City of London

A New Mobility Transportation Master Plan for London

2030 Transportation Master Plan: SmartMoves

Final Report: Volume 2

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Project Number:

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Date:

May, 2013

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LONDON 2030
TRANSPORTATION MASTER PLAN

City of London

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Executive Summary

1. Introduction: The New Mobility Transportation Master Plan

A New Mobility Transportation Master Plan for London study began in the fall of 2009 with the mandate of updating the *2004 Transportation Master Plan* (TMP). Following the 2004 study, the London Transit Commission (LTC) completed a *Transit Ridership Growth Strategy* in 2006 which recommended implementation of a Bus Rapid Transit (BRT) strategy to achieve the mode share targets of the 2004 TMP. The City of London (City) also completed their first *Bicycle Master Plan* in 2007, which contained a number of recommendations to enhance cycling facilities throughout the City.

The primary scope of this TMP update was to build upon the recommendations from these recent studies, incorporate the most recent strategic planning objectives of Council, and assess the viability of implementing a rapid transit system for the City.

The *City of London Strategic Plan* identified a vision as a "City of Opportunity". The plan identified five strategic outcomes to guide future planning and contribute to a continuation of the high quality of life in the City, the results are:

- A Vibrant and Diverse Community
- A Green and Growing City
- A Sustainable Infrastructure
- A Caring Community
- A Strong Economy

Many of these objectives have links to transportation infrastructure and services. The recommendations within this TMP are primarily designed to provide Sustainable Transportation Infrastructure; support a Green and Growing City; and in doing so, support a Strong Economy.

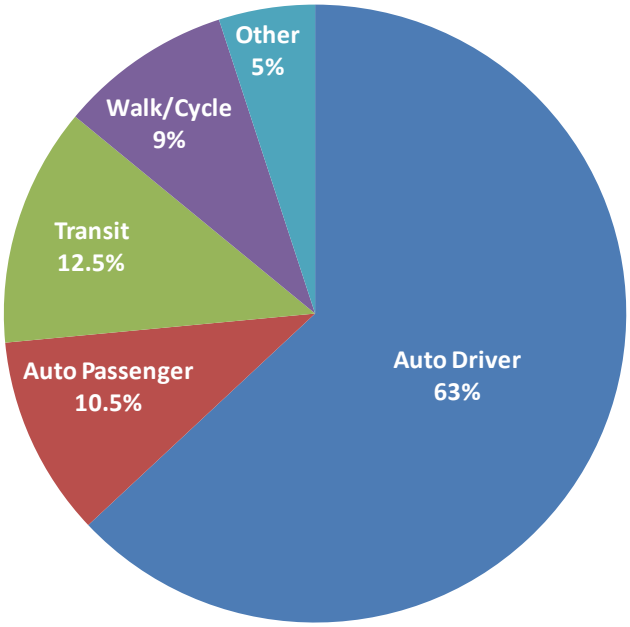
The 2030 TMP is a long-term transportation strategy for the City that will help guide the City's transportation and land use decisions through to 2030 and beyond. The TMP is focused on improving mobility for residents of the City by providing viable choices through all modes of travel.

On a typical weekday, City of London residents make an average of 620,000 person trips.

The study included the completion of a comprehensive household travel survey. The survey established a baseline of current travel patterns and public attitudes towards transportation in the City.

The survey confirmed that the private automobile dominates as the existing mode of choice for daily travel, accounting for 73.5% of travel in the weekday AM and PM peak periods.

However, the survey also revealed that public transit is carrying a larger share of daily and peak period trips than initially believed. The current 12.5% mode share has exceeded the 10% target established in the 2004 TMP. Use of active transportation modes (cycling / walking) has also improved from the 2004 TMP. The survey found that almost 9% of daily trips are made by active transportation modes, compared to 7.5% in 2004. Other modes such as the taxi, school bus, and motorcycle make up the remaining 5%.



2009 PM Peak Period Mode Shares

These findings demonstrate that the residents of the City are embracing more sustainable forms of transportation. More importantly, these findings suggest that a plan featuring the right mix of land use and transportation policies combined with strategic infrastructure investments could significantly increase the share of non-automobile trip making and support a viable rapid transit system in the City.

The key goal of the 2030 TMP is to provide more attractive travel choices for those who live, work, and play in the City. To achieve that goal, significant improvements in transit service will be required as well as greater support for walking, cycling, and carpooling. If more attractive travel choices are available, Londoners will be more likely to change their travel patterns, resulting in an overall reduced dependency upon the automobile. Over time, this shift in behaviour can reduce the need for costly and disruptive road widening projects while maintaining overall good transportation levels of service and providing overall environmental benefits. To guide the development of this TMP, weekday peak period modal share targets were established to provide an overall framework for this new mobility TMP.

Smart Moves Mode Share Targets

Mode	Today	2030 Target
Transit	*12.5%*	*20% City-wide*
Active Transportation (walking/cycling)	*9%*	*15% City-wide*
Auto (driver & passenger)	*73.5%*	*60% City-wide*
Other Modes	*5%*	*5%*

The 2030 TMP study is guided by a Council supported vision that is transit focused. Transit works best where there is sufficient land use density to generate ridership to support the system. Historically, the City has been growing at a rate of about 1% per year. Much of this growth has been occurring in the urban fringe areas, with only 22% of future growth planned to be accommodated through intensification of existing built-up neighbourhoods.

In the context of the pattern of historical growth, achieving this transit focused vision requires that the City first consider changes to the way that future growth is managed. This critical first step sets the framework for the rest of the TMP, which in turn establishes the transportation policies and infrastructure to support a new vision for mobility.

Accordingly, there are five “Smart Moves” that form the basis for this new TMP, each playing a role in supporting the achievement of the plan and Council’s strategic objectives. Each of these initiatives supports a strong and healthy downtown, which will remain the City’s primary economic engine and pre-eminent centre in the emerging urban structure. These five “Smart Moves” are:

- Rethinking Growth to Support the Transportation Master Plan
- Taking Transit to the Next Level
- Actively Managing Transportation Demand
- Greater Investment in Cycling and Walking Infrastructure
- More Strategic Program of Road Network Improvements

A summary of these five bold initiatives is outlined in the following sections, and these key actions form the basis for *A New Mobility Transportation Master Plan for London*. The Executive Summary concludes with a brief discussion on the Transportation Master Plan Implementation and provides recommendations on furthering the Collaborative Approach to City Building.

This 2030 Transportation Master Plan Final Report (Volume 2) outlines and describes the study recommendations and is structured into five chapters:

- Introduction;
- City Building for the New Mobility;
- The New Mobility Transportation Master Plan;
- Implementing the New Mobility Plan; and
- Conclusion.

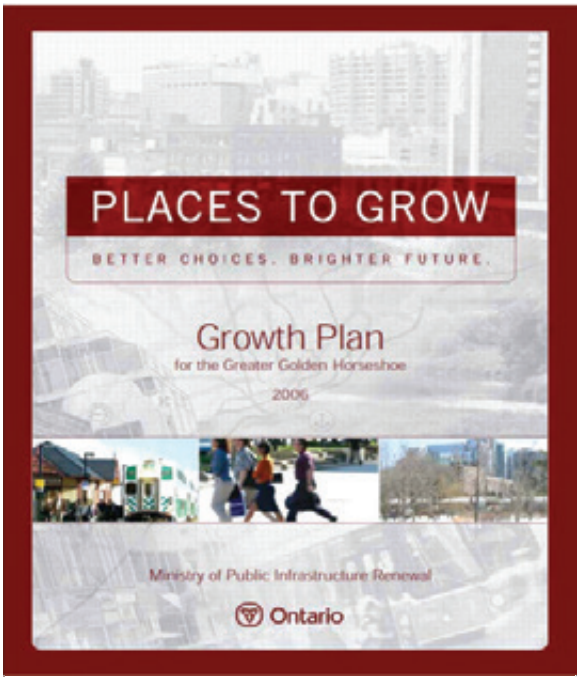
Due to the large size of the TMP study documentation, the final report is divided into the following three Volumes: Volume 1 - Executive Summary, Volume 2 - Final Report, and Volume 3 - Appendices.

2. Rethinking Growth to Support the Transportation Master Plan

A key goal of the TMP is to provide convenient alternatives to enhance mobility for all users and all modes of travel. The success of this TMP will depend on assisting such behaviour changes by fostering an urban structure and form that encourages increased use of transit, walking, and cycling. The City must also be prepared to help people find attractive choices to automobile use.

London must steadily encourage the emergence of a more transit, pedestrian, and bike-friendly urban form. This means that new growth, and other major City initiatives, must be encouraged and directed towards those locations which can best contribute to this mobility-driven urban structure.

Many cities in Ontario, and around the world, are recognizing that traditional patterns of urban development are not sustainable in terms of their municipal operating costs, personal movement expenses, and climate change implications. In 2006 the Ontario government introduced comprehensive legislation in its *Places to Grow Growth Plan* to direct the pattern of urban development in the Greater Golden Horseshoe area in southern Ontario centred on the Toronto region.

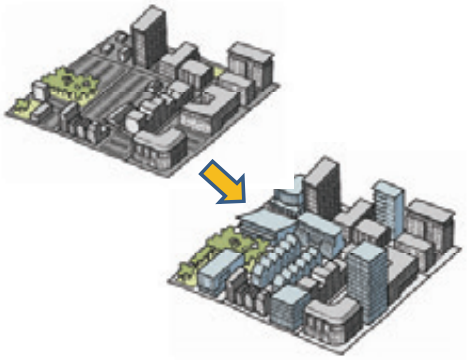


This legislation and policy direction sets an important precedent for London and other major Ontario cities not covered by the *Growth Plan*. The *Growth Plan's* primary focus is to set clear urban boundaries and targets for intensification within the existing urban area and new settlement areas. Its secondary purpose is to provide a sustainable distribution of people, jobs, and destinations to support a more developed transit system.

While the City must develop its own distinct growth management strategy, the *Places to Grow Growth Plan* and other precedents for growth management suggest some effective strategies. These strategies can be summarised as follows:

- Place clear limitations on urban expansion;
- Direct as much new growth as possible to locations inside the existing built area of the City;
- Encourage growth to locations where it supports transit ridership, walking, and biking;
- Locate key destinations in places where they can be served by transit; and
- Improve the quality of the built urban environment to establish attractive alternatives to city-edge living and working.

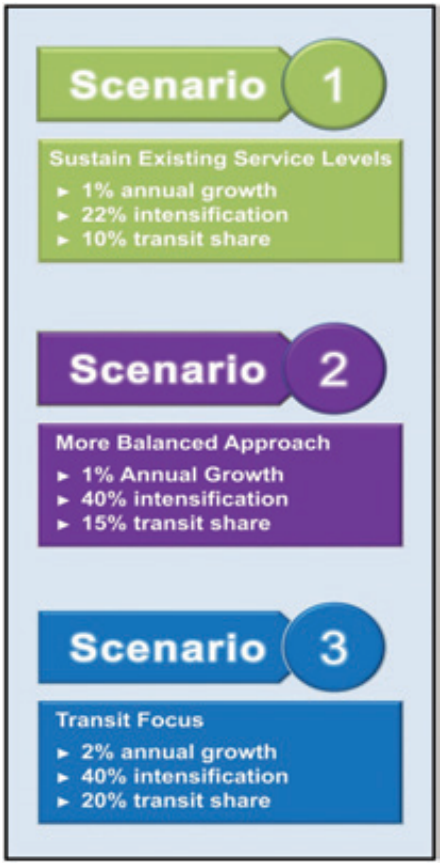
A Car-Oriented Downtown (top) versus a Compact, Pedestrian-Friendly Downtown (bottom)



These strategic directions have been used in the development of a series of land use scenarios for assessment during the TMP process. Three primary growth / transportation scenarios were assessed in order to determine the most effective integrated land use and transportation strategy to achieve this transit focused vision.

Scenario 1, representing a continuation of the status quo, was compared to Scenario 2 and 3 (along with two sub alternatives); each of which featured alternative growth allocation patterns and growth rates, along with higher transit mode share targets.

The technical analysis of Scenario 1, with its low 22% intensification rate and its focus of growth around the periphery of the City, has clearly shown that continuing this type of growth strategy does not support a transit focused vision. Based on the growth assessment findings, Council directed the study team to finalize the TMP based on the following:



Assessment of Growth Scenarios – Key Findings

1. *The status quo (1% growth with 22% intensification) does not support rapid transit, does not support downtown growth, and is not sustainable in the longer term. A higher city subsidy for transit and higher transportation infrastructure costs per new resident could be expected.*
2. *With a growth rate of 1%, the City can only support rapid transit if the growth strategy directs more people and jobs to locations along the proposed rapid transit routes. If 40% of future growth can be located within existing built-up areas and directed to two key corridors, then the City would have the ridership needed to support two rapid transit routes: one north/south corridor and one east/west corridor.*
3. *Intensification (even with low growth rates) reduces growth related infrastructure costs and supports higher transit ridership making rapid transit viable. This in turn supports growth downtown.*
4. *Higher growth rates of up to 2% per year would support higher order transit, significantly reduce infrastructure costs per new resident, and would allow the city urban structure (particularly the downtown) to change faster.*

- A City growth rate of 1% to be utilized as a conservative baseline;
- A City growth rate of 2% to be the corporate target to guide planning;
- Transportation goals, land use, development intensification, and urban form be aligned; and
- A minimum 40% intensification target to be adopted for the upcoming Official Plan review.

London City Hall

Based on Council direction, the TMP team considered both Scenarios 2 and 3 in developing this TMP. These scenarios feature a 40% intensification target, meaning that 40% of future growth will be directed into the current built-up areas of the City to provide the land use density and mix of uses to support transit and non-automobile modes of travel. Scenario 2 assumes the baseline 1% per year growth rate (which would be considered conservative from a BRT ridership perspective). Scenario 3 assumes a higher 2% annual growth rate which would represent the corporate target to be pursued. If

achieved, Scenario 3 might offer the possibility of expanding the BRT network or upgrading parts of the system to Light Rail Transit (LRT).

This unique TMP approach provides important flexibility in plan implementation. If the City achieves a higher growth rate, the additional infrastructure improvements and associated costs will have been identified and specifically linked to that additional growth. If the incremental growth is planned to be transit-oriented, it can increase the effectiveness of the initial BRT investments, boost BRT and overall transit system ridership, and minimize the cost of additional infrastructure improvements.

The ongoing ReThink London initiative is an important city building master plan that will take these growth management strategies and use them to establish the specific goals, priorities, and policies that will shape how the community grows in the future.

The growth management strategies will be based on an urban structure plan that will establish the overall intentions for the future form and function of the urban areas, and identify the specific locations where growth should be encouraged. An urban structure plan typically sets out the major growth points, or “nodes”, where growth is to be encouraged. These nodes are linked by a series of “corridors”, representing major streets that have potential for rapid transit development and connect to other major elements of the City’s transportation infrastructure such as airports, transit hubs, and regional expressways.

The City Planning and Transportation Departments have been active partners in the preparation of this TMP. In its recent draft publication, *Building the Place to Be – City of London Urban Design Guidelines,* the City Planning Department prepared a ‘nodes and corridors’ urban structure plan for London. This plan, which reflects the emerging directions of the TMP, identifies north/south and east/west rapid transit corridors and identifies key nodes such as the downtown, key intersections, the major educational and hospital institutions, as well as the airport and regional transportation facilities. It also acknowledges that developing these nodes will require a focus on linking development to transit and walking/cycling infrastructure.

The Richmond/Wellington (north/south) and Oxford/Dundas (east/west) rapid transit corridors present design and development opportunities and challenges in their overall function and detailed implementation. Preliminary assessments of the corridors have been made and examples of typical Transit Oriented Development (TOD), as illustrated below, have been prepared to demonstrate the viability of the corridors to accommodate significant growth, which will be confirmed through future detailed planning studies.

Oxford West Corridor
(Farrah Road and Wonderland Road)

Wellington Corridor
(at Southdale Road)

3. Taking Transit to the Next Level

At the heart of this new mobility TMP is a BRT network (see Exhibit ES-1). BRT is defined as bus-based transit service designed to provide faster, more efficient service than an ordinary bus line, while resembling rail transit in service quality, look, and feel.

A well designed BRT system attracts transit ridership, achieves better travel times than traditional transit routes, increases neighbourhood property values, attracts future residential and business development along its path, conserves energy and reduces greenhouse gases, and enhances the City's image and the quality of life.

Hi -Tech BRT Vehicles – Coventry Sprint, UK

The proposed rapid transit network for the City consists of the Richmond/Wellington (north/south) corridor and the Oxford/Dundas (east/west) corridor, both serving the downtown and broader central area as depicted on Exhibit ES-1. A bus-based rapid transit system can be supported with 1% annual growth (the recent historical trend), if 40% of the growth is directed to the downtown and along the proposed transit corridors, as envisioned in land use Scenario 2, described in the previous section. With stronger overall growth or higher rates of intensification, the additional population and jobs along the BRT corridors may encourage ridership, which would justify parts of the network being upgraded from BRT to LRT. Rapid transit in the recommended corridors would build upon the existing strong ridership base and provide enhanced services to encourage new ridership.

Many other transit improvements will also be required to boost ridership and transit modal share. These include more frequent service on all main routes, re-structured routes to feed the BRT (and pre-BRT) services, and generally making the transit system easier to use for riders through broader use of technology, more fare options (including Smart Cards), and expanded use of real time information.

Viva - Real Time Arrival Information

To achieve this new mobility TMP, a significant transformation is required in how Londoners travel. Changing travel behaviour takes time – it will not happen overnight! The City needs to start the process right away. The best way to start is with early implementation of transit improvements that demonstrate noticeable benefits. With noticeable improvements residents and workers will be more likely to change their habits, particularly those who currently drive alone. Undoubtedly, the transit improvement with the most potential to change travel behaviour is the proposed BRT network, so efforts should be focused to have a functional network in place as quickly as possible. Recognizing that a number of road widenings will be needed to provide exclusive transit lanes, a target date of 2020 (while optimistic) is appropriate for having both corridors in place with close to 100% levels of transit priority.

EmX Bus Rapid Transit System – Eugene, Oregon

One of the major features of a bus-based rapid transit system is its flexibility to allow for phased implementation. While road widenings are being planned, designed and constructed, service improvements and treatments such as signal priority measures and queue-jump lanes can be put in place to speed up service and build ridership. Operating the designated lanes as High Occupancy Vehicle (HOV) lanes, or allowing other "green vehicles" to use the lanes during peak periods, may also be an excellent way to maximize the effectiveness of the investment in dedicated lanes while building ridership and BRT service frequency over time.

In this regard, a new semi-express service (similar to Waterloo Region's I-Express) is recommended to be put in place in both corridors within two years and be steadily upgraded year by year.

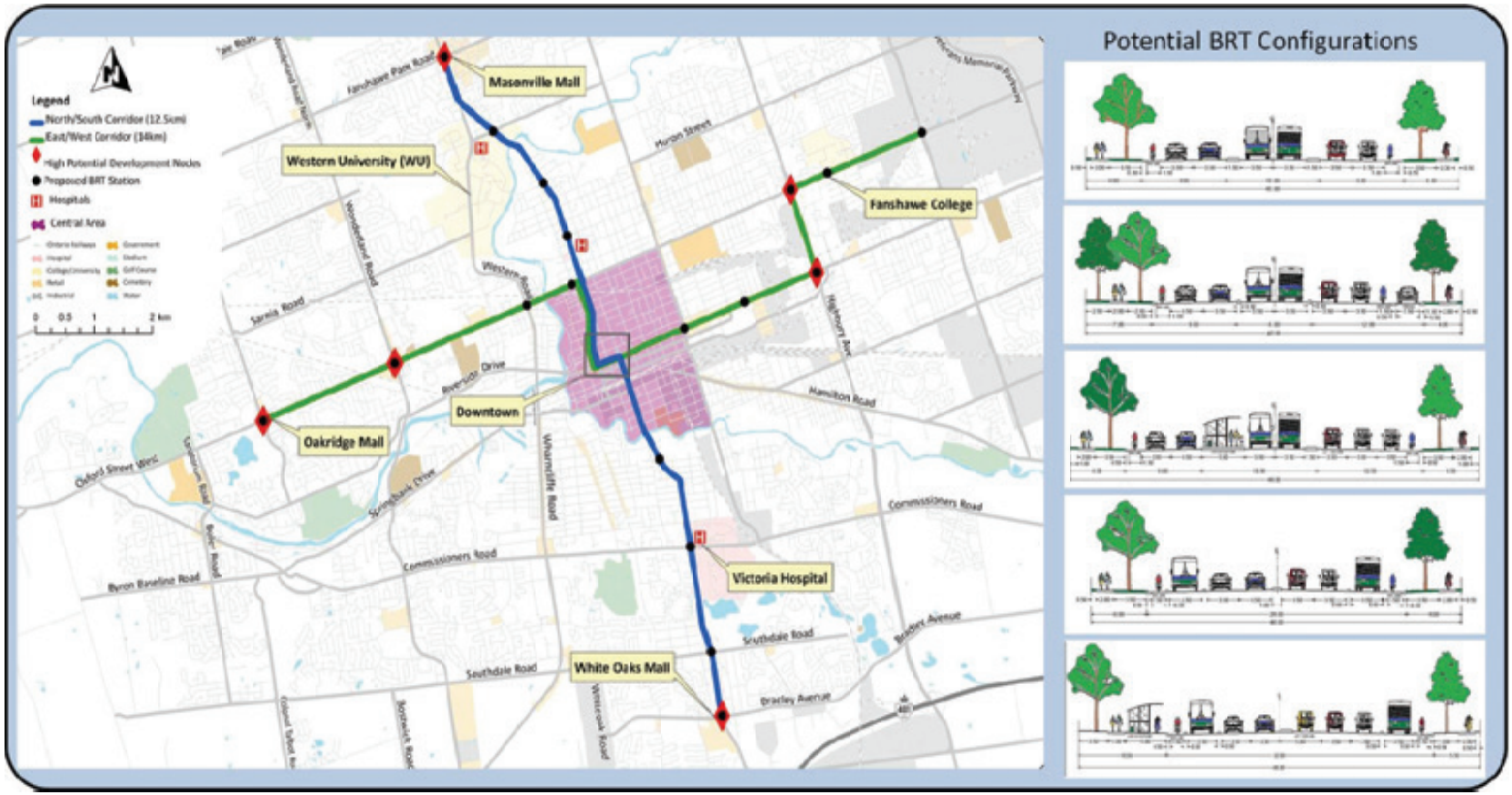
Region of Waterloo – I-Express

A preliminary analysis of both corridors has identified 25 intersections where queue-jump lanes could be quickly implemented. This will involve some refocusing of capital and operating plans, both at LTC and the City.

Viva Fare Payment Kiosk

Transit Priority Signal

Exhibit ES-1. Recommended Bus Rapid Transit Network



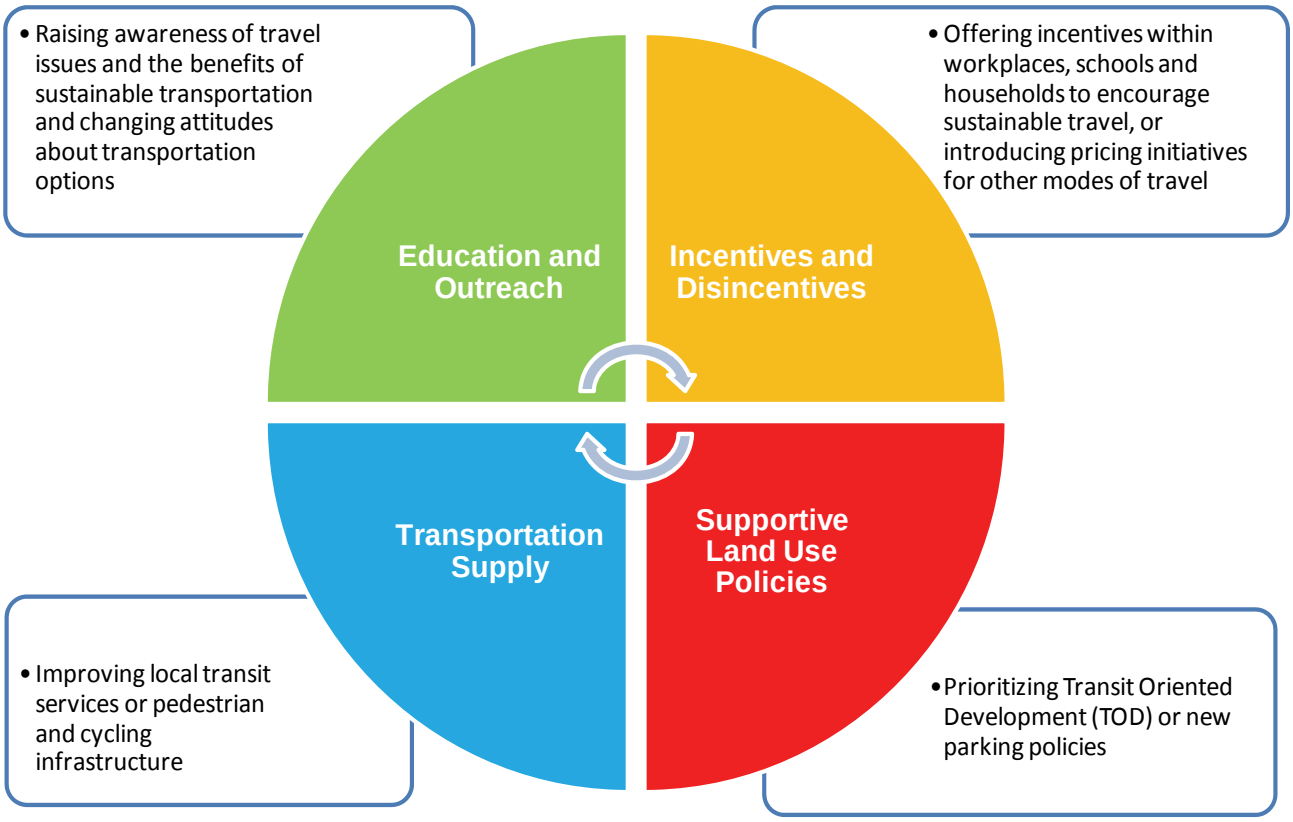
Taking Transit to the Next Level

4. Actively Managing Transportation Demand

As the City continues to grow and the importance of balancing economic, social and environmental needs is increasingly recognized, a more sustainable approach to accommodate growth and mobility should be encouraged. Many jurisdictions in Canada and across the world are moving away from traditional means of addressing transportation needs (e.g. investing in new roadway infrastructure) and are instead looking to ways to reduce and manage vehicular transportation demand.

Transportation demand management (TDM) incorporates a range of interconnected policies, programs, and mobility services that influence whether, why, when, where, and how people travel.

TDM can include the following:



Strengthening TDM efforts is another important part in the process of transforming travel in London. The following five broad directions are proposed as a focus for City efforts in the short term:

- Strengthen policy support
- Promote sustainable travel for all time periods
- Target commuter travel
- Target school travel
- Increase investment in active transportation infrastructure

Within these areas, 21 specific initiatives are proposed for further development and implementation in the short-term (refer to chapter 3, section 2).

Among these included developing a policy focussed on “complete streets” and people (not just vehicles) movement, strengthening partnerships with the healthcare sector (members of which should be strong advocates of increased active transportation), and intensifying the TDM program for City employees to set a strong example for other large employers. Other initiatives include expanding the Active and Safe Routes to School (ASRTS) program to a city-wide scale, working with school boards to develop secondary school programs, and accelerating the implementation of on-street cycling routes and secure bicycle parking facilities.

Safe Routes to School – Walking School Bus, London

The supply and pricing of parking are also important policy tools at the City's disposal, which can influence modal choice decisions and therefore aid in the transformation process. The City is currently working on short and long-term parking strategies for the downtown and these should include pricing structures that support transit. Later, with intensification of development in the transit corridors and at specific nodes, similar parking supply and pricing strategies should be considered for these areas.

Another important parking initiative should be the implementation of park-and-ride facilities at the extremities of the proposed BRT lines. In other jurisdictions, this has proven to be an effective way of boosting transit ridership and reducing automobile travel, particularly for longer distance and downtown-oriented trips.

Structured parking may eventually replace surface lots in the downtown

Pay and Display Parking Kiosk, London

5. Greater Investment in Cycling and Walking Infrastructure

Active transportation is closely linked with TDM and includes any form of human-powered transportation but, in the context of this TMP, the focus is on walking and cycling. Active transportation has substantial benefits in the following areas:

- Improved personal health and quality of life;
- Reduced travel costs;
- Availability to a broad range of individuals;
- Vibrancy and security of communities;
- Reliability of travel time; and
- Minimal environmental impacts.

All Trips Begin with a Walk

More active transportation infrastructure will be needed to support growth in intensification areas and improve access to transit, particularly the proposed new BRT services. Specific initiatives include completing gaps in the sidewalk network, providing a more continuous and extensive network of on-street bike routes, and providing secure bike parking facilities at all key public destinations and employment concentrations.

Secure Bicycle Storage, Western University

The City has a vast network of trails and off-street bike paths focused on the Thames Valley Parkway (TVP) system. This network is a key contributor to the higher quality of life enjoyed by City residents. However, the City's current bike lane network is relatively under-developed and discontinuous.

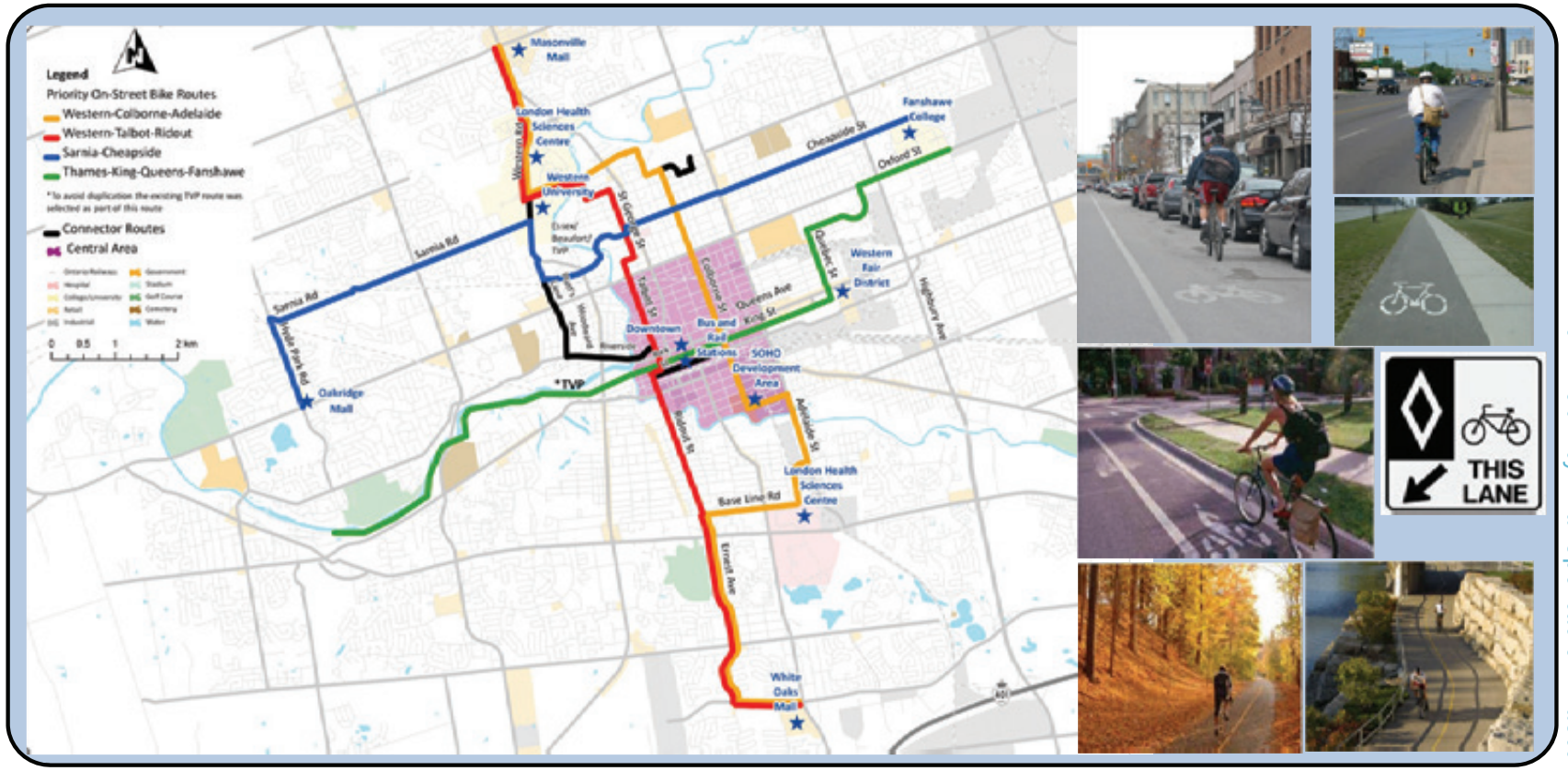
Walking and Cycling Structure, London

Of the 21 identified short-term TDM initiatives, the one considered most important to the transformation process is the upgrading of on-street cycling routes. In this regard, four priority on-street cycling routes have been identified (see Exhibit ES-2) for implementation within three years using bike lanes wherever possible.

Two of the priority routes are north/south and two are east/west, with one tying into the TVP system west of the downtown. All priority routes serve the broader central area, key city destinations, and the proposed intensification areas. To increase usage, the routes need a greater degree of recognition and thus they should be named, well maintained in all seasons, very well marked on the pavement, and well signed.

Richmond Street and Central Avenue Intersection, London

Exhibit ES-2. Priority On-Street Bike Routes



Greater Investment in Cycling and Walking Infrastructure

6. More Strategic Program of Road Network Improvements

Despite the greater emphasis of this TMP on transit, active transportation, TDM, and parking, many road improvements will still be required. The City's approach to defining the need for road network improvements has become more strategic (and selective) than in past TMP efforts for the City.

First of all, the more strategic approach reflects a reduced modal share for the automobile by 2030, consistent with the City's expectation that transit and active transportation modal shares will increase significantly from current levels. Closely related to this is the need for an increased percentage of capital and operating funds for non-automobile modes – transit and walking/cycling.

Secondly, roadway improvement needs have been based on a corridor level analysis, as opposed to the more traditional link by link analysis. This means, for example, that where two adjacent roadway links both show capacity deficiencies, only one improvement may be necessary to resolve the corridor deficiency.

The City's approach explicitly recognizes that road improvements will be required for different purposes. In this regard, a number of widenings are required to support the BRT initiative. These are shown in green in Exhibit ES-3 and include Richmond Street north of the Thames River, Oxford Street West west of Richmond Street, most of Wellington Road south of Horton Street, and parts of Dundas Street, Highbury Avenue, and Oxford Street East. A listing of road widening projects to support the BRT corridors, along with capital cost estimates are provided in Table ES-1. These widenings, which support the BRT initiative, should be top priorities.

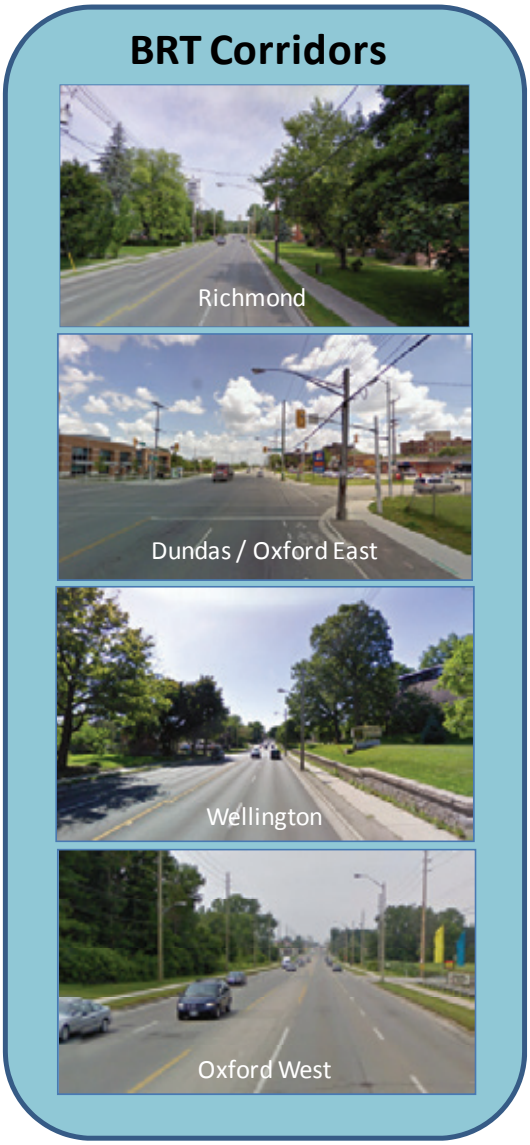


Table ES-1. Road Improvements for Bus Rapid Transit Implementation – by Horizon

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
South Leg				**5,500**	**$88,200,000**
Wellington Road	Bradley Avenue and Horton Street	4 to 6 lanes	2015	5,500	$88,200,000
North Leg				**2,300**	**$49,200,000**
Richmond Street	Fanshawe Park Road to Raymond Avenue	4 to 6 lanes	2016	2,300	$49,200,000
East Leg				**6,200**	**$66,300,000**
Highbury Avenue	Dundas Street to Oxford Street	4 to 6 lanes	2017	1,300	$13,900,000
Dundas Street	Adelaide Street to Highbury Avenue	4 to 6 lanes	2019	2,500	$26,700,000
Oxford Street	Highbury Avenue to Clarke Road	4 to 6 lanes	2020	2,400	$25,700,000
West Leg				**6,000**	**$64,200,000**
Oxford Street West	Hyde Park Road to Richmond Street	4 to 6 lanes	2018	6,000	$64,200,000
Downtown				**6,000**	**$32,100,000**
Richmond Street	Raymond Avenue to York Street	Optimization	2016	3,800	$20,300,000
York Street	Richmond Street to Colborne Street	Optimization	2017	900	$4,800,000
Colborne Street	York Street to Dundas Street	Optimization	2019	300	$1,600,000
Dundas Street	Colborne Street to Adelaide Street	Optimization	2018	700	$3,800,000
Wellington Street	Horton Street to York Street	Optimization	2020	300	$1,600,000
Totals				**26,000**	**$300,000,000**

Roadway extensions and widenings to support baseline growth are also shown in Exhibit ES-3. The red lines represent future four-lane roadways and the blue lines note future six-lane roadways. The majority of these are in more suburban locations where transit is less able to compete with the automobile.

Other road improvements labelled “Optimization/Transit Priority” (shown in purple) reflect highly constrained urban rights-of-way where opportunities for widening are

limited. Optimization of these corridors will be focused on intersection improvements, turning lanes, and transit priority measures such as HOV lanes and queue-jump lanes at intersections. Widening these corridors to six lanes is not recommended so as to avoid competing with investments made to support the BRT system.

A listing of major road improvement projects along with capital cost estimates and the recommended implementation horizon are summarized in Table ES-2.

A sensitivity analysis has also been undertaken to define what further road network improvements would be needed to support a higher rate of growth (2% annually vs. 1%). Careful monitoring and review through subsequent TMP updates will be required to determine if and when these additional road improvements would be required.

Another strategic aspect of the road improvement program relates to supporting the concept of "complete streets". A complete street is one that is designed to accommodate the mobility needs of all ages, abilities, and modes of travel. Safe and comfortable access for pedestrians, bicycles, transit users, and the mobility challenged are not design after-thoughts, but are integral to the planning of the street from the start.

In practise, the "complete street" concept typically involves apportioning the road right-of-way to better serve all users (including pedestrians and cyclists) and may include providing wider boulevards, enhanced sidewalks, bicycle lanes, street furniture and amenities, and other enhancements designed to make the street less automobile oriented.

