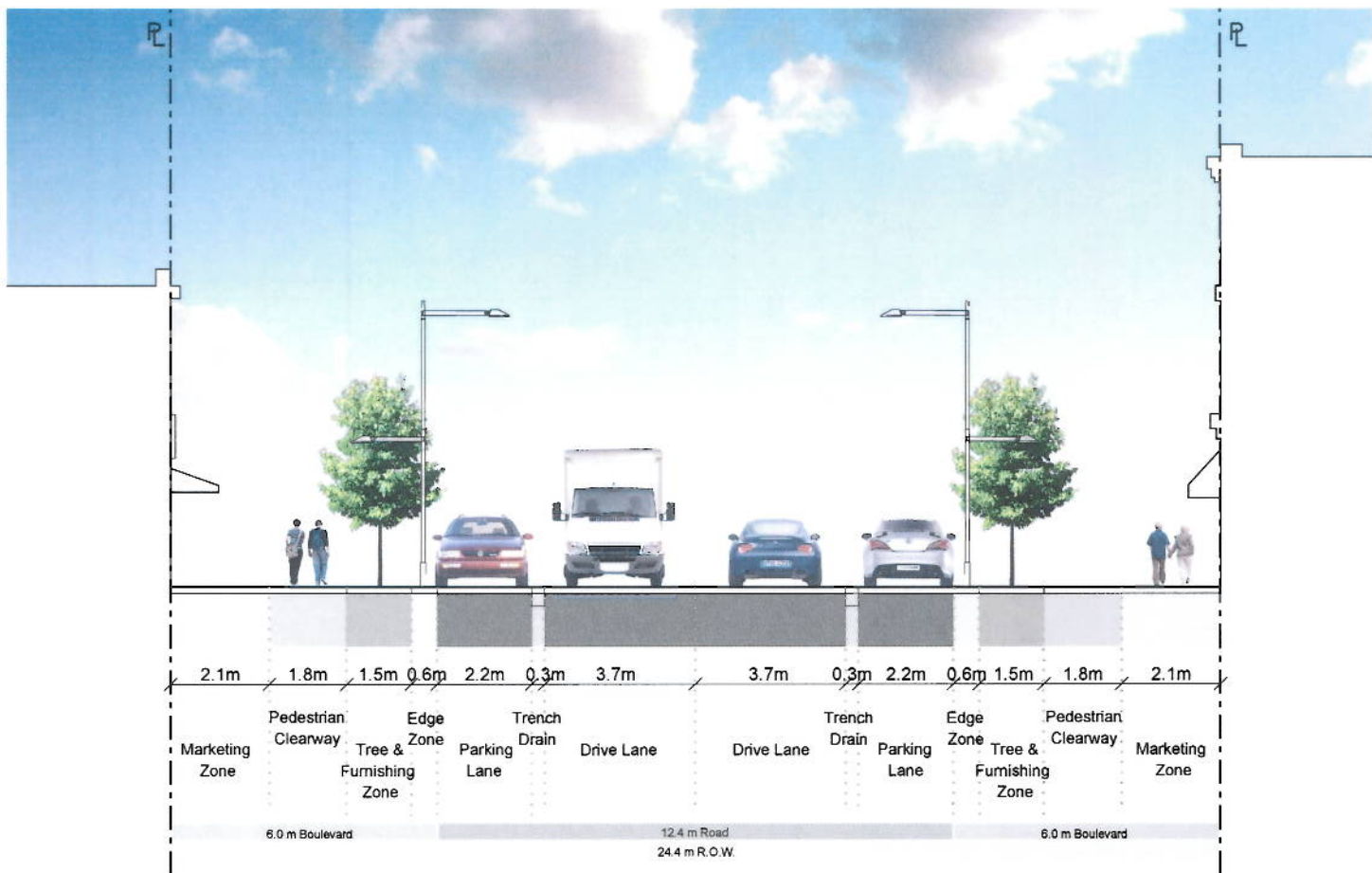




Image depicting Option 2





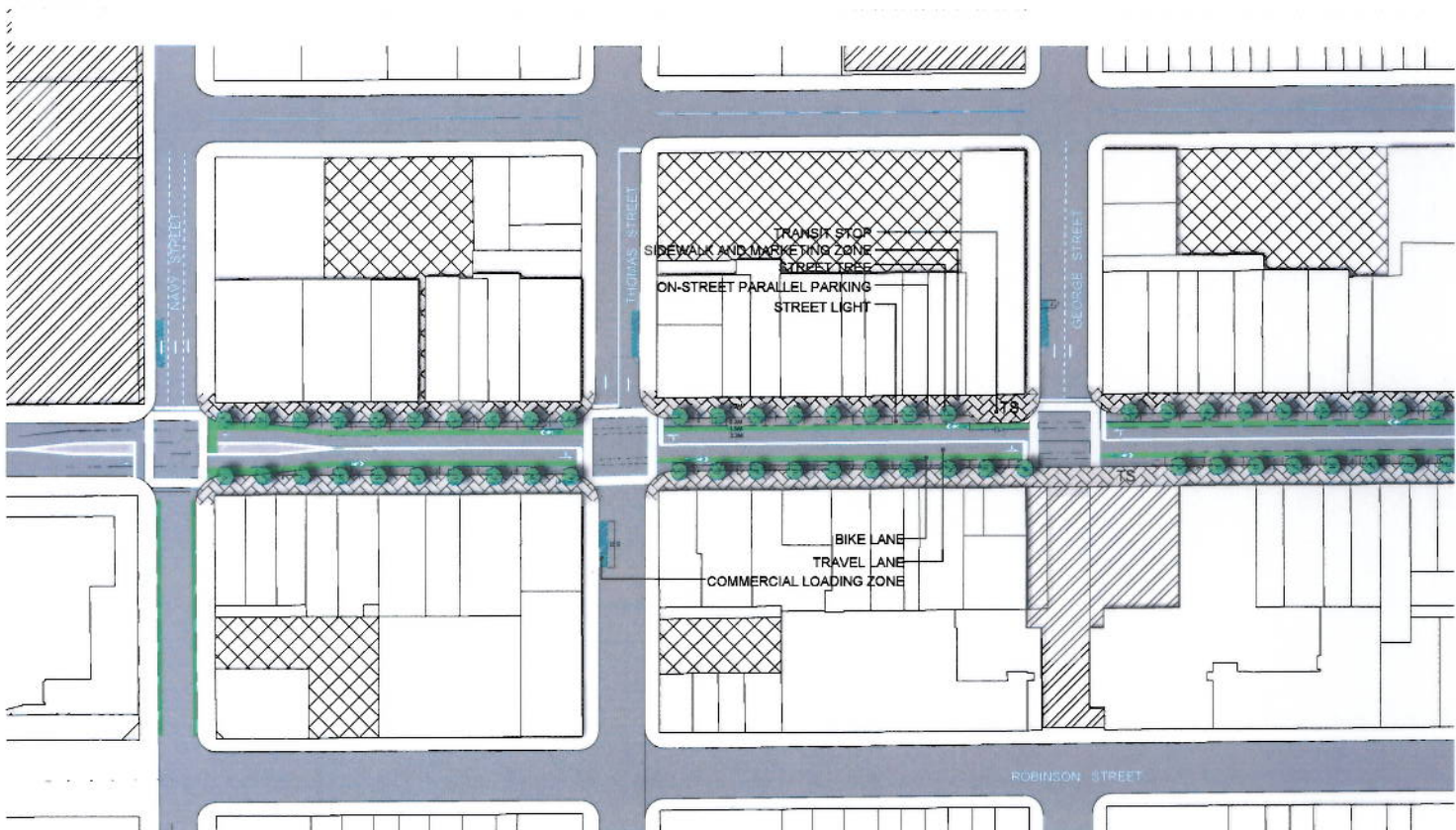
Section showing Option 2

Option 3



6.4 Option 3 – Reconstruct/Streetscape Lakeshore Road with Bike Lanes, No Centre Lane

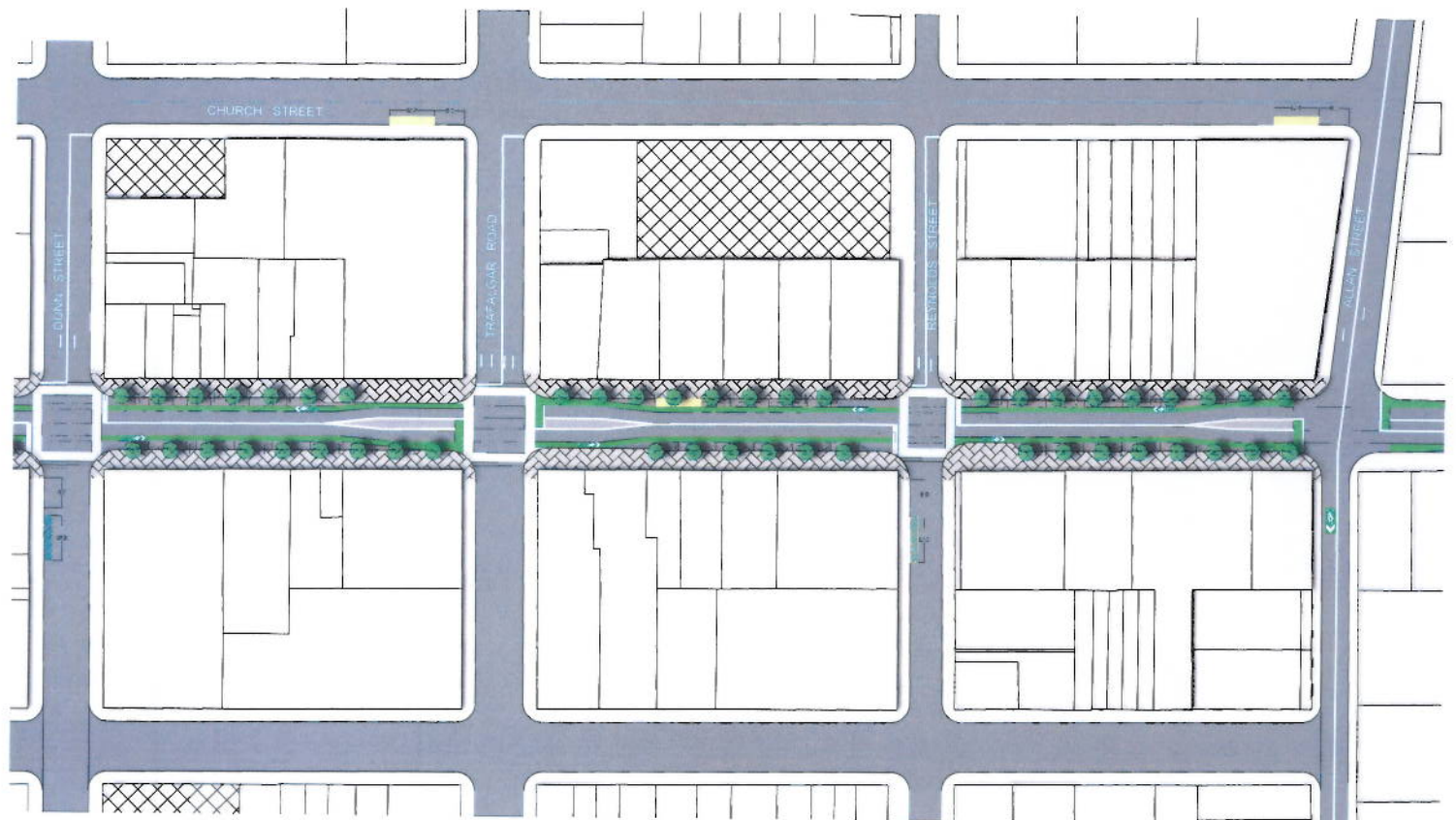
Option 3 removes the centre lane and provides a dedicated 1.5m bike lane on either side of the street. Boulevards widen from 4.55m to 5.2m and provide space for street trees, a sidewalk and a small "Marketing Zone". The dedicated bike lane on Lakeshore precludes an east-west facility on parallel streets (Church and/or Robinson) so that all road users are accommodated on Lakeshore – often called a 'Complete Streets' approach. Left-turn lanes will be provided at signalized intersections (Navy, Trafalgar, Allan) and parallel on-street parking is retained on both sides of the street. Option 3 can be constructed as a curbless or curbed street.