Portland Multi-Use Downtown Corridor

Studies have shown that implementing these types of improvements can enhance safety for non-automobile users, reduce vehicle speeds, and can maximize the person-carrying capability of the roadway (i.e. people movement rather than vehicle movement). This concept should be the accepted policy approach to pursuing all roadway improvements within the City.

St. George Street, Toronto

More Strategic Program of Road Network Improvements

Exhibit ES-3. 2030 Baseline Road Network Improvements

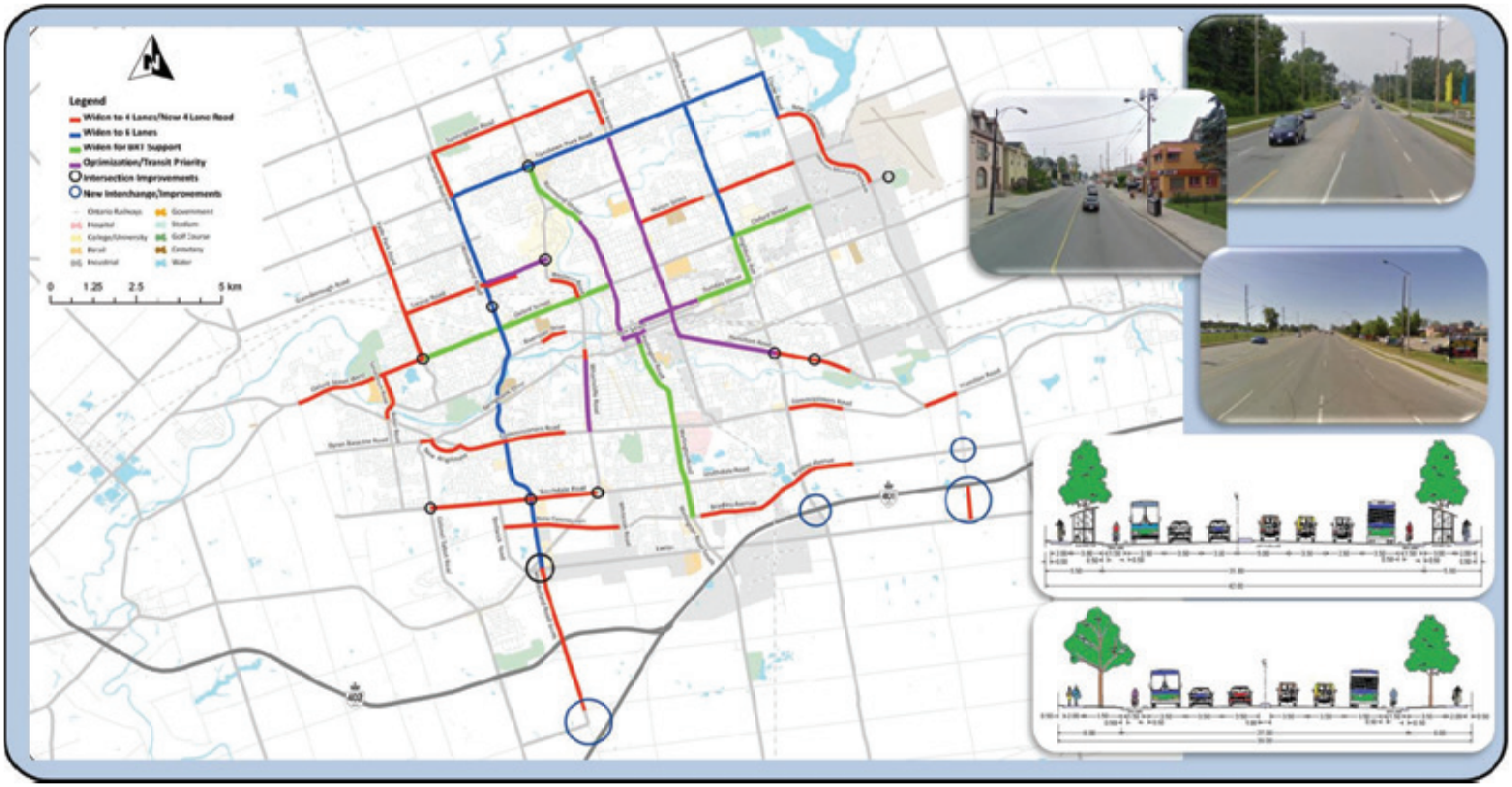


Table ES-2. Major Road Improvements – by Horizon

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
Oxford Street West	**Hyde Park Road to Sanatorium Road**	**2 to 4 through lanes with centre turn lane**	**0-5**	**1,230**	**$10,600,000**
Commissioners Road	**Wonderland Road to Viscount Road**	**2 to 4 through lanes with centre turn lane**	**0-5**	**1,400**	**$12,600,000**
Southdale Road	**Wonderland Road to Wharncliffe Road**	**2 to 4 through lanes**	**0-5**	**1,150**	**$11,500,000**
Wonderland Road Interchange	**Highway 401**	**Interchange**	**0-5**	**n/a**	**[a] $25,000,000**
Fanshawe Park Road	**Adelaide Street to Highbury Avenue**	**2 to 4 through lanes with centre turn lane**	**0-5**	**2,000**	**$15,900,000**
Sarnia Road	**Wonderland Road to Sleightholme Avenue**	**3 to 4 through lanes**	**0-5**	**850**	**$8,100,000**
Western Road	**Platts Lane to Oxford Street**	**2 to 4 through lanes, including widening rail underpass**	**0-5**	**950**	**$17,000,000**
VMP Extension and Interchange	**Highway 401 to Wilton Grove Road**	**4 through lanes and interchange**	**0-5**	**1,000**	**[b] $25,000,000**
Highbury Avenue Interchange	**Highway 401**	**Interchange**	**0-5**	**n/a**	**[c] $30,000,000**
Hyde Park Road	**CPR to Fanshawe Park Road**	**2 to 4 through lanes**	**0-5**	**2,200**	**$13,800,000**
Hyde Park Road	**Oxford Street to CPR**	**2 to 4 through lanes**	**0-10**	**2,000**	**$22,200,000**
	Oxford to CPR	2 to 4 through lanes	0-5	2,000	$20,400,000
	Oxford Intersection	2 to 4 through lanes	5-10	n/a	$1,800,000
Sunningdale Road	**Wonderland Road to Adelaide Street**	**2 to 4 through lanes**	**0-10**	**5,200**	**$47,100,000**
	Stage 1 - Phase 1 - Wonderland/Sunningdale Intersection	2 to 4 through lanes	0-5	300	$2,200,000
	Stage 1 - Phase 2 - Richmond/Sunningdale Intersection	2 to 4 through lanes	0-5	300	$3,300,000
	Stage 2 - Phase 1 - Adelaide to Bluebell	2 to 4 through lanes	5-10	1,100	$14,900,000
	Stage 2 - Phase 2 - Bluebell to Richmond	2 to 4 through lanes	5-10	1,150	$7,300,000

More Strategic Program of Road Network Improvements

More Strategic Program of Road Network Improvements

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
	Stage 2 - Phase 3 - Richmond to Wonderland	2 to 4 through lanes	5-10	2,350	$19,400,000
Bradley Avenue Extension	**Jalna Boulevard to Bostwick Road**	**4 through lanes**	**0-15**	**3,800**	**$35,400,000**
	Phase 2 - Jalna to Wharncliffe	4 through lanes	5-10	1,800	$10,300,000
	Phase 1 - Wharncliffe to Wonderland	4 through lanes	0-5	1,025	$13,000,000
	Phase 3 - Wonderland to Bostwick	4 through lanes	10-15	975	$12,100,000
Huron Street	**Adelaide Street to Vesta Road**	**2 to 4 through lanes**	**5-10**	**1,800**	**$12,900,000**
Bradley Avenue	**Dearness Drive to Jackson Road**	**2 to 4 through lanes**	**5-10**	**4,800**	**$43,100,000**
	Phase 1 - Dearness to Pond Mills	2 to 4 through lanes	5-10	2,500	$22,800,000
	Phase 2 - Pond Mills to Jackson	2 to 4 through lanes	5-10	2,300	$20,300,000
Sarnia Road	**Wonderland Road to Hyde Park Road**	**2 to 4 through lanes**	**5-10**	**2,350**	**$6,600,000**
	Phase 1 - Aldersbrook to Wonderland	2 to 4 through lanes	5-10	1,000	$2,000,000
	Phase 2 - Hyde Park to Oakcrossing Gate	2 to 4 through lanes	5-10	1,350	$4,600,000
Boler Road / Sanatorium Road	**Commissioners Road to Oxford Street West**	**2 to 4 through lanes**	**5-10**	**1,450**	**$17,200,000**
	Phase 1 - Oxford to Riverside	2 to 4 through lanes	5-10	900	$6,000,000
	Phase 2 - Riverside to Commissioners	2 to 4 through lanes	5-10	550	$11,200,000
Adelaide Street North	**Grenfell Drive to Sunningdale Road**	**2 to 4 through lanes**	**5-10**	**1,000**	**$8,100,000**
Wharncliffe Road	**Becher Street to Springbank Drive**	**2 to 4 through lanes**	**5-10**	**300**	**$20,000,000**
Riverside Drive	**Woodward Avenue to Beaverbrook Avenue**	**2 to 4 through lanes**	**5-10**	**800**	**$4,300,000**
Old Victoria Road	**Old Victoria Intersection**	**Intersection**	**5-10**	**n/a**	**$4,700,000**
Wonderland Road	**Fanshawe Park Road to Riverside Drive**	**4 to 6 through lanes**	**5-20**	**5,400**	**$42,000,000**
	Phase 1 - Riverside to Oxford	4 to 6 through lanes	5-10	1,000	$13,800,000
	Phase 2 - Oxford to Sarnia	4 to 6 through lanes	5-10	1,600	$12,300,000

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
	Phase 3 - Sarnia to Fanshawe	4 to 6 through lanes	20	2,800	$15,900,000
Veterans Memorial Parkway	**Huron Street to Clarke Road**	**New 2 through lanes then 4 through lanes**	**5-20**	**1,850**	**$18,700,000**
	Phase 1 - Huron to Clarke	2 through lanes	5-10	1,850	$11,500,000
	Phase 2 - Huron to Clarke	2 to 4 through lanes	15-20	1,850	$7,200,000
Wonderland Road	**Riverside Drive to Exeter Road**	**4 to 6 through lanes**	**5-20**	**6,700**	**$41,100,000**
	Phase 1 - Riverside to Springbank	4 to 6 through lanes	5-10	1,500	$20,200,000
	Phase 2 - Springbank to Southdale	4 to 6 through lanes	10-15	3,100	$12,600,000
	Phase 3 - Southdale to Exeter	4 to 6 through lanes	15-20	2,100	$8,300,000
Veterans Memorial Parkway	**Oxford Street to Huron Street**	**2 to 4 through lanes**	**10-15**	**1,800**	**$9,100,000**
Oxford Street West	**Sanatorium Road to Westdel Bourne Road**	**2 to 4 through lanes**	**10-15**	**2,650**	**$14,100,000**
	Phase 1 - Sanitorium to Commissioners	2 to 4 through lanes	10-15	1,650	$8,800,000
	Phase 2 - Commissioners to Westdel Bourne	2 to 4 through lanes	10-15	1,000	$5,300,000
Fanshawe Park Road	**Wonderland Road to Adelaide Street**	**4 to 6 through lanes**	**10-15**	**4,875**	**$24,600,000**
	Phase 1 - Adelaide to Richmond	4 to 6 through lanes	10-15	2,400	$10,800,000
	Phase 2 - Richmond to Wonderland	4 to 6 through lanes	10-15	2,475	$13,800,000
Commissioners Road East	**Highbury Avenue to Jackson Road**	**2 to 4 through lanes**	**10-15**	**1,500**	**$7,500,000**
Wonderland Road North	**Sunningdale Road to Fanshawe Park Road**	**2 to 4 through lanes**	**10-15**	**1,300**	**$10,700,000**
Fanshawe Park Road	**Adelaide Street to Highbury Avenue**	**4 to 6 through lanes**	**10-15**	**2,300**	**$10,700,000**
Hamilton Road	**Old Victoria to Veterans Memorial Parkway**	**2 to 4 through lanes with centre turn lane**	**10-15**	**925**	**$4,700,000**
Hamilton Road	**Old Victoria to Veterans Memorial Parkway**	**2 to 4 through lanes with centre turn lane**	**10-15**	**925**	**$4,700,000**

More Strategic Program of Road Network Improvements

More Strategic Program of Road Network Improvements

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	(2012$)
Huron Street	**Highbury Avenue to Clarke Road**	**2 to 4 through lanes**	**10-15**	**2,400**	**$16,100,000**
Wharncliffe Road	**Horton Street to Commissioners Road**	**Optimization**	**10-15**	**2,200**	**$7,300,000**
Adelaide Street	**Fanshawe Park Road to Hamilton Road**	**Optimization**	**10-15**	**6,300**	**$20,800,000**
Wonderland Road	**Exeter Road to Highway 401**	**2 to 4 through lanes**	**10-20**	**4,900**	**$39,400,000**
	Phase 1 - Exeter to Hwy 402	2 to 4 through lanes	10-15	2,000	$19,000,000
	Phase 2 - Hwy 402 to Hwy 401	2 to 4 through lanes	15-20	2,900	$20,400,000
Fanshawe Park Road East	**Clarke Road to Highbury Avenue**	**2 to 6 through lanes with centre turn lane**	**15-20**	**2,500**	**$22,400,000**
Clarke Road	**VMP Extension to Fanshawe Park Road**	**2 to 6 through lanes**	**15-20**	**1,375**	**$30,400,000**
Southdale Road West	**Colonel Talbot Road to Pine Valley Boulevard**	**2 to 4 through lanes with centre turn lane**	**15-20**	**2,800**	**$23,400,000**
	Phase 1 - Colonel Talbot to Farnham	2 to 4 through lanes with centre turn lane	15-20	2,200	$18,400,000
	Phase 2 - Farnham to Pine Valley	2 to 4 through lanes with centre turn lane	15-20	600	$5,000,000
Hamilton Road	**Highbury Avenue to River Run Terrace**	**2 to 4 through lanes**	**15-20**	**2,300**	**$13,200,000**
Commissioners Road West	**Wonderland Road to Cranbrook Road**	**2 to 4 through lanes with centre turn lane**	**15-20**	**1,000**	**$8,400,000**
Commissioners Road West	**Cranbrook Road to Springbank Drive**	**4 through lanes with centre turn lane**	**15-20**	**1,100**	**$7,700,000**
Byron Baseline Road	**Commissioners Road West to Colonel Talbot Road**	**3 to 4 through lanes with centre turn lane**	**15-20**	**500**	**$3,800,000**
Hamilton Road	**Adelaide Street to Highbury Avenue**	**Optimization**	**15-20**	**2,800**	**$9,300,000**
Highbury Avenue	**Fanshawe Park Road to Oxford Street**	**4 to 6 through lanes**	**15-20**	**4,100**	**$24,500,000**
Veterans Memorial Parkway Interchange	**Bradley Avenue**	**Interchange**	**20**	**n/a**	**$26,000,000**
Totals				**97,855**	**$827,000,000**

** Likely contribution from Ontario Government: (a) Wonderland Road Interchange: $15,000,000; (b) VMP Extension and Interchange: $10,000,000; (c) Highbury Avenue Interchange: $23,000,000*

7. Transportation Master Plan Implementation

Capital costs associated with the baseline 2030 TMP are summarized in the table below:

Capital Cost Estimates	
Municipal Road Widening	$827 M
Intersections and other Minor Improvements	$60 M
Municipal Transit	$378 M
Active Transportation	$20 M
Parking	$24 M
Total Transportation Capital (2012$)	**$1,309 M**

These capital costs are gross and are not reduced to show the inclusion from development charges and expected contributions from both the federal and provincial governments for BRT related costs. The cost estimate includes $60 M in additional improvements set aside for intersection improvements and minor road widenings (as detailed further in chapter 3, section 3). Thus, the total transportation capital cost associated with the new mobility TMP is over $1.3 B. Furthermore, sufficient City funding should be set aside for keeping all transportation assets in a state of good repair.

Of the $378 M municipal transit capital, about $340 M is estimated to be BRT related and therefore should be eligible for contributions of up to one-third of the capital costs from both senior levels of government. However, both federal and provincial governments are currently under significant budget pressures and therefore it will be necessary to develop a compelling business case to secure their support.

Annual Operating and Maintenance Costs	
Roads	$35.7 M
Transit	$14.3 M
Active Transportation, TDM, & Parking	$7.3 M
Total Operating and Maintenance Costs(2012$)	**$57.3 M**

Projected 2030 annual operating and maintenance costs (in 2012 dollars) associated with the baseline TMP are estimated at just over $57 million per year, as summarized in the table above. The transit operating costs are net of fares collected from riders, based on current rates of recovery.

The *Official Plan* is one of the basic mechanisms for implementing the recommendations of the TMP. The *Official Plan* contains Council's objectives and policies to guide the short-term and long-term physical development of all lands within the boundary of the City. It provides direction for the allocation of land use, provision of municipal services and facilities, and preparation of regulatory by-laws to control the development and use of land.

To address the set of city-wide land use and transportation issues discussed above, policies with respect to the following matters should be incorporated into the new *Official Plan*:

- A nodes and corridors urban structure plan that identifies the specific nodes and corridors, the downtown and other destinations, with general policies with respect to the ambitions for each such corridor and location;
- Established growth management principles for specific intensification targets such as the encouragement of transit-supportive development, the efficient use of urban space, the allocation of growth between the urbanized area and the fringe areas, and the concentration of development around nodes and corridors;
- Established specific intensification targets for urbanized areas, the central area, specific nodes and corridors, and major destinations;
- A review of the transportation needs for TMP updates on a five year basis, in conjunction with the results of a new comprehensive transportation survey and monitoring program;
- The definition of the upper limit of Level of Service E, where the demand equals the available road capacity, applied on a corridor basis as the justification basis for roadway capacity improvements;
- Classification of individual major roads and corridors with respect to their transportation function and urban design character;
- Established new rights-of-way widths for rapid transit corridors (40 m between intersections and 48 m at signalized intersections), and major arterials (39 m between intersections and 42 m at signalized intersections);
- Recognition that the design of a road will set the quality of pedestrian environment and residential amenity and will have a major impact on whether an urban form of infill and intensification, as desired at important nodes and corridors, is viable;
- Recognition that each node and corridor has a distinct character and that secondary planning policies may be necessary to provide detailed guidance;
- An established positive policy framework for transit supportive development in terms of the density, scale, function, and design of such development; and
- An established positive policy framework for the creation of pedestrian and bicycle friendly urban design and development policies.

Specific policies have been proposed under the headings of Growth Management, Integrated Transportation Planning, Public Transit, Transit Oriented Development, Complete Streets, Supporting Active Transportation, Transportation Demand Management and Parking. These should be considered for refinement during the preparation of the new *Official Plan*.

The success of this TMP will depend upon achieving a major transformation in how Londoners travel. Since changing travel behaviour will take considerable time, it will be necessary to monitor key travel indicators on a continuous basis to ensure that adequate progress is being made or, if it is not, to take appropriate actions to get back on track.

A transportation monitoring program has therefore been developed to assist the City in this regard. This program will allow the City to expand on its annual progress report to Council. One of the key indicators to be measured is travel modal share and, as noted previously, targets have been set for transit, active transportation, and automobile modes as part of this TMP. The recommended program includes conduct of household travel surveys (similar to the 2009/10 survey conducted as part of this TMP), counts of person travel by all modes across pre-defined screenlines and cordons, travel time surveys by mode for pre-defined typical trips, and attitude surveys of transit riders. Reports on the monitoring program will serve as key inputs to future TMP updates and the data will allow the City's transportation model to be recalibrated on a regular basis.

Finally, there is considerable work to be done over the next couple of years to move forward in a proactive manner on the BRT initiative, to approach senior levels of government as prospective funding partners and address their requirements, and to transform the existing attitudes and perceptions regarding transportation in the City. To kick-start the TMP implementation, an immediate action plan for Council has been developed, comprised of the 12 points listed in Table ES-3 below.

Table ES-3. Immediate Action Plan for Council

Action Plan Point	Timing	Rationale
1. Cement *Transportation Master Plan* Foundations	2012 – 2013	A revised growth strategy, *Centres and Corridors Urban Structure Plan*, *Downtown Master Plan*, and new *Official Plan* are all cornerstones for the *Transportation Master Plan*. All four initiatives are well underway but need to be completed expeditiously.
2. Develop Proposal for Provincial and Federal Funding of Bus Rapid Transit	2012 – 2013	A compelling business case will need to be developed to secure funding commitments, so that the net cost to Londoners is affordable.
3. Pursue Revisions to *Development Charges Act*	2013	The ability to secure additional development charges for transit, active transportation, and transportation demand management initiatives will also help to minimize costs to City taxpayers.
4. Initiate Class Environmental Assessments for Bus Rapid Transit Corridors	2013 – 2014	Securing environmental approvals for the bus rapid transit network is the next step in the implementation process. Through Class Environmental Assessments route alignments, station locations, terminal requirements, roadway configurations, and property needs will be finalized. Transit vehicle requirements will also be determined and cost estimates refined.
5. Initiate Corridor Land Use Planning Studies	2013 – 2014	In coordination with the Class Environmental Assessments, corridor land use planning studies will identify specific opportunities and constraints for intensification and develop guidelines for transit-oriented development.
6. Refine and Implement Short-Term Transit Improvement Plan	2012 – 2014	A short-term transit plan for the bus rapid transit corridors is needed so that service improvements can be realized quickly in order to start building ridership and increasing transit modal share.
7. Undertake Transit Route Restructuring Study	2014	The future bus rapid transit network will become the backbone of the London Transit Commission network. A route restructuring study will be needed to ensure that the effectiveness of the bus rapid transit network is maximized from a total London Transit Commission system perspective.
8. Implement On-Street Priority Cycling Routes	2013 – 2014	To bring the City's on-street cycling routes up to par with its off-street trail network, four continuous on-street cycling routes have been identified for early implementation.
9. Finalize a Downtown Parking Strategy	2014	Short and long-term parking strategies for the downtown area should incorporate pricing structures to support transit and make it easier for more people to come downtown.
10. Identify Opportunities for Park-and-Ride Facilities	2014	Park-and-ride facilities at the extremities of the bus rapid transit lines will boost ridership and reduce automobile usage. Due to the need for property acquisition or negotiation of shared parking use with others such as shopping mall owners, additional time will be required. A park-and-ride plan in the near term will ensure that such facilities can be put in place as quickly as possible.
11. Finalize and Implement a Short-Term Transportation Demand Management Plan	2012 – 2014	Various initiatives have been recommended for short-term implementation. These need to be detailed in the context of existing programs and consolidated into a cohesive program.
12. Develop a Communications Plan to Build Community Support	2013	A level of momentum has been created through the *Transportation Master Plan* process, but this needs to be continued and expanded to ensure *Transportation Master Plan* success.

8. A Collaborative Approach to City Building

Engaging and consulting the public and key stakeholders has been a critical part of the TMP work. During the course of the TMP study, four sets of meetings have been held. In each case, the initial workshops were held with the User Vision Group and the Sustainable Transportation Roundtable Group and those were followed up with full public workshops. Overall, participants at those meetings were very supportive of the TMP work and the team's willingness to listen to and address comments and concerns. At the final meetings held in May 2012, there was strong support for the draft TMP presented.

Transportation Master Plan Workshop 2011

Another positive aspect of the TMP effort has been the inter-disciplinary approach taken by the City with the ongoing coordinated involvement of City Planning and LTC under the leadership of the Engineering Department. This has ensured that all technical perspectives have been considered and that all on-going City and LTC initiatives have both contributed to the TMP and been informed of the work of the TMP.

> *A commitment to investing in the provision of enhanced transit services in the community is a critical component of establishing the credibility of the plan, and demonstrating the commitment of the City towards implementation.*

As the TMP moves forward to the implementation stage, this collaborative process needs to be continued. It will be particularly important for the City and LTC to build awareness and further support for the new mobility TMP and to brand the BRT initiative. As the TMP implementation process unfolds, the City should exploit all opportunities to convey the TMP new mobility themes. One such opportunity would be the recently launched ReThink London process.

Marketing the vision to build community support should facilitate the environmental and funding approval processes and demonstrate a strong local commitment to critical funding partners – the senior levels of government.

A level of momentum has been created through the TMP process, and strong public support has been expressed through the consultation program for this project. This needs to be continued and expanded to ensure the TMP success, and to maintain support for the major initiatives recommend in the TMP – they represent the vision for transportation in the City for the next 20 years.

Visualizing the Transformation

1. Introduction: 2030 Transportation Master Plan: Smart Moves

The *2030 London Transportation Master Plan: SmartMoves* project provided the City of London (City) with a vision and implementation plan to proactively respond to the way the City's future population move, live, work, and play. *A New Mobility Transportation Master Plan for London* is all encompassing and has embraced current provincial initiatives, sound engineering, financial prudence, and emergent planning principles that are shaping municipal growth across Ontario.

The *Transportation Master Plan* (TMP) study began in the fall of 2009 with the mandate of updating the 2004 TMP. Following the 2004 study, the London Transit Commission (LTC) completed a Transit Ridership Growth Strategy in 2006 which recommended implementation of a Bus Rapid Transit (BRT) strategy to achieve the mode share targets of the 2004 TMP. The City also completed their first *Bicycle Master Plan* in 2007, which contained a number of recommendations to enhance cycling facilities throughout the City.

The primary scope of this TMP update was to build upon the recommendations from these recent studies, incorporate the most recent strategic planning objectives of City Council and assess the viability of implementing a rapid transit system for the City.

The *City of London Strategic Plan* identified a vision as a "City of Opportunity". The plan identified five strategic outcomes to guide future planning and contribute to a continuation of the high quality of life in the City, the results are:

- A Vibrant and Diverse Community
- A Green and Growing City
- A Sustainable Infrastructure
- A Caring Community
- A Strong Economy

Many of these objectives have links to transportation infrastructure and services. The recommendations within this TMP are primarily designed to provide Sustainable Transportation Infrastructure; support a Green and Growing City; and in doing so, support a Strong Economy.

The London 2030 TMP is a long-term transportation strategy for the City that will help guide the City's transportation and land use decisions through to 2030 and beyond. The TMP is focused on improving mobility for residents of the City by providing viable choices through all modes of travel.

The study included the completion of a comprehensive household travel survey. The survey established a baseline of current travel patterns and public attitudes towards transportation in the City.

The survey confirmed that the private automobile dominates as the existing mode of choice for daily travel, accounting for 73.5% of travel in the weekday AM and PM peak periods.

However, the survey also revealed that public transit is carrying a larger share of daily and peak period trips than initially believed. The current 12.5% mode share has exceeded the 10% target established in the 2004 TMP. Use of active transportation modes (cycling / walking) has also improved from the 2004 TMP. The survey found that almost 9% of daily trips are made by active transportation modes, compared to 7.5% in 2004. Other modes such as the taxi, school bus, and motorcycle make up the remaining 5%.

These findings demonstrate that the residents of the City are embracing more sustainable forms of transportation. More importantly, these findings suggest that a plan featuring the right mix of land use and transportation policies combined with strategic infrastructure investments could significantly increase the share of non-automobile trip making and support a viable rapid transit system in the City.

The key goal of the London 2030 TMP is to provide more attractive travel choices for those who live, work, and play in London. To achieve that goal, significant improvements in transit service will be required as well as greater support for walking, cycling, and carpooling. If more attractive travel choices are available, Londoners will be more likely to change their travel patterns, resulting in an overall reduced dependency upon the automobile. Over time, this shift in behaviour can reduce the need for costly and disruptive road widening projects while maintaining overall good transportation levels of service and providing overall environmental benefits. To guide the development of this TMP, weekday peak period modal share targets were established to provide an overall framework for this new mobility TMP.

The London 2030 TMP study is guided by a Council supported vision that is transit focused. Transit works best where there is sufficient land use density to generate ridership to support the system. Historically, the City has been growing at a rate of about 1% per year. Much of this growth has been occurring in the urban fringe areas, with only 22% of future growth planned to be accommodated through intensification of existing built-up neighbourhoods.

In the context of the pattern of historical growth, achieving this transit focused vision requires that the City first consider changes to the way that future growth is managed. This critical first step sets the framework for the rest of the TMP, which in turn

establishes the transportation policies and infrastructure to support a new vision for mobility.

The cost of following the previous century's growth model is increasingly becoming unsustainable. This obsolete model based on the outward peripheral expansion is swiftly being replaced by nodal redevelopment within the existing developed areas of the City.

The change from the old to the new is being influenced by factors outside of individual City's control, such as:

- shifting employment demands;
- family size;
- population growth;
- immigration;
- lifestyle choices;
- attitudes towards the automobile;
- increasing legislation identifying and protecting susceptible environments; and
- increasing servicing costs for water, sewer, and road projects.

These factors contribute to pressure for redevelopment and intensification of existing developed land. Continuing to facilitate the previous patterns of outward growth will become ever increasingly difficult, expensive, and environmentally challenging, while also using valuable time and effort that could be marshalled and focused on facilitating oncoming changes. The City can best transition itself into a successful urban centre that attracts new and vibrant growth through acceptance and preparation for the consequences of these oncoming changes.

Accordingly, there are five "Smart Moves" that form the basis for this new TMP, each playing a role in supporting the achievement of the plan and Council's strategic objectives. Each of these initiatives support a strong and healthy downtown, which will remain the City's primary economic engine and pre-eminent centre in the emerging urban structure. These five "Smart Moves" are:

1. Rethinking Growth to Support the Transportation Master Plan
2. Taking Transit to the Next Level
3. Actively Managing Transportation Demand
4. Greater Investment in Cycling and Walking Infrastructure
5. More Strategic Program of Road Network Improvements

A summary of these five bold initiatives is outlined in the following sections, and these key actions form the basis for the *New Mobility Transportation Master Plan for London*. This report concludes with a brief discussion on the Transportation Master Plan Implementation and provides recommendations on furthering the Collaborative Approach to City Building.

The London 2030 TMP Final Report (Volume 2) outlines and describes the study recommendations and is structured into five chapters:

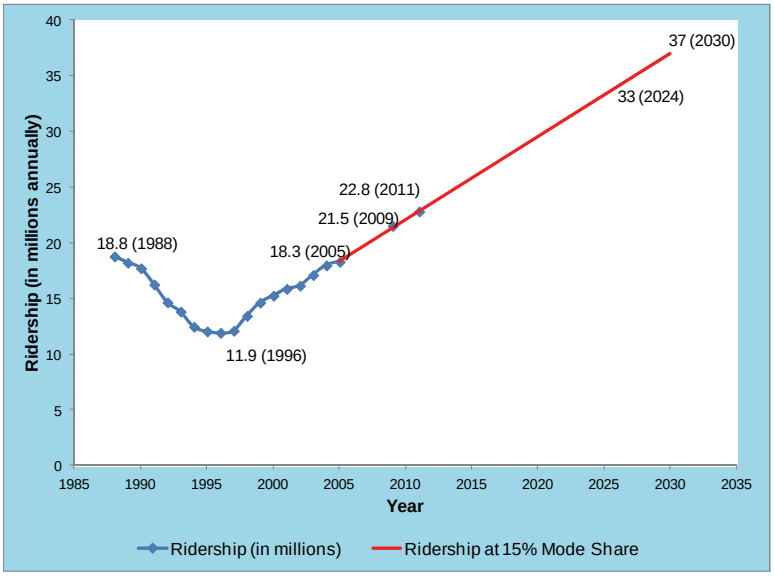
1. Introduction;
2. City Building for the New Mobility;
3. The New Mobility Transportation Master Plan;
4. Implementing the New Mobility Plan; and
5. Conclusion.

Due to the large size of the TMP study documentation, the final report is divided into the following three Volumes: Volume 1 - Executive Summary, Volume 2 - Final Report, and Volume 3 - Appendices.

1.1 Recap of Transportation Master Plan Phase 1: Existing Conditions and Strategic Servicing

In Phase 1 of the TMP, the first interim report provided an overview of existing conditions, identified key issues, and discussed opportunities and challenges.

Today in the City, the main transportation mode is the private automobile which accounts for about 73.5% of daily travel. Public transit carries about 12.5% and active transportation (walking and cycling) modes represent a further 9%, with other modes such as taxis and motorcycles making up the remaining 5%.



Transit Ridership Trends / Forecasts

For a municipality of its size, the City has a financially strong transit system, which carried 22.8 million trips in 2011, or an average of 61 trips per resident. This represents an increase of 84% since 1996. There are 38 routes operated by the London Transit Commission (LTC) on a grid-like pattern of roads, with 70% of the routes serving the downtown area. The LTC recovers a relatively high 58% of its annual operating costs through fare box revenues.

Annual ridership has been growing since 1996, in part due to a 20% increase in transit service during the same time period. In the 2004 TMP an aggressive transit ridership growth forecast reflecting a 15% mode share suggested that the City would need to accommodate 37 million riders per year. Based on the 2009 and 2011 ridership results from LTC, the City is on track to hit that target. However, from a service quality perspective, complaints about late schedules, missed passengers, and overcrowding have increased 55% over the past three years[1]. The service quality pressures being experienced today raise the question of sustainability in the longer term. There is limited ability to accommodate continued growth in demand without further investments to increase the system wide level of service.

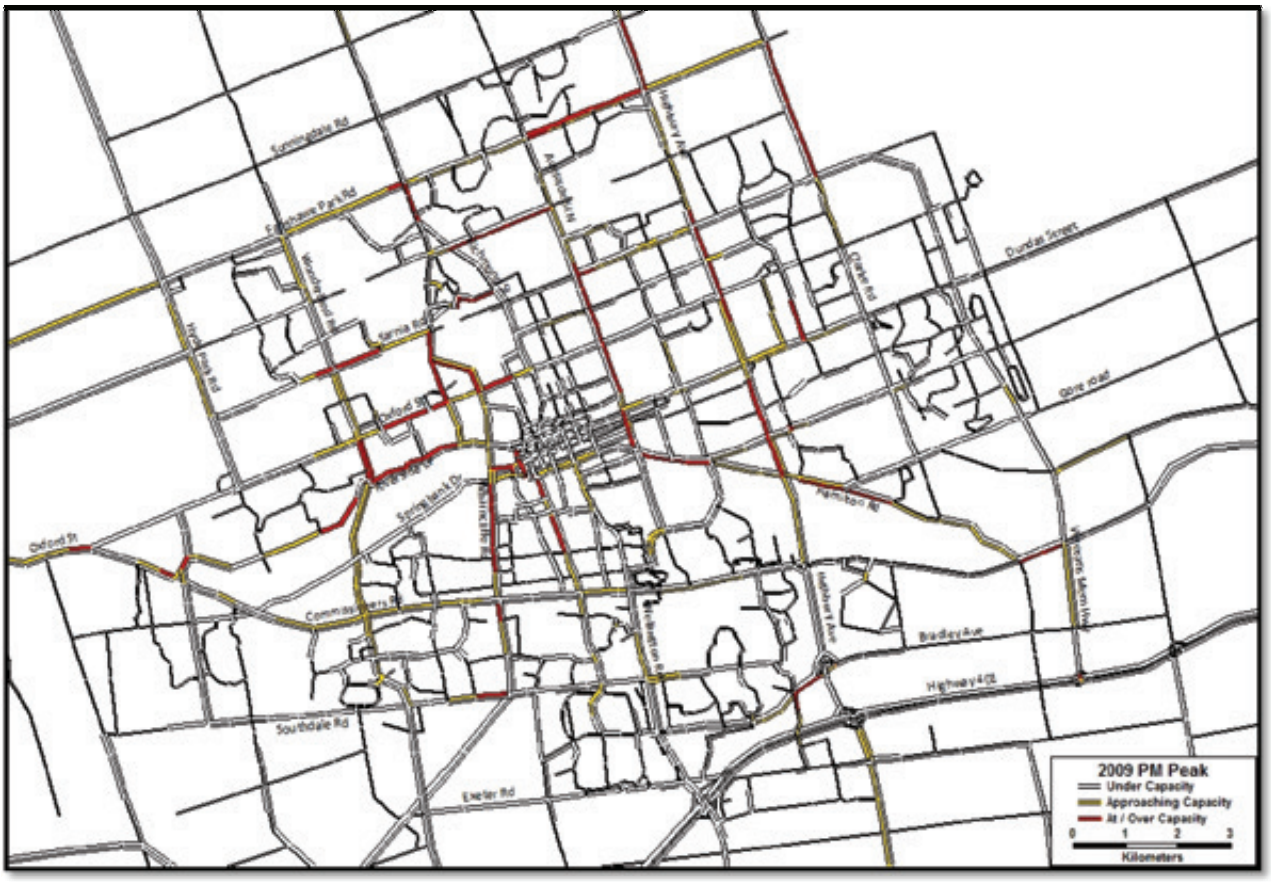
Inter-city transit is provided by VIA Rail, Greyhound, and two local providers (About Town and Robert Q). The latter provide reasonably good service to Toronto Pearson International and Detroit Metro airports. Inter-city bus service to adjacent towns and communities is minimal.

A vast network of trails and bike paths contribute to the City's active transportation infrastructure and play a large role in the high quality of life enjoyed by City residents. Active transportation modes both move people and have the added benefits of contributing to healthier lifestyles and reducing air pollution generated by automobiles.

The highway and arterial road network provide the foundation for the City's transportation network. Overall the level of service is good on the existing road network with, for the most part, only modest levels of delay experienced. It is estimated that about 10% of the City's arterial and collector road network operates at, or over, capacity during the afternoon PM peak period, as illustrated in Exhibit 1, below. While the City has recently invested in computerized traffic control systems, the benefits cannot be expected to solve all congestion problems.

[1] *London Transit Commission 2011 Annual Report*

Exhibit 1. 2009 Afternoon (PM) Peak Hour Traffic Conditions



In suburban areas of the City, parking is typically provided in surface lots at no charge to the users. However, in the downtown area there is a mix of on-street and off-street parking with some off-street parking being provided in structures. All day parking charges ranging from $7 - $9 are common across the City's downtown. The City currently controls about 20% of the downtown parking supply. Both the supply and pricing of parking are key factors in the mode choice decision by individual trip makers and in a business's choice of location (e.g. suburban vs. downtown).

Phase 1 concluded by identifying three possible strategic scenarios used to establish a framework to guide the City's TMP. Comments from stakeholders and the general public on the three scenarios are summarized in Table 1.

Table 1. Stakeholder and General Public Input on the Three Strategic Scenarios

Key Messages Heard from Stakeholders and the General Public	
Scenario 1: ***(Sustain Existing Levels)***	Least expensive and easiest to achieve, but does not do enough to increase transportation choice.
Scenario 2: ***(More Balanced)***	More choice, more inclusive, reduces pollution and improves health, but may not be enough to get people out of cars.
Scenario 3: ***(Transit Focused)***	More choice, more inclusive, increases transit ridership and promotes a transit culture, but requires a large investment and growth may not be sufficient to support it.

1.2 Recap of Transportation Master Plan Phase 2: Transportation Goals and Guiding Principles

The second interim report documented the results of the TMP Phase 2 update, which was undertaken in two parts. During the first part, discussion papers on four key topics were prepared:

1. Land Use and Transit Oriented Development;
2. Transit (including Bus Rapid Transit and Light Rail Transit);
3. Parking Management; and
4. Active Transportation and Transportation Demand Management.

These papers were used to solicit feedback from residents and stakeholders and led to the development of a series of guiding transportation principles, which were presented to Council for endorsement.

The City is moving towards sustainable transportation. Quality of life is a major selling point and asset for the City. Transportation goals should be aligned with that cause. Accommodating growth in a sustainable manner is an obvious goal as is the improvement of the City's transportation system for existing residents and businesses. Based on input received during the study, the following transportation related goals and principles (Exhibit 2) were developed and adopted by Council to guide the development of the TMP.

Exhibit 2. Transportation Goals and Guiding Principles

1. Provide safe, affordable, efficient transportation for everyone

Ensure all residents including those with low incomes, disabilities, the elderly, and others who cannot, or do not, own their own vehicle are provided safe, affordable, reliable, convenient, and efficient transportation options.

2. Make London's neighbourhoods pedestrian and bicycle friendly

Recognizing the importance of good health to citizens, enhance opportunities to walk and bike in London, which in return will reduce single-occupancy vehicle trips.

3. Integrate land use and transportation planning to encourage more sustainable lifestyles

Create neighbourhoods that contain the full range of development densities and land uses, including those that are compact, mixed-use, and pedestrian-friendly, while ensuring the health, safety, and well-being of individuals and families.

4. Preserve and enhance environmental resources

Avoid impacts to the natural environment to the extent possible in expanding transportation infrastructure.

5. Promote reliable, convenient, and seamless transit

Encourage London Transit Commission and other transit operators to provide seamless public transit service within London and between London and outlying towns and communities.

6. Promote economic vitality

Ensure economic competitiveness by providing a safe, reliable, and efficient transportation system.

7. Support diverse transportation system funding

Seek innovative funding sources and strategies to ensure a more balanced, sustainable transportation system.

8. Minimize use of fossil fuels

Transportation needs must be met without generating emissions that threaten public health, global climate, biological diversity, or the integrity of essential ecological processes.

9. Optimize the existing transportation system

Make the most of what currently exists by preserving and maximizing the use of facilities and services – support new technologies, access management, and transportation system management initiatives. Avoid or defer the need for new infrastructure that does not support this set of goals.

10. Minimize growth in travel demand

Encourage initiatives and programs that reduce demands on the transportation system, especially at peak hours, or reduce the number of vehicles on the roads while accommodating the same number of people.

11. Encourage the efficient movement of freight and support the greater use of freight by rail

Support strategies that improve freight movement within London's boundaries and minimize the flow of heavy trucks through or adjacent to residential communities.

12. Develop parking strategies that reduce single-occupant vehicle travel

Develop strategies that reduce the demand for parking in the downtown area, existing and future employment centres, and other activity nodes.

13. Foster awareness of sustainable transportation

Develop programs and activities that enhance residents' awareness and understanding of the benefits of sustainable transportation.

1.3 Where Are We Today? A Solid Foundation for the Transportation Master Plan

Every TMP combines an element of visionary thinking (i.e. where do we want to go?) with an element of grounded reality (i.e. what have we been able to achieve so far?). In some respects it is easy to be visionary; to think of how we would like our transportation system to be. It is much harder to combine this visionary thinking with realistic forecasts and assessments grounded in fact, which are also very important factors to consider when making good decisions about future investment priorities.

Recognizing the importance of understanding the foundation from where this TMP would be developed, the City undertook a household travel survey at the outset of this project to collect information on:

- ***Who*** is travelling around our city?
- ***What*** modes of travel are they using?
- ***When*** are they travelling?
- ***Where*** are they coming from and going to?
- ***Why*** are they travelling, and ***why*** are they choosing the modes of travel they are?

The final survey included 6,800 households within the Greater London Area with over 16,300 participants reporting on their daily trips.

The 2009/2010 full household travel survey summary report is included in **Appendix E**. A few key findings from this survey have been highlighted in this report to provide insight into the attitudes of the City's residents regarding their travel choices and to set the context for the scenarios that evolved as the TMP was completed.

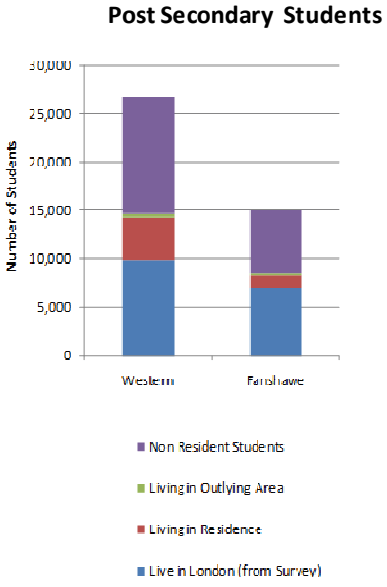
The survey was designed to provide a snapshot of transportation in the City on a typical weekday. The household travel survey was undertaken using a random telephone survey of residents within the City and the communities surrounding the City. An internet based survey was also provided and a number of residents participated in this as well.

The survey was designed to obtain a sample of approximately 5% of City residents and 2% of the population of the remaining communities within the London Census Metropolitan Area. By comparison, the 2002 household travel survey undertaken as part of the 2004 TMP, used a sample size of approximately 3.5% and only included residents living within the City itself.

Surveying communities in the London Census Metropolitan Area is important to account for the approximate 23,350 daily trips made by residents living outside the City that travel into the City for work, school, shopping, or other personal and recreational activities. While this represents about 4% of total daily trip making demands in the City, the largest impacts are typically felt on the road system leading into the City and along the City limits. In these areas, the role of externally generated trip making can be significantly higher.

The number of post-secondary students in London is equivalent to a city the size of St. Thomas.

The survey also captured and reported on the travel patterns of post-secondary students. Western University's student enrolment for 2009 was 26,635 full time students, while Fanshawe College reported 15,000 full time students. The combined population of the students attending these two institutions is roughly equivalent to the population of St. Thomas. While many of these students already live in London, the students living in residence and students who come to the City from other municipalities to study represent an influx of about 28,000 temporary residents - roughly equivalent to the population of a small town, like Strathroy.



A substantial portion of these students are not accounted for within the 2006 Census population data because they are not permanent residents of the City. However, the students who reside in the City during the school year play an important role in assessing the transportation needs of the City. The post-secondary students represent close to half of the daily transit users in the City in addition to the other trips they make by automobile, walking, and cycling modes.

There are about 675,000 person trips made within the City on a typical day.

Based on the 2009 household travel survey completed by the City's residents, there are approximately 675,000 daily trips made within the City. This includes an estimated 620,000 daily trips made by permanent residents of the City and an additional 55,000 daily trips made by non-resident students. Based on a population of 291,555 residents

over the age of 15 within the City, this represents an average of 2.3 daily trips per person in the City and 4.9 daily trips per household. These results are about 18% lower than the average daily trip rate (2.8 per person) observed during the previous household survey (2002), undertaken for the 2004 TMP. By comparison, the Region of Waterloo residents made an average of 2.4 trips per day in 2006 and 6.4 trips per day per household, based on the results of the transportation tomorrow survey.

The recent household travel survey also indicated that approximately 24% of total daily trips are made to go to work or to work related destinations and 10% of trips are to travel to school. Travel to shopping, social/recreational, and personal business destinations represent a total of 15% of total daily trips. Approximately 48% of trips made on a daily basis are accounted for by residents returning to their home destinations.

When compared to the 2002 household travel survey, the recent results indicate that travel by transit and non-automobile modes is higher, with transit use increasing to 11.2% of daily trips compared to 7.1%. Trips made by walking and cycle modes have also increased from 7.3% of daily trips to 8.7% of daily trips. These positive results are partially due to the investment in improved service on the London Transit system, which has generated a 33% increase in ridership since 2002. However, these results may also be indicative of lower overall travel demand, which may be influenced by the state of the local economy since 2008.

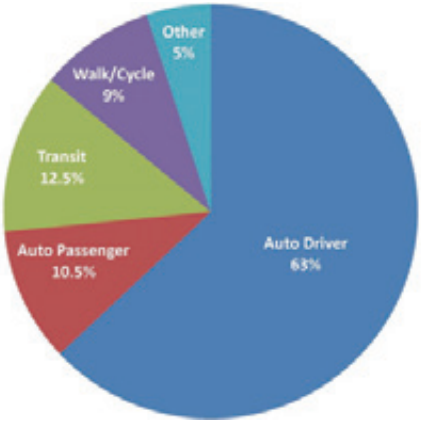
During the AM and PM peak periods, the share of trips made using transit increases to just over 12%. This increase is largely based on the high transit use reported for trips to and from school and for discretionary trips. Active transportation modes account for between 7.7% and 8.4% of trips during the peak periods, which is lower than the daily average of 8.7%. Despite the lower mode shares during these periods, the survey results indicate that

Trip making in the City is about 18% lower than reported in the 2002 survey, but transit ridership has increased by 33%.

As a result, the transit mode share in the City has improved from 7.1% in the 2002 survey to 11.2% of daily trips in the 2009 survey.

Comparison of Daily Mode Shares

Mode of Travel	2002 Survey	2009 Survey
Auto Driver	73.3%	62.5%
Auto Passenger	9.5%	13.5%
Transit	7.1%	11.2%
Walk / Cycle	7.3%	8.7%
Other	2.9%	4.1%
	100.0%	100.0%



2009 PM Peak Period Mode Shares

just over 51% of all active transportation trips in the City are made during the six hours of the day representing peak travel times.

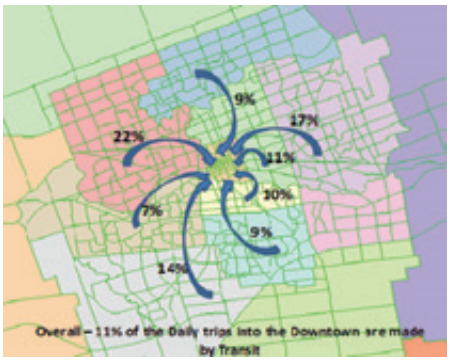
Based on current modes shares, the City has largely achieved their target transit mode shares identified in the previous TMP (2004). Once the economy recovers, the automobile use is anticipated to increase resulting in a lower share of trips being made by non-automobile modes of travel. Significant improvements must be made to improve the attractiveness of active transportation and using transit in the City to counteract the anticipated increase in automobile usage.

The overall travel demand during the PM peak period is approximately 7% higher than the AM peak period.

57% of PM peak period trips are made for work, 21% for school, and 22% of the trips are discretionary trips.

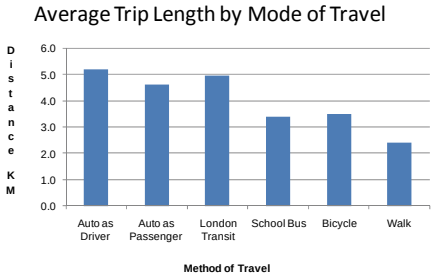
Transit use is estimated at just over 6% and active transportation use is estimated to be 5%, both for work trips. Transit is the dominant mode of travel for school trips, serving over 30% of the daily secondary and post-secondary school travel. Trips made by a school bus are included with "other" travel modes and represent an additional 18% of school travel. Approximately 15% of students over the age of 15 walk or cycle to school.

On a daily basis, approximately 11% of trips to and from the downtown area are made by transit. This mode share is in line with the overall city-wide mode shares, but it is not as high as it could be. In many larger urban centres, transit plays a much larger role in serving trips into the downtown area. For example, many suburban growth centres in the Greater Toronto Area feature higher transit mode shares into their downtown urban centres. The North York City Centre (Yonge Street at Sheppard Avenue) features an AM peak period transit mode share of 28%, while the Scarborough City Centre (Highway 401 at McCowan Road) achieves a transit share of 20%. The low transit mode share for trips to and from the City's downtown area and the modest share of work trips using transit both represent significant opportunities for improvement.



Transit Share of Downtown Trips

The average trip length is an important factor in understanding the travel choices that residents make and the potential effectiveness of various transportation policies and infrastructure. The trip length is estimated based on the straight line distance between the start and end location for each trip made. In the City, the average length for all trips, by all modes of travel, made in a typical day is 4.8 km. By comparison, the average trip length in the Region of Waterloo was estimated at 9.1 km based on the 2006 *Transportation Tomorrow Survey*.



The short average trip length for the City's residents presents both challenges and opportunities in planning a transportation system for the future. Due to the shorter average trip lengths, encouraging residents to choose other modes of travel for some of their trip making, particularly during spring and summer months when more favourable weather encourages more active transportation, should be easier. On the challenging side, shorter average trip lengths across the City makes the transit option very hard to compete in terms of travel times, especially where there is not significant congestion.

Approximately 58% of all of the trips to the downtown area start and end within the downtown area. Of these, approximately 34% are made by active transportation modes.

Many people in the City have access to an automobile but choose to use their bicycle, walk, or use public transportation. These people are referred to as choice riders, and understanding how and why these users make the travel choices they do can provide insights on how to attract others to make similar choices.

Approximately 11% of LTC users reported that they had an automobile available to make their trip, but chose transit instead. This share increases to about 19% for walking trips and 38% for cycling trips. The vast majority of these choice riders are under the age of 30, but there are a growing number of older residents choosing active transportation, for obvious health benefits.

What would it take to change your mode of travel from automobile to transit?

1. Knowledge of routes / schedules (65%)
2. Frequency of service (55%)
3. Express bus service (53%)
4. Pay more for parking (51%)
5. Reduced need to transfer (47%)

(% of those who would shift modes indicating support)

Approximately 2.8% of residents indicated having to pay for parking, at an average cost of $52.59 per month. Interestingly enough, the average monthly

transit pass costs users $69.00 per month for unlimited weekday rides. This does not suggest that the LTC pass is too expensive, rather that all day parking costs may be too inexpensive in the City.

Public Attitudes

353 randomly selected residents of the City who participated in the household travel survey were also administered a public attitude survey. When respondents were asked about the most important factors that influence their choice of travel modes, most cited convenience as their primary consideration, followed by cost and the need for an automobile, either for their job or for emergencies.

About 65% of the respondents who indicated they would consider changing their travel modes, suggested they would consider transit if they only knew the routes and schedules better. In the previous public attitude survey, completed in 2002, this factor was only cited by 22% of respondents. While the LTC has improved the amount of information that is provided about transit routes and schedules, ongoing initiatives (e.g. Webwatch and the automatic vehicle location system) should be further enhanced with more real-time information on transit schedules or at transit stops.

Increasing the frequency of service and providing express services were also noted as key factors influencing the attractiveness of transit. Increasing the level of frequency on key routes also reduces the need for users to know the schedules as the wait time is reduced to catch the next bus. In the previous 2002 survey, only 31% of respondents cited improved service frequency as being important to their choice, compared to 55% in 2009.

When residents were asked how the City should prioritize spending on transportation 44% of respondents indicated high levels of support for widening existing roads, but a similar share also noted the need for investment in new express bus or

How should the City of London prioritize spending on transportation?

1. Widening existing roads (44%)
2. Provide new express bus or rapid transit routes (40%)
3. Connect missing parts of city streets (38%)
4. Provide financial incentives to encourage transit (38%)
5. Provide longer hours of transit service (35%)
6. Construct carpool lots / high-occupancy vehicle lanes (35%)
7. Build new major roads through / around the City of London (35%)
8. Increase frequency of transit service (35%)
9. Provide financial incentives to encourage carpooling (34%)
10. Add more new transit routes (31%)
11. Build new bike trails or dedicated bike lanes on city roads (23%)

(% indicating strong support or support)

What would it take for you to cycle to work or school?

1. Showers / change rooms and secure bike racks (43%)
2. More separate trails / bike lanes (40%)

(% of those who would shift modes indicating support)

rapid transit services. Road widening and connecting missing road segments ranked ahead of building new roads through or around the City.

Approximately 23% of respondents indicated support for investment in new bike trails or dedicated bike lanes on City roads. Of the 15% of respondents who indicated that they would consider shifting modes for trips to and from work, about 40% of them indicated that building new bike trails or lanes would encourage them to make the shift to active transportation modes. This suggests that the market for commuter based cycling infrastructure is approximately 9% of the overall population.

The short average trip lengths in the City may make transit and active transportation modes much more attractive options as automobile operating costs continue to increase.

To encourage users that have a choice in their travel modes to shift away from their cars, these services need to be convenient and efficient.

Travel Survey Summary

The household travel survey represents a brief yet important snapshot into the travel patterns of City residents. City residents typically enjoy relatively modest congestion levels and reasonable travel times to work or school by all modes of travel. The relatively short trip lengths will make the public transit option difficult to compete with the comfort and convenience offered by the personal automobile.

Cost factors may be an important factor motivating change. Operating costs for automobile travel (e.g. fuel, insurance, etc.) are expected to continue encouraging some residents to explore other modes of travel. The short average trip lengths that City residents currently make, may make transit and active transportation modes much more attractive options in the face of continuing increases to automobile operating costs. However, transit and active transportation services will need to be convenient and efficient in order to encourage users that have a choice in their travel modes. Influences that can affect future shifts in transportation away from automobile use and toward transit are peak oil costs, carbon pricing, and measures to increase the cost of all day parking in the downtown area.

The travel survey highlighted the importance of the existing student ridership base and the role that this segment of the transit ridership market plays in daily ridership usage. Similarly, the low transit mode share for trips to and from the downtown area and the modest share of work trips that use transit represent opportunities for growth and have factored into the prioritization of the various Bus Rapid Transit (BRT) corridors and proposed routes.

The recent positive trends away from automobile use in the community have been instrumental in forming the strategic direction of the long-term transportation vision. The

TMP promotes the investment in infrastructure to encourage increased transit use and higher rates of trips made by active transportation modes.

The Downtown Area is becoming a Place with a Distinct Character and Attractiveness

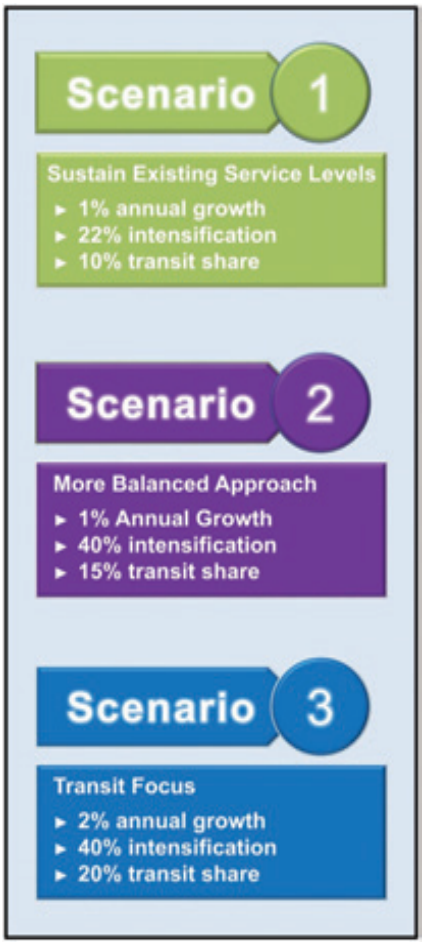
1.4 Recap of Transportation Master Plan Phase 2: Assessing Scenarios

In the second part of Phase 2, the three strategic scenarios outlined in Phase 1 were refined into integrated land use and transportation network scenarios. When these scenarios were assessed in more detail, the optimization of transit support required for the anticipated growth in various areas of the City became apparent. As a result, alternative rapid transit corridors were assessed and specific directions for supportive active transportation, Transportation Demand Management (TDM), and parking policies were developed.

1.4.1 Assessing the Growth Scenarios

Transportation in London in 2030 – Scenario 1: The Base Case

Sustaining existing service levels, Scenario 1 represents the base case for transportation in the year 2030. From a land use allocation perspective, Scenario 1 is consistent with the *Growth Management Implementation Study* (GMIS) land uses. Peak period modal shares would essentially remain the same as today.



Initial testing of this scenario using the City's transportation model found that the number of AM peak hour trips in 2030 would increase by about 19% and total vehicle kilometres of travel would increase by 18%. As a result, if the City implemented only the already committed road improvements, the level of congestion in the collector and arterial road network would be expected to increase from about 10% of the network at, or over, capacity in 2009 to about 15% in 2030[2].

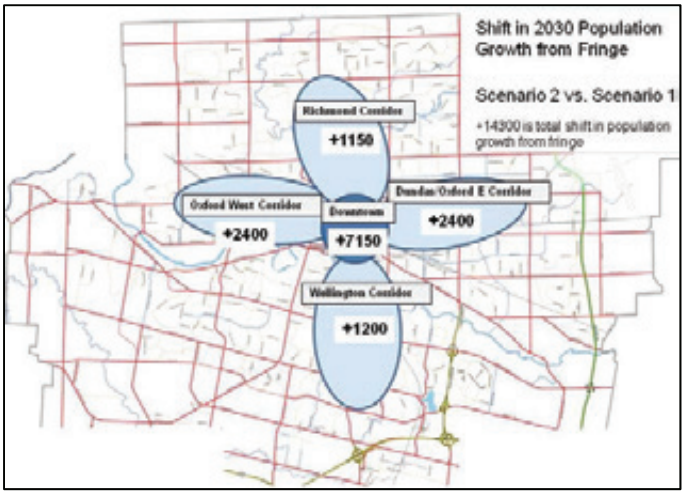
Even if all the road improvements identified in the 2004 TMP were implemented, approximately 12% of the network would be expected to operate at, or over, capacity during the peak periods. Implementing additional road widening projects to address these expected deficiencies would place a significant financial burden on the City.

On the transit side, some significant improvements would be needed just to hold the modal share at current levels. In this regard, two semi-express routes were assumed to be in place and operational with transit priority measures (signal priority and queue-jump lanes) at major intersections. Extensions of existing routes into new development areas on the fringe of the City would occur and continued system-wide technology upgrades such as real-time displays at bus stops and cell phone connections to schedule and route information. Considering these changes, the transportation model indicated that the Scenario 1 land use and transit network would not generate sufficient ridership on the express routes to support full implementation of BRT.

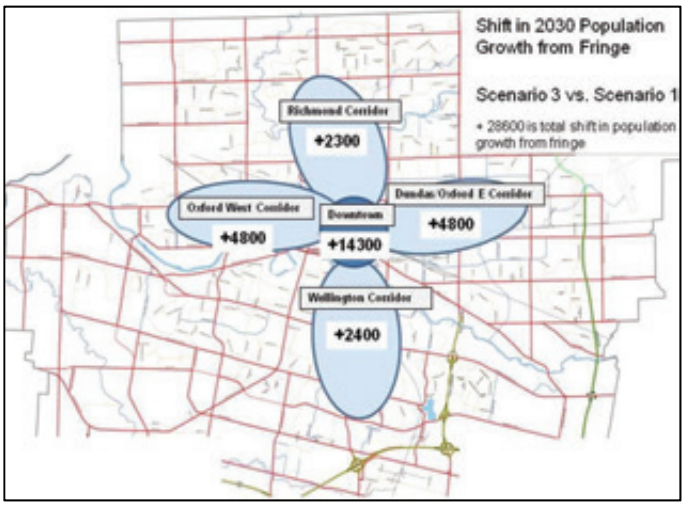
[2] *Measured in terms of lane-kilometres at, or over, capacity as opposed to the simple length of network referred to in section 2.4.5.*

Alternative Growth Allocations – Scenarios 2 and 3

The first alternative was structured around intensifying 40% of existing developed area, which is the current policy in the *Greater Toronto Area Growth Plan*. This was considered compatible with the definition of Scenario 2. Of the total amount of growth allocated to the existing developed areas, three quarters was assumed to be directed to the downtown area, key nodes, and transit corridors.



A second alternative growth scenario assumed a higher 2% overall annual growth rate (vs. 1% as in Scenario 2) while maintaining an intensification factor of 40%. With significantly more growth in existing developed areas, this scenario was considered to be compatible with a more extensive network of rapid transit services associated with Scenario 3. The allocation of growth within the existing developed areas was assumed to be in the same proportion as for Scenario 2. In response to direction from Council, two additional land use alternatives were also considered. Scenario A featured the same 2% growth rate as Scenario 3, but only assumed a 22% intensification factor, while Scenario B assumed an annual growth rate of 1.5% with a 30% intensification factor.



The reallocation of population growth for all scenarios recognizes that there are significant planning commitments in place which will make change difficult over the next decade. Accordingly, these scenarios assume that most of the shift from greenfields to developed areas would occur in the 2020 to 2030 period, after the lapse or build-out of already constructed greenfield developments.

Table 2. Comparison of Alternative Growth Allocations

	Scenario 1	Scenario 2	Scenario 3	Scenario A	Scenario B
Total Population	429,500	429,500	493,140	493,140	466,500
Growth Rate	1%	1%	2%	2%	1.5%
Intensification Factor	22%	40%	40%	22%	30%
Growth in Downtown	3,075	5,600	11,200	4,550	6,330
Growth in Centres and Corridors	3,075	5,600	11,200	2,600	7,470
Lane-km Congested	298	272	325	354	321
% of Major Roads Congested	15%	14%	17%	18%	17%

All four of the growth scenarios with higher growth rates and / or higher intensification factors (summarized in Table 2) were found to generate sufficient ridership to support two rapid transit corridors in the City. These corridors will run in the north/south and east/west directions as the Richmond Street / Wellington Road corridor and the Dundas Street / Oxford Street corridor, respectively. A full comparison of the alternative growth scenarios is included in *Interim Report 2* and **Appendix A** of this report.

1.4.2 Evaluation of Scenarios

An evaluation process incorporating transportation, land use, natural and social environments, economic, and financial criteria was used to illustrate the advantages and disadvantages of each scenario. A summary of the assumptions and key findings of this evaluation is included in **Appendix A**.

In addition to the evaluation of transit and land use scenarios, *Interim Report 2* outlined the land use and transportation initiatives required to achieve the 15% and 20% transit modal shares associated with Scenarios 2 and 3, respectively, by 2030. Key Phase 2 conclusions were as follows:

1. With a growth rate of 1%, the City can only support rapid transit if the City's growth strategy directs more people and jobs to locations along the proposed rapid transit routes;
2. If development can be intensified, with 40% of new growth located within existing developed areas and directed to the downtown area and two key corridors, then the City would have the ridership needed to support one north/south rapid transit corridor and one east/west rapid transit corridor; and
3. Increasing the use of public transit to 20% will not only require a significant investment in rapid transit infrastructure, but will also require other significant system wide transit improvements, along with strong supportive policies and programs in the areas of active transportation, TDM, and parking.

The public and stakeholder response at the third set of workshops in January 2011 was supportive of the strategic direction and specifically they:

- thought the City should move towards Scenarios 2 and 3 as quickly as possible;
- generally supported a two route rapid transit system focused on the downtown area;
- supported the City's growth plan being revised to increase the intensification factor;
- agreed that marketing and education are key to overcoming public resistance to providing transit priority on London roadways; and
- generally supported proposals related to active transportation, TDM, and parking.

Los Angeles, CA

The User Vision Group and the Sustainable Transportation Roundtable provided key inputs to the development of the 2030 TMP.

1.5 Basis for the New Mobility Transportation Master Plan: A Flexible Approach

In December 2011, the findings and conclusions from the Phase 2 work were presented to Council. The proposed BRT concept was recommended to be incorporated into the TMP update, with the initial two routes proposed to be further evaluated in Phase 3 of the TMP. Council further supported the following:

- An annual growth rate for the City of 2% be the corporate target;
- An annual growth rate for the City of 1% be utilized as a more conservative baseline travel forecast for the TMP;
- Transportation, land use, development intensification, and urban form goals be aligned; and
- A minimum 40% intensification target be adopted for the coming *Official Plan* review.

Intensification can Support the Development of Vibrant People-Oriented Places

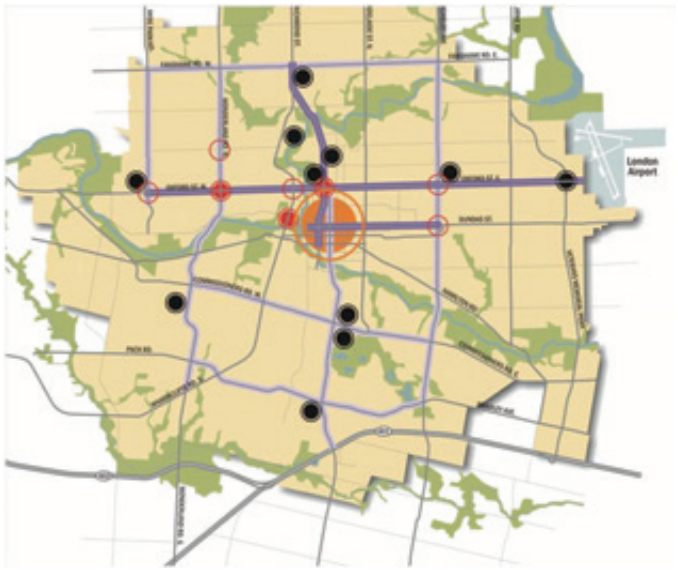
Based on Council direction, both Scenarios 2 and 3 were used in developing this TMP. Scenario 2 assumes the baseline 1% per year growth rate (which is considered conservative from a BRT ridership perspective). Scenario 3 assumes a higher 2% annual growth rate which represents the corporate target. If achieved, Scenario 3 might offer the possibility of expanding the BRT network or upgrading parts of the system to Light Rail Transit (LRT).

A minimum of 40% of new population growth will be located within existing built up areas to reduce sprawl and encourage more transit use, walking, and cycling.

75% of these new residents will be directed to the downtown and BRT corridors.

While the annual growth is significantly different, Scenarios 2 and 3 are similar from a growth management perspective. Both provide for 40% of the growth being accommodated within the existing developed area, with the majority of that growth directed to designated intensification areas, including the downtown area and future development nodes along the BRT corridors. The major difference is how much annual growth would go to the so-called fringe areas of the City.

Several distinct areas are referenced throughout the document. These are defined here to aid the readers understanding. Typically the "fringe area" refers to new development in greenfield areas that run along the built-out boundary, but exists within the municipal boundary. The "central area" has been defined as the area bounded by the Thames River on the west and south, Adelaide Street to the east and Oxford Street to the north. The "central area" is illustrated graphically on Executive Summary Exhibit ES-1, as the pink shading and is labeled in the legend. The definition of the "downtown area" is also commonly known as the core and is bounded by Ridout Street on the west, the CN rail lines on the south, Colborne Street on the east, and Dufferin Avenue on the north. The "built-up area" is defined as the existing edge of fully serviced development of the City and jogs in and out to take in various subdivisions on the City's periphery. The built-up area is currently located close to the municipal boundary in the north, Wickerson Road along the west, Bradley Avenue in the southwest, Highway 401 along the south, and Veterans Memorial Parkway along the east.



Transit and growth spread amongst the downtown area and the City's nodes and corridors

As shown in Table 3, Scenario 3 provides for almost 31,000 more people in the fringe area than Scenario 1. Scenario 1 reflects the land use forecasts prepared for the GMIS. Scenario 2 would reduce the fringe area growth by 13,350 residents. Further refinement of Scenario 3 through the *Official Plan* review would be very useful to assess opportunities to direct more than 40% of new growth into the urbanized areas of the City, as this will further support the vision of a more sustainable transportation system.

This unique TMP approach provides important flexibility in plan implementation. If the City achieves a higher growth rate, the additional infrastructure improvements and associated costs will have been identified and specifically linked to that additional growth. If the incremental growth is planned to be transit-oriented, the growth can

increase the effectiveness of the initial BRT investments, boost BRT and overall transit system ridership, and minimize the cost of additional infrastructure improvements.

Table 3. Population Growth Comparison of Three Scenarios

2007 - 2030 Growth in Population							
Part of City	Existing (2007) Population	Scenario 1 – GMIS *1% Annual Growth 22% Intensification*		Scenario 2 *1% Annual Growth 40% Intensification*		Scenario 3 *2% Annual Growth 40% Intensification*	
		Absolute Growth	*% Increase*	*Absolute Growth*	*% Increase*	*Absolute Growth*	*% Increase*
Total City of London	355,675	73,800	20.75	73,800	20.75	147,600	41.5
Existing Developed Area Subtotal	347,075	16,200	4.7	29,550	8.5	59,100	17.0
Downtown Area	15,700	2,300	14.6	11,075	70.5	22,150	141
Transit Nodes and Corridors	84,675	1,300	1.5	11,075	13.1	22,150	26.2
Rest of Existing Developed Area	246,700	12,600	5.1	7,400	3.0	14,800	6.0
Fringe Area Subtotal	8,600	57,600	670	44,250	515	88,500	1,029

1.6 Five "Smart Moves" to Achieve London's Vision

The key goal of the 2030 TMP is to provide more attractive travel choices for those who live, work, and play in London. To achieve that goal, significant improvements in transit service will be required as well as greater support for walking, cycling, and carpooling. If more attractive mobility choices are available, Londoners will be more likely to change their travel patterns, resulting in an overall reduced dependency upon the automobile. Over time, this shift in behaviour can reduce the need for costly and disruptive road widening projects while maintaining overall good transportation levels of service and providing overall environmental benefits.

The 2030 TMP study is guided by a Council supported vision that is transit focused. Transit works best where there is sufficient land use density to generate ridership to support the system. Historically, the City has been growing at a rate of about 1% per year. Much of this growth has been occurring in the City's fringe areas, with only 22% of future growth planned to be accommodated through intensification of existing developed neighbourhoods.

In the context of the pattern of historical growth, achieving this transit focused vision requires that the City first consider changes to the way that future growth is managed. This critical first step sets the framework for the rest of the TMP, which in turn establishes the transportation policies and infrastructure to support a new vision for mobility.

Accordingly, there are five "Smart Moves" that form the basis for this new TMP, each playing a role in supporting the achievement of the plan and Council's strategic objectives. Each of these initiatives supports a strong and healthy downtown, which will remain the City's primary economic engine and pre-eminent centre in the emerging urban structure. These five "Smart Moves" are:

1. Rethinking Growth to Support the Transportation Master Plan
2. Taking Transit to the Next Level
3. Actively Managing Transportation Demand
4. Greater Investment in Cycling and Walking Infrastructure
5. More Strategic Program of Road Network Improvements

A summary of these five bold initiatives is outlined in the following sections, and these key actions form the basis for the "New Mobility" TMP.

SMART MOVE 1 – Rethinking Growth to Support the Transportation Master Plan

A key goal of the TMP is to provide convenient alternatives to enhance mobility for all users and all modes of travel. The success of this TMP will depend on assisting such behaviour changes by fostering an urban structure and form that encourages increased use of transit, walking, and cycling. The City must also be prepared to help people find attractive choices to automobile use.

The City must steadily encourage the emergence of a more transit, pedestrian, and bike-friendly urban form. This means that new growth and other major city initiatives must be encouraged and directed towards those locations which can best contribute to this mobility-driven urban structure. Chapter 2, City Building for the New Mobility, provides a more detailed discussion about the recommendations for rethinking growth in the City.

SMART MOVE 2 - Taking Transit to the Next Level

At the heart of this "New Mobility" TMP is a BRT network (see Exhibit 21, section 3.1) consisting of a north/south corridor along Richmond Street / Wellington Road and an east/west corridor along Dundas Street / Oxford Street, both serving the downtown area and broader central area. A BRT based system can be supported with 1% annual growth (the recent trend) if 40% of the growth is directed to the downtown and these

transit corridors (as in Scenario 2). With stronger growth (as in Scenario 3), or greater than expected ridership, additional BRT services would likely be justified and/or parts of the BRT network might be upgraded to LRT.

Many other transit improvements will also be required to boost transit ridership and transit modal share. These include more frequent service on all main routes, restructured routes to feed the BRT (and pre-BRT) services (e.g. semi-express bus), and generally making transit easier for riders through broader use of technology, more fare options (including smart cards), and expanded use of real-time information. Again, a greater level of effort would be required in all of these areas for Scenario 3, as it strives for a 20% transit share city-wide.

SMART MOVE 3 - Greater Investment in Cycling and Walking Infrastructure

More active transportation infrastructure will be needed to support growth in intensification areas and improve access to transit. Specific initiatives include closing gaps in the sidewalk network, providing a more continuous and extensive network of on-street bike lanes, providing secure bike parking facilities at all key public destinations, and encouraging these facilities at stores and major employers. Another key initiative is the promotion of "complete streets" where the street right-of-way is more fairly apportioned to all roadway users, including pedestrians and cyclists.

SMART MOVE 4 - More Actively Managing Transportation Demand

Strengthening TDM efforts is another important part in the process of transforming travel in the City. The following seven broad directions are proposed as a focus for City efforts:

1. Strengthen policy support
2. Promote sustainable travel for all time periods
3. Target commuter travel
4. Target school travel
5. Increase investment in active transportation infrastructure
6. Finalize downtown parking strategy
7. Use parking to support transit, active transportation, and TDM

Within the above directions areas, 28 specific initiatives are proposed for further development and implementation (see Table 12, section 3.2.3). Among these included developing a policy focussed on "complete streets" and people (not just vehicles) movement, strengthening partnerships with the healthcare sector (members of which should be strong advocates of increased active transportation), and intensifying the TDM program for City employees to set a strong example for other large employers.

Other initiatives include expanding the Active and Safe Routes to School (ASRTS) program to a city-wide scale, working with school boards to develop secondary school programs, and accelerating the implementation of on-street cycling routes and secure bicycle parking facilities.

The supply and pricing of parking are also important policy tools at the City's disposal, which can influence modal choice decisions and therefore aid in the transformation process. The City is currently working on short and long-term parking strategies for the downtown and these should include pricing structures that support transit. Later, with intensification of development in the transit corridors and at specific nodes, downtown type supply and pricing strategies should be considered for these areas. Another important parking initiative should be the implementation of park-and-ride facilities at the extremities of the proposed BRT lines. In other jurisdictions this has proven to be an effective way of boosting transit ridership and reducing automobile travel, particularly for longer distance and downtown-oriented trips.

SMART MOVE 5 - More Strategic Program of Road Network Improvements

Despite the greater emphasis of this TMP on transit, active transportation, TDM, and parking, more road improvements will still be required. The City's approach, however, to defining the need for road network improvements has become more strategic (and selective) than in past TMP efforts. Firstly, the more strategic approach reflects a reduced modal share for the automobile by 2030, consistent with the expectation that transit and active transportation modal shares will increase significantly from current levels. Secondly, roadway improvement needs have been based on a corridor level analysis, as opposed to a link by link analysis. This means, for example, that where two adjacent roadway links both show capacity deficiencies, only one improvement may be necessary to resolve the corridor deficiency. Additionally, this approach recognizes that some road widenings will be required to support the proposed BRT, with new lanes being dedicated for exclusive transit use. This is in keeping with the "complete streets" philosophy and the new focus on people (rather than vehicles) movement.

1.7 Collaborative Approach to City Building

Engaging and consulting the public and key stakeholders has been a critical part of the TMP work. During the course of the TMP study, four sets of meetings were held. In each case, the initial workshops were held with the User Vision Group and the Sustainable Transportation Roundtable group and those were followed up with full public workshops. Overall, participants at those meetings were very supportive of the TMP work and the team's willingness to listen to and address comments and concerns. A summary of the public consultation events held during the study are included below.

Meeting reports summarizing the feedback received were posted on the study website and are included in **Appendix L**.

1.7.1 Public Workshops

Public Workshop #1 was held on November 10th, 2009 at the Western Fair Grounds and gave participants a chance to share feedback on big transportation issues and opportunities within the City. This meeting was part of the first phase of the project which looks at where we are at today and developing a vision for the future.

Public Workshop #2 was held on May 19th, 2010 at the London Convention Centre. This time the meeting provided participants with the opportunity to explore the different transportation strategies being considered in order to develop a long-term vision for the transportation in the City.

Public Workshop #3 was held on January 19th, 2011 at the Western Fair Grounds. Participants were presented with the assessment of growth scenarios and preliminary recommendations on the proposed BRT network and supporting policies.

Public Workshop #4 was held on May 16th, 2012 at the Western Fair Grounds. Participants were presented with the draft recommendations of the TMP and were given the opportunity to provide comments for consideration.

1.7.2 Advisory Groups

User Vision Group

This community-based group was made up of about 40 City residents who represent the needs of transportation users in the City. The group that represented a cross-section of residents, consisted of the young and old, students, professionals, retirees, people with accessibility challenges, transit riders, motorists, cyclists, and pedestrians from all across the City. The purpose of the group was to provide advice to the City from the perspective of people who use the City's transportation system every day. The User Vision Group met four times over the duration of the study, providing their advice on each major phase of the TMP's development.