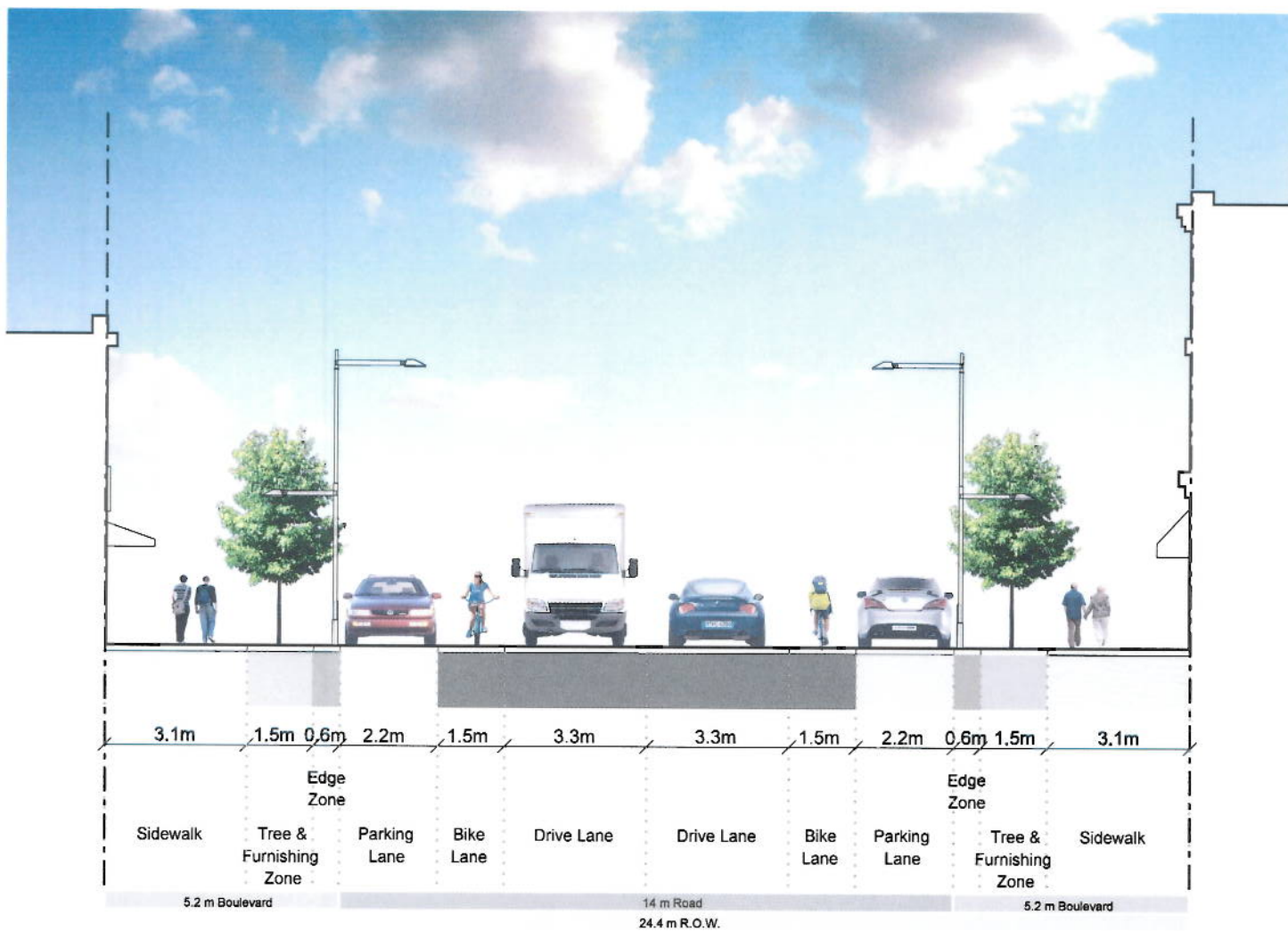


Plan view of Option 3



Image depicting Option 3

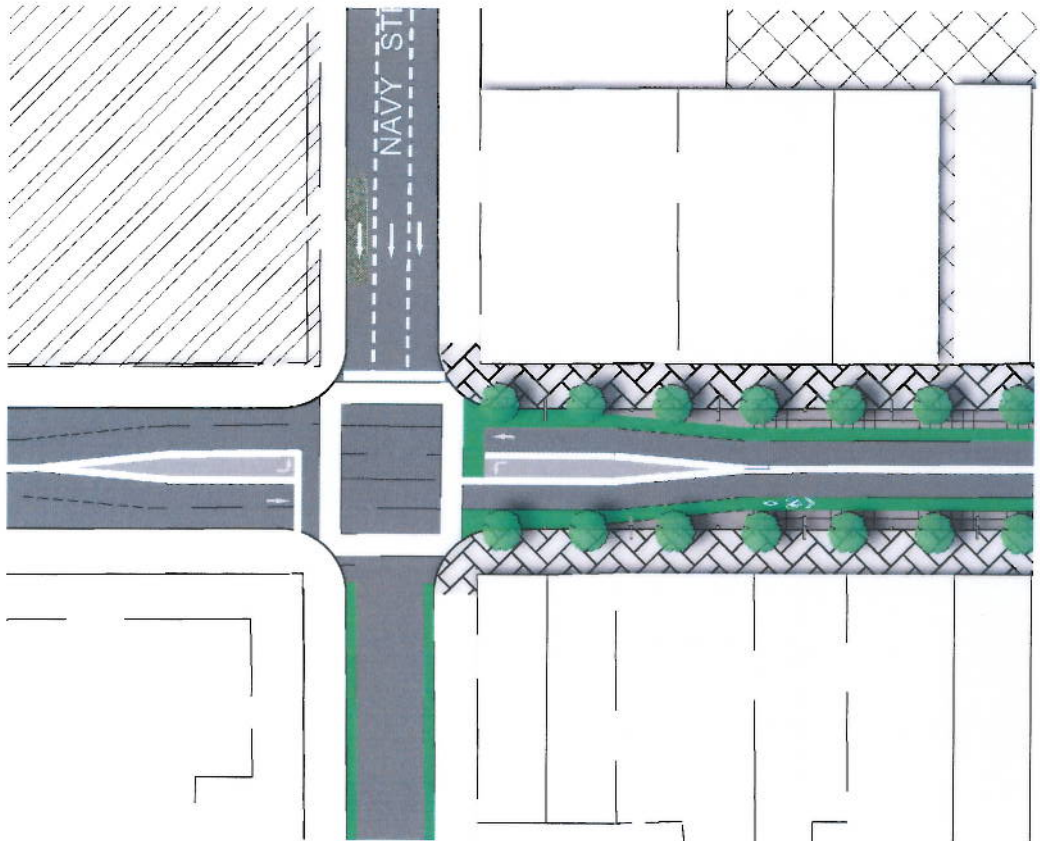




Section showing Option 3

6.5 Left-Turn Lanes

In Options 2 & 3, where the centre turn lane is removed, dedicated left-turn lanes will be provided at all signalized intersections (Navy, Trafalgar & Allan) to facilitate frequent turning movements. These dedicated turn lanes will ensure that left-turning vehicles do not block traffic on Lakeshore. At intersections without dedicated turn-lanes, a vehicle can squeeze by a queuing vehicle as the parallel parking lane ends before the intersection, opening up room to pass slowly on the outside (as is the case today).