User Vision Group Meeting #1 (October 21st, 2009)
User Vision Group Meeting #2 (May 13th, 2010)
User Vision Group Meeting #3 (November 23rd, 2010)
User Vision Group Meeting #4 (May 9th, 2012)

Sustainable Transportation Roundtable Group

This group was made up of local stakeholders and organizations that represent a variety of transportation interests within London such as the environment, the movement of goods, commuting, health, research, accessibility, and safety. The purpose of the group was to provide advice to the City from the perspective of residents and businesses that use and rely on London's transportation system every day.

Sustainable Transportation Roundtable Group Meeting #1 (October 21st, 2009)
Sustainable Transportation Roundtable Group Meeting #2 (May 13th, 2010)
Sustainable Transportation Roundtable Group Meeting #3 (November 23rd, 2010)
Sustainable Transportation Roundtable Group Meeting #4 (May 9th, 2012)

The key messages heard at the meetings and received by follow-up e-mails are summarized in Exhibit 3.

SmartMoves Public Open House

Another positive aspect of the TMP effort has been the inter-disciplinary approach taken by the City with the ongoing coordinated involvement of City Planning and LTC under the leadership of the Transportation Planning and Design Division within the City's Engineering Department. This has ensured that all technical perspectives were considered, all on-going City and LTC initiatives contributed to the TMP, and both were informed about the ongoing work through interim reports, drafts, and regular meetings.

As the TMP moves forward to the implementation stage, this collaborative process needs to be continued. It will be particularly important for the City and LTC to build awareness and further support for the new mobility TMP and to brand the BRT initiative.

As the TMP implementation process unfolds, the City should exploit all opportunities to convey the TMP new mobility themes. One such opportunity would be the recently launched *ReThink London* process. Marketing the vision to build community support should facilitate the environmental and funding approval processes and demonstrate a strong local commitment to critical funding partners – senior levels of government.

Exhibit 3. Key Messages from Public Consultation

1. Many participants said they liked the plan and were happy to see that the City is "recognizing the need for improved mass transit and money for mass transit".

Other things that participants said they liked about the *Transportation Master Plan* included the increased emphasis on intensification and the "sustainable and eco-friendly changes", the two levels of transit with both high frequency bus rapid transit and feeder lines, and the increased emphasis on active transportation.

2. Happy with increased emphasis on intensification and transit oriented development to reduce "sprawl".

Participants were very supportive of the increased support for transit oriented development that would encourage walkability and cycling. Many participants said they were pleased with the recommendation to increase intensification in some areas. A suggestion was made to encourage intensification in all new developments in order to plan for the needs of *future active and public transit users.*

3. Many said they were very happy with emphasis on active transportation.

Many participants said they liked the increased focus, investment, and action on active transportation such as cycling and walking and would like to see roads made safer for people walking and on bikes. There were also many participants who said they would like to see dedicated bike lanes included in the plan.

4. Implementation will require a change in behaviour from the public.

Several participants said they felt that the public play a key role in the implementation of the *Transportation Master Plan* by making changes to how they get around the City. Several participants said they would like to see a greater marketing campaign employed and incentives created to raise awareness of the health and environmental benefits of active transportation and reduce "stigma" surrounding use of public transportation.

5. Create a mechanism to "check in" on the progress of the Transportation Master Plan as it is being implemented.

Some participants said that they would like to see a process created to ensure that the Transportation Master Plan continues to be implemented in order to "stay on track a couple of years down the road". One participant also recommended that the *Transportation Master Plan* incorporate a mechanism that quantifies the level of successful implementation by measuring the carbon footprint of the transportation system before implementation as compared to 5 and 10-years from now.

6. Mixed opinions about road widening.

Many participants said they would like to see less money provided for road widening, while some felt that road widening in certain areas may be necessary. For example, one participant said that they were happy that Wonderland Road is proposed to be widened to six lanes, while another participant said they would rather leave the road as is and implement bus rapid transit instead.

2. City Building for the New Mobility

As part of the *City of London Strategic Plan* (2011-2014), Council has identified five results that contribute to the high quality of life in the City of London (City):

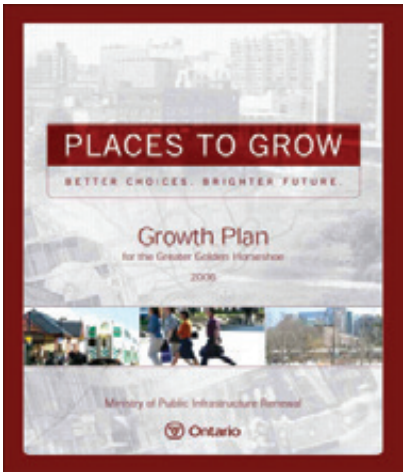
1. A Vibrant and Diverse Community
2. A Green and Growing City
3. A Sustainable Infrastructure
4. A Caring Community
5. A Strong Economy

This *Transportation Master Plan* (TMP) is very supportive of a sustainable infrastructure and a strong economy. The 2030 TMP is a long-term transportation strategy for the City that will help guide the City's transportation system and land use decisions through to 2030 and beyond.

Rethinking how we grow, will provide benefits in achieving the community vision outlined in the *City of London Strategic Plan*, while enhancing the way City residents travel around the City.

2.1 Land Use and Transportation

Recognizing that a goal of the TMP is to provide transportation options, its success will depend on assisting such behaviour changes by fostering an urban structure and form that encourages the use of transit, walking, and cycling. The City must be prepared to help people find attractive alternatives to automobile use.



That goal suggests that London must steadily encourage the emergence of a more transit, pedestrian, and bike-friendly urban form. New growth and other major City initiatives must be encouraged and directed towards those locations in which they can best contribute to this mobility-driven urban structure.

Many cities in Ontario and around the world are recognizing that traditional patterns of urban development are not sustainable in terms of their municipal operating costs, personal movement expenses, and climate change implications. In 2006, the Ontario Government introduced comprehensive

legislation in its *Places to Grow Act* to direct the pattern of urban development in the Greater Golden Horseshoe area in southern Ontario centred on the Toronto region. This legislation and policy direction, now substantially implemented by area municipalities, sets an important precedent for the City and other major Ontario cities not covered by the *Places to Grow Act*. Its primary focus is to set clear urban boundaries and targets for intensification within the existing urban area and new settlement areas. Its secondary purpose is to provide a sustainable distribution of people, jobs, and destinations to support a more developed transit system.

While the City must develop its own distinct growth management strategy, the *Places to Grow Act* and other precedents for growth management suggest some effective strategies. Simply put they can be summarized as follows:

- Place clear limitations on urban expansion;
- Direct as much new growth as possible to locations inside the existing developed area of the City;
- Encourage growth in locations where it supports transit ridership, walking, and cycling;
- Locate key destinations in places where they can be served by transit; and
- Improve the quality of the existing developed urban environment, including street design, to establish attractive alternatives to city-edge living and working.

These strategic directions have structured this element of the TMP and their subsequent implementation through development of policies and initiatives in the new *Official Plan*.

2.2 Growth Management

2.2.1 Urban Structure Plan

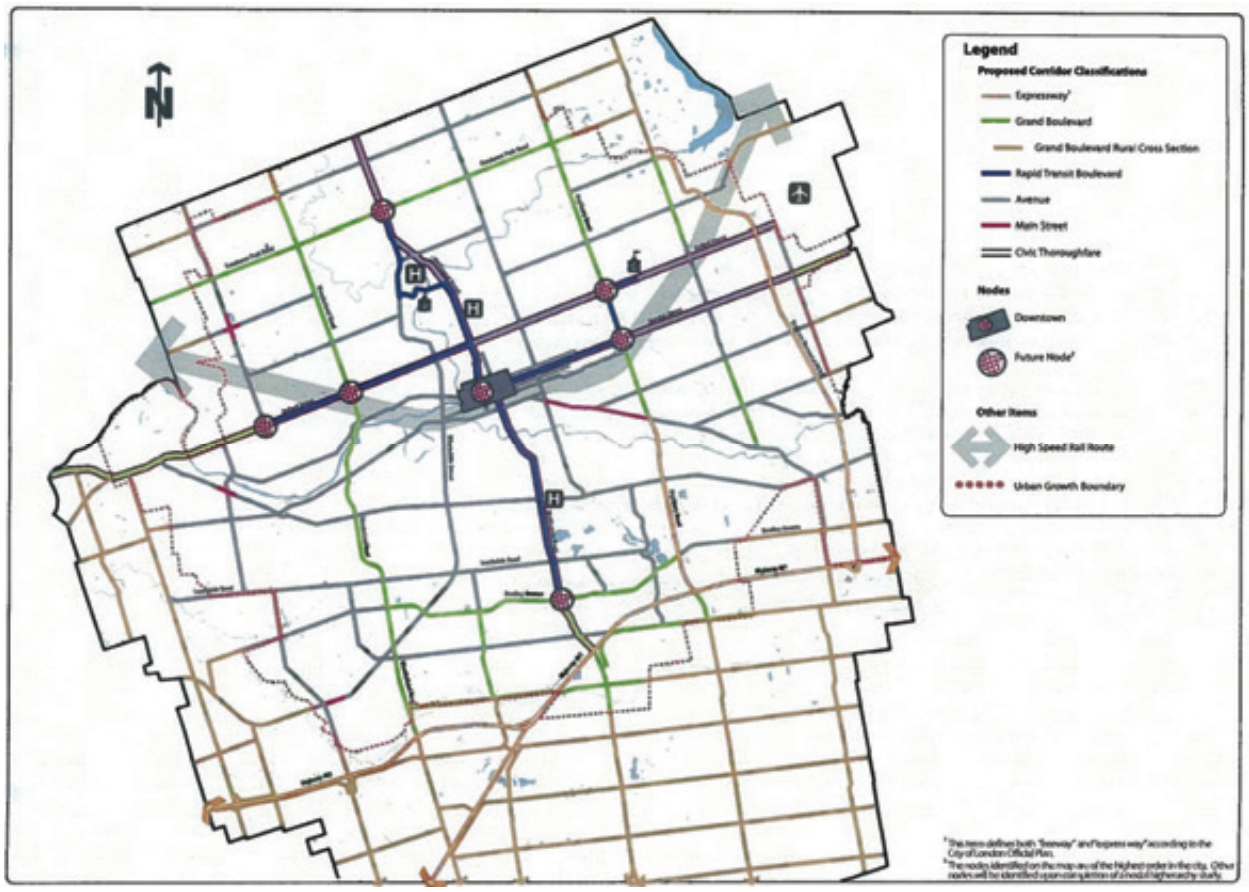
The growth management strategies identified above will be based on an urban structure plan that will establish the overall intentions for the future form and function of the urban area, and identify the specific locations where growth is to be encouraged. Such an urban structure plan typically sets out both the major growth points; the “nodes”, the downtown area, major intersections, major institutions, and development opportunities; and the “corridors”, the major streets that link the nodes, have potential for rapid transit development, and connect to other major elements of the City’s transportation infrastructure such as airports, transit hubs, and regional expressways.

In its recent draft publication, *Building the Place to Be – City of London Urban Design Guidelines,* the City Planning Department prepared a *Nodes and Corridors Urban*

Structure Plan for the City. This plan, which reflects the emerging directions of the TMP, identifies north/south and east/west rapid transit corridors and identifies key nodes such as the downtown area, key intersections, and the major educational and hospital institutions, as well as the airport and regional transportation facilities.

This essential urban structure plan has been used in the deployment of the specific population and employment growth projections used to test the viability of rapid transit systems (see Exhibit 4), as detailed in the next section.

Exhibit 4. Nodes and Corridors Urban Structure Plan



An urban structure plan does more than just identify areas of intended growth and intensification. The plan establishes a basis for the City to plan a specific type of street character that will support a more urban form of development. For example, on-street parking plays a large role in slowing traffic, providing a buffer between pedestrians and traffic, and creating a vibrant activity area for residential and commercial uses that are close to the front lot line.

An urban structure plan also establishes a basis to plan for a use, intensity, and built form that will create a development character that is supportive of urban living. Finally,

urban structure plans create a hierarchy of nodes and corridors and allows for urban design guidelines to be applied differently to different levels of the urban hierarchy. All of this sets the right context for encouraging the type of infill and intensification that is supportive of sustainable forms of transportation.

2.2.2 Growth Management Scenarios for London

To determine the most effective balance between the City's future urban form and investment in its transportation system, extensive modelling was undertaken to demonstrate alternative distributions of new residential and employment development. The most recent 2011 Census found that the City's population had grown by 3.7% over the past five years.

Two scenarios were examined in detail. The TMP is based on Scenario 2 developed during the study process. A sensitivity analysis was also conducted for Scenario 3.

Scenario 2 proposes a balanced approach to growth and was formulated to reflect the growth management policies developed in the *Places to Grow Act* for the Greater Golden Horseshoe area. Scenario 3 is more transit focused. The scenarios both assume a 40% intensification rate, meaning that the percentage of total urban growth in the City would be directed to urbanized areas within the existing built envelope, with the balance developed in new settlement areas on the urban fringe. Scenario 2 assumes a population growth rate of 1% and Scenario 3 assumes a growth rate of 2%. The historic annual growth rate for the City has been just less than 1%. Within the urbanized area, the projected growth was distributed between the downtown area (37.5%), transit nodes and Bus Rapid Transit (BRT) corridors (37.5%), and the rest of the urban area (25%). For further details, refer to **Appendix A**.

The scenarios also allocated employment growth in slightly different ways. Scenario 2 assumes a 14% (28,000 jobs) increase in overall employment growth. The allocation between urbanized and fringe areas is roughly equal, with 52% of jobs directed toward the urbanized area and 48% of jobs directed toward the fringe areas. Allocation within the urbanized area is distributed between the downtown area (27%), Western University (WU) and London Health Sciences (LHS) (9%), Victoria Hospital (9%), remaining nodes and corridors (28%), and the rest of the urban area (27%). Allocation within the fringe areas is distributed between the Veterans Memorial Parkway (VMP) and Highway 401 (41%), other industrial areas (13%), and the rest of fringe (46%).

Scenario 3 has a more substantial increase of 28% (56,000 jobs) in overall employment growth. In this scenario, additional job growth obtained through a higher growth rate is directed toward the urban areas. As a result, the urbanized area receives 68% of job growth and the fringe areas receive 32%. Allocation within the urbanized area is distributed between the downtown area (28%), WU and LHS (12.5%), Victoria Hospital

(12.5%), remaining nodes and corridors (24%), and the rest of the urban area (23%). Allocation within the fringe areas is broken down into VMP and Highway 401 (35%), other industrial areas (20%), and the rest of fringe (45%). For further details, refer to **Appendix A**.

The population and growth scenarios were tested to determine their effectiveness in supporting rapid transit along key corridors. The analysis showed that transit ridership is indeed quite sensitive to such different assumptions about the distribution of new growth, demonstrating the strength of the relationship between land use planning and transit sustainability. Clear implications flow from this analysis to the formulation of appropriate policies for inclusion in the new *Official Plan* that effectively direct development in the optimal distribution to support rapid transit.

2.2.3 Transit Corridors

The TMP and the City's draft urban structure plan identify the key corridors for rapid transit; a north/south corridor primarily utilizing Richmond Street and Wellington Road and an east/west corridor utilizing Dundas Street and Oxford Street.

These rapid transit corridors present design and development opportunities and challenges in their overall function and detailed implementation. The City's draft urban design guidelines place these "rapid transit boulevards" within a wider hierarchy of street prototypes for the City, as indicated in Table 4 below.

Table 4. Hierarchy of Urban Streets – Urban Structure Plan

Expressway	Grand Boulevard	Rapid Transit Boulevard	Avenue	Mainstreet
• Priority for Vehicles and Freight Movement • Move Large Volumes of Vehicular Traffic • Quality Standard of Urban Design to Promote the City	• Emphasis on through movement of vehicles and Freight • High Quality Pedestrian Realm • High Standard of Urban Design	• Emphasis on through movement and connection to/of transit vehicles • Move large volumes of traffic (Pedestrian, cycle and Vehicular) • Higher Quality Pedestrian Realm • Higher Standard of Urban Design	• Emphasis on Pedestrian, cycle and transit movements • Move medium volumes of vehicular traffic • Higher Quality Pedestrian Realm • Higher Standard of Urban Design	• Priority for Pedestrians • Move medium-large volumes of cycle, transit and vehicle movements • Minimise Width of Vehicle Zone • Highest Quality Pedestrian Realm • Highest Standard of Urban Design
50-100m	36-45m	40-50m	20-30m	20-30m

Public right-of-way designation from the City's urban design guidelines, draft December 2011

As the rapid transit system is developed, detailed study will be necessary to refine the general design parameters for the corridors in terms of the allocation of right-of-way to transit functions, general traffic, cyclists, pedestrians, landscaping, and street-related activities. Experience in Ontario and elsewhere is that the simple sum total of these demands can result in overly wide, non-urban street environments, and difficult design trade-offs are necessary. An overall and site specific street design strategy will also be required for major intersections and typical station conditions.

Recognizing and resolving the many local conditions where the right-of-way is constrained by its inherent narrowness, by the presence of mature trees, unique heritage, or other distinct urban character will be important steps. While detailed study will be required, the following corridor sections can already be identified as requiring special study because of their particular environment.

North/South Corridor

- Wellington Road
  - Thames River Crossing
  - Weston Street to Alexandra Street
  - Victoria Hospital complex (if this route is diverted from Wellington Road)
- Downtown area and Victoria Park section
- Richmond Street, Oxford Street to Huron Street
- Western University Route (if this route is diverted from Richmond Street)

East/West Corridor

- Downtown area section
- Dundas Street, Adelaide Street to Highbury Avenue

2.2.4 Transit-Supportive Development Design

The previous section identified the challenges involved in developing urban design corridors within a largely existing right-of-way. The complementary opportunity is the encouragement of new development along those corridors.

Significant development potential exists along corridors and at the indicated nodes, both as general intensification and in the special treatment of large sites. Corridor and node planning and development studies should be undertaken to identify development opportunities and their specific urban design treatment. Such conclusions should then be incorporated in the new *Official Plan*. Practice in other jurisdictions has shown that prior facilitation of development along corridors through pre-planning is an important strategy for the practical realization of the required transit-supportive activity. Planning and zoning policies that indicate the acceptable form and nature of future development, and rebalance the planning presumption in its favour, are important if the significant investment in transit is to yield the desired ridership results.

As a part of the TMP study process, a number of potential sites along the proposed transit corridors were investigated to identify the nature of the planning and urban design issues that might be encountered in the process of implementing transit-supportive intensification.

The following scenarios describe what such intensification might look like at four locations along the planned BRT corridors of Dundas Street / Oxford Street East, Oxford Street West, Richmond Street, and Wellington Road South.

Dundas Street / Oxford Street East Corridor

Currently this area has a number of independent retailers and turn-of-the-century building types with small floor plates. North of the site is the "annex" residential area, a designated heritage district.

This scenario shows intensification in the form of a four to six storey building, with commercial uses at grade. The building steps down in the north toward the residential area. The built form would create a continuous street frontage along Dundas Street and Quebec Street (see Exhibit 5).

Exhibit 5. Dundas Street / Oxford Street East Corridor (Northwest Corner of Dundas Street and Quebec Street – Old East Village)

Oxford Street West Corridor

This site is an example of intensification of a large site as part of a future node. This large parcel of land is bounded by a future six lane traffic corridor along Wonderland Road North, Farrah Road, Proudfoot Lane, and the proposed BRT corridor along Oxford Street West. There is a cemetery in the southeast corner of the site. Adjacent uses include shopping plazas and parking lots. The City's long-range plan is to bring significant intensification to this area (see Exhibit 6).

In this intensification scenario the large block is divided into five smaller blocks and retains the cemetery and green space in the southeast corner. The smaller blocks are created through the creation of three internal roads. The internal roads improve pedestrian and traffic circulation and create additional opportunities for residential and commercial frontage.

Taller buildings are located along the high-traffic Wonderland Road North with the highest density portions situated on the prominent corner of Wonderland Road North and Oxford Street West. Commercial and retail uses are located in the most high-traffic areas in the ground floor of buildings along Wonderland Road North and Oxford Street West. Lower-density townhouses and two to three storey buildings are situated along the site's interior roadways.

The cemetery remains a prominent open space feature on the site. The cemetery is integrated into the new development through new green space connections and the cemetery itself becomes a terminus for the central internal roadway and extension of Horizon Drive.

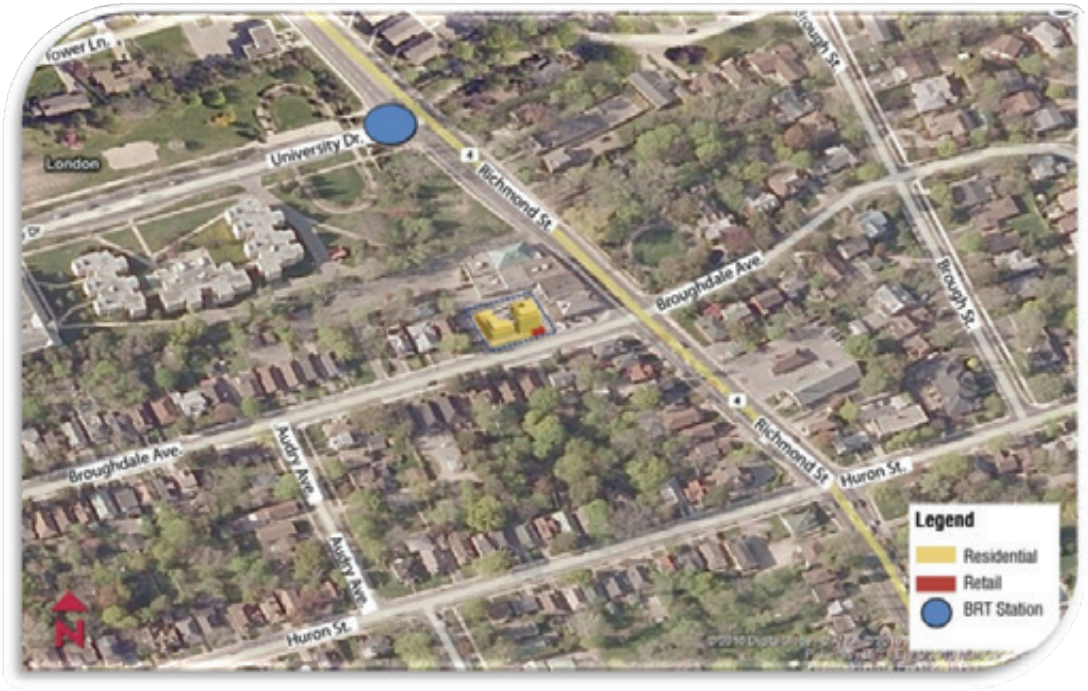
Richmond Street Corridor

This site provides an example of general intensification and is located in a predominantly low-rise single family neighbourhood with an abundance of student housing. Single family houses front onto Broughdale Avenue with a few low-rise commercial buildings at the corner of Richmond Street.

In this intensification scenario two buildings of four to six storeys share the site and driveway access. The buildings are mainly residential condominiums with a small corner piece of retail closer to Richmond Street. The building transitions into the surrounding low-rise residential neighbourhood by stepping down toward the side and rear lot lines (see Exhibit 7).

Exhibit 6. Oxford Street West Corridor (Farrah Road and Wonderland Road)

Exhibit 7. Richmond Street Corridor (at Broughdale Avenue)



Wellington Road South Corridor

This site provides another example of intensification on a larger site. It is an irregular shaped area on the northeast corner of Wellington Road and Southdale Road. A seniors housing complex, strip malls, single-family housing, and an environmentally sensitive forest area make up the surrounding uses.

In this intensification scenario the large parcel of land is broken up into three smaller parcels with the creation of two internal roads. Each parcel contains a range of building types that range from one to seven storeys. The higher density buildings are located along Southdale Road, with the tallest building at the prominent corner of Southdale Road and Wellington Road South. Townhouses are located along the interior road. A strip of open space along the eastern portion of the property creates a linkage with the environmentally protected forest area (see Exhibit 8).

Exhibit 8. Wellington Road South Corridor (at Southdale Road)

2.3 Official Plan Policies and Modal Share Targets

2.3.1 Policies for Inclusion in new Official Plan

The transportation principles and policies identified in this document serve as a tool to integrate transportation planning into the *Official Plan*. The *Official Plan* is one of the basic mechanisms for implementing the recommendations of the TMP. The *Official*

Plan contains Council's objectives and policies to guide the short-term and long-term physical development of all lands within the boundary of the municipality. It provides direction for the allocation of land use, provision of municipal services and facilities, and preparation of regulatory by-laws to control the development and use of land.

The TMP provides a framework that will guide new growth areas, as well as major changes in existing built-up areas. As the TMP is an overarching city-wide document, many local details will require further study and analysis through secondary plan processes and / or through the corridor studies identified previously.

ReThink London is the planning and consultation process initiated to update the *Official Plan* for the City. This initiative is an important City building master plan that will take these growth management strategies and use them to establish the specific goals, priorities, and policies that will shape how the community grows in the future.

With respect to the set of city-wide land use and transportation issues discussed above however, policies with respect to the following matters should be incorporated into the *Official Plan*.

ReThink London is the planning and consultation process initiated to update the _Official Plan_ for the City of London.

ReThink London will incorporate the TMP recommendations on land use and transportation policies to guide future growth.

- A nodes and corridors urban structure plan that identifies the specific nodes and corridors, the downtown and other destinations, with general policies with respect to the ambitions for each such corridor and location;
- Established growth management principles for specific intensification targets such as the encouragement of transit-supportive development, the efficient use of urban space, the allocation of growth between the urbanized area and the fringe areas, and the concentration of development around nodes and corridors;
- Established specific intensification targets for urbanized areas, the central area, specific nodes and corridors, and major destinations;
- A review of the transportation needs for TMP updates on a five year basis, in conjunction with the results of a new comprehensive transportation survey and monitoring program;
- The definition of the upper limit of Level of Service E, where the demand equals the available road capacity, applied on a corridor basis as the justification basis for roadway capacity improvements;

- Classification of individual major roads and corridors with respect to their transportation function and urban design character;
- Established new rights-of-way widths for rapid transit corridors (40 m between intersections and 48 m at signalized intersections), and major arterials (39 m between intersections and 42 m at signalized intersections);
- Recognition that the design of a road will set the quality of pedestrian environment and residential amenity and will have a major impact on whether an urban form of infill and intensification, as desired at important nodes and corridors, is viable;
- Recognition that each node and corridor has a distinct character and that secondary planning policies may be necessary to provide detailed guidance;
- An established positive policy framework for transit supportive development in terms of the density, scale, function, and design of such development; and
- An established positive policy framework for the creation of pedestrian and bicycle friendly urban design and development policies.

Specific policies, which should be considered for refinement during the preparation of the new *Official Plan*, have been proposed under the following headings (for more information, refer to **Appendix Q** *Proposed Policies for London's New Official Plan*):

- Growth Management
- Integrated Transportation Planning
- Public Transit
- Transit Oriented Development
- Complete Streets Supporting Active Transportation
- Transportation Demand Management and Parking

2.3.2 Modal Share Targets

The key goal of this new TMP is to provide more legitimate mobility travel choices for those who live, work, and play in the City. To achieve that goal, significant improvements in transit service will be required as well as greater support for walking, cycling, and carpooling. If more legitimate travel choices are available, Londoners will be more likely to change their travel patterns, resulting in overall reduced dependency upon the automobile. Tracking changes in modal share over time will be necessary as a key metric in measuring the success of this "New Mobility" TMP. To help the City determine the level of its success, modal share targets need to be set and embraced by the Council and City administration. Targets that should be set will be a challenge to achieve, yet at the same time not impossible. Modal share targets would be most meaningful for weekday peak periods, as these are the busiest times of the week and

are used in determining deficiencies in the City's transportation networks. The following weekday peak period modal share targets, summarized in Exhibit 9, have been set to provide an overall framework for this "New Mobility" TMP:

Exhibit 9. SmartMoves Mode Share Targets

Smart Moves Mode Share Targets

Mode	Today	2030 Target
Transit	*12.5%*	*20% City-wide*
Active Transportation (walking/cycling)	*9%*	*15% City-wide*
Auto (driver & passenger)	*73.5%*	*60% City-wide*
Other Modes	*5%*	*5%*

Exhibit 9 summarizes city-wide targets and therefore includes all travel to, from, and within the entire City. A critical support for this TMP is intensification of growth within the existing developed areas of the City and the concentration of this intensification in designated centres (nodes and corridors) where transit will be particularly promoted. Thus, in these areas transit and active transportation modal shares should be higher than the city-wide averages. Within these intensification areas, the City's central area would be expected to experience the highest modal shares for transit and active transportation. Thus, it is proposed that in addition to city-wide targets, there should also be targets for nodes and corridors as well as for the central area.

In reviewing existing modal share information from the 2009/2010 household travel survey, analyzing City trends, and analyzing results from the City's transportation model, the following matrix of modal share targets, summarized in Table 5, has been developed for both 2030 and the interim horizon of 2020.

Measuring modal shares on a regular basis will be possible though implementation of a comprehensive transportation monitoring program, which is recommended as part of this TMP (refer to section 4.7 and **Appendix P** for more details).

Table 5. Recommended Weekday Peak Period Modal Share Targets

Location	Transit			Active Transport			Automobile		
	2009	2020	2030	2009	2020	2030	2009	2020	2030
City-Wide	12.5	15.0	20.0	8.0	11.0	15.0	73.5	68.0	60.0
Nodes & Corridors	12.5	15.0	22.5	8.0	12.0	17.5	73.5	66.0	55.0
Central Area	12.5	18.0	25.0	11.0	15.0	20.0	70.5	62.0	50.0

2.4 Translating Growth into Future Travel Demands

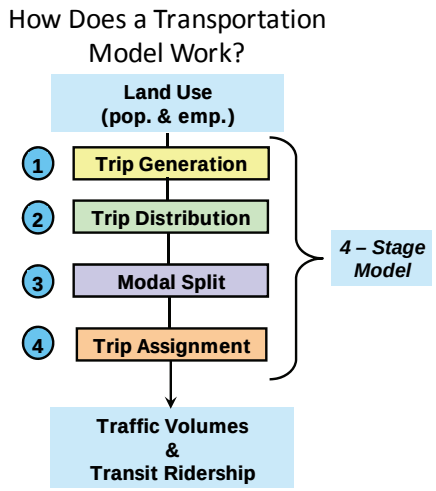
The previous section of the TMP focused on how to accommodate population growth in a more sustainable manner and the supporting key policy objectives that should guide future transportation planning in the City, including transportation mode share targets.

Combined with these policy-based directions, the link between land use and transportation is further strengthened through the technical work of translating future growth into future travel demands.

The City currently has a computerized travel forecasting model that was upgraded as part of this TMP study. Its key outputs are projected volumes on the City's road and transit networks for a typical weekday peak hour. The model was first calibrated to replicate existing conditions and then confidently applied to forecast travel by mode for future horizon years (in this case 2030).

The model requires four main inputs:

1. Population and employment forecasts for the City and region and for small areas (referred to as traffic zones) within the City;
2. Travel patterns and characteristics for various trip purposes;
3. Assumptions regarding external factors that influence travel (fuel prices, external growth, parking costs); and
4. Speed and capacity characteristics of the road and transit networks.



The model was recalibrated for 2009 conditions using the household travel survey data and applied to forecast 2030 travel demands.

The travel demand forecasting process is essentially split into four key steps. Each of these steps is described briefly below (refer to **Appendix G** for more details).

2.4.1 Trip Generation

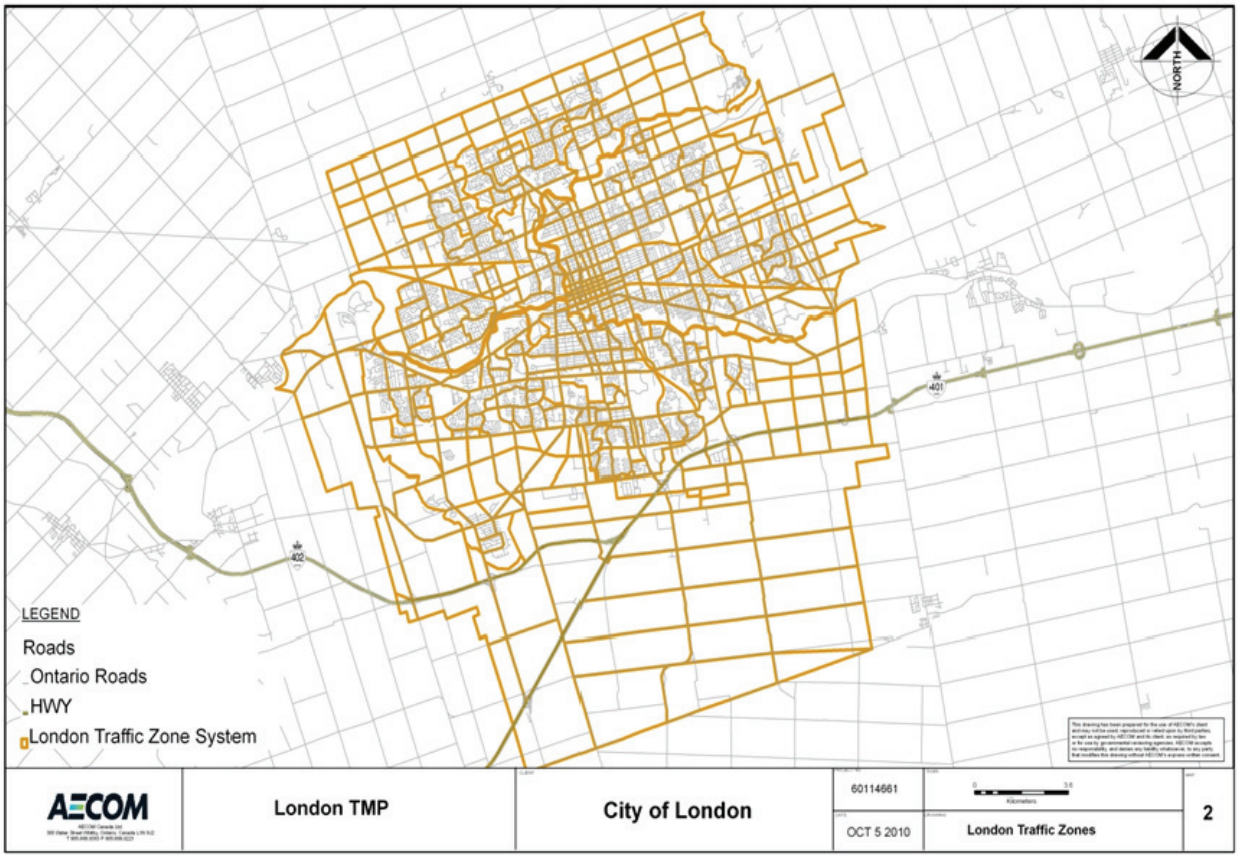
Trip generation is the process used to estimate the demand for travel based on the population of a community, the employment within a community, and the various types of other land uses that generate people activity (schools, shopping malls, community centres, etc). There are a number of demographic and socio-economic factors that influence the demand for travel within a community. The key ones tend to be the number of people and the breakdown of the population by different age categories, the number of employed residents (also known as the employed labour force), the share of residents who work from home or work outside of the community, the post-secondary student enrolment, and the type of employment uses in the City.

Some of these factors are applied at the city-wide level, while others represent characteristics of certain areas of the City. To facilitate detailed forecasting work, the City is broken down into a series of small areas called traffic zones. Each traffic zone represents a geographic area of the City where the land uses and land use characteristics are relatively similar, or where future growth has been planned. Within the City, there are 532 traffic zones, as illustrated in Exhibit 10, below. These traffic zones are grouped into 42 distinct planning areas, consistent with those used by the City for land use planning, and these planning areas are grouped into 11 super zones, which describe large areas of the City (i.e. the downtown area).

In the outlying communities surrounding London, 96 traffic zones were created based on Census planning areas and municipal boundaries covering an area from Woodstock, to Stratford, to Strathroy, and south to Lake Erie. This external area was included to capture trip making activity into and out of the City in a more detailed manner than the previous model was able to do.

Each trip is defined as a movement from an origin to a destination for a distinct purpose, and therefore has two spatial components; a zone where the trip is produced and a zone where the trip is destined to. Each zone in the City will produce a certain number and type of trips and will attract a certain number of and type of trips, based on the population living in the zone, the employment and type of employment within the zone, and the presence of other land uses within the zone.

Exhibit 10. City of London Traffic Zones



Using the results of the household travel survey, relationships between the actual number of trips produced and attracted, the land use, and demographic characteristics of each traffic zone were developed for each category of trip. The relationships are expressed as trip generation rates. Separate rates were calculated for the AM three hour peak period and the PM three hour peak period. Separate trip generation rates were developed for zones within the City and outside the City, to reflect the different characteristics of urban and rural communities.

The model uses eight different trip purposes for internal and external trips made by residents and these are divided into four age categories (0-19, 20-44, 45-64, and 65+) to reflect the demographic differences in trip making activity of different age groups. There are three trip purposes for trips made by post-secondary students living in the City.

For work trip purposes, the trip generation rates are based on the employed labour force living within a zone and the number of jobs within each traffic zone, by employment category. For non-work purposes, the trip generation rates are based on a

combination of the total population within each zone and the employment in each zone, as the employment represents the presence of service related business that attract non-work trips.

Trip rates for secondary school trips are based on the population by age category at the home end of the trip. Future trip making for non-resident students is based on growth factors applied to existing observed trips from the travel survey, based on the relative growth in post-secondary enrolment in the City, minus any planned increase in students living in residence[3]. In the absence of detailed enrolment forecasts for each post-secondary institution to 2030, a growth rate based on the overall population growth rate has been assumed in the model.

Some heavily congested urban centres, such as the GTA, use travel time or travel costs, to predict the distribution of trips, given the levels of congestion experienced in those transportation systems and the affect that congestion can have on where people choose to live, work, and do their daily activities.

Once the trip generation models are estimated, the trip generation results are calibrated against the results from the travel survey to ensure that the models are able to accurately predict the number of trips generated for the base year land use. Further details on the trip generation rates and trip generation calibration can be found in **Appendix G**.

Trip generation rates were developed for both the AM and PM peak periods. Since the PM peak represents the worst case scenario in terms of demand for trip making, the PM peak model was used in the final forecasting work undertaken for the TMP.

2.4.2 Trip Distribution

Trip distribution is the process used to predict the destination choices of trip makers. Using the estimates of future trip productions and attractions for each traffic zone from the previous step, a trip distribution model is used to predict how many trips will travel between each pair of traffic zones, from trip origin to trip destination.

The model uses the distance between zones as the primary factor to determine the share of trips that are expected to travel between any two zones. This is due to the fact that the City experiences relative modest level of congestion, and has relative short average trip lengths.

[3] *Students living in residence were not captured in the household travel survey and are not included in trip generation.*

Difference models are developed for each trip purpose or group of trip purposes, to reflect the different travel patterns that exist for each purpose. For example, some motorists are more likely to travel longer distances to and from work than they are for shopping or other discretionary trips, as families with more than one employed members will often choose to locate closer to the work location of one spouse. Trips to and from school tend to shorten in distance as schools are typically located within neighbourhoods where residents live.

Further details on the trip distribution model and calibration results can be found in **Appendix G**.

2.4.3 Mode Choice

Mode choice models are used to predict the choices that individuals or groups of individuals make in selecting the transportation modes that are used for particular types of trips. Typically, the goal is to predict the share or absolute number of trips made by each available mode of transportation between each pair of origin-destination zones.

Mode choice can be estimated using a policy based approach (i.e. policy of 20% of trips using transit), or using a predictive model that estimates the share of trips that would be made by a particular mode based on the performance of that mode compared to the modes of travel available. The TMP uses both approaches.

During the initial testing of growth scenarios, a policy based approach was used to determine the relative demand that would use each mode of travel if the policy targets were achieved. This was done to test the initial feasibility and potential ridership that would be attracted to a rapid transit system, to assess the viability of Light Rail Transit (LRT) vs. BRT, and to assess the order of magnitude implications on road network improvement needs. During the refinement of the TMP, the predictive mode choice model was utilized to estimate the share of trips that would travel by each mode of travel given the performance of the transportation network improvements, and various cost assumptions.

Separate models are estimated for each trip purpose, since the relative attractiveness of each mode of travel may differ depending on the purpose of the trip. For example, many survey respondents noted that they require a car as part of their job. In this case, the cost to drive may play a lesser role in determining the share of trips made by automobile than for other discretionary trips.

Before applying the mode choice model, the model is also calibrated against observed travel patterns to determine how well the mathematical model can predict current behaviour. Further details on the trip distribution model and calibration results can be found in **Appendix G**.

Table 6. Factors Influencing Mode Choice and Assumptions Used for 2030

What Drives Future Mode Choice?	
Factor	**2030 Assumption**
Automobile Operating Cost	Double today's cost (over and above inflation) – reflects higher price of fuel
Value of Time	$30/hr for work trips; $15/hr for non-work trips – increase with inflation
Transit Fares	Today's rates increase with inflation
Parking Costs	Only applied in downtown area – rates increase with inflation
Transit Travel Times	Estimated from model and includes walking to / from bus stop, wait time, transfer time, and travel time 7.5 min frequency - BRT routes 20-30 min maximum on other routes
Automobile Travel Times	Estimated from model based on traffic volumes and congestion

2.4.4 Trip Assignment

Trip assignment refers to the estimation of the routes that users will take to travel between their origin zone and destination zones by each mode of travel. For automobile trips, the result of the automobile assignment stage estimates traffic volumes on each road segment in the model. For transit trips, the model estimates the riders that use each transit route in the system. Walking, cycling, and school bus trips are not assigned in the model even though these trips are estimated in the previous stage.

Each road segment and transit route is coded into the model and various parameters are applied to describe the performance characteristics of each link or route. For roads, the free flow speed, the length, the number of travel lanes, and the capacity per lane are all inputs to the model. For automobile assignment, the model attempts to route trips between their origin zone and destination zone using the shortest route in terms of travel time, which incorporates the additional time due to heavy traffic volumes or congestion.

Calibration of the automobile assignment is a step also undertaken by comparing the simulated automobile volumes on the road network to the observed automobile volumes at a series of screenlines, representing travel across a series of parallel roads in a defined area. Exhibit 11 illustrates the sections of roads that are at or approaching capacity during the morning (AM) peak hour. This simulation was used in the model for calibration and for reporting future lane requirements.

For the transit assignment, transit person trips are also assigned to the model using a series of route and service characteristics that describe travel on each route. Since each transit trip essentially starts with a walk trip, the location of the routes and stops in comparison to the traffic zone play an important role in the choice of which transit route to use to get to a destination. The transit frequency also plays a role in the route choice in the model, since the model estimates the wait time at the stop based on the frequency of service. In this way, routes that offer more frequent service may be used more heavily than other routes serving the same destination if all other factors are equal.

Details describing the automobile and transit network settings and assignment calibration for the model are contained in **Appendix G**.

2.4.5 Future Travel Demands

The assessment of travel demands and deficiencies begins with an understanding of the state of the current road system. In 2009, the base year of the household travel survey and the transportation model developed for this project, the road network in the City had a number of corridors that were operating at or over their base capacity. In some cases, this resulted in congestion at the major intersections and on other corridors creating longer duration congestion extended well beyond the intersections as vehicles backed-up in long queues on multiple legs.

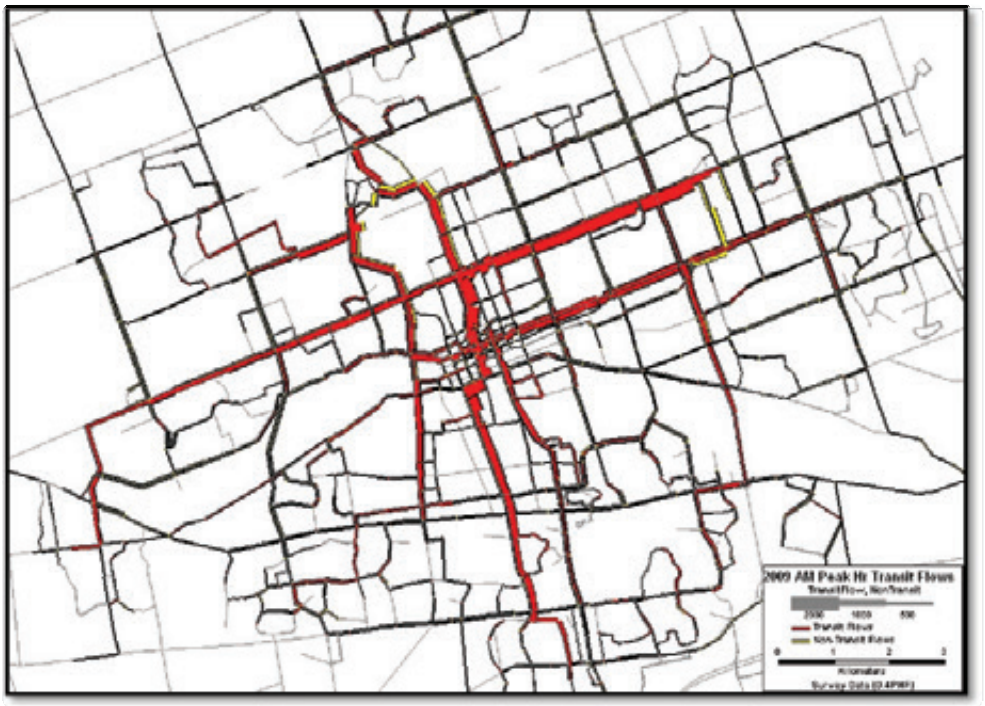
Approximately 10% of the arterial and collector road network in the City is operating at, or over, capacity in the PM peak.

Exhibit 11 illustrates the key corridors where current congestion was experienced during a typical afternoon (PM) peak hour, based on forecasts generated through the model calibration process. The transportation model includes about 498 km of arterial and primary collector road network within the City boundaries, which represents 996 km of road network when both directions of travel are included. Of that, approximately 97 km (or 10%) of this network operates at, or over, capacity in the PM peak hour.

Exhibit 12 illustrates the morning (AM) peak hour transit flows on the existing network. The heaviest ridership is in the Dundas Street / Oxford Street corridor in the east/west direction, and in the Richmond Street / Wellington Road, Ridout Street, and Wharncliffe Road / Western Road corridors in the north/south direction.

Exhibit 11. 2009 Simulated Road Network Deficiencies

Exhibit 12. 2009 Simulated Transit Flows



Future travel demand forecasts are primarily based on the growth in population and employment within the City. Table 7 summarizes the growth in population, employment and the relative increase in travel demand for the Scenario 2 and 3 land use alternatives.

The Scenario 2 land use forecasts results in a 19% increase in population (just under 1% per year), while Scenario 3 assumes a 39% increase (just under 2% per year). Growth in employment is forecast at 21% and 36% respectively.

On an overall basis, the growth in trip making for each scenario is roughly in line with population growth. For Scenario 3, the higher growth in trip making is partially related to a higher growth in the younger residents, which is needed to provide the labour force to support the forecast growth in employment. For Scenario 2, the largest increase in travel demand is related to the demand in discretionary trip making, partially due to the aging of the population over the next 20 years, where the growth in residents over the age of 65 is expected by double by 2030. For Scenario 3, this is outpaced by the growth in work related trips, with a 52% increase compared to 2009.

Table 7. Population, Employment, and Travel Demand Growth by Scenario

		Scenario 2			Scenario 3		
City Population	2009	2030	Growth	% Growth	2030	Growth	% Growth
0-19	88,826	87,318	(1,508)	-1.7%	102,205	13,379	15.1%
20-44	133,171	144,248	11,077	8.3%	170,326	37,155	27.9%
45-64	93,556	100,667	7,111	7.6%	117,743	24,187	25.9%
65+	46,578	97,320	50,742	108.9%	112,437	65,859	141.4%
Total	362,131	429,553	67,422	18.6%	502,711	140,580	38.8%

City Employment	2009	2030	Growth	% Growth	2030	Growth	% Growth
Industrial	32,943	45,515	12,572	38.2%	50,104	17,161	52.1%
Institutional	32,386	41,078	8,692	26.8%	49,689	17,303	53.4%
Commercial	123,588	141,671	18,083	14.6%	156,218	32,630	26.4%
Total	188,917	228,264	39,347	20.8%	256,011	67,094	35.5%

PM Peak Period Travel Demand	2009	2030	Growth	% Growth	2030	Growth	% Growth
Work Trips	131,715	154,432	22,717	17.2%	200,166	68,451	52.0%
Discretionary Trips	36,838	47,529	10,691	29.0%	55,440	18,602	50.5%
School Trips	27,446	31,014	3,568	13.0%	36,186	8,740	31.8%
Total	195,999	232,975	36,976	18.9%	291,792	95,793	48.9%

Using the transportation model, this additional growth in travel demand was translated into increase demand for automobile, transit and walk-cycle modes of travel. To assess the performance of the road network, a series of screenlines were used to examine capacity deficiencies along various corridors in the City. Screenlines are used to measure travel demands crossing key physical boundaries within the City (such as the Thames River, railway corridors, Highway 401 / 402, or across key arterial roads), and can include one or more roadways. In many cases, one roadway crossing a screenline can be operating at capacity while another has capacity available and motorists can be expected to distribute between the two roads – making best use of the available capacity. In order to avoid overbuilding the road network and undermining the investment in improved transit, this screenline approach was initially used to determine where to target planned road widening. Exhibit 13 illustrates the locations of the key screenlines used to assess the road network in the City.

Exhibit 13. Screenlines Used for Deficiency Analysis

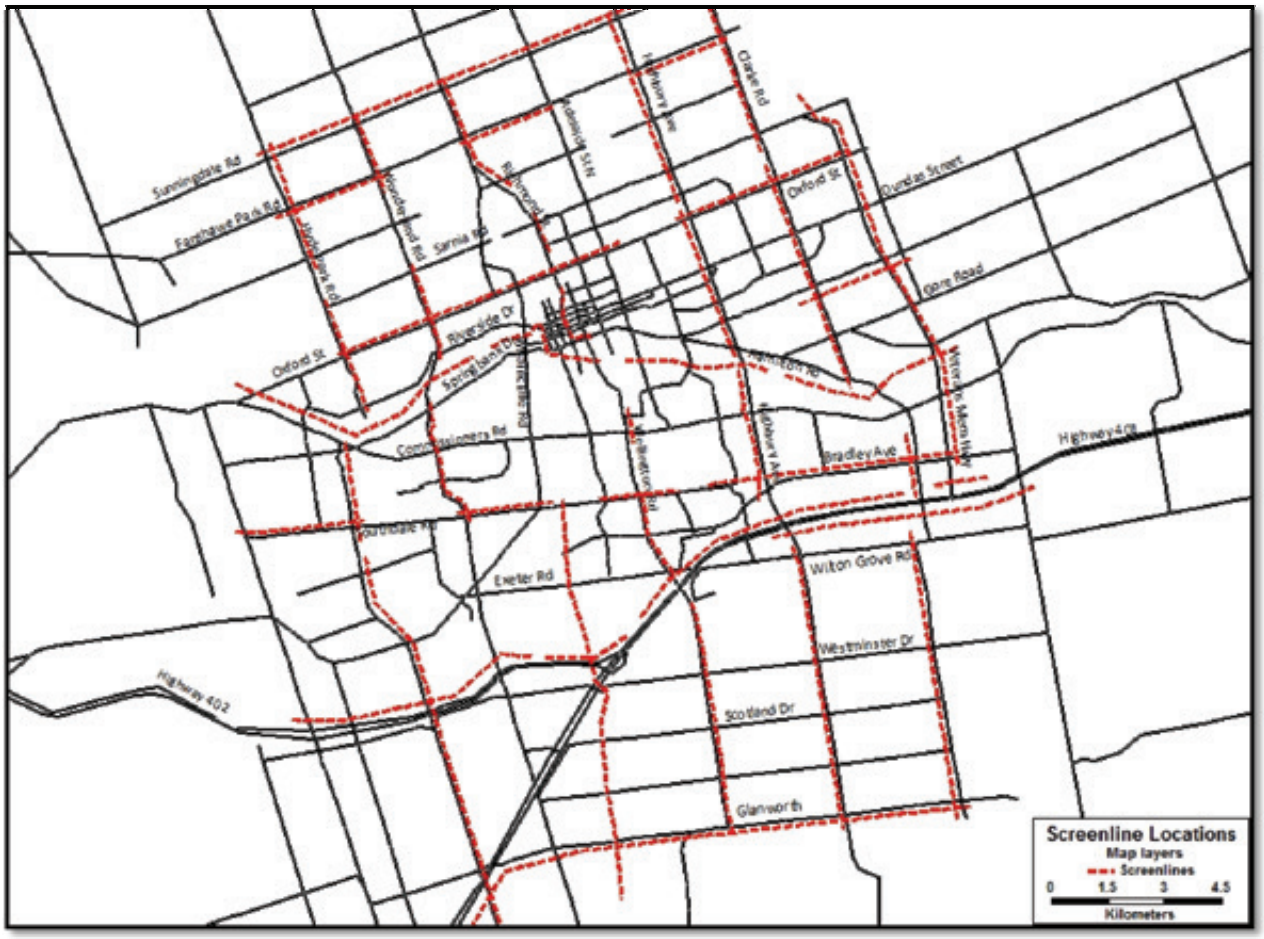
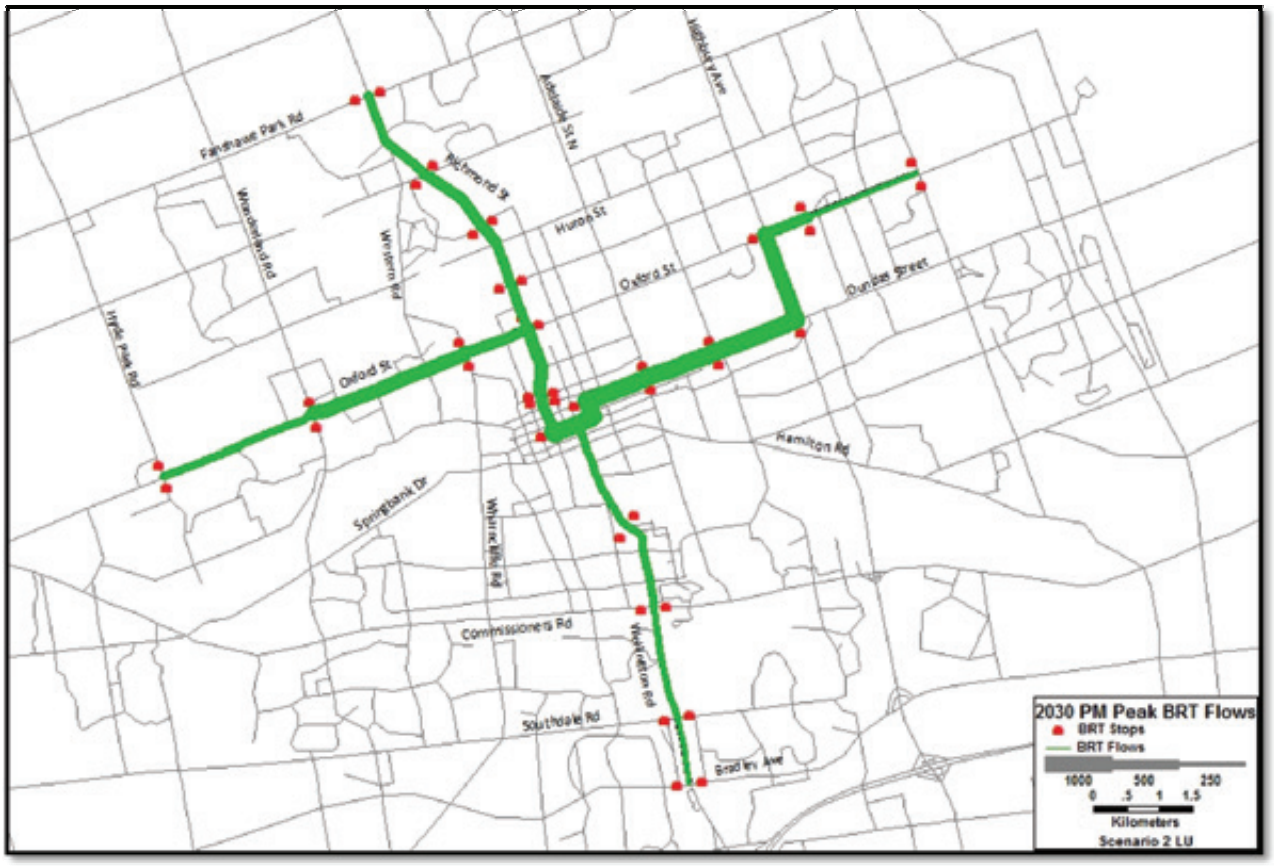


Exhibit 14 illustrates the 2030 PM peak hour transit demand forecast for the BRT routes based on the Scenario 2 land use forecast. The highest ridership demand is on the east/west corridor with overall ridership forecasts during the PM peak hour of just over 1,600 riders boarding in the westbound direction and 460 riders boarding to travel eastbound. The strong westbound demand reflects the heavy student usage on this route from Fanshawe College, back into the downtown area in the afternoon. As a result, the heaviest ridership is expected on the portion of the route to the east of the downtown area. At the peak point in the route, the westbound BRT on the Dundas Street / Oxford Street corridor is forecasted to carry just over 900 passengers per hour. In the eastbound direction the number of riders at the peak point in the route is forecasted at just over 200 passengers per hour.

The Richmond Street / Wellington Road BRT corridor in the north/south direction is forecasted to carry just over 1000 passengers in the northbound direction with just under 800 passengers boarding in the southbound direction. The highest level of ridership occurs in the area of Western University, just north of Oxford Street, where the peak point ridership is forecasted to carry 615 northbound passengers per hour and 540 southbound passengers per hour.

Exhibit 14. 2030 Scenario 2 Bus Rapid Transit Flows

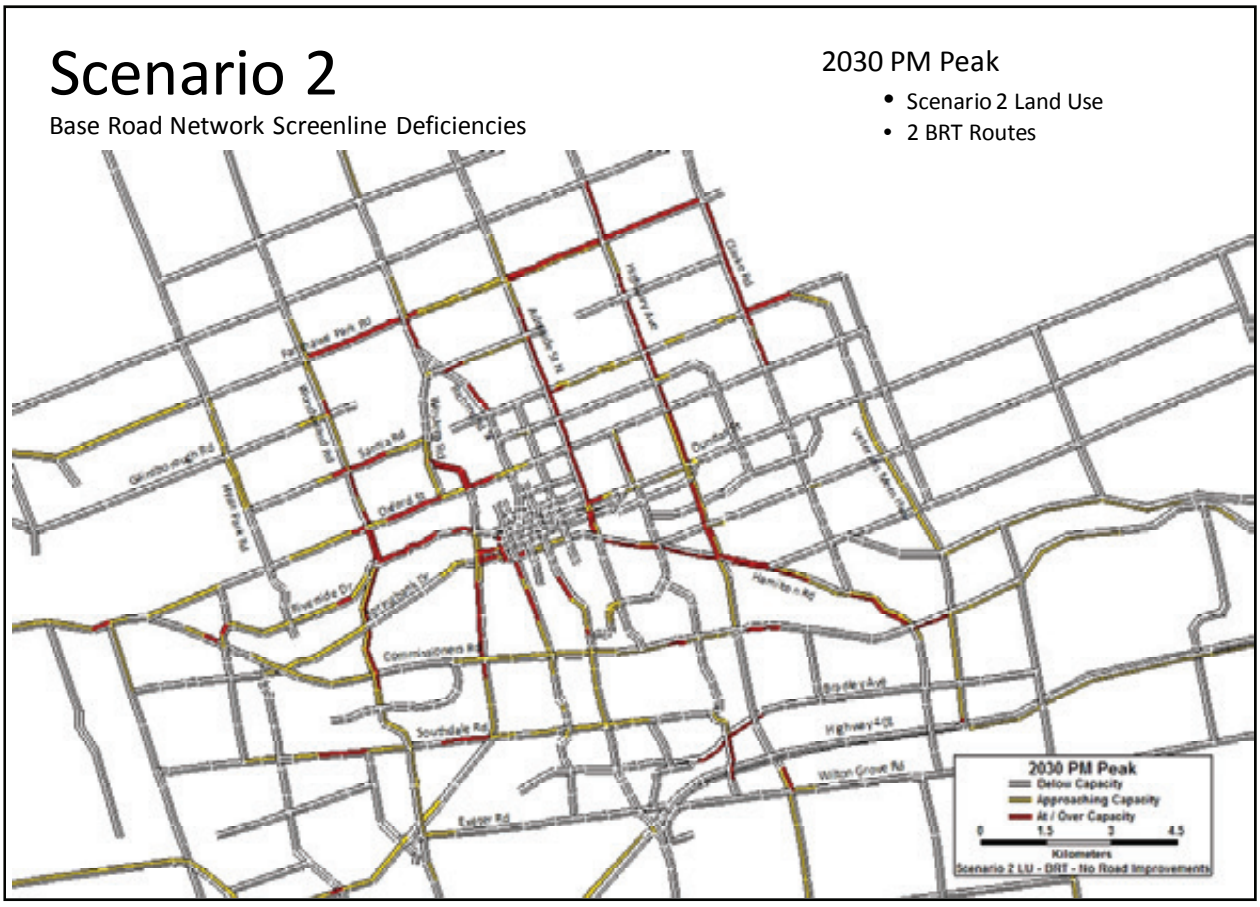


Translating Growth into Future Travel Demands

With the Scenario 2 growth in automobile demand by 2030, there will be a significant increase in road network congestion by 2030, and some level of road improvements will be required. With no improvements beyond those currently on the City capital program, approximately 127 km of the road network will be operating at, or over, capacity by 2030, representing about 13% of the road network.

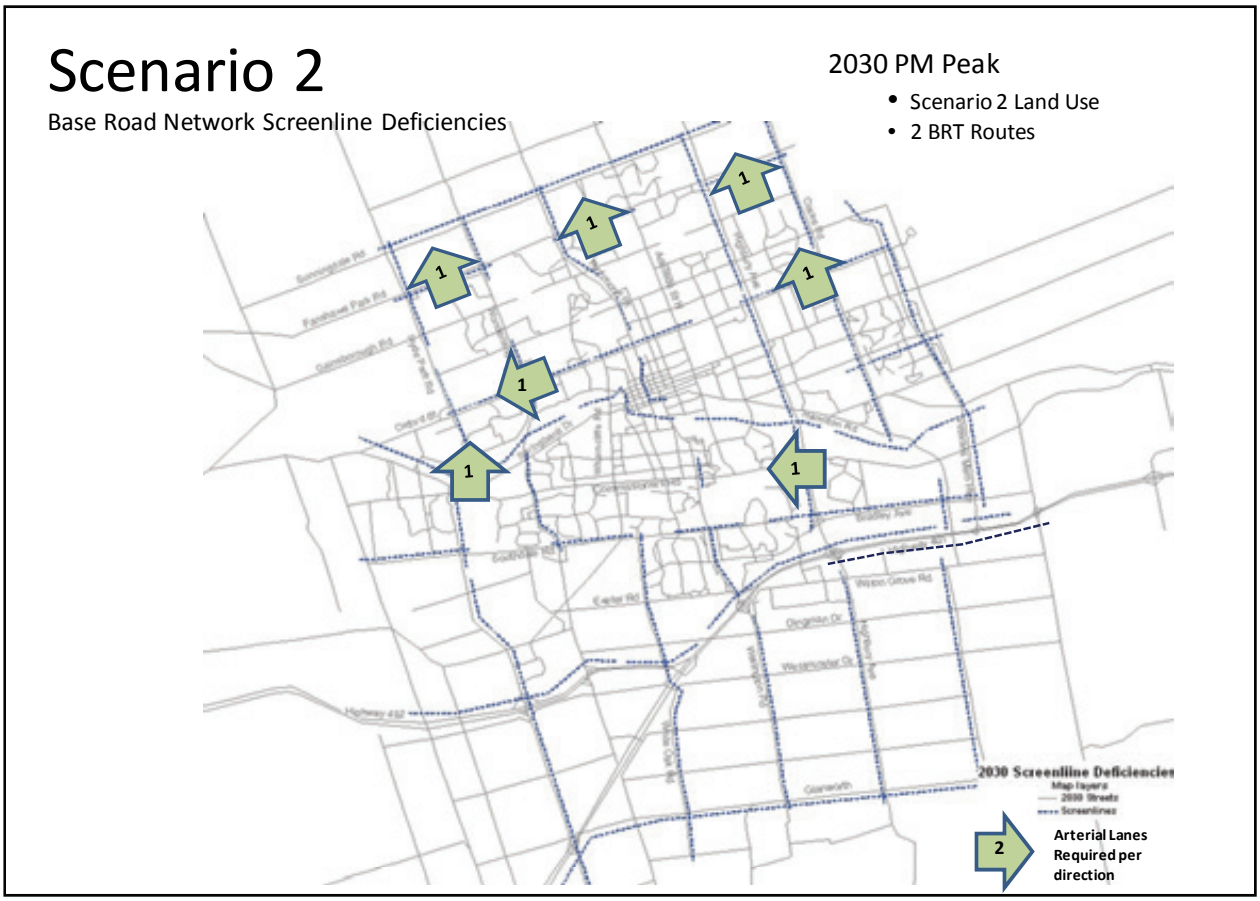
Key north/south corridors like Adelaide Street, Highbury Avenue, Clarke Road, Wonderland Road, and Western Road / Wharncliffe Road are forecasted to be deficient. East/west roads such as Oxford Street, Riverside Drive, Hamilton Road, and portions of Southdale Road will also be deficient.

Exhibit 15. 2030 Scenario 2 – Base Road Network Deficiencies



When the future travel demands are assessed on a screenline basis, the equivalent capacity provided by seven arterial lanes per direction is required under 2030 base conditions. Exhibit 16, below, illustrates the screenlines where additional road network improvements would be required to provide the additional capacity needed to avoid significant levels of congestion.

Exhibit 16. 2030 Scenario 2 Screenline Deficiencies



The screenline deficiencies illustrated in Exhibit 15 show the majority of the future deficiencies are located in the suburban growth areas of the City, and road improvements will be needed to facilitate the future planned growth, particularly in the north end as shown in Exhibit 16. Through the downtown area, the major screenlines are not forecasted to be at capacity (primarily to the dense grid network of roads) although many of the major arterials (like Adelaide Street and portions of Richmond Street) are forecasted to be at capacity. A road network improvement strategy designed to direct through traffic around the perimeter of the City, where land use densities are not as transit supportive, is recommended to assist in relieving congestion through the downtown area and allowing more emphasis on transit where it can generate the most ridership.

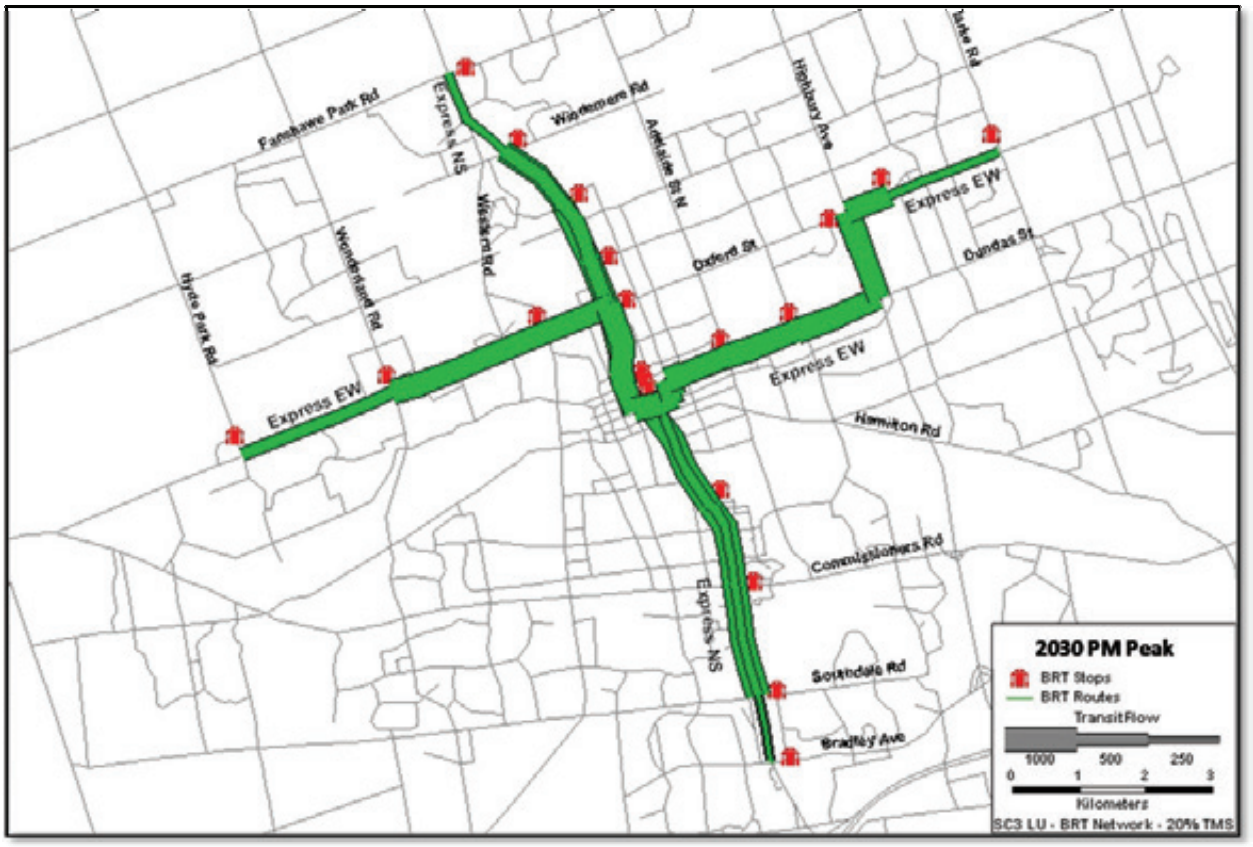
Scenario 3 Land Use

In the event the City achieves the higher growth associated with Scenario 3 land use, additional ridership on the BRT routes can be expected, although additional automobile demands will also result. Exhibit 17 illustrates the 2030 PM peak hour transit demand

forecasted for the BRT routes based on the Scenario 3 land use distribution. The highest ridership demand is still on the east/west corridor with overall ridership forecasts during the PM peak hour of just over 3,400 riders boarding in the westbound direction and 1,100 riders boarding to travel eastbound. Similar to Scenario 2, the heaviest ridership is expected on the portion of the route to the east of the downtown area, although the higher mode share target and additional growth directed to this corridor generates additional ridership beyond the student demand. At the peak point in the route, the westbound BRT on the Dundas Street / Oxford Street corridor is forecasted to carry just over 2,300 passengers per hour. In the eastbound direction the number of riders at the peak point in the route is forecasted at just over 680 passengers per hour.

The Richmond Street / Wellington Road BRT corridor in the north/south direction is forecasted to carry just over 2,000 passengers in the northbound direction with about 1,100 passengers boarding in the southbound direction. The highest level of ridership occurs in the area of Western University, just north of Oxford Street, and through the downtown area. The peak point ridership is 1,500 northbound passengers per hour and 650 southbound passengers per hour. With this level of ridership, enhanced BRT service levels of three to five minute frequency is required to provide enough passenger capacity.

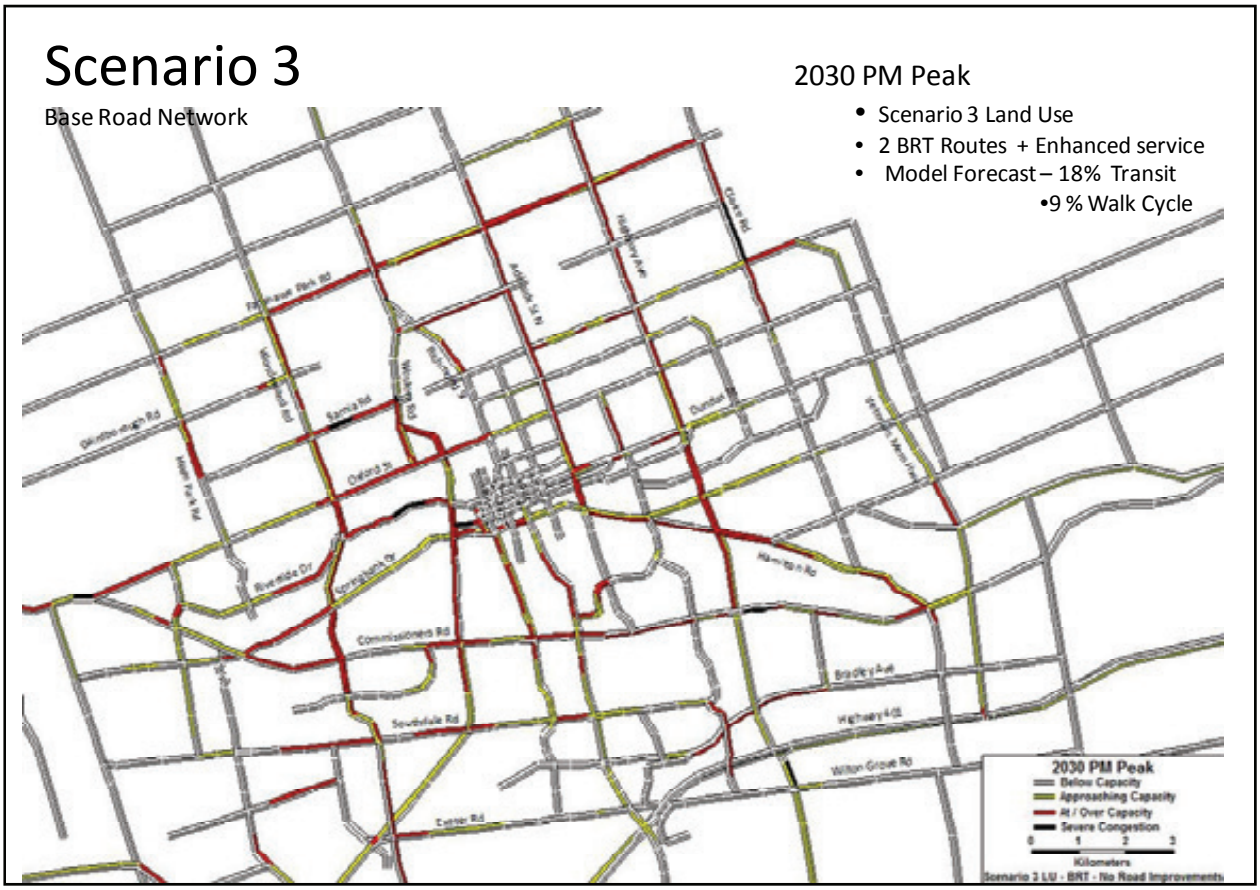
Exhibit 17. 2030 Scenario 3 Bus Rapid Transit Flows



With the Scenario 3 growth in automobile demand by 2030, there will be a significant increase in road network congestion by 2030, and a significant level of road improvements will be required. With no improvements beyond those currently on the City capital program, approximately 200 km of the road network will be operating at, or over, capacity by 2030, representing just over 20% of the road network (as shown in Exhibit 18).

Virtually all of the north/south corridors such as Adelaide Street, Highbury Avenue, Clarke Road, Wonderland Road, and Western Road / Wharncliffe Road are forecasted to be deficient. East/west roads such as Fanshawe Park Road, Oxford Street, Riverside Drive, Commissioner Road, Hamilton Road, and portions of Southdale Road will also be deficient.

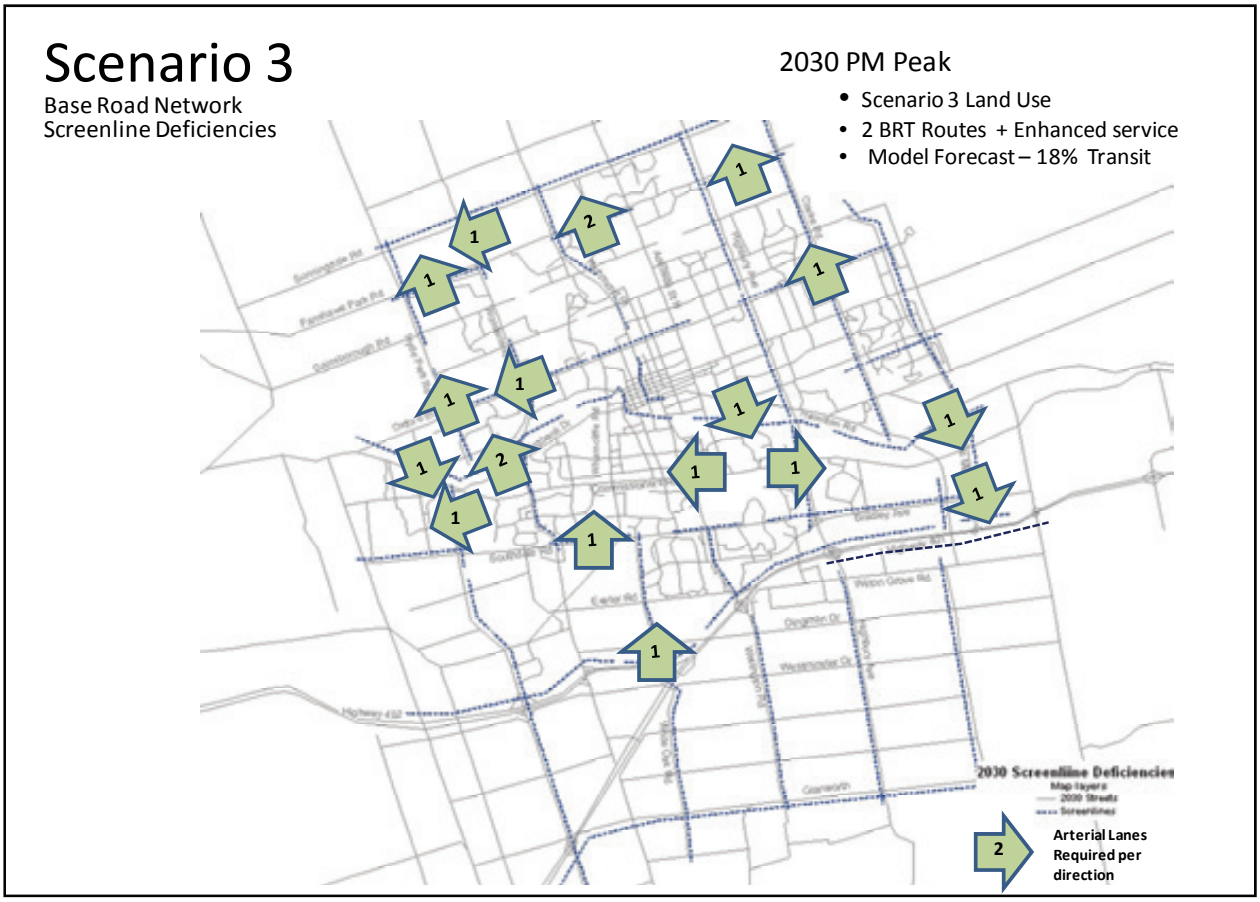
Exhibit 18. 2030 Scenario 3 – Base Road Network Deficiencies



When the future travel demands are assessed on a screenline basis, the equivalent capacity provided by 19 arterial lanes per direction are required under 2030 base conditions. Exhibit 19, below, illustrates the screenlines where additional road network

improvements would be required to provide the new capacity required to avoid significant levels of congestion.

Exhibit 19. 2030 Scenario 3 Screenline Deficiencies



The screenline deficiencies illustrated in Exhibit 19 show the majority of the future deficiencies are located in the suburban growth areas of the City, and road improvements will be needed to facilitate the future planned growth, particularly in the north end and west end. Through the downtown area, the major screenlines are not forecasted to be at capacity (primarily due to the dense grid network of roads) although many of the major arterials (like Adelaide Street and portions of Richmond Street) are forecasted to be at capacity.