6.6 Commercial Loading Zones

The Transportation Study has concluded that the current practice of delivery vehicles using the centre lane is unsafe and should be discontinued. This recommendation applies to all Options (even Option 1, where the centre lane is retained). The town has tolerated this practice for many years but with renewal of the streetscape comes opportunity to implement a new approach to deliveries in the downtown. Most cities in Southern Ontario with a similar main street retail condition operate efficiently and effectively using a system of Commercial Loading Zones (CLZ). This system is particularly well suited to downtown Oakville as blocks are small, providing CLZs at each up/down street (and one on Lakeshore). This will ensure that no business is more than half a block away from a dedicated loading zone. CLZs will be reserved for the exclusive use of delivery vehicles for a portion of the day (from 7am – 3pm, for example) and then revert back to parking spots during evenings and weekends. Approximately 12 parking spots on up/down streets and two spots (adjacent spots in one location) on Lakeshore Road will convert to CLZs to provide adequate coverage throughout downtown. The number of loading zones can be adjusted to best suit changing business needs in the downtown over time.



6.7 Cycling in Downtown

For Options 1 & 2, which do not provide an option for cyclists on Lakeshore, bike facilities should be installed on Robinson to provide a safer east-west route through downtown. Within the existing curblines, Robinson can accommodate a dedicated bike lane, two travel lanes and on-street parking.



An existing bike lane in downtown Oakville on Navy Street, south of Lakeshore

6.8 Wide Boulevards

Creating wider boulevards on Lakeshore will benefit patrons, residents and retailers by improving the public realm in downtown Oakville. Today, boulevards are relatively narrow at 4.55m wide and accommodate street trees, site furnishings, and a sidewalk. If the centre traffic lane is removed, the boulevard on each side of the street can be increased up to 6.0m, allowing for the creation of a new 2.0m wide 'Marketing Zone' in addition to a tree and furnishing zone and a wider sidewalk. The 'Marketing Zone' is for the exclusive use of downtown businesses and can be used for restaurant/cafe patios or for shop owners to display their wares. Marketing Zones have proven successful in similarly sized cities and on similar retail high streets at attracting innovative retailers. Additionally, with renewal of cultural hub facilities it will become increasingly important to complete the experience of going to the theatre, visiting the art gallery, or attending cultural events and the 'Marketing Zone' encourages restaurants and retailers to use the street.



Wide boulevards allow businesses to use the street

6.9 Impacts on Parking

There are currently 127 parking on Lakeshore between Navy and Allan Streets. In Option 1, where the centre lane is retained, this number is reduced only by two stalls (to 125) to accommodate one Commercial Loading Zone (CLZ) east of Trafalgar (as the practice of loading vehicles using the centre lanes is no longer to be permitted). For Options 2 and 3, where the centre lane is being eliminated in favour of wider boulevards, the number of spots will be reduced by 8 percent to 117 total. This reduction is primarily due to the accommodation of left-turn lanes (due to required offset and taper areas), larger offsets from non-signalized intersections and the aforementioned CLZ on Lakeshore.

On the up/down streets, each new CLZ replaces two parking stalls each but it is important to remember that this is only for a defined period of time (weekdays only and not during evenings and weekends). Approximately 12 parking spots will need to be converted to CLZs to create the initial delivery network throughout downtown.

7.0

Next Steps

7.1 Evaluating the Options

Using shared criteria developed in conjunction with town staff and the DCH project team, the next step is to evaluate each of the three options to determine a preferred approach.

7.2 Develop Streetscape Plans for all other streets in downtown

In addition to Lakeshore Road, this study is also tasked with producing a streetscape design for all other streets in the downtown. The project team will produce section/plan options for every other street and examine the network and street options to determine a preferred approach.

7.3 Develop Concept Options for Towne Square

Towne Square is the heart of downtown Oakville. It hosts major events in downtown but is also a place for day-to-day activities. The Towne Square, constructed over twenty years ago, is now in a poor state of repair so needs to be reconstructed in the short-term. With revitalization, there is an opportunity to re-imagine the space and renew its purpose to better reflect contemporary city life as well as evolving public realm conditions in downtown. Over the coming months, our design team will produce concept design options for the space and test them with stakeholders and the public, ultimately selecting a preferred design and set of guiding principles.