3. The New Mobility Transportation Master Plan

The planners for the City of London (City) have been equal partners in the preparation of this *Transportation Master Plan* (TMP). And in parallel with TMP work, they have been laying the groundwork for the foundations of this TMP. These foundations are comprised of a revised growth strategy, an urban structure plan, the *Downtown Master Plan*, and a new city-wide *Official Plan*. All of these initiatives are well advanced and the work of the TMP team has indeed informed these initiatives.

Complementing the previously discussed supportive policies, these are the following four main elements of this new TMP:

1. Taking Transit to the Next Level
2. Greater Investment in Cycling and Walking Infrastructure
3. More Actively Managing Transportation Demand
4. More Strategic Program of Road Network Improvements

Each of these elements has been developed to support a strong and healthy downtown, which will remain the City's primary economic engine and pre-eminent centre in the emerging centres and corridors urban structure. To avoid some duplication, the following discussion combines the second and third areas above as active transportation and Transportation Demand Management (TDM) are closely related.

3.1 Taking Transit to the Next Level

3.1.1 A Rapid Transit Network to Support Mobility and Growth

Rapid transit seeks to make public transit more competitive with the automobile by speeding up service. This is typically done in three ways: eliminating some stops; speeding up the boarding process; and dedicating travel lanes exclusively for transit use or providing priority for buses at intersections.

At the heart of this "New Mobility" TMP is the proposed rapid transit network, illustrated in Exhibit 21, consisting of a north/south route in the Richmond Street / Wellington Road corridor and an east/west route in the Dundas Street / Oxford Street corridor, both serving the downtown and broader central area. A Bus Rapid Transit (BRT) system can be supported with 1% annual growth (the recent trend) if 40% of the growth is directed to the downtown and these transit corridors. With stronger growth or greater than expected ridership, parts of the network might be upgraded from BRT to Light Rail Transit (LRT).

The development of the recommended BRT network plan was built on the work completed by London Transit Commission (LTC) as part of the *Long Term Transit Growth Strategy* (2006), which identified eight corridors (see Exhibit 20) for potential rapid transit implementation:

1. Western Road / Richmond Street from Masonville Mall to downtown;
2. Dundas Street / Oxford Street East from Argyle Mall to downtown (via Fanshawe College);
3. Richmond Street from Masonville Mall to downtown;
4. Wellington Street from White Oaks Mall to downtown;
5. Oxford Street from Oakridge Mall to Fanshawe College;
6. Wharncliffe Road / Southdale Road from Westmount Shopping Centre to downtown;
7. Wonderland Road / Sarnia Road from Westmount Shopping Centre to Western University; and
8. Fanshawe Park Road from Hyde Park Power Centre to Masonville Mall.

Exhibit 20. Long List of Potential Rapid Transit Corridors

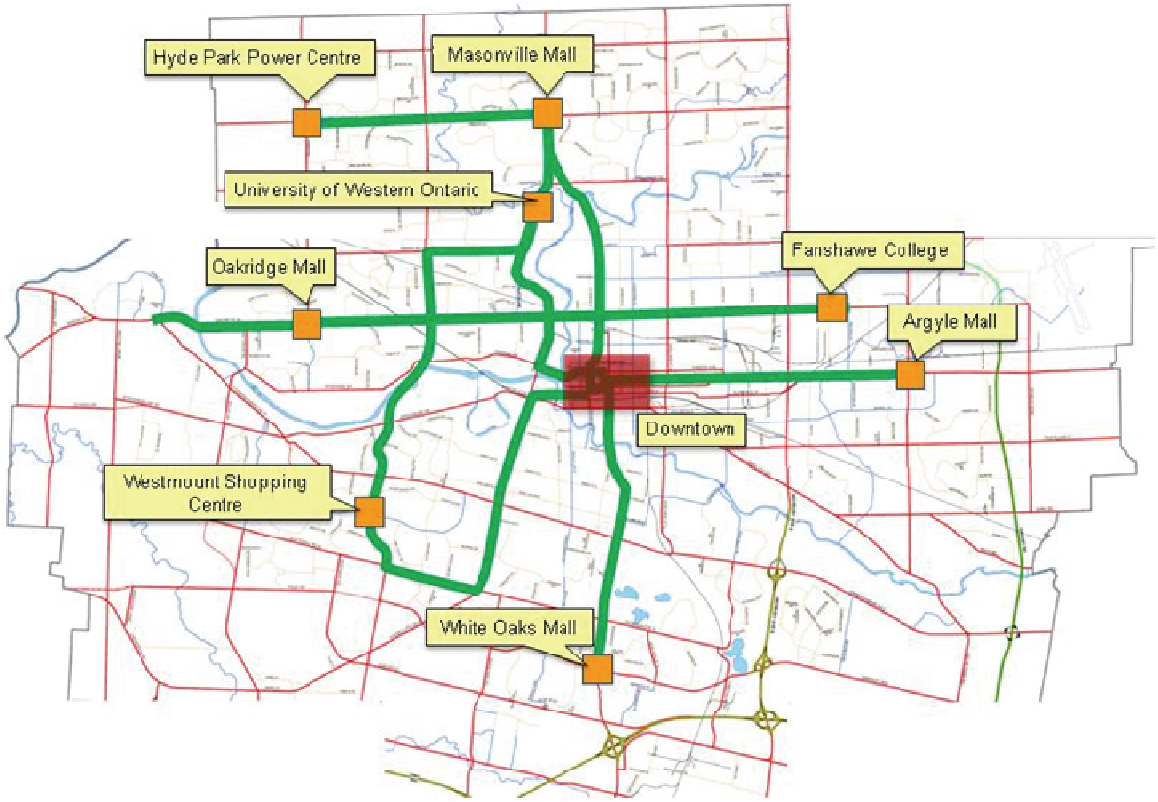
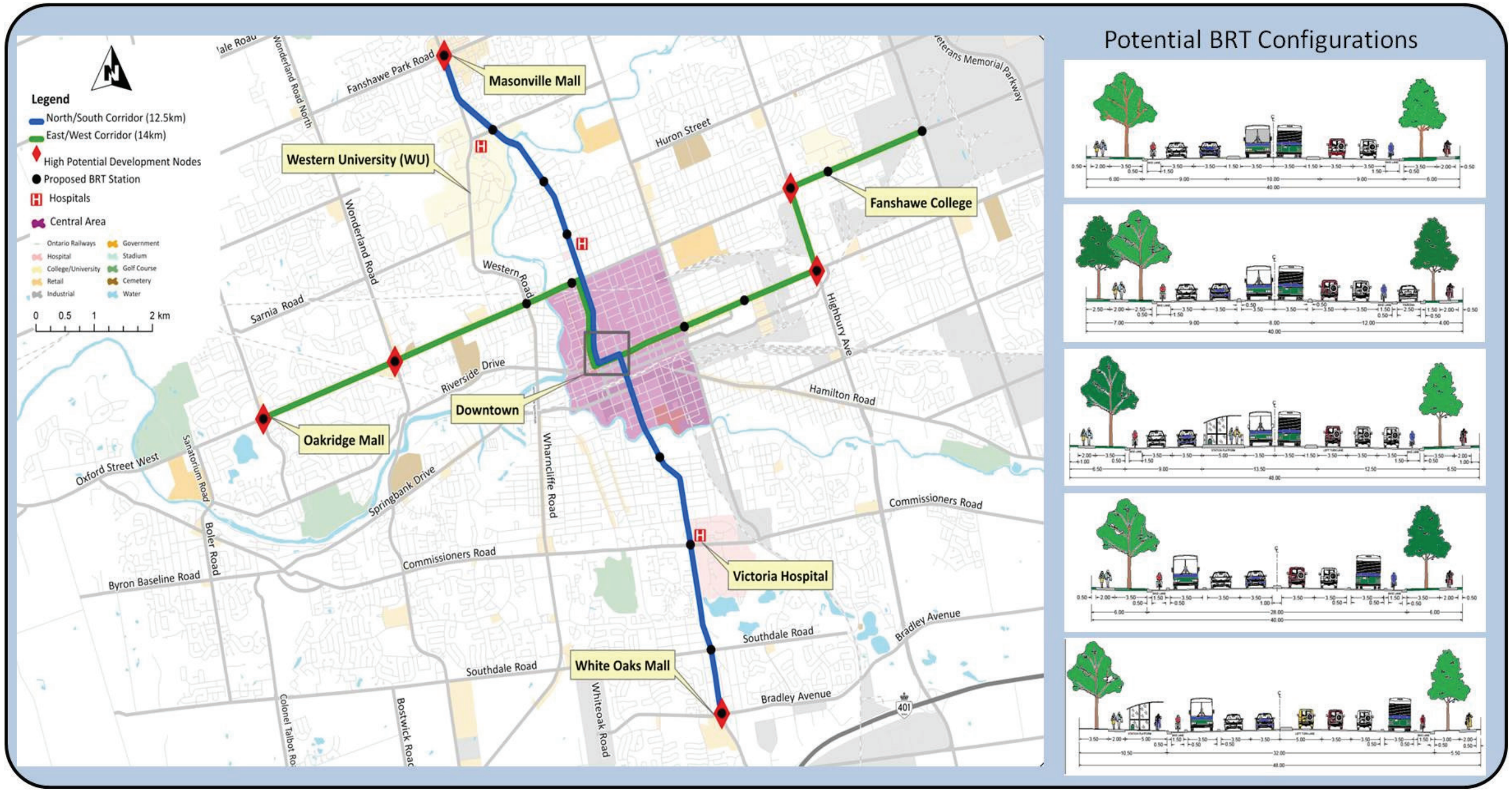


Exhibit 21. Recommended Bus Rapid Transit Network



Keeping in mind the importance of integrating transportation and land use planning, the corridors were assessed from both transportation and land use perspectives to arrive at a short list of preferred corridors. Overall, the highest rated corridors were Richmond Street and Wellington Street, followed closely by Dundas Street / Oxford Street East, and Western Road / Richmond Street, in that order. Of the remaining four, Fanshawe Park Road was rated "poor" (from both transportation and land use perspectives), while the other three were rated "moderate". Table 8 shows the summary of the assessment of the eight individual corridors as detailed in Interim Report 2.

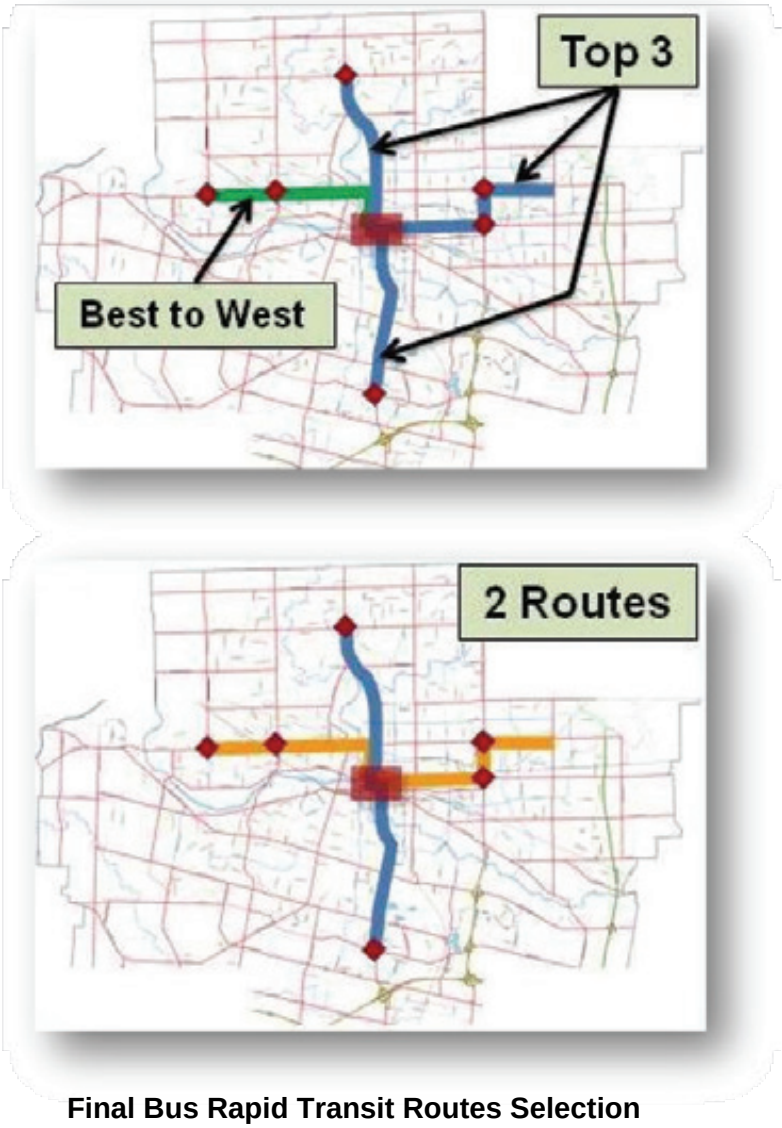
Table 8. Assessment of Eight Potential Rapid Transit Corridors

Transportation Factors	Corridors							
	1	2	3	4	5	6	7	8
	Western	Dundas	Richmond	Wellington	Oxford	Wharncliffe	Wonderland	Fanshawe
Supportive of Existing Ridership	●	●	●	●	◉	◉	◉	○
Cost ($10 M/km)	●	◉	●	●	◉	◉	◉	●
Traffic Constraints to Achieving Exclusive Transit ROW	●	◉	◉	◉	◉	◉	◉	●
Potential to Connect with Other Modes and RT Corridors	●	●	●	●	○	●	○	○
Potential for Upgrading from BRT to LRT	●	●	●	●	◉	◉	◉	○
Sub-Total for Transportation	GOOD	GOOD	GOOD	GOOD	MODERATE	MODERATE	MODERATE	MODERATE

Land Use Factors	Corridors							
	1	2	3	4	5	6	7	8
	Western	Dundas	Richmond	Wellington	Oxford	Wharncliffe	Wonderland	Fanshawe
Linkages to Major Existing Activity Centres	●	●	●	●	◉	◉	◉	○
Potential to Support Centres	○	●	●	●	●	◉	◉	○
Physical Constraints to Achieving Exclusive Transit ROW	○	○	○	○	○	◉	◉	●
Potential for Improving Public Realm	●	●	●	●	◉	◉	◉	○
Support for Overall Downtown Vitality	●	●	●	●	○	●	○	○
Sub-Total for Land Use	MODERATE	GOOD	GOOD	GOOD	MODERATE	MODERATE	MODERATE	POOR
TOTAL (Transportation & Land Use)	MODERATE/ GOOD	GOOD	GOOD	GOOD	MODERATE	MODERATE	MODERATE	POOR

Rapid transit networks for Scenarios 2 and 3 were then developed by combining the best individual corridors into integrated routes. Four of the corridors were combined into a two route BRT network for both Scenario 2 and Scenario 3: the Richmond Street and Wellington Road corridors were combined into a north/south route, and the Oxford Street West and Dundas Street / Oxford Street east corridors were combined into an east/west route.

The base network recommended above converges on the downtown very well from all four cardinal directions. The routes also serve existing major trip generators, such as Western University, Fanshawe College, and numerous hospitals. As well they have the potential to serve five other future development nodes, as noted on Exhibit 20. Keeping in mind that Scenario 3 was defined as a more extensive network, additional semi-express routes along most of the remaining corridors, operating with transit priority at major intersections, would supplement the BRT routes.



Final Bus Rapid Transit Routes Selection

In projecting future transit ridership levels for the proposed BRT network, it was assumed that both routes would operate in exclusive or semi-exclusive transit lanes, whether in dedicated median transit lanes, dedicated curb lanes for transit, or in High-Occupancy Vehicle (HOV) / BRT lanes where the ability to widen the road is constrained (typical cross-sections of these concepts are included in **Appendix N**).

Ridership forecasts for the Scenario 2 and 3 land use distribution are summarized in Table 9, below. A typical BRT vehicle capacity of 100-110 passengers per bus and ridership levels of 1,200 passengers per hour per direction would require a bus frequency of 5 minutes during peak periods.

Table 9. Comparison of AM Peak Hour Ridership Forecasts for Richmond Street / Wellington Road and Dundas Street / Oxford Street Corridors

Corridor	Scenario 2	Scenario 3
Richmond Street / Wellington Street **northbound**	1,000 – 1,100	2,000 – 2,200
Richmond Street / Wellington Street **southbound**	800 – 900	1,100 – 1,300
Dundas Street / Oxford Street **eastbound**	1,600 – 1,700	2,300 – 2,500
Dundas Street / Oxford Street **westbound**	450 – 550	600 – 700

Outside the central area, it was generally felt that the arterial BRT corridors could be widened to six lanes in width to achieve exclusive lanes, although more detailed assessments have subsequently shown that it is not feasible in some sections (for typical cross-sections, see Exhibit 21). Within the central area, sufficient road right-of-way is generally not available to widen pavements and, since the central area is served by a relatively fine grid of roadways, it was concluded that exclusive or semi-exclusive lanes could be achieved without widenings (i.e. by using existing curb lanes, so that sidewalks could also serve as station platforms). The next phase of studies, including completion of *Municipal Class Environmental Assessments* (Class EAs) will examine these proposed corridors in more detail to determine specific requirements.

The implementation of BRT services along the two major corridors will likely be phased-in over a period of time allowing the growth in the service to relate to the growth in the ridership in the corridors. Each of the implementation phases needs to consider several components of BRT service including frequency of service, type and branding of vehicles, new technologies for the vehicles, right-of-way priorities, fares and fare technologies, and corridor infrastructure requirements, including enhanced pedestrian and cycling provisions within the context of creating green streets.

The initial stages of implementation will feature semi-express service along the planned BRT corridors, utilizing specially branded buses sharing a dedicated lane with HOVs. Improved use of technologies such as transit signal priority and automotive vehicle location will provide enhanced schedule reliability, real-time vehicle tracking and reporting, and improved travel times. Providing a higher overall quality service in the early stage of implementation is critical to start building ridership and immediately increasing transit modal share.

Intersection improvements include addition of queue jump lanes and signal upgrades to support transit signal priority. These can be added even if the overall corridor is not

congested because they allow reduced travel times for buses by reducing signal and queue delay.

By considering a shared transit / HOV lane, the opportunity exists to create a “green lane” (which permits usage of HOV lanes by energy efficient vehicles as well). In combination with enhanced pedestrian and cycling infrastructure in these corridors, there are unique opportunities to create a “green street” within the right-of-way. This would require strategic input and direction from Council for enforcement.

HOV lanes are becoming a common feature in the urban landscape of most North American Cities

3.1.2 Downtown Bus Rapid Transit Routing

A preliminary assessment of six downtown routing options was undertaken as part of this TMP update, and is documented in **Appendix C**. The options generally were quite similar with differentiating features noted below in Table 10.

With a fine grid network of streets, there could be many more options developed, but the below six were considered representative. The assessment of the options revealed no clear preference, but the Base Option, Option 1, and Option 5 rated better than the others. These three options should therefore be considered in more detail as part of future Class EAs.

A separate assessment of the need for a downtown transit exchange or terminal concluded that a central facility would integrate the various forms of transit in the City by making it easier to transfer both between various LTC routes and between LTC and inter-city rail and bus services. In addressing the issue of an on-street versus off-street facility, it was determined that the arrival of high speed rail service to the City would be the impetus for an integrated multi-modal off-street facility especially with Scenario 3. The fewer transfers associated with Scenario 2 could be accommodated with an on-street facility. In both scenarios, the location of the terminal should be close to the VIA

Rail station and the Greyhound inter-city bus terminal. This would require short diversions for some routes, but the extra costs would be offset by the additional convenience to passengers.

Table 10. Downtown Bus Rapid Transit Routing Options

Bus Rapid Transit Routing	
Base Option ***(used in model testing)***	Both routes utilize Richmond Street and York Street to interface with inter-city bus and rail terminals.
Option 1	Both routes utilize Dundas Street, thereby providing more direct routing for east/west service.
Option 2	Both routes use one-way portions of King Street and Queens Avenue in the downtown core.
Option 3	Both routes use a Richmond Street / King Street / Clarence Street / Queens Avenue loop to connect to an on-street exchange located on a new north/south transit-only road between York Street and King Street
Option 4	An off-street exchange between the two bus rapid transit routes is located between Carling Street and Queens Avenue just west of Richmond Street. The north/south route utilizes Horton Street to connect between Richmond Street and Wellington Street. The east/west route utilizes Dundas Street.
Option 5	Both routes utilize Clarence Street as the north/south spine and York Street between Clarence Street and Wellington Street to connect to the VIA Rail station. The east/west route uses Wellington Street to return to Dundas Street

More detailed routing analysis is also required in the Western University area and in the Victoria Hospital area, where model sensitivity testing indicated that there would be ridership benefits if routes could be diverted to better serve these major generators.

At the Western University campus location, the BRT route along Richmond Street would require students accessing the campus to disembark at the University Drive stop and either walk into the campus (over 1 km distance) or board one of the existing routes that turn onto University Drive to access the main campus buildings on the west side of the river. Initial modeling results show that very few of these riders will utilize the BRT for trips to the campus itself, given the fact that LTC bus routes 13 (Wellington) and 6 (Richmond) both offer direct access to service the campus building on the west side of the river. By 2030, the estimated ridership using these existing routes into the campus represent over 2,000 transit trips inbound during the AM peak hour and approximately 300 passengers outbound in the PM peak hour period.

Opportunities to route the BRT through the university campus could increase ridership beyond the initial forecasts developed in the TMP but this would need to be weighed against the additional travel time associated with routing the BRT vehicles through the congested campus road network.

A similar situation exists in the Victoria Hospital complex along the Wellington Road portion of the BRT route where it intersects with Commissioners Road. The initial testing of this route assumed the BRT would run along the Wellington Road corridor, with a stop located in the vicinity of the Wellington Road / Commissioners Road intersection. The walk distance from the intersection to the closest building within the hospital complex is approximately 250 m or a three minute walk, but this increases to almost 10 minutes to access the main hospital buildings further to the east.

There are two existing transit routes that enter the hospital site; LTC bus route 6 (Richmond) enters the site via Baseline Road and route 24 (Baseline) enters via Baseline Road and Commissioners Road. Opportunities to route the BRT through this complex may increase the attractiveness to serve this key transit generator and may allow for transfers between the three routes as well.

3.1.3 Assessment of Transit Priority Measures at Key Intersections

As part of the transit route assessment, opportunities to incorporate transit priority treatments were investigated in the context of the initial implementation strategy for enhanced service in the BRT corridors. A full assessment report is contained in **Appendix D**, and a summary of the key recommendations for each corridor is provided below.

Richmond Street Corridor

The Richmond Street BRT route is located along Richmond Street, between Dufferin Avenue and Hillview Boulevard, over a distance of about 5.2 km. There are 14 signalized intersections in this corridor, including the signals at Dufferin Avenue and Hillview Boulevard, resulting in an average signal spacing of 400 metres. Within this corridor Richmond Street has two through travel lanes in each direction.

Source: City of Ottawa Report

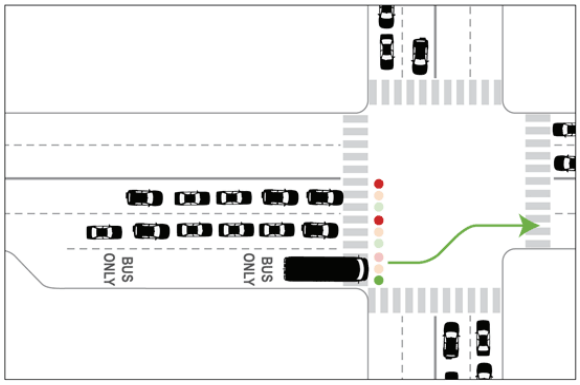
In general terms, provision of traffic signal priority for transit combined with transit queue-jump lanes, where possible, will provide some reductions in running time and should also improve the reliability of the transit schedules. It is expected that the most cost effective means of providing transit priority at signals would be through equipping buses with transmitter devices, traffic signal controllers with receiving devices, and the

development and installation of traffic signal timing plans that provide priority to approaching BRT buses.

One location where transit priority at a signalized intersection should be given high priority is the intersection of Oxford Street and Richmond Street. No options for physical improvements at this intersection have been identified and recognizing the importance to both BRT routes, special transit priority plans for the signals at this intersection are very important.

The suggested bus priority plan for the short-term implementation of the Richmond Street BRT route should consist of the following:

- Transit priority at traffic signals along the full route (about 14 signalized intersections). This should include a special transit signal plan for the traffic signals at Oxford Street and at University Drive intersections with higher levels of priority for approaching bus movements.
- Transit queue-jump lanes are recommended at several locations, such as:
  - Richmond Street and Grosvenor Street intersection
  - Richmond Street and Cheapside Street intersection
  - Richmond Street and Victoria Street intersection
  - Richmond Street and Windermere Road intersection
  - Richmond Street and Western Road intersection
  - Richmond Street and Hillview Boulevard / mall entrance intersection



Transit Priority at Intersections

It is anticipated that the cost of these measures would be about $1.8 million to $2.2 million, not including costs for engineering, property, and any utility relocation.

Wellington Street / Road Corridor

The Wellington Street / Road BRT route is located along Wellington Street and Wellington Road, with a potential diversion route through the London Health Sciences Centre (LHSC) and Parkwood Hospital complexes, continuing south to White Oaks Mall. There are 12 signalized intersections in this corridor, including the signals at Horton Street, a new signal for the hospital connection and White Oaks Mall entrance, resulting in an average signal spacing of 600 metres.

Within this corridor, Wellington Road generally has a four lane cross-section north of Base Line Road and is very constrained by a limited right-of-way and adjacent development.

In summary, the suggested bus priority plan for the short-term implementation of the Wellington Street / Road BRT route should consist of the following:

- Transit priority at traffic signals along the full route (12 signalized intersections).
- Transit queue-jump lanes/queue-jumpers at several locations, such as:
  - LHSC and Parkwood Hospital with potential connection to Commissioners Road intersection combined with a new bus only road connection to Wellington Road (subject to discussions with Parkwood Hospital about routing through the complex)
  - Wellington Road and Wilkins Street intersection
  - Wellington Road and Southdale Road intersection
  - Wellington Road and Bradley Avenue intersection

Transit Queue Jump – Southdale Road

It is anticipated that the cost of these measures would be about $2.0 million to $2.4 million, not including costs for engineering, property, and any utility relocation.

Dundas Street / Oxford Street East Corridor

The section of Dundas Street between Colborne Street and Egerton Street is about 1.9 km in length and has nine signalized intersections, which is an average signal spacing of about 240 metres. The corridor is also significantly constrained with generally one through lane in each direction and very limited opportunities for road widening. It is expected that there might be up to three BRT stops in this section (e.g. Colborne Street, Adelaide Street, and Quebec Street intersections).

Synchronization of the signals along this section to optimize the BRT operations rather than general traffic operations is a possible strategy to improve operational performance of BRT. Queens Avenue (one way westbound) and King Street (one way eastbound) offer alternate routes for general traffic to avoid this section of the Dundas Street corridor. However, a preferred strategy that would provide greater operational benefits

would be the provision of transit priority at signalized intersections, particularly for the section of Dundas Street between Colborne Street and Egerton Street.

This measure would likely consist of equipping buses with transmitter devices, traffic signal controllers with receiving devices, and the development and installation of traffic signal timing plans that provide priority to approaching BRT buses.

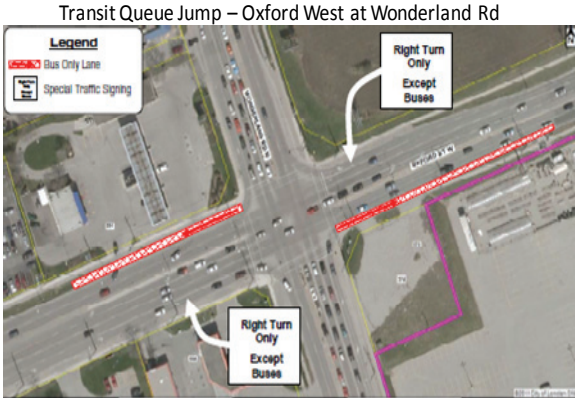
The suggested bus priority plan for the short-term implementation of the Dundas Street / Oxford Street East BRT route should consist of the following:

- Transit priority at traffic signals along the full route (16 signalized intersections).
- Transit queue-jump lanes/queue-jumpers at several locations, such as:
  - Dundas Street and Adelaide Street intersection
  - Section of Dundas Street in vicinity of Quebec Street and Egerton Street intersections
  - Dundas Street and Highbury Avenue intersection (potential eastbound bus only left turn lane)
  - Highbury Avenue and regional mental health centre intersection
  - Highbury Avenue and Oxford Street East intersection (potential queue-jump in westbound left turn lane)

North East Campus Parkway and University Way NE Seattle, USA

It is anticipated that the cost of these measures would be about $1.5 million to $2.0 million, not including costs for engineering, property, and any utility relocation.

Transit Queue Jump – Oxford West at Wonderland Rd



Oxford Street West Corridor

The Oxford Street West BRT route is located along Oxford Street West, between Richmond Street and Hyde Park Road, over a distance of about 5.9 km.

Along the Oxford Street West BRT route,

there are 11 traffic control signals that are typically spaced several hundred metres apart. In general terms, provision of priority for transit will provide some reductions in running time and should also improve the reliability of the transit schedules.

In summary, the suggested bus priority plan for the short-term implementation of the Oxford Street West BRT route should consist of the following:

- Transit priority at traffic signals along the full route (11 signalized intersections).
- Transit queue-jump lanes/queue-jumpers at several locations, such as:
  - Oxford Street West and Talbot Street intersection
  - Oxford Street West and Woodward Avenue intersection
  - Oxford Street West and Cherryhill Boulevard intersection
  - Oxford Street West and Proudfoot Lane intersection
  - Oxford Street West v Wonderland Road intersection
  - Oxford Street West and Capulet Lane intersection
  - Oxford Street West and Guildwood Boulevard intersection
  - Oxford Street West and Guildwood Gate intersection
  - Oxford Street West and Hyde Park Road Intersection

It is anticipated that the cost of these measures would be about $1.5 million to $2.0 million, not including costs for engineering, property, and any utility relocation.

An overview of the preliminary plan for “pre-BRT” transit service in the City is provided in Table 11, below. Overall, the plan will provide bus priority to enable an early implementation of the BRT plan for the four major routes connecting to the downtown area, with a combined length of about 25 km outside the downtown area. The cost of the suggested transit priority measures is estimated to be approximately $7.0 to $9.0 million.

Table 11. Preliminary “Pre-Bus Rapid Transit” Priority Plan

Bus Rapid Transit Route	Length Outside Downtown Area (km)	Number of Signalized Intersections	Approximate Cost of Initial Implementation
Richmond Street	5.2	14	$1.8 - $2.2 million
Wellington Street / Road	6.6	12	$2.0 - $2.4 million
Dundas Street / Oxford Street East	6.9	16	$1.5 - $2.0 million
Oxford Street West	5.9	11	$1.5 - $2.0 million
Total	24.6	53	**$6.8 - $8.6 million**

Exhibit 22 illustrates the key locations where queue-jump lanes should be considered to provide some initial transit travel time benefits in advance of constructing the full dedicated BRT lanes.

The transit priority working paper in **Appendix D** provides an overview of transit priority measures that have been successful in many other cities and that are recommended for implementation in the City. The two primary measures to achieve transit priority to support the BRT plan are transit priority at signalized intersections and queue-jump lane arrangements at signalized intersections, as shown in Exhibit 22.

Transit Queue-Jump Lane
Halifax, Nova Scotia

The investigations to date have been at a relatively high level and at this stage the plan serves primarily to demonstrate the opportunities that should be considered. An important next step will be a preliminary design study for each corridor that provides a more detailed investigation of the constraints, geometric improvements, utility relocations, additional property requirements, and the impacts on the existing urban area. It is recommended that the preliminary design study should follow the Class EA process to help identify and assess the wide range of impacts of the plan.

Transit Queue-Jump Lane
Brampton Zum System

In addition to the required preliminary design study noted above, the City should conduct a

detailed investigation into the most appropriate strategy and technologies to provide transit priority at over 50 signalized intersections in the corridors. This investigation should review the experience of the many different jurisdictions in Canada and USA that currently provide transit priority at signals to determine the approach that best suits the City's needs and existing traffic control system.

The development of effective transit priority plans requires the knowledge and experience of different disciplines within the City organization. In particular, it is important that the plans incorporate transit operations, traffic engineering, and civil engineering input throughout. An approach that is suggested for the City would be the establishment of a "TMP Priority Task Force" to carry out the necessary studies and develop the final plans for the transit priority measures. The task force would require a clear mandate that supports the early implementation of "pre-BRT" plans focused on effective transit priority measures.

3.1.4 Enhancing Transit Service in Supporting Corridors

A successful BRT system will also require investments in upgraded or enhanced transit service in other supporting corridors within the City to drive up transit ridership. Today, much of the transit service runs on frequencies of 10-30 minutes during peak periods and 15-30 minutes during the off-peak periods. Many of these routes have strong ridership today and are experiencing difficulties maintaining schedule adherence along busy roads such as Sarnia Road, Western Road, Wharncliffe Road, and Oxford Street.

Existing Daily Transit Flows – 2009

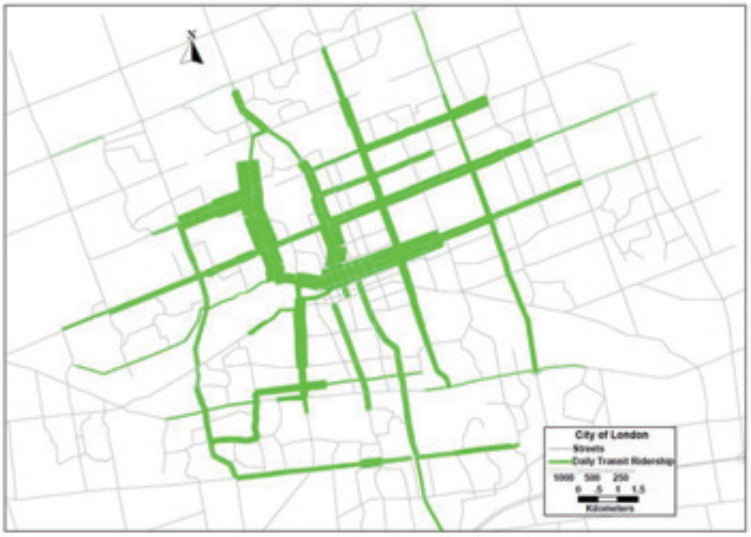
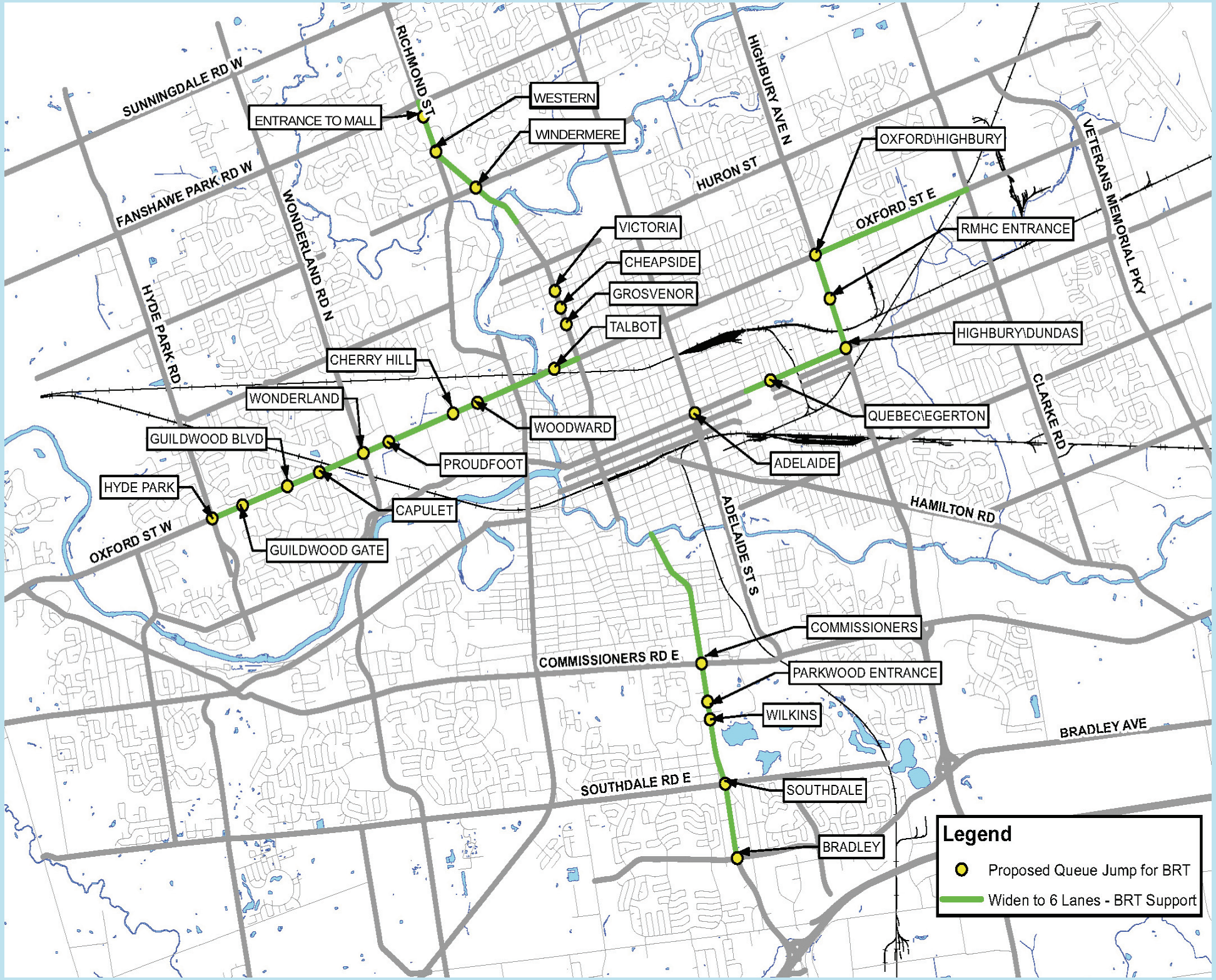
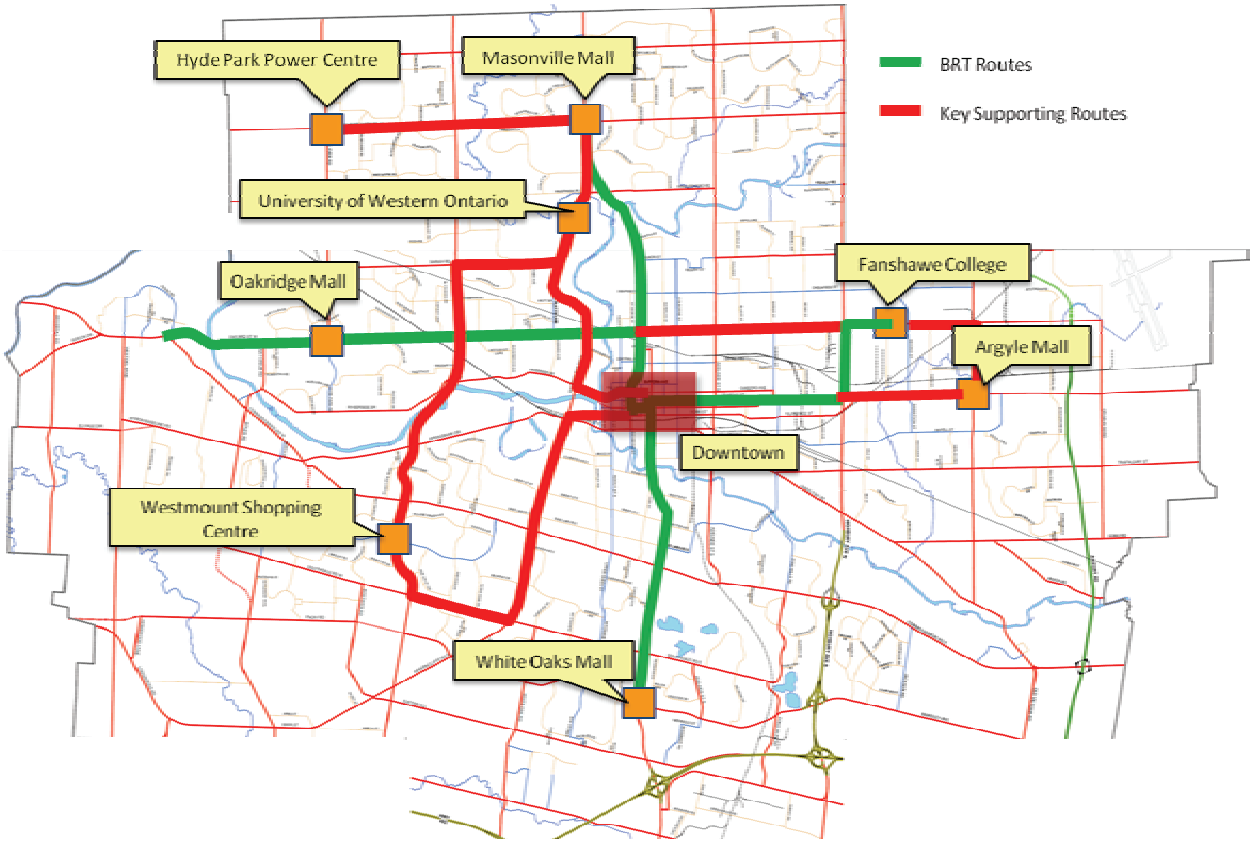


Exhibit 22. Recommended Queue-Jump Lanes at Intersections



Other routes along corridors such as Fanshawe Park Road and Wonderland Road have difficulty competing with the automobile due to heavy traffic volumes and intersection congestion, and due to the lower densities, those routes do not attract as much ridership as the best performing routes. Exhibit 23 illustrates key supporting transit routes that should be considered for enhanced service to support the BRT corridors and improve transit ridership across the City. Model runs completed during the study indicate that adding this additional enhanced service on key supporting routes can increase the overall city-wide transit mode share by up to 1%, and represents a key initiative needed to achieve the 20% target transit mode share by 2030.

Exhibit 23. Key Supporting Transit Routes



3.2 Promoting Active Transportation and Transportation Demand Management

3.2.1 Benefits of Active Transportation and Transportation Demand Management

As the City continues to grow and the importance of balancing economic, social and environmental needs is increasingly recognized, a sustainable approach to accommodate growth and mobility has emerged. Many jurisdictions in Canada and across the world are moving away from traditional means of addressing transportation needs (e.g. investing in new roadway infrastructure) and are instead looking to ways to reduce and manage travel demand as part of a sustainable transportation system.

Active transportation includes any form of human-powered transportation (e.g. walking and cycling) and has substantial benefits in the following areas:

- Improved personal health and quality of life;
- Reduced travel costs;
- Availability to a broad range of individuals;
- Reliability of travel time;
- Vibrancy and security of communities; and
- Minimal environmental impacts.

TDM is closely linked to active transportation. It incorporates a range of policies, programs, and mobility services that influence whether, why, when, where, and how people travel. TDM can include the following:

- **Education and Outreach**
  Raising awareness of travel issues and the benefits of sustainable transportation and changing attitudes about available options.
- **Incentives and Disincentives**
  Offering incentives for workplaces, schools, and households to encourage sustainable travel, or introducing pricing initiatives for other modes of travel.
- **Transportation Supply**
  Improving local transit services or pedestrian and cycling infrastructure.
- **Supportive Land Use Policies**
  Prioritizing transit oriented development (TOD) or new parking policies.

Benefits of active transportation and TDM are evident in the environmental, economic, and social realms.

Sustainable travel supports a mode shift away from single occupancy vehicle (SOV) use and can reduce the total vehicle kilometres travelled. In turn, this leads to decreased levels of harmful greenhouse gas (GHG) emissions, contributing to better local air quality. In Canada, transportation accounts 28% of the nation's estimated GHG emissions, an increase of 34% from 1990 levels[4]. Despite the advent of hybrid and electric vehicles, Canadians are increasingly driving larger and less fuel-efficient vehicles.

Overall, Canada's per capita use of energy for road transportation is significantly higher than the G8 and OECD-30 averages and second only to that of the United States[5]. The Community of London Environmental Awareness Reporting Network (CLEAR Network) has estimated 33% of the energy consumed in the City was used by cars and trucks on City roads, most of which were personal vehicles.

Recurrent urban congestion is estimated to cost Canadians in the region of $2.8 billion - $4.4 billion per year, of which 90% is attributable to time lost in traffic[6]. The remainder of this cost is borne by increased fuel consumption and increased GHG emissions. As fuel prices continue to rise, so too does the cost of driving and of congestion.

The advantage of active transportation and TDM is that they often involve low-cost, but high-benefit initiatives or improvements. For example, the cost of providing one kilometre of bike lane is ($27,000 - $50,000) which is far less than the cost of one kilometre of road widening ($2,000,000 per lane). If mode shift can be induced, then the benefit-cost ratio is significant (1:20). Similarly, the costs attributable to promoting better use of the existing active transportation or transit system are negligible in comparison to the cost of road widening. Adopting this stance requires a fundamental move away from the traditional "predict and provide" approach to transportation planning and instead promotes demand management techniques.

Increasingly, the link between active travel, improved health, and a reduced financial burden on the health care system is being recognized. For example:

- Transport Canada has reported that obesity, diabetes, and mortality can be cut dramatically by a 30 minute walk a day and by losing 5-7% body weight.
- A study in the San Francisco Bay area found that a 15% mode share in active transportation could reduce the burden of heart disease by 14%, dementia and depression by 6-7%, and some forms of cancer by 5%[7]. In the context of rising

[4] *National Inventory Report 1990-2010: Greenhouse Gas Sources and Sinks in Canada, Environment Canada, 2012*
[5] Organization for Economic Co-operation and Development. *OECD Environmental Data, Compendium 2006/2007. Transport Table 5 and General Data Table 1A. 2006-2007. Paris, France*
[6] *"The Cost of Urban Congestion In Canada", Transport Canada, 2006. Values adjusted to 2012 dollars using Bank of Canada Inflation Calculator, AECOM*
[7] *Maizlish N, Woodcock J, Co S, Ostro B, Fanai A; Health Co-Benefits and Transportation-Related Reductions in Greenhouse Gas Emissions in the Bay Area, A Technical Report, November 2011*

levels of obesity in Canada, active transportation, and TDM can play a key role in improving the overall health of Canadians.

- The Middlesex-London Health Unit Healthy City Active London Report states that young adults who actively commute to work or school have significantly healthier bodyweights and fitness levels, and experience a reduced risk of obesity and high blood pressure.

The facilitation of increased active transportation also provides greater accessibility to employment and education opportunities, medical care, and other key amenities for disenfranchised groups without access to a car. This serves to reduce social isolation, while it also promotes a sense of community and neighbourhood vitality.

Areas with transportation systems supporting a range of modes are also often considered more attractive for future economic and housing development.

3.2.2 Active Transportation and Transportation Demand Management: Fundamental Elements of the Vision for London

Active transportation and TDM are critical elements of the TMP. Through these elements, several of the TMP's principles and goals will be achieved:

- Make it easier to get around London through a menu of options;
- Make London's neighbourhoods pedestrian and bicycle friendly;
- Integrate land use and transportation planning to encourage more sustainable lifestyles;
- Preserve and enhance environmental resources;
- Minimize the use of fossil fuels;
- Optimize the existing transportation system;
- Minimize the growth in travel demand;
- Develop parking strategies that reduce SOV travel; and
- Foster awareness of sustainable transportation.

The city-wide target mode share for active transportation by 2030 is 15%, which represents a 6% increase over today's share. This shift is supportive of the "transit focus" future proposed for the City, which prioritizes a fundamental shift in the way the City shapes its urban structure and integrates it with the development of its transportation system. A greater focus on active transportation and TDM helps to strengthen transit, revitalize the downtown area, and support the creation of hubs of urban growth and economic vitality within transit corridors. Active transportation mode

share targets for nodes and corridors and the downtown area are 17.5% and 20.0%, respectively.

The City has been actively pursuing active transportation and TDM activities for a number of years and as such, some significant advances have been made. This section summarizes the existing conditions, including active transportation infrastructure and wider TDM programs.

A vast network of trails and bike paths contributes to the City's active transportation infrastructure and plays a large role in the high quality of life enjoyed by City residents. As of 2012, the City's network of active transportation facilities included:

- 51 km of managed hiking trails;
- 40 km total length of the Thames Valley Parkway (TVP); and
- 146 km of paved pathway (TVP and all other paved pathways).

Active transportation is taking hold across Canada; Move On in Colchester, Nova Scotia is one example

While the off-road network is fairly well-defined, largely comprising of the TVP, the on-road network would benefit from improved connectivity. There are a number of signed bike routes; however these do not connect to form a strong, cohesive network. Similarly, there are comparatively few dedicated on-road bike lanes, with Ridout Street and King Street forming the only strong axis of connectivity into and out of the downtown area.

In addition to infrastructure improvements, the City funds several active transportation and TDM programs and is supported by the LTC, the Middlesex-London Health Unit, and a number of other community groups (e.g. Thames Region Ecological Association). Further information is found in the discussion paper *Active Transportation and Transportation Demand Management* (March 2010), prepared in the early stages of this TMP.

3.2.3 Active Transportation and Transportation Demand Management in the Future

Towards 2030, the City will continue to move forward with active transportation and TDM, expanding on existing initiatives but also seeking to establish new programs. The City's priorities in active transportation have shifted towards building connectivity in the network and connecting the downtown area outwards to major destinations. This vision aligns well with the "transit focus" of the TMP, which seeks to achieve the same objective of linking areas of future growth and development through improved transit options.

The City also recognizes the potential opportunities for cycling infrastructure afforded by the construction of larger infrastructure projects. The focus of the TMP on providing new rapid transit infrastructure presents the opportunity to consider the integration of bike lanes, thereby providing the framework for the longer-term expansion of the active transportation network.

Based upon the City's experiences and characteristics, the results of the 2009 / 2010 travel survey, public comments, and the City's desired future direction, a set of proposed directions have been produced for active transportation and TDM. These directions have also been informed by best practice programs or initiatives in other jurisdictions in North America. A more in-depth assessment of best practice case studies is found in **Appendix F** of the TMP Interim Report #2 entitled *Towards a More Sustainable Transportation System in London* (March 2011).

The proposed directions for active transportation and TDM are described below and a summary of the key recommended actions resulting from these directions is provided in Table 12.

Direction 1: Strengthen Policy Support

Policies to prioritize active transportation and TDM provide increased opportunities for behavioural change. It is important to recognize the relationship between land use and transportation planning in shaping community form. Initiatives such as "complete streets" focus on designing for walking, cycling, transit, and car movements in the same corridor. For the City, the impending development of a new *Official Plan* affords an opportunity to strengthen its policy support. Section 2.3 and **Appendix Q** of this TMP include recommended policies for the new *Official Plan* in all transportation related areas, including active transportation, TDM, and parking. Integrating TDM within the City's development review and approval process is also important for facilitating sustainable travel. Cities such as Ottawa have included the need for a TDM plan as part of the transportation impact study and this ensures that TDM is a key focus of any new development.

Direction 2: Promote Sustainable Travel for All Time Periods

The City is interested in opportunities for behavioural change throughout the day and not just at peak travel times. 15% of trips made by Londoners are for social / recreational purposes, with 40% of all trips made during midday and 4% in the evening off-peak periods. Increased incentives and opportunities should be provided for shifting to sustainable transportation for these trips, as has been achieved in Vancouver through the "TravelSmart" personalized journey planning program and distribution of information toolkits. The targeted promotion of active transportation and TDM is also vital to its success and may be achieved through the development of a strong TDM brand, such as "Smart Trips" in Portland, Oregon, and the "Travelwise" program in the Region of Waterloo.

Direction 3: Target Commuter Travel

Some 57% of travel in the City occurs during the morning and evening peak travel periods, with almost one quarter of total daily trips being work-related. Commuter travel directs much of the need for road infrastructure improvements and is a key market to target for active transportation and TDM programs. An effective way of addressing commuter trips is through the provision of transit incentives. For example, Winnipeg's "EcoPass" program provides discounted transit passes to the staff of participating companies, with a range of discounts to suit individual needs. Furthermore, it is also important for municipalities to demonstrate that they can "walk the walk", test new TDM measures, and pass on lessons to other City employers through their own staff travel programs. For example, the City of Mississauga has a comprehensive plan to reduce drive-alone trips, which recently won the Smart Commute Employer of the Year award.

Direction 4: Target School Travel

There are many benefits to targeting school travel, including the development of long-term health and environmentally conscious travel habits. The City already has an Active and Safe Routes to School (ASRTS) program; however this is not city-wide and should be expanded. Secondary school years are particularly important as young adults become able to make their own travel choices. A similar program in Vancouver promotes active transportation for this secondary school target group and may be used as a case study for the City, where no secondary school programs currently exist. College/university age students typically study at higher education facilities which are well served by transit and provide the opportunity for associated TDM programs, such as the successful initiatives implemented by York University in Toronto. Western University and Fanshawe College are strong partners for the City to build on, and one potential action may be to expand Western University's "Purple Bikes" scheme into a larger bike-sharing initiative such as Bixi (as seen in Toronto and Montreal).

Direction 5: Increase Investment in Active Transportation Infrastructure

The City should accelerate its efforts to provide a safe, attractive, and continuous active transportation network that caters to commuters and recreational users, and aligns with the desire to connect the downtown area with key destinations (e.g. Western University and Fanshawe College). This is required in order to encourage greater mode shift for a range of trips. Increased investment in infrastructure is recognized as having a positive effect in cities such as Vancouver and Portland, Oregon. To immediately increase connectivity of the on-street network, a priority on-street bike route plan has been developed for implementation within three years.

As previously stated, the City should continue to use the *2007 Bicycle Master Plan* (BMP) implementation feasibility assessment as a guide for future improvements, without necessarily following it prescriptively, and continue to look for other opportunities to achieve cost efficiencies wherever possible.

Direction 6: Finalize Downtown Parking Strategy

Parking is intrinsically linked with TDM and requires a carefully balanced approach. It is essential to ensure the long-term vitality of the City's downtown businesses by providing sensibly priced and accessible parking. However, the need to encourage transit ridership and reduce SOV trips into the downtown area should also be a key consideration.

Current utilization of parking in the City averages about 70%, which is lower than similarly sized cities and suggests that there is adequate supply. Additionally, average monthly parking rates are lower than the cost of a monthly transit pass. However, the City is unable to significantly change the cost of downtown parking, as 90% of parking is privately-controlled. As a result, only 11% of daily trips to the downtown area are made by transit. To encourage a greater mode share, a more transit supportive downtown parking strategy is needed.

Direction 7: Use Parking to Support Transit, Active Transportation, and Transportation Demand Management

Parking outside of the downtown area also has an impact on travel behaviour within the downtown and outlying areas. To increase transit mode share and support TDM initiatives such as carpooling, a city-wide parking strategy is needed, focused on proposed nodes and corridors where intensification is planned. Building on existing initiatives, the City should incorporate the short-term actions listed in Table 12 below into a cohesive city-wide TDM plan, which would provide more details regarding implementation.

Table 12. 28 Priority Recommendations for Active Transportation and Transportation Demand Management

Proposed Direction	Priority Actions
Short-Term (2012 – 2015)	
Direction 1: *Strengthen Policy Support*	1. Focus policy development on "complete streets" and people movement 2. Increase priority for active transportation and transportation demand management in planning for and funding transportation improvements 3. Incorporate transportation demand management into the City development review and approval process 4. Ensure that strong active transportation and transportation demand management policies are included in new *Official Plan* 5. Develop more detailed transportation demand management plan for the City, with specific programs for implementation
Direction 2: *Promote Sustainable Travel for all Time Periods*	6. Implement incentives to encourage sustainable travel for all trips 7. Strengthen partnerships with the health care sector to encourage increased active transportation 8. Publish information on existing and planned City programs 9. Provide a means for active transportation and transportation demand management feedback (e.g. a website or forum)
Direction 3: *Target Commuter Travel*	10. Lead by example, intensify City transportation demand management program and set strong example for others to follow 11. Expand "Travelwise" program in the City, capturing high density areas and large employers
Direction 4: *Target School Travel*	12. Expand active and safe routes to school program on a city-wide basis 13. Develop and implement secondary school transportation demand management projects 14. Partner with Western University and Fanshawe College to expand transportation demand management programs
Direction 5: *Increase Investment in Active Transportation Infrastructure*	15. Expand and accelerate on-street bike lanes implementation focusing on key gaps and links 16. Ensure secure bike parking at City facilities, transit stops, and major destinations 17. Continue investment in off-street multi-use pathways 18. Address gaps in the sidewalk network and provide pedestrian amenities 19. Improve winter maintenance along key active transportation corridors
Alignment with Future Bus Rapid Transit Network	20. Seek to plan for active transportation facilities within future rapid transit corridors where appropriate 21. Provide adequate and secure bike parking at key growth nodes and plan for bike parking at transit stops within future rapid transit corridors

Proposed Direction	Priority Actions
Medium-Term (2016-2020)	
Direction 6: *Finalize Downtown Parking Strategy*	22. Explore opportunities to increase City control of downtown parking 23. Establish close working relationship with the downtown parking working group and any new downtown development corporation to ensure long-term parking needs are met, while supporting transit ridership 24. Ensure that parking capacity is maintained (or increased) where appropriate over the next 10-years to support the continued revitalization of the downtown area
Direction 7: *Use Parking to Support Transit, Active Transportation, and Transportation Demand Management*	25. Plan for municipal parking facilities at key development nodes on future rapid transit corridors, with parking
Long-Term (Beyond 2020)	
Direction 6: *Finalize Downtown Parking Strategy*	26. Ensure that in the longer term, parking capacity is limited to encourage increased transit ridership – through application of maximum parking standards and appropriate pricing
Direction 7: *Use Parking to Support Transit, Active Transportation, and Transportation Demand Management*	27. Include park-and-ride facilities at future rapid transit terminals and other strategic locations 28. Partner with Ontario Ministry of Transportation to expand the network of carpool lots on key corridors (e.g. Highway 401 or 402 interchanges)

3.2.4 Bicycle Safety Issues

A key consideration raised at TMP public meetings regarding the development of active transportation infrastructure was one of safety. The City's BMP (2007) signalled a departure from the previous City practice of providing in-boulevard bicycle paths (IBBPs) along arterial corridors. IBBPs are exclusive bicycle paths located between the sidewalk and curb lane of an arterial road right-of-way. The reason for this shift in policy is because of conflicts between the motorist and cyclist at intersections and driveway entrances, and the requirement for diligent maintenance to clear any debris along the IBBP.

On-Street Bike Lanes Have Long Been Considered Safer Than Separated Boulevard Paths

The BMP promoted the development of on-street bike lanes on specified arterial routes. Widened curb lanes were considered, but while these are suitable for more experienced cyclists, they lack the necessary markings and lane treatments to provide a safe and comfortable environment for all users. On-road bike lanes are generally curb-side lanes with a clearly defined boundary separating the facility from the general traffic lane.

The advantage of on-street bike lanes is that in comparison to having no dedicated facilities, they provide a safer and more legible route for recreational cyclists, while also providing experienced cyclists with a more direct route, thus promoting a more inclusive network. The trade-off between catering for experienced commuter cyclists and recreational cyclists is a key factor to consider in the design of the facility. Experienced cyclists generally prefer an on-road facility following the most direct routes, while less-experienced cyclists may prefer off-road facilities where general traffic does not pose a perceived threat to safety.

The perceived safety of on-road bike lanes can be enhanced by providing a buffer (e.g. a 0.6 m wide hatched marking) between the bike lane and general traffic. This serves to mitigate traffic speeds along the corridor, while also increasing cyclist comfort level and promoting ridership. This would be an appropriate measure to take on major arterials (e.g. Oxford Street, Richmond Street, or Wellington Street) and other streets with frequent bus service. This may be considered a balance between the needs of a variety of users. There are other bicycle route treatments that should also be considered (e.g. signal priority, cycle tracks, bike boxes).

Bright Demarcation at Intersections Enhance the Concept of Crossing the Bike Lane to Vehicles and Increase Awareness

3.2.5 Priority On-Street Bike Routes

One of the most important initiatives in Table 12 is to expand and accelerate the implementation of on-street bike lanes, focusing on key gaps and links (as highlighted within Direction 5: *Increase Investment in Active Transportation Infrastructure*).

In the City, there is already a fairly well-developed off-road network to cater to

Walking and Cycling Structure, London, Ontario

recreational cyclists, while the opportunities afforded by integrating more cycling facilities into the street network would serve to encourage transportation choices for transportation trips. This would support wider policy initiatives to reduce peak congestion as well as promote a healthier, active lifestyle.

Building on bike lanes and routes already in place, the intent is to quickly (within a three-year timeframe) create key north/south and east/west continuous on-road bike routes throughout the central part of the City, utilizing bike lanes to the greatest extent possible. These routes are identified herein with reference to the key road names that form the majority of the recommended route.

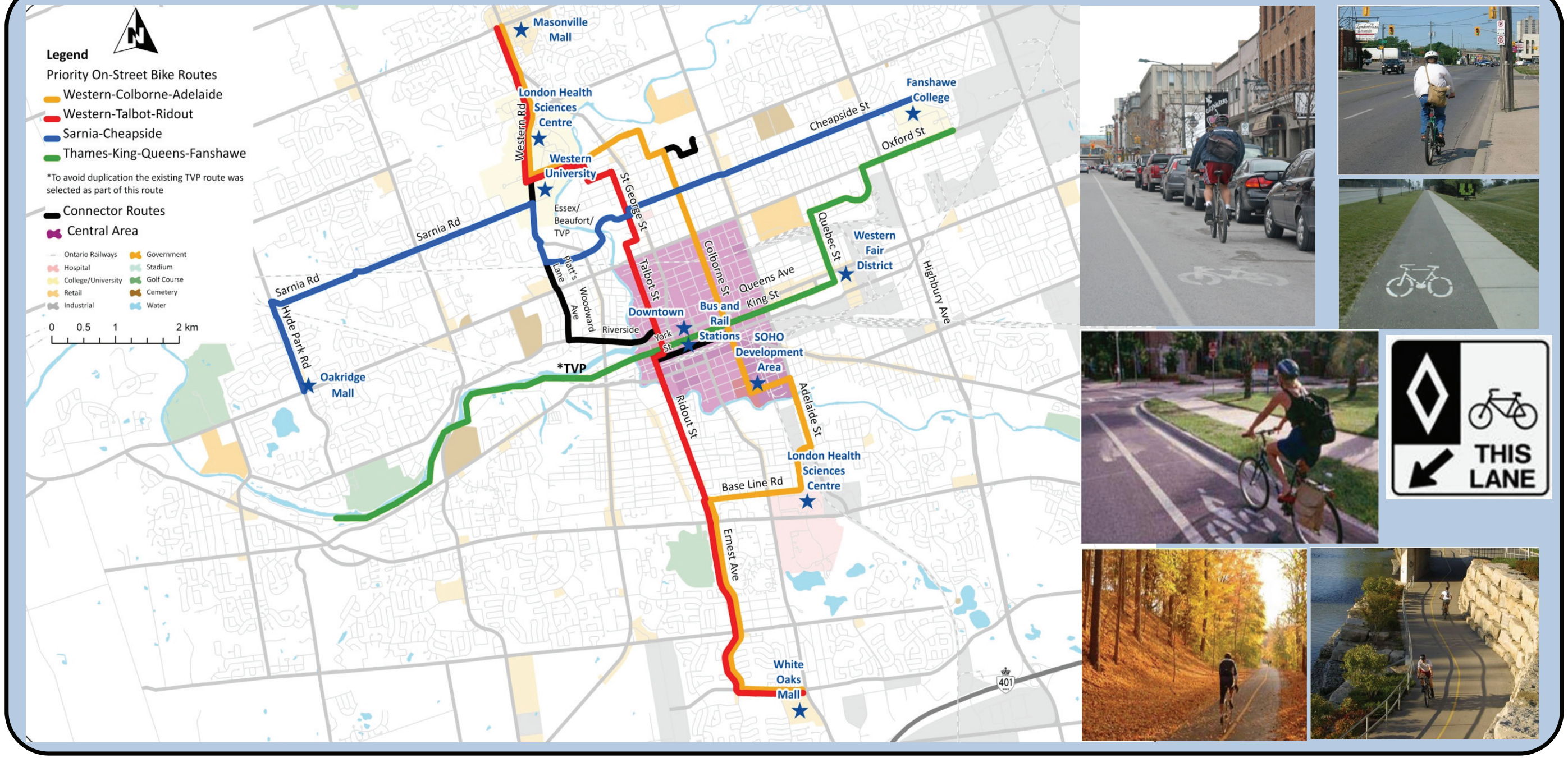
Dual Bike Lanes Very Much In-Line with the Phenomenon Known as "Road Diet"

Based upon a review of the current network and recognizing proposed improvements, it is recommended that the following five routes be considered to form priority routes and make a visible and substantial gain in the on-street bike network as quickly as possible:

1. **Northern East / West Route**: Sarnia Road - Cheapside Street
2. **Central Route**: TVP - King Street - Queens Avenue - Fanshawe Park Road
3. **Western North / South Route**: Western Road - Talbot Street - Ridout Street
4. **Eastern North / South Route**: Western Road - Colborne Street - Adelaide Street
5. **Connector Routes**: York Street Connector; Platts Lane / Woodward Avenue - Riverside Drive; Regent Street / TVP

The routes are shown on Exhibit 24. New linkages for each route, along with the benefits of each, are detailed in **Appendix O.**

Exhibit 24. Priority On-Street Routes



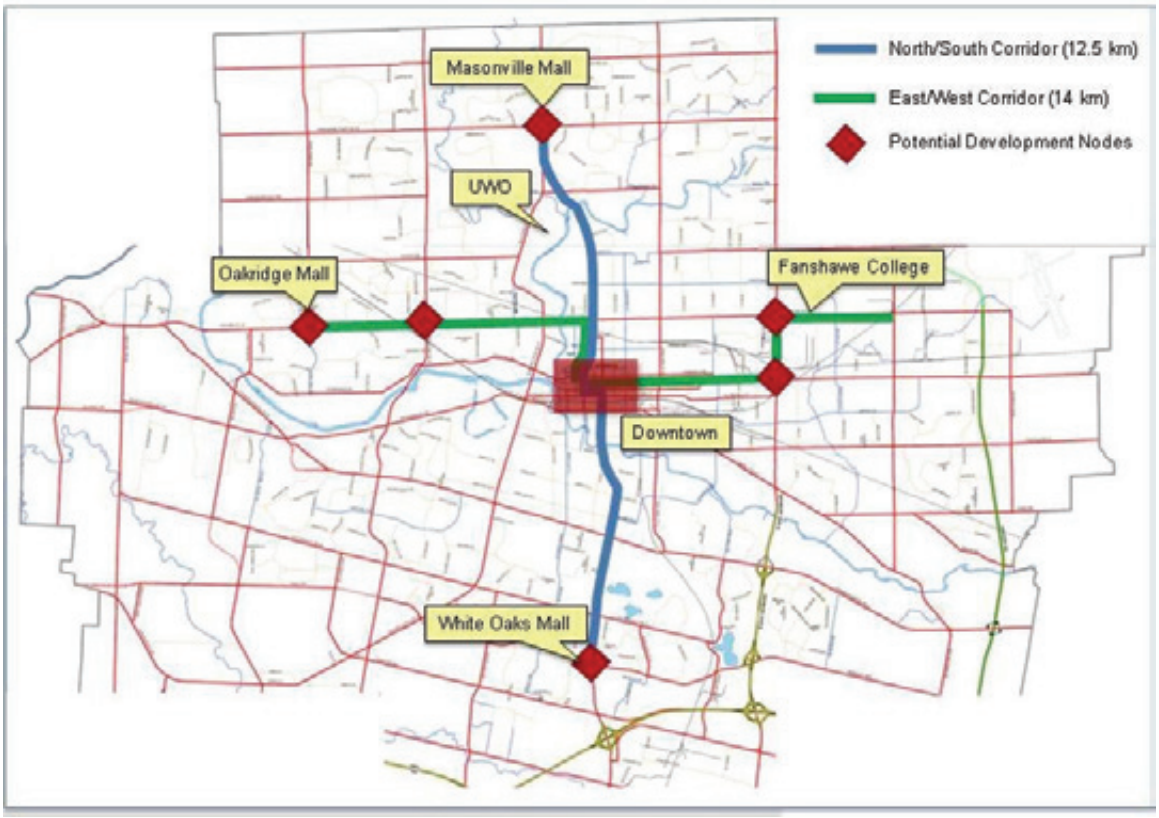
3.2.6 Alignment with Wider Recommendations of the TMP

The 2030 TMP has a strong transit focus vision and central to this is the development of a rapid transit network. As shown on Exhibit 25, it is proposed that two main corridors are prioritized for the implementation of rapid transit:

1. **Richmond Street / Wellington Street Corridor**, forming a key north/south route
2. **Dundas Street / Oxford Street West / East Corridor**, forming a key east/west route

A future rapid transit network based on these corridors would help to support a revitalized downtown, as well as providing enhanced accessibility to key destinations in outlying areas, including Western University, Fanshawe College, Oakridge Mall, White Oaks Mall, and Masonville Mall. Clearly, this aligns well with the City's priority to build connectivity in its active transportation network between the downtown area and key trip attractors and this provides the opportunity to develop a truly integrated multi-modal transportation system.

Exhibit 25. Proposed Rapid Transit Corridors



Source: Interim Report #2: Towards a More Sustainable Transportation System in London (March 2011)

3.3 A More Strategic Program of Road Network Improvements

Despite the greater emphasis in this TMP on transit, active transportation, TDM, and parking, many road improvements will still be required. One difference between this TMP and past studies is the more strategic approach is used to define the need for road network improvements.

Automobile Mode Share Targets		
2009*	**2020**	**2030**
73.5%	68.0%	60.0%

based on 2009 household travel survey

A Higher Reliance on Transit

The approach to determining where and when to invest in road improvements starts with the emphasis in this TMP on increasing the share of peak period trips made by non-automobile modes of travel. The share of peak period trips made by the automobile is forecasted to reduce from 73.5% today, to 60% by 2030. In 2030, this difference represents approximately 16,500 automobile trips removed from the City road network during the peak hour; roughly equivalent to 18 arterial lanes of capacity[8]. For Scenario 2, the reduction is estimated at just fewer than 7,000 automobile trips, the equivalent of eight arterial lanes. Despite this significant shift, the total demand for automobile travel is still forecast to grow by 49% from today's level at the target population growth rate (2% per year), and 19% from today's level at the Scenario 2 growth rate (1% per year).

A Corridor Approach to Determine Needs

Roadway improvement needs were based on a corridor level analysis. This means, for example, that where two adjacent roadway links both show capacity deficiencies, only one improvement may be necessary to resolve the corridor deficiency. An iterative modelling approach was used to test network improvements to determine how well they addressed the corridor level deficiency. In most cases projects identified in the previous 2004 TMP or projects identified through previous Class EAs were recognized as the preferred improvement to address future needs rather than introduce new widening projects.

Resulting Congestion of Single Occupant Vehicles, Bike Lanes, and Public Transit on Required Road Width

[8] *Based on typical arterial lane capacity of 900 vehicles/hour/lane*

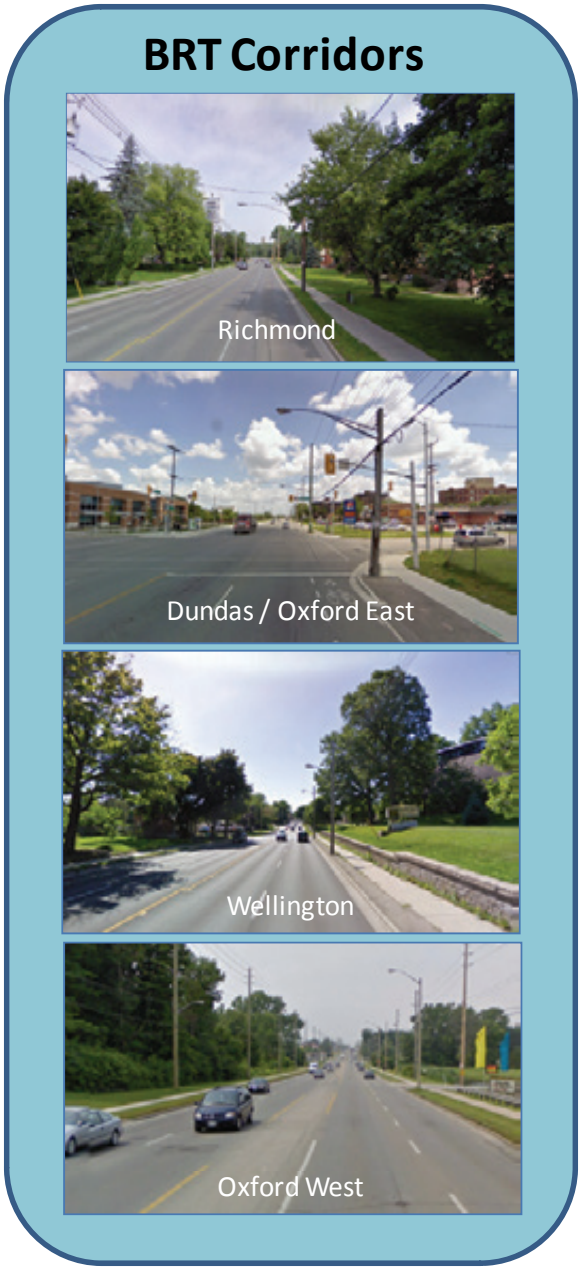
Road Widening to Support Transit

Another key difference in our strategic approach to identifying road improvement needs explicitly recognizes that road improvements will be required for different purposes. In this regard, a number of widenings are required to support the BRT initiative. These are shown in green in Exhibit 22 and include Richmond Street north of the river, Oxford Street West west of Richmond Street, most of Wellington Road south of Horton Street, and parts of Dundas Street, Highbury Avenue, and Oxford Street East.

The widening projects required to support the implementation of full BRT services are recommended as top priorities to enable full implementation of BRT dedicated lanes by the 2020 horizon year.

Road widening projects in urban built-up areas have generally been avoided so as not to compete with, or undermine, priority transit corridors, except where required to fill in between adjacent segments or at key constraint areas (such as the railway crossing on Wharncliffe Road, just north of Horton Street), which has been identified in a number of previous transportation plans. Road widening projects have generally been directed to areas where transit cannot compete as well with automobile travel due to the lack of density or the dispersed nature of transit oriented destinations.

Heavy travelled corridors such as Sarnia Road (which parallels the Oxford Street West BRT segment), Wharncliffe Road (which parallels the Wellington Road BRT segment), and Adelaide Street (which parallels the Richmond Street BRT segment) were all identified as operating at, or over, capacity by



2030, but widening has not been recommended. Instead, these corridors have been identified for "capacity optimization" and/or transit priority to manage delays and travel times on these routes without undermining the use of the BRT corridors.

Optimization Corridors

Other road improvements categorized as "optimization / transit priority" projects reflect highly constrained urban rights-of-way where the opportunity to complete physical improvements will be limited. For these constrained corridors, the recommended strategy is to optimize the operation of these roads through intersection improvements, centre turning lanes, right turn lanes, signal co-ordination strategies, and transit priority measures, such as HOV lanes and queue-jump lanes at intersections.

The 2004 TMP estimated that optimization treatments could increase the capacity of major arterial roads by 5% to15% depending on the treatment used.

With a 1% annual growth rate, this simple measure can defer the need for widening by 5 – 15 years.

The specific improvement plan for each corridor will be developed through separate corridor-specific Class EAs, which should consider the future role and urban design objectives of the corridor, the future role of transit service in the corridor, and opportunities to improve road capacity without major widening to determine the preferred optimization treatment.

What About the Ring Road?

The topic of a future "ring road" around the City has long been debated in the community and through past transportation studies. In keeping with the transit focus of this TMP, a formal freeway "ring road" is not recommended by 2030 however the arterial road network improvement plan (Exhibit 26) has been developed in a manner to provide a high capacity automobile and goods movement corridor on each side of the City.

To the east, the plan builds upon the existing Veterans Memorial Parkway (VMP) and recommends widening the VMP from Oxford Street north to Huron Street to four lanes, combined with the extension of a new four lane segment north to Clarke Road. Clarke Road itself is also recommended for widening to an ultimate six lane cross-section providing the connection from the VMP to the Fanshawe Road corridor.

A separate freeway "ring road" is not precluded in the longer term, but would need to be considered in conjunction with MTO and Middlesex County.

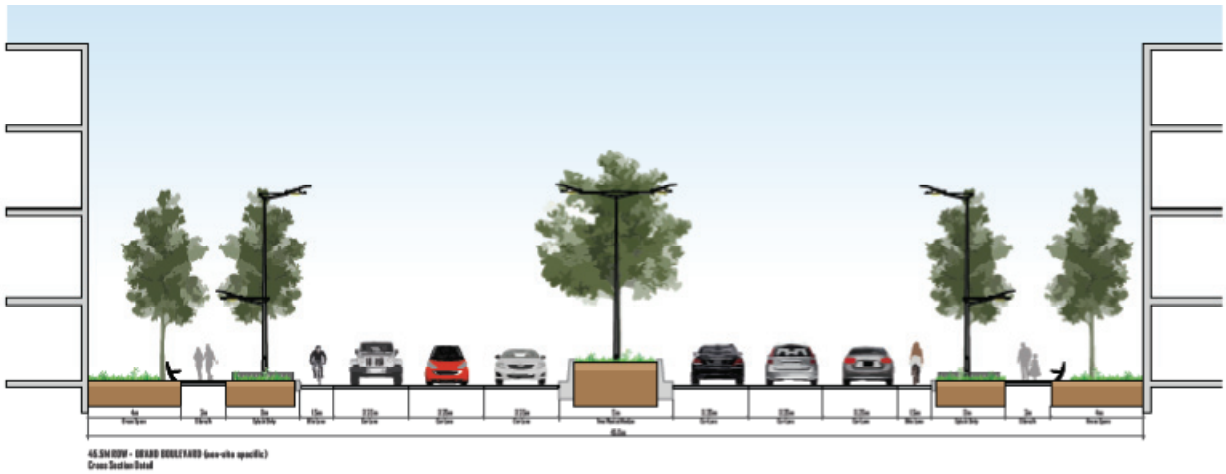
To the north, the plan includes widening Fanshawe Park Road to a continuous six/seven lane "grand boulevard" corridor, consistent with the City *Draft Urban Design Guidelines*.

Exhibit 26. High Capacity Arterial Ring Road

To the west, Wonderland Road will provide the continuous "grand boulevard" connection between Fanshawe Park Road and Highway 401. Between Fanshawe Park Road and Exeter Road, this corridor is recommended for widening from the current four lanes to six lanes by 2030. To the south, a widening from the current two lanes to four lanes, plus a new interchange at Highway 401 is recommended.

It should be noted that from Fanshawe Park Road, south to Gainsborough Road, the current four lane cross-section of Wonderland Road will provide sufficient capacity to 2030, provided that the transit mode share targets are achieved and that the recommended widening of Richmond Street (from Ross Park north to Fanshawe Park Road) to provide the dedicated BRT lanes can be completed. The achievement of higher growth associated with the Scenario 3 growth target would also trigger the need for this additional widening. A future Class EA would need to review this section of Wonderland Road to determine the need to widen it to six lanes to achieve the complete arterial "ring road" network and improve road capacity by the year 2030.

Grand Boulevard



The need for a separate freeway "ring road" is not precluded in the longer term; however the City, Middlesex County, and possibly MTO would have a role in determining the need for, location, and timing for a facility of this nature.