7.4 Study the feasibility of Curbless design for Lakeshore

Curbless design for Lakeshore Road has been consistently supported by stakeholders and the public, but this concept needs further study during the detailed engineering design phase of the project to ensure that it is technically possible on Lakeshore Road. The study team will examine this design feature to ensure its compatibility.

7.5 Study approaches to constructing a major retail street – lessons from other cities

Town staff and the project team have begun to meet with other municipalities that have reconstructed their downtown main street to compile approaches for construction and mitigation measures. The team will continue to gather information on best practices and produce a menu of options and considerations for detailed design.



DOWNTOWN TRANSPORTATION STUDY

Prepared for the Town of Oakville
Engineering and Construction Department
And Brook McIlroy Inc.

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Draft Report

June, 2014



**Hatch Mott
MacDonald**



Executive Summary

In 2010, the Planning Services Department prepared the “Downtown Oakville Strategic Review” which was presented to Planning and Development Council at its meeting of August 9, 2010. This review included twelve strategic initiatives, three of which included Urban Design Guidelines, Transportation, Access and Mobility and the Towne Square. In 2013, the Town of Oakville initiated the Downtown Oakville Transportation and Streetscape Study to address these three initiatives and to inform the planned rehabilitation of Lakeshore Road East through the Downtown Business District which is to commence in 2016. Subsequently, Brook McIlroy Inc. (BMI) and Hatch Mott MacDonald (HMM) were retained by the Town of Oakville to complete the Downtown Transportation Study (DTS) in conjunction with the preparation of streetscape/landscape plans for the Downtown Oakville commercial district and a concept plan for Towne Square.

HMM was engaged to complete the Downtown Transportation Study that included a study area bounded by Sixteen Mile Creek, the north side of Randall Street, the east side of Allan Street and the south side of Robinson Street. The objectives of the study were to:

1. Assess the characteristics of the existing road network from both a traffic safety and traffic operational perspective, with consideration of all road users including pedestrians, cyclists, commercial vehicle operators, transit service providers, and motorists;
2. Assess traffic effects arising from the conversion of the one-way streets in Downtown Oakville to two-way operation; and examination of the possibility of converting an existing ROW to a pedestrian only mall.

The assessment of the existing road network was made at an operational level of detail and examined the operation of the existing intersections and road sections in Downtown Oakville. The traffic effects of converting the one-way streets to two-way operation and the possible conversion of an existing right-of-way to a pedestrian mall were undertaken at a strategic planning level.

The study consisted of completing a review of available planning and traffic studies relevant to the Downtown area, assembling other relevant information and collecting additional traffic data, and estimating traffic flows for all intersections. An existing conditions assessment was then completed. This included traffic and safety assessments of a range of network elements including: traffic control devices and the traffic control system, cycle routes, pedestrian movements, transit routes and service levels, commercial loading, and parking. Strategic assessments of two network scenarios were also undertaken: converting one-way streets to two-way operation; and converting a public right-of-way to a pedestrian mall.

The main findings and recommendations reached in the DTS include the following:



Item 1: Existing Conditions Assessment

Lakeshore Road and Trafalgar Road are the primary transportation arteries providing access to the downtown. Lakeshore Road between Navy Street and Trafalgar Road is currently carrying approximately 13,500 vehicles per day while Trafalgar Road between Lakeshore Road and Randall Street is carrying approximately 6,400 vehicles per day. These roadways connect the Downtown to the surrounding areas of the Town and provide continuous connection to areas in east, west and north Oakville and beyond.

Traffic operational assessment of downtown streets indicated that acceptable levels of service are being provided at both signalized and unsignalized intersections. A number of operational and safety issues were identified in Downtown Oakville. These include:

1. Commercial Vehicle Loading and Unloading on Lakeshore Road

The current practice of permitting commercial vehicles to use the centre turn lane on Lakeshore Road for loading/unloading activities was found to be contributing to a number of safety issues:

- Restricted and/or blocked sightlines for pedestrians and other vehicles wishing to cross or turn onto Lakeshore Road;
- Exposure of pedestrians and motorists to conflicts and increased risk of collision in the centre of the road due to the limited road width available to accommodate through traffic movement, parking and commercial vehicle loading/unloading.

On the basis of the findings of the field investigation and safety review, it was concluded that the commercial vehicle use of the centre lane for loading/unloading purposes should be prohibited in conjunction with provision of commercial loading zones in curb side areas either on Lakeshore Road or on side streets.

It is recommended that the Town investigate prohibiting vehicle loading and unloading activity in the centre lane and providing alternative commercial loading spaces in curb areas with such changes being implemented as soon as possible. These spaces could be restricted for use during a particular period of the day, such as during the morning hours when activity in the downtown may be lower. Strict enforcement of a 'no parking' restriction within the two yellow lines along Lakeshore Road will be required to ensure the centre lane is free of parked vehicles.

2. Dedicated Turn Lanes on Lakeshore Road



Separate left turn lanes at the three unsignalized intersections along Lakeshore Road were found to be warranted by the combination of the percent left turning vehicles and the advancing and opposing traffic volumes. A similar conclusion was made for the four signalized intersections that are carrying higher volumes of turning traffic.

It is recommended therefore, that the centre left turn lane be retained for left turn movement. At a minimum, left turn lanes should be retained at all signalized intersections and provision of a slip-around be made in the form of a wider drivable intersection approach to enable through vehicles to bypass left turning vehicles at unsignalized intersections. This may mean a set back of the on-street parking to permit these types of maneuvers. In addition, the findings of the field investigation and safety review indicate that commercial vehicle use of the centre lane for loading/unloading purposes should be prohibited in conjunction with provision of commercial loading zones in curb side areas either on Lakeshore Road or on side streets.

3. Pedestrian Crossings of Lakeshore Road

The review of the pedestrian movement in the downtown, and the comments received by the Town in the past indicate that crossings by pedestrians of Lakeshore Road are occasionally difficult. This is particularly so at the two unsignalized intersections at Thomas and at Dunn Streets. Part of the crossing difficulty arises from the reduced visibility of oncoming vehicles due to the presence of on-street parking and trucks in the centre left turn lanes close to the intersections. Relocating the commercial loading/unloading activity to the curb areas will improve sightlines available to pedestrians as will improving the gaps between traffic moving along Lakeshore.

It is recommended that the Town consider implementing synchronized signal timings at the 4 traffic signals along Lakeshore Road to improve gaps in traffic and assist pedestrians and side-street traffic crossing at the unsignalized locations.

4. Cycling in the Downtown

Currently, with the exception of a small section of Navy Street, cycling on downtown streets is via on-road signed routes. In the coming years as roads in the downtown are improved or reconstructed, dedicated on-road bike lanes are proposed on Church and Randall Streets, with on-road signed routes remaining on Lakeshore Road, Trafalgar Road and Robinson Streets, as recommended in the Town's Active Transportation Master Plan (ATMP).

It is recommended that in the interim period prior to reconstruction of Church and Randall Streets and provision of dedicated on-street bicycle lanes on these roads as recommended in the Town's ATMP, on-street bike lanes be provided on Robinson Street from Allan to Navy Streets, with Allan Street south of Lakeshore Road to Robinson Street signed as an on-road bike route.



In addition, to improve cyclist and vehicle safety, it is recommended that the eastbound channelized right turn lane be removed and replaced with a standard curb radius to create a narrower intersection to better control turning movements and to increase the weaving length available between the Randall and Church Street intersections. In conjunction with geometric changes to the Randall Street and Navy Street intersection, it is recommended that a pedestrian signal be installed at the uncontrolled pedestrian crosswalk on the south leg of the Navy Street and Church Street intersection. In addition, bicycle pockets/bike boxes should be provided on the north approach at the Navy Street and Church Street intersection to provide a safe area for cyclists to stop and be seen by vehicles if this intersection is fully signalized in the future.

5. Needed Geometric Improvements

Based on the results of the field review and operations and safety assessments, the following improvements are recommended for the downtown streets:

1. Removal of the channelized eastbound right turn from Randall Street to Navy Street and replacement with standard radius corner with north – south pedestrian crossing on the west side of the intersection.
2. Removal of the uncontrolled pedestrian crossing of Navy Street at Church Street, located on the south side of Church Street, and replacement with a controlled pedestrian crossing using a pedestrian signal. This change to be made in conjunction with the geometric changes to the Randall/Navy street intersection.
3. Provision of wheelchair ramps at the pedestrian signal crossing of Randall Street west of the Fire Hall. This signal to remain in place with the recommended changes to the Randall/Navy intersection. The Fire Department is able to pre-empt this signal and the signal at the Navy Street / Randall Street intersection to permit emergency vehicles to enter or leave the Fire Hall.
4. Replacement of the existing pedestrian crossover located on Robinson Street near George Street with a pedestrian signal.

The cost for these improvements is estimated to be approximately \$377,000.

In addition to these geometric improvements, consider adjusting the traffic signal timing to provide synchronization of signals at the 4 traffic signals along Lakeshore Road to provide gaps to facilitate pedestrians and side-street traffic crossing Lakeshore Road.

6. Parking

The *Downtown Oakville & Kerr St. Village Commercial Parking Study* concluded that the current parking supply in Downtown Oakville is adequate in the short term. However, some optimization of the allocation of long-term parking between the existing parking areas could be undertaken. In the medium



term, as more development occurs and in conjunction with possible redevelopment of the Downtown Cultural Hub (DCH), additional parking will be required, including consideration of a second parking structure serving the downtown.

The existing parking limit at parking meters for on-street parking on Lakeshore Road is 2 hours. The Downtown Parking Study has recommended changing this maximum time limit to 3 hours. The effect of this change will be to increase the current average parking duration in these spaces from approximately 70 minutes to approximately 80 – 90 minutes which may result in an increased demand of approximately 15 – 25 spaces.

It is recommended therefore that the Town consider maintaining the current metered maximum time of 2 hours for on-street spaces on Lakeshore Road, at least until the improvements to Lakeshore Road have been implemented.

7. Traffic Signal Control System

The Town has indicated that the current signal system is nearing the end of its serviceable life. It is **recommended that when Lakeshore Road is reconstructed, all traffic signal equipment and wiring should be replaced. This would include installation of a fibre optic connection along Lakeshore Road to improve network redundancy. If the one-way system of traffic movement is changed to two-way traffic movement, this would be an appropriate time to replace/upgrade the traffic signal equipment along the affected roads.**

The existing traffic signal clearance intervals and pedestrian crossing times provided by the Town of Oakville were compared with the minimum times determined by applying the OTM Book 12 guidelines. This review revealed that the current clearance intervals and pedestrian crossing times are in conformance with OTM Book 12 guidelines with the exception of the traffic signal at Thomas and Church Streets. At this one location the Yellow and All Red clearance interval is approximately 0.8 seconds less than the 4.8 second minimum requirement.

Item 2a: One-Way Street Conversion

This analysis has shown that converting the one-way streets to two-way operation reduces travel time and distance by approximately one percent while not increasing delay significantly. It also results in reduced fuel consumption of approximately 3 percent. Two-way traffic movement makes travel simpler and reduces turning movements at some intersections. Separate left turn lanes at signalized intersections and slip-arounds at other intersections on Lakeshore Road should still be provided, otherwise the network benefits of reduced travel time and fuel consumption would be negated. The conversion also simplifies the provision of curb side commercial loading zones but does require additional geometric changes at several locations:

1. Separate southbound right-turn lane and eastbound left turn lane at the Trafalgar Road and Randall Street intersection;
2. Separate westbound left turn lane at the Randall Street and Navy Street intersection;
3. Separate southbound left turn lane at the Navy Street and Church Street intersection; and
4. Additional signal heads and stop signs for the intersections along Randall Street, Church Street and Lakeshore Road.
5. Changes to the Dunn Street / Randall Street intersection to maintain one-way southbound movement on Dunn Street north of Randall Street. This may involve the removal of the channel and stop control at Randall Street.

An assessment to confirm the feasibility of providing these improvements should be undertaken if the conversion of the one-way to two-way operation is implemented.

It is recommended that if the one-way streets are to be converted to two-way operation, the recommendations of the ATMP be reviewed to confirm the provision of on-street dedicated bicycle lanes on both Church Street and Randall Street.

Item 2b: Pedestrian Mall Conversion

Converting one of the public rights-of-way to a pedestrian mall similar to the Towne Square concept was examined. Two streets were chosen as candidates for closure: Navy Street between Randall Street and Lakeshore Road and George Street between Randall Street and Lakeshore Road.

Converting one of the public rights-of-way to a pedestrian mall similar to the Towne Square concept was examined. Two streets were chosen as candidates for closure: Navy Street between Randall Street and Lakeshore Road and George Street between Randall Street and Lakeshore Road.

Closure of the section of Navy Street from Randall to Lakeshore Road would mean that traffic wanting to access the properties adjacent to the west end of Church Street near Navy Street would not be able to do so with the current one-way eastbound operation of Church Street. For this section of Navy to be closed, the sections of Church Street between Navy and Thomas Streets and Randall Street between Navy and Thomas Streets would have to become two-way roadways. However, temporary closure of Navy Street between Randall Street and Lakeshore Road might be possible for special events as any disruption to local access on Church Street from Navy Street to Thomas Street will be short lived.

If Randall and Church Streets are converted to two-way traffic flow, a permanent closure of this section of Navy Street would require the following additional improvements:

1. Separate eastbound right turn lane at the Randall Street and Thomas Street intersection.
2. Separate southbound left turn lane at the Lakeshore Road and Thomas Street intersection.



3. Signal controls may be warranted at these two intersections.

Closure of George Street will not result in significant changes to the traffic flows at adjacent intersections and no further improvements would be required.

Downtown Cultural Hub (DCH)

The findings and recommendations of the DTS are based on the existing conditions assessment and the two network assessments identified in the Terms of Reference: conversion of the one-way streets to two-way operation; and conversion of a public right-of-way to a pedestrian mall. It is noted that a parallel transportation analysis is being undertaken for the development of the Downtown Cultural Hub that could see significant new development of the existing Centennial Square, Fire Hall and Post Office sites in the Downtown. The effects of this new development may alter the findings and recommendations made in the DTS. **It is recommended that the findings and recommendations of the DTS be reviewed and updated to reflect the recommendations of the DCH transportation analysis.**