Updated Triggers for Widening

The 1994 TMP utilized a volume to capacity (V/C) ratio of 0.90 (meaning that the road is operating at 90% of capacity) as a trigger to indicate the need for widening. This is generally associated with level of service (LOS) D operation conditions. A similar target was used in the 2004 TMP.

The City has long recognized that they, along with most municipalities, are facing an infrastructure deficit, and it is rare that they are actually able to initiate a road widening project when the road reaches 90% of capacity. In most cases, the improvements do not occur until the road is well beyond the peak hour operational capacity.

From a sustainability perspective, this is not such a bad situation. Additional delays encourage drivers to reconsider their travel options; they can chose to travel at a different time of day, utilize a different route, shift to a new mode of travel, or even reconsider the need to take a trip at all. Unfortunately, this situation can also lead to neighbourhood traffic infiltration issues, increased driver frustration and collisions at intersections, and delays to transit services that depend on reliable travel times along arterial roads.

Recognizing the need to balance these considerations, the recommended widening target for this TMP has been adjusted to a V/C ratio of 1.0 (representing 100% of capacity). This revised target is associated with LOS E operations and represents the effective capacity of the road corridor.

Recommended Road Improvement Program

Roadway extensions and widenings to support future growth are shown in red (future four lane roadways) and blue (future six lane roadways) in Exhibit 27. The majority of these are in more suburban locations where transit is less able to compete with the automobile.

Other road improvements labelled "Optimization / Transit Priority" (shown in purple) reflect highly constrained urban rights-of-way where opportunities for widening are limited. Optimization of these corridors will be focused on intersection improvements, turning lanes, and transit priority measures such as HOV lanes and queue-jump lanes at intersections. Widening these corridors to six lanes is not recommended so as to avoid competing with investments made to support the BRT system.

Table 13, below, provides a listing of the road widening projects required to support implementation of the BRT network.

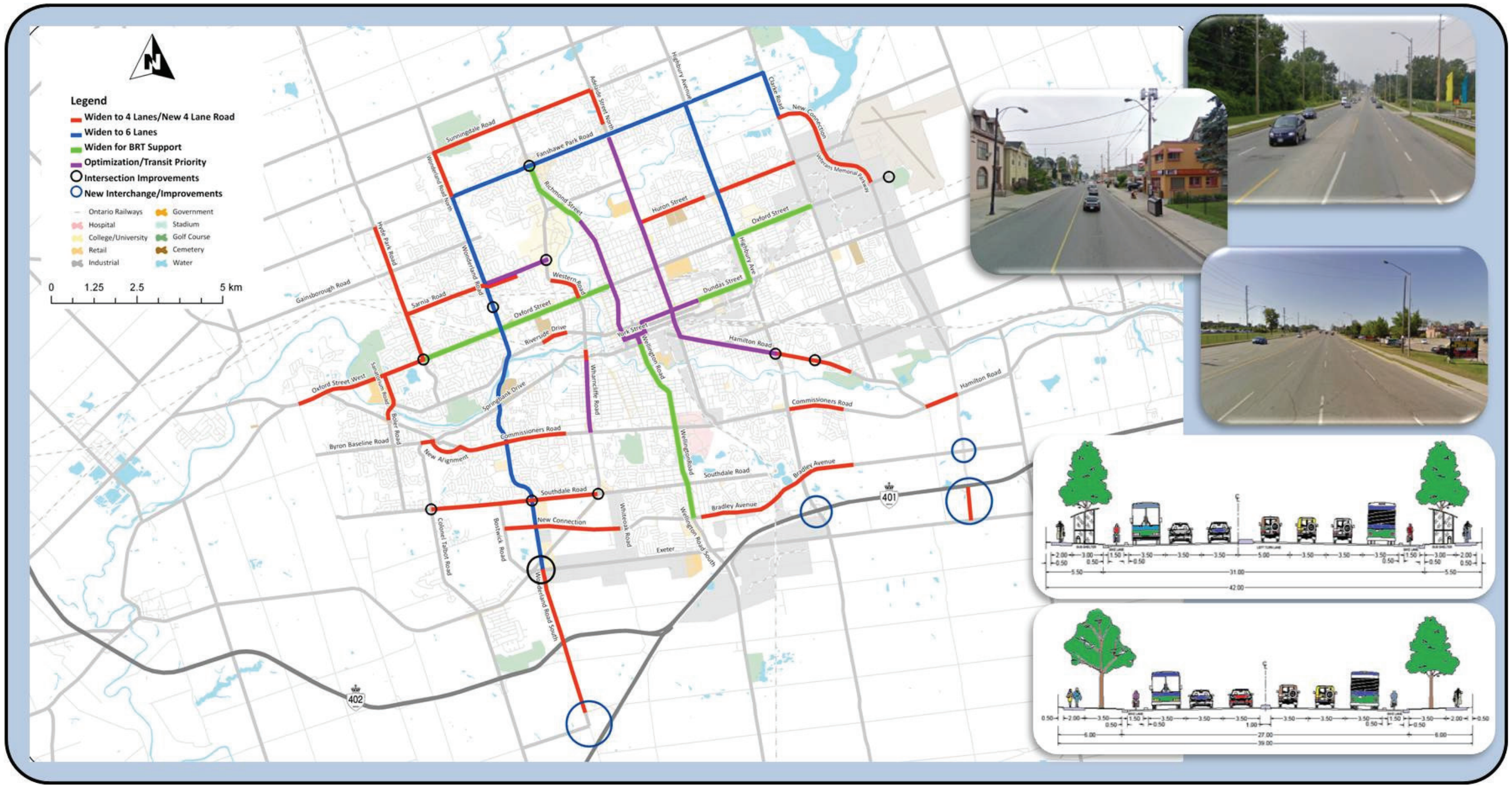
Level of Service	What it Means?
A	Free Flowing Traffic Minimal Delays All traffic clears on green
B	Free Flowing Traffic Minimal Delays Most traffic clears on green
C	Uniform Traffic Flow Moderate Delays Some movements will not clear on green
D	Congestion noticeable Poor progression with frequent stops and increased delay Many movements at capacity and will not clear on green
E	Poor traffic flow with frequent stops and high delays Most movements over capacity and traffic rarely clears on first green
F	Forced Flow conditions with severe congestion Most movements over capacity with long queues that do not clear on green

Level of Service for roadways is grouped into six categories as described above

Table 13. Road Improvements for Bus Rapid Transit Implementation – by Horizon

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
South Leg				**5,500**	**$88,200,000**
Wellington Road	Bradley Avenue and Horton Street	4 to 6 lanes	2015	5,500	$88,200,000
North Leg				**2,300**	**$49,200,000**
Richmond Street	Fanshawe Park Road to Raymond Avenue	4 to 6 lanes	2016	2,300	$49,200,000
East Leg				**6,200**	**$66,300,000**
Highbury Avenue	Dundas Street to Oxford Street	4 to 6 lanes	2017	1,300	$13,900,000
Dundas Street	Adelaide Street to Highbury Avenue	4 to 6 lanes	2019	2,500	$26,700,000
Oxford Street	Highbury Avenue to Clarke Road	4 to 6 lanes	2020	2,400	$25,700,000
West Leg				**6,000**	**$64,200,000**
Oxford Street West	Hyde Park Road to Richmond Street	4 to 6 lanes	2018	6,000	$64,200,000
Downtown				**6,000**	**$32,100,000**
Richmond Street	Raymond Avenue to York Street	Optimization	2016	3,800	$20,300,000
York Street	Richmond Street to Colborne Street	Optimization	2017	900	$4,800,000
Colborne Street	York Street to Dundas Street	Optimization	2019	300	$1,600,000
Dundas Street	Colborne Street to Adelaide Street	Optimization	2018	700	$3,800,000
Wellington Street	Horton Street to York Street	Optimization	2020	300	$1,600,000
Totals				**26,000**	**$300,000,000**

Exhibit 27. 2030 Baseline Road Network Improvements



A More Strategic Program of Road Network Improvements

Table 14. Major Road Improvements – by Horizon

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
Oxford Street West	**Hyde Park Road to Sanatorium Road**	**2 to 4 through lanes with centre turn lane**	**0-5**	**1,230**	**$10,600,000**
Commissioners Road	**Wonderland Road to Viscount Road**	**2 to 4 through lanes with centre turn lane**	**0-5**	**1,400**	**$12,600,000**
Southdale Road	**Wonderland Road to Wharncliffe Road**	**2 to 4 through lanes**	**0-5**	**1,150**	**$11,500,000**
Wonderland Road Interchange	**Highway 401**	**Interchange**	**0-5**	**n/a**	**[a] $25,000,000**
Fanshawe Park Road	**Adelaide Street to Highbury Avenue**	**2 to 4 through lanes with centre turn lane**	**0-5**	**2,000**	**$15,900,000**
Sarnia Road	**Wonderland Road to Sleightholme Avenue**	**3 to 4 through lanes**	**0-5**	**850**	**$8,100,000**
Western Road	**Platts Lane to Oxford Street**	**2 to 4 through lanes, including widening rail underpass**	**0-5**	**950**	**$17,000,000**
VMP Extension and Interchange	**Highway 401 to Wilton Grove Road**	**4 through lanes and interchange**	**0-5**	**1,000**	**[b] $25,000,000**
Highbury Avenue Interchange	**Highway 401**	**Interchange**	**0-5**	**n/a**	**[c] $30,000,000**
Hyde Park Road	**CPR to Fanshawe Park Road**	**2 to 4 through lanes**	**0-5**	**2,200**	**$13,800,000**
Hyde Park Road	**Oxford Street to CPR**	**2 to 4 through lanes**	**0-10**	**2,000**	**$22,200,000**
	Oxford to CPR	2 to 4 through lanes	0-5	2,000	$20,400,000
	Oxford Intersection	2 to 4 through lanes	5-10	n/a	$1,800,000
Sunningdale Road	**Wonderland Road to Adelaide Street**	**2 to 4 through lanes**	**0-10**	**5,200**	**$47,100,000**
	Stage 1 - Phase 1 - Wonderland/Sunningdale Intersection	2 to 4 through lanes	0-5	300	$2,200,000
	Stage 1 - Phase 2 - Richmond/Sunningdale Intersection	2 to 4 through lanes	0-5	300	$3,300,000
	Stage 2 - Phase 1 - Adelaide to Bluebell	2 to 4 through lanes	5-10	1,100	$14,900,000
	Stage 2 - Phase 2 - Bluebell to Richmond	2 to 4 through lanes	5-10	1,150	$7,300,000
	Stage 2 - Phase 3 - Richmond to Wonderland	2 to 4 through lanes	5-10	2,350	$19,400,000
Bradley Avenue Extension	**Jalna Boulevard to Bostwick Road**	**4 through lanes**	**0-15**	**3,800**	**$35,400,000**
	Phase 2 - Jalna to Wharncliffe	4 through lanes	5-10	1,800	$10,300,000
	Phase 1 - Wharncliffe to Wonderland	4 through lanes	0-5	1,025	$13,000,000
	Phase 3 - Wonderland to Bostwick	4 through lanes	10-15	975	$12,100,000
Huron Street	**Adelaide Street to Vesta Road**	**2 to 4 through lanes**	**5-10**	**1,800**	**$12,900,000**
Bradley Avenue	**Dearness Drive to Jackson Road**	**2 to 4 through lanes**	**5-10**	**4,800**	**$43,100,000**
	Phase 1 - Dearness to Pond Mills	2 to 4 through lanes	5-10	2,500	$22,800,000
	Phase 2 - Pond Mills to Jackson	2 to 4 through lanes	5-10	2,300	$20,300,000
Sarnia Road	**Wonderland Road to Hyde Park Road**	**2 to 4 through lanes**	**5-10**	**2,350**	**$6,600,000**
	Phase 1 - Aldersbrook to Wonderland	2 to 4 through lanes	5-10	1,000	$2,000,000
	Phase 2 - Hyde Park to Oakcrossing Gate	2 to 4 through lanes	5-10	1,350	$4,600,000
Boler Road / Sanatorium Road	**Commissioners Road to Oxford Street West**	**2 to 4 through lanes**	**5-10**	**1,450**	**$17,200,000**
	Phase 1 - Oxford to Riverside	2 to 4 through lanes	5-10	900	$6,000,000
	Phase 2 - Riverside to Commissioners	2 to 4 through lanes	5-10	550	$11,200,000
Adelaide Street North	**Grenfell Drive to Sunningdale Road**	**2 to 4 through lanes**	**5-10**	**1,000**	**$8,100,000**
Wharncliffe Road	**Becher Street to Springbank Drive**	**2 to 4 through lanes**	**5-10**	**300**	**$20,000,000**
Riverside Drive	**Woodward Avenue to Beaverbrook Avenue**	**2 to 4 through lanes**	**5-10**	**800**	**$4,300,000**
Old Victoria Road	**Old Victoria Intersection**	**Intersection**	**5-10**	**n/a**	**$4,700,000**
Wonderland Road	**Fanshawe Park Road to Riverside Drive**	**4 to 6 through lanes**	**5-20**	**5,400**	**$42,000,000**
	Phase 1 - Riverside to Oxford	4 to 6 through lanes	5-10	1,000	$13,800,000

Road Name	Limits	Improvement	TMP Recommended Year	Project Length (m)	Grand Total (2012$)
	Phase 2 - Oxford to Sarnia	4 to 6 through lanes	5-10	1,600	$12,300,000
	Phase 3 - Sarnia to Fanshawe	4 to 6 through lanes	20	2,800	$15,900,000
Veterans Memorial Parkway	**Huron Street to Clarke Road**	**New 2 through lanes then 4 through lanes**	**5-20**	**1,850**	**$18,700,000**
	Phase 1 - Huron to Clarke	2 through lanes	5-10	1,850	$11,500,000
	Phase 2 - Huron to Clarke	2 to 4 through lanes	15-20	1,850	$7,200,000
Wonderland Road	**Riverside Drive to Exeter Road**	**4 to 6 through lanes**	**5-20**	**6,700**	**$41,100,000**
	Phase 1 - Riverside to Springbank	4 to 6 through lanes	5-10	1,500	$20,200,000
	Phase 2 - Springbank to Southdale	4 to 6 through lanes	10-15	3,100	$12,600,000
	Phase 3 - Southdale to Exeter	4 to 6 through lanes	15-20	2,100	$8,300,000
Veterans Memorial Parkway	**Oxford Street to Huron Street**	**2 to 4 through lanes**	**10-15**	**1,800**	**$9,100,000**
Oxford Street West	**Sanatorium Road to Westdel Bourne Road**	**2 to 4 through lanes**	**10-15**	**2,650**	**$14,100,000**
	Phase 1 - Sanatorium to Commissioners	2 to 4 through lanes	10-15	1,650	$8,800,000
	Phase 2 - Commissioners to Westdel Bourne	2 to 4 through lanes	10-15	1,000	$5,300,000
Fanshawe Park Road	**Wonderland Road to Adelaide Street**	**4 to 6 through lanes**	**10-15**	**4,875**	**$24,600,000**
	Phase 1 - Adelaide to Richmond	4 to 6 through lanes	10-15	2,400	$10,800,000
	Phase 2 - Richmond to Wonderland	4 to 6 through lanes	10-15	2,475	$13,800,000
Commissioners Road East	**Highbury Avenue to Jackson Road**	**2 to 4 through lanes**	**10-15**	**1,500**	**$7,500,000**
Wonderland Road North	**Sunningdale Road to Fanshawe Park Road**	**2 to 4 through lanes**	**10-15**	**1,300**	**$10,700,000**
Fanshawe Park Road	**Adelaide Street to Highbury Avenue**	**4 to 6 through lanes**	**10-15**	**2,300**	**$10,700,000**
Hamilton Road	**Old Victoria to Veterans Memorial Parkway**	**2 to 4 through lanes with centre turn lane**	**10-15**	**925**	**$4,700,000**
Huron Street	**Highbury Avenue to Clarke Road**	**2 to 4 through lanes**	**10-15**	**2,400**	**$16,100,000**
Wharncliffe Road	**Horton Street to Commissioners Road**	**Optimization**	**10-15**	**2,200**	**$7,300,000**
Adelaide Street	**Fanshawe Park Road to Hamilton Road**	**Optimization**	**10-15**	**6,300**	**$20,800,000**
Wonderland Road	**Exeter Road to Highway 401**	**2 to 4 through lanes**	**10-20**	**4,900**	**$39,400,000**
	Phase 1 - Exeter to Hwy 402	2 to 4 through lanes	10-15	2,000	$19,000,000
	Phase 2 - Hwy 402 to Hwy 401	2 to 4 through lanes	15-20	2,900	$20,400,000
Fanshawe Park Road East	**Clarke Road to Highbury Avenue**	**2 to 6 through lanes with centre turn lane**	**15-20**	**2,500**	**$22,400,000**
Clarke Road	**VMP Extension to Fanshawe Park Road**	**2 to 6 through lanes**	**15-20**	**1,375**	**$30,400,000**
Southdale Road West	**Colonel Talbot Road to Pine Valley Boulevard**	**2 to 4 through lanes with centre turn lane**	**15-20**	**2,800**	**$23,400,000**
	Phase 1 - Colonel Talbot to Farnham	2 to 4 through lanes with centre turn lane	15-20	2,200	$18,400,000
	Phase 2 - Farnham to Pine Valley	2 to 4 through lanes with centre turn lane	15-20	600	$5,000,000
Hamilton Road	**Highbury Avenue to River Run Terrace**	**2 to 4 through lanes**	**15-20**	**2,300**	**$13,200,000**
Commissioners Road West	**Wonderland Road to Cranbrook Road**	**2 to 4 through lanes with centre turn lane**	**15-20**	**1,000**	**$8,400,000**
Commissioners Road West	**Cranbrook Road to Springbank Drive**	**4 through lanes with centre turn lane**	**15-20**	**1,100**	**$7,700,000**
Byron Baseline Road	**Commissioners Road West to Colonel Talbot Road**	**3 to 4 through lanes with centre turn lane**	**15-20**	**500**	**$3,800,000**
Hamilton Road	**Adelaide Street to Highbury Avenue**	**Optimization**	**15-20**	**2,800**	**$9,300,000**
Highbury Avenue	**Fanshawe Park Road to Oxford Street**	**4 to 6 through lanes**	**15-20**	**4,100**	**$24,500,000**
Veterans Memorial Parkway Interchange	**Bradley Avenue**	**Interchange**	**20**	**n/a**	**$26,000,000**
Totals				**97,855**	**$827,000,000**

** Likely contribution from Ontario Government: (a) Wonderland Road Interchange: $15,000,000; (b) VMP Extension and Interchange: $10,000,000; (c) Highbury Avenue Interchange: $23,000,000*

Localized Intersection Improvements

Along with these major items, the TMP also recommends the undertaking of smaller and simpler improvements, studies, and programs that can alleviate localized traffic congestion in the short-term. These improvements include turning lanes at intersections, optimizing signal operations, extended sidewalks, intersection widening, pathways and bike lanes while costing relatively very little when spread out over 10 years.

The specific improvements are illustrated previously in Exhibit 27 and are summarized in Table 15, below. These improvements are based on recommendations from localized traffic studies with the exception of the Hyde Park Road and Oxford Street improvements which are based on a Class EA completed by the City. These studies have resulted in the need for intersection specific improvements to accommodate growth. Where Class EAs have not been completed, some of these improvements would fall under the Class EA process requiring the completion of Schedule B or Schedule C prior to implementation.

These projects are considered growth related projects and the City will need to consider these improvements within the overall development charges schedule of priorities for roadway improvements.

Need to Extend Sidewalk on Northeast Quadrant

Table 15. Identified Improvement Construction Projects (0-10 years)

Location	Improvement	Recommended Year	Total Cost
Hamilton Rd & Gore Rd	• Potential **roundabout**.	5-10	$1,800,000
Highbury Ave & Hamilton Rd	• Centre, two-way **left turn lane** on Highbury Ave from north of Hamilton Rd to north of Calvin St / Magee St. • Centre **raised median** on Hamilton Rd from Highbury Ave to Coventry Ln. • Additional **through lane** southbound on Highbury Ave on the west side, north of Hamilton Rd, merge with parallel lane, taper before Power St south of Hamilton Rd. • Modify southbound and northbound channelized right-turn lanes on Highbury Ave to **pedestrian-friendly channelized right turn lanes**.	0-5	$1,700,000
Hyde Park Rd & Oxford St	• Additional southbound **left turn lane** to create double left. • Additional eastbound **left turn lane** to create double left.	5-10	$1,900,000
Wonderland Rd, Wharncliffe Rd, & Exeter Rd	• Construction of **raised concrete median** within all three legs of the 6 points triangle. • Construction of northbound and southbound **left turn lanes** on Wonderland Rd at Wharncliffe Rd.	0-5	$6,000,000
Western Rd & Sarnia Rd	• Additional northbound **left turn lane** to create double left. • Additional eastbound **left turn lane** to create double left. • Additional westbound **through lane** (create 4 lane cross-section on east leg of intersection).	0-5	$2,400,000
Oxford St & Crumlin Side Rd	• **Intersection improvements** (NBL, SBL, & SBR). • Potential **roundabout** site.	5-10	$2,300,000
Colonel Talbot Rd & Southdale Rd W *Transportation Impact Assessment study completed 2007*	• Construction of westbound **right turn lane**. • Construction of 177 m long **raised concrete median** beginning at Colonel Talbot Rd stop line. • Construction of 60 m long **raised concrete median** beginning at Southdale Rd stop line.	5-10	$1,800,000
Beaverbrook Ave & Wonderland Rd N	• Construction of eastbound **right turn lane** on Beaverbrook Ave.	0-5	$1,700,000
Richmond St & Fanshawe Park Rd *Transportation Impact Assessment study completed 2012*	• Additional eastbound and westbound **through lanes** on Fanshawe Park Rd (widening to 6 lanes) – 2016. • Additional westbound **left turn lane** to create double left – 2016. • Construction of northbound pedestrian-friendly channelized **right turn lane** – 2016. • Additional northbound and southbound **through lanes** on Richmond St (widening to 6 lanes) – 2021. • Additional northbound **left turn lane** to create double left – 2021.	0-5	$1,900,000
Total			$21,500,000

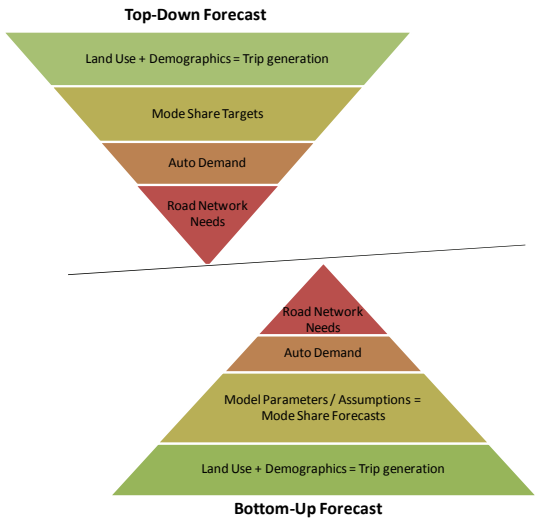
Forecasting Methodology

The need for road widening projects to address capacity needs was based on the transportation modelling work undertaken for the TMP. The modelling work, utilized a *bottom up, needs based* process combined with a *policy driven, top down* approach to determining ultimate road improvement needs. Using the automobile portion of the model, future capacity deficiencies were identified in the road network, and various road widening projects or new road corridors were tested to determine how well they address future demands.

Bottom Up Approach

A detailed transportation model was developed, incorporating proposed growth and allocation of growth, demographic forecasts, proposed transit infrastructure, and key transportation policies influencing mode choice (i.e. parking costs), as described in section 2.4 of this report.

The model was designed to forecast the number of trips expected to be made during peak periods in 2030, the mode of travel used (automobile driver, automobile passenger, transit, walk/cycle, other), and the automobile demand and transit ridership on various roadways / routes in the City. The model estimated the share of trips that would be attracted to transit, automobile, and other non-automobile modes of travel based on series of assumptions related to future operating costs, parking costs, and model performance results for the automobile and transit modes of travel.



For the roadway deficiency assessment, the afternoon (PM) peak hour was used, as this typically represents the worst case conditions for an overall travel demand perspective based on traffic data from the City and results of the 2009/2010 Household Travel Survey. The PM peak also captures the activity around retail centres, which have higher trip generation rates during the afternoon and evening periods.

Top Down, Policy Approach

The transportation model was also used to assess road improvement needs using a top down, policy driven approach, primarily as it relates to the share of trips made by the various modes of travel. In this case, the mode share targets established for this TMP (see section 2.3.2) were used to estimate the number of transit, automobile, and walk/cycling trips in 2030, and the resulting automobile demand was used to determine and assess road improvement needs.

This two part process yielded some very interesting results. First, it was found that without additional policy intervention, it may be difficult to meet all of the 2030 mode shares targets established in the TMP. For example, base forecasts from the model suggest that implementation of the BRT routes and local transit improvements will result in additional shifts to transit use in the City, and the forecast mode share is expected to hit 17-18% of total peak period trips, falling just short of the 20% target for 2030. Further refinement of the overall route structure and more refined testing of service improvements in other corridors may improve these results, and should be explored in subsequent studies.

However, modelling results have indicated that it may be difficult to achieve the target walk/cycle share of 15% by 2030, with the model projecting shares of 7-8% respectively[9]. The modeling also suggests that the improvements to transit may reduce automobile occupancy as automobile passengers shift to transit to take advantage of improved service. As a result of these two factors, the model is predicting a higher share of automobile driver trips than recommended in the policy based approach.

The road network improvements identified in Exhibit 27, are based on these bottom up forecasts and reflect the Scenario 2 land use (1% growth rate) and the estimated mode shares from the model. If the 20% transit mode share and 15% walk/cycle mode share target can be achieved for the Scenario 2 land use, some of the road improvements indentified in Exhibit 27 may be able to be deferred beyond 2030.

2030 Scenarios & Automobile Trips PM Peak Hour		
	Scenario 2 Model Forecast	**Scenario 3 Policy Based**
Population	429,500	502,710
Employment	228,265	256,010
Growth Rate	1% / year	2% / year
Automobile Share	73%	60%
Walk / Cycle Share	8%	15%
Transit Share	17%	20%
Internal Automobile Trips	73,786	73,279
External-London Work Automobile Trips*	8,582	9,711
External Through**	4,104	4,104
Total Automobile Demand	86,472	87,094
Difference	**0.7%**	

** External Residents working in London / Middlesex are higher in Scenario3 due to higher employment forecast*

*** External Through Trips – no origin or destination in London / Middlesex area (i.e. Highway 401 trips)*

The top down, policy based model runs found that if these policy mode share targets can be achieved (particularly the 60% automobile share target), the additional growth associated with the Scenario 3 land use (2% per year), can generally be accommodated with no additional road network improvements, as the overall automobile demand is

[9] *It is noted that the model is not able to directly model the effects of improving walking / cycling infrastructure so these estimates may be understated and do not reflect the planned improvements within the TMP*

within 0.7% of the Scenario 2 automobile demand used to determine road improvement needs.

These results stress the importance of land use and parking policy decisions to the achievement of the mode share results, and in turn, the reduction in road network investment needs over the longer term.

Base model runs have assumed no significant change to the current parking policies in the City, pending ongoing work related to the *Downtown Master Plan* and ongoing revitalization objectives. Increasing the cost of all-day parking in the downtown would certainly influence the mode choice for work trips to and from the downtown during peak periods, although it is recognized that there may be implications in terms of attracting employment growth into the downtown. A more aggressive policy that looks to implement paid parking beyond the downtown, say to other transit oriented nodes may offset some of this concern and boost transit ridership in the process.

Similarly, the results for the walk/cycle mode shares may be an indication that additional focus on integrating land uses within planned development areas is needed within the context of the ongoing *Official Plan* review; *ReThink London*. The assumed mix of population and employment by traffic zone developed for the TMP may not provide enough of a mix of population growth and employment growth within development areas to promote the short trips that are most viable for walking and cycling modes to be competitive. This also suggests increased emphasis on providing the enhanced active transportation infrastructure recommended in the TMP to encourage the mode shifts to occur.

Sensitivity Analysis Findings

Sensitivity analysis, undertaken to define what further road network improvements would be needed to support a higher rate of growth (2% annually vs. 1%), have found that the proposed road network can accommodate the high growth forecasts if the target policy mode shares can be achieved. This will require a co-ordinated focus on implementing the complimentary policies and land use decisions to foster the shift in travel behaviours envisioned in this TMP.

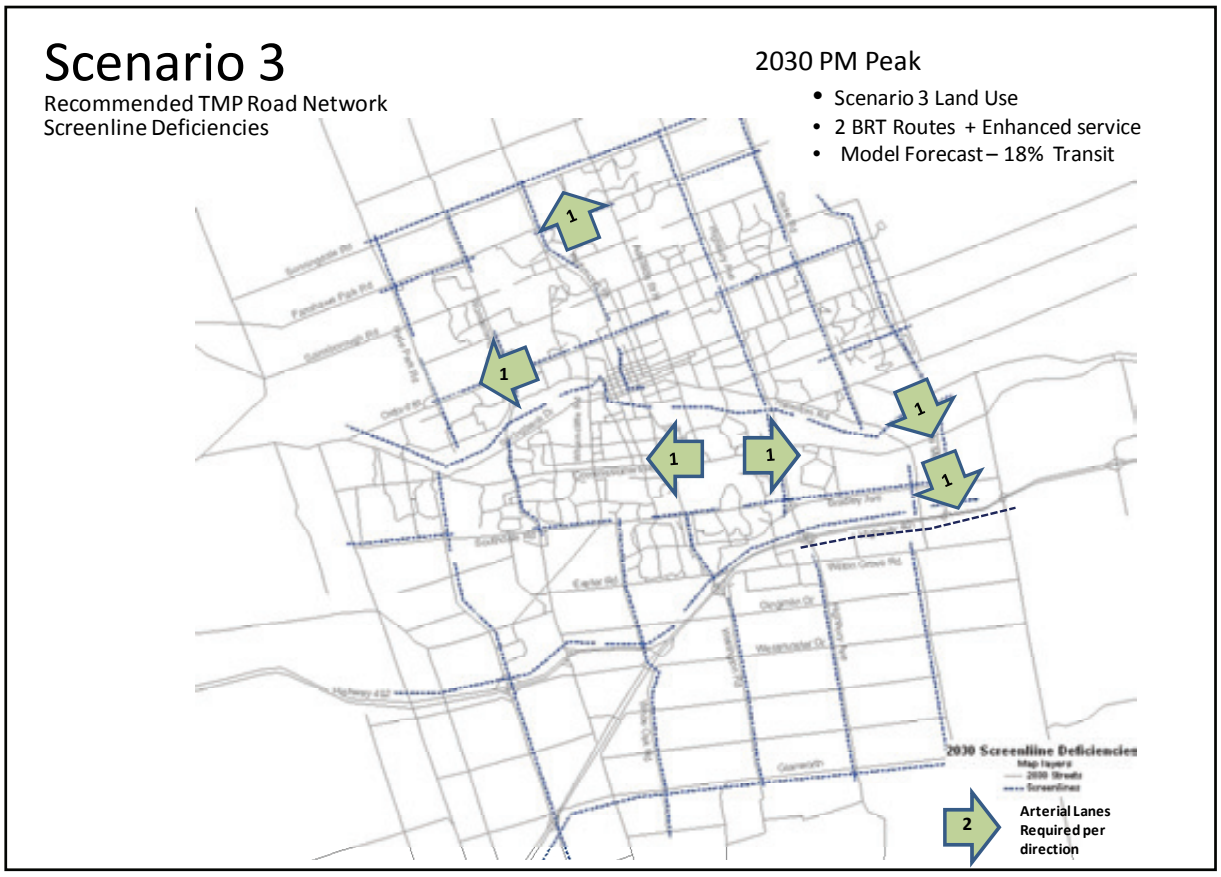
St. George Street, Toronto
(Photo: Transport Canada)

Careful monitoring and review through subsequent TMP updates will be required to determine how the City is progressing towards the growth and mode share targets, with a view to reviewing and updating the road improvement needs. If growth continues at

1% per year, but the City is successful in achieving the mode share targets outlined in this plan, some road improvements identified in this TMP could be deferred until beyond 2030. In the event that the higher growth rate is achieved, combined with lower than planned mode shares, additional road improvements may be required beyond those identified in the TMP.

Model runs for the Scenario 3 land use, showed little change in the estimated mode shares compared to Scenario 2, and as a result the automobile demands could be up to 23% higher if the policy mode split targets are not realized. Even with the TMP recommended road network improvements in place, the Scenario 3 growth would require the equivalent of six additional lanes across the major screenlines in the City if the target mode shares are not achieved, as illustrated in Exhibit 28.

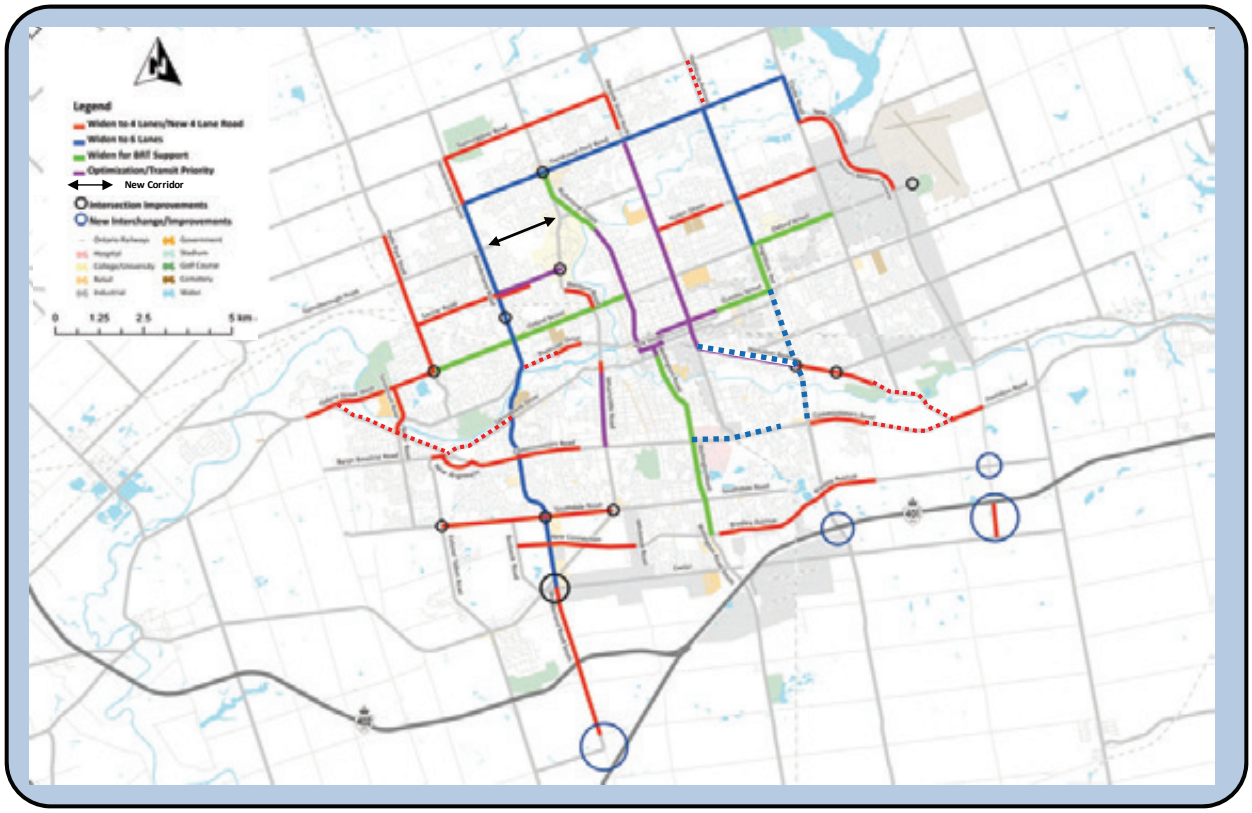
Exhibit 28. Additional Screenline Lane Requirements – Scenario 3



An assessment of additional potential road network widening needs for this higher growth scenario was completed based on the screenline performance and the capacity deficiencies on major arterial links. Exhibit 29 illustrates the additional road network improvements (shown in dashed lines) that would be required in event that the policy

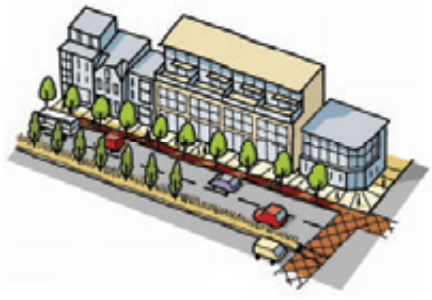
mode share targets are not achieved, and the City's growth achieves the 2% annual growth rate in Scenario 3.

Exhibit 29. Additional Potential Road Improvements – Scenario 3



Moving Towards Complete Streets

Another strategic aspect of this TMP relates to supporting the concept of "complete streets". This concept involves more fairly apportioned road rights-of-way to all users (including pedestrians and cyclists) so as to maximize the person-carrying capability of the roadway (i.e. people movement rather than vehicle movement). A "complete street" is sometimes also referred to as a liveable corridor, which:



Sample Design of a Liveable Corridor

- Hosts one or more transit routes;
- Has market demand to attract supportive levels of mixed-use development;
- Has land available for different types of development;

- Is pedestrian and cyclist friendly, with easy walking and cycling paths and facilities; and
- Exhibits potential for an attractive public gathering place, such as open green space.

This concept should be the accepted policy approach to pursuing all roadway improvements within the City (for more details, refer to **Appendix Q** "Proposed Policies for the new *Official Plan*").

Special Analysis for Veterans Memorial Parkway / Highway 401 Area

Potential industrial growth to the south of Highway 401 in the area bounded by Highbury Avenue, Wilton Grove Road, and Westchester Bourne Road as shown in Exhibit 30, below, has been proposed to accommodate a large industrial development. For the purpose of the TMP, a growth of 2,370 employees has been assumed to be located in the zones immediate south of Highway 401 by 2030 under the Scenario 2 land use.

Exhibit 30. Employment Growth South of Highway 401

For 2030 conditions this additional growth is expected to generate approximately 820 outbound automobile trips in the PM peak hour, in additional to the additional truck traffic that would be generated by the industrial nature of this development area. Highbury Avenue (south of Highway 401) is forecasted to be at or over capacity in both directions, although the screenline itself (which includes Westchester Bourne Road) has some reserve capacity remaining. The assumed amount of industrial growth applied to these zones for 2030 has not resulted in a screenline capacity deficiency, although

upon full build out of the lands it is anticipated that the screenline would reach capacity during peak periods as well.

Given the high truck percentages on Highbury Avenue, and the grades approaching the interchange, the section of Highbury Avenue south of Highway 401, will operate at capacity earlier than indicated in the forecasts.

The high turn volumes from Highbury Avenue to Wilton Grove Road will also result in additional capacity issues by 2030, which may impact the operation of the Highbury Avenue interchange at Highway 401. A new road link is recommended to extend the existing Veterans Memorial Parkway south of Highway 401 to Wilton Grove Road, to serve these new development lands (details provided in Table 16 below).

Table 16. Screenline Analysis South of Highway 401

South of Highway 401	Truck %	Future Forecast 2030 – PM Peak					
		Adjusted Volume		Capacity		V/C Ratio	
		NB	SB	NB	SB	NB	SB
Highbury Ave	11.4 %	1244	870	900	900	1.38	0.97
Old Victoria Rd	2.0 %	399	215	750	750	0.53	0.29
Westchester Bourne	7.0 %	461	519	900	900	0.51	0.58
Screenline Total		**2104**	**1604**	**2550**	**2550**	**0.83**	**0.63**

An Approach to Improving Road Safety

Currently, the City is conducting a *Road Safety Strategy* to develop new and/or enhanced approaches to reducing the number and severity of motor vehicle collisions for the City and Middlesex County. For many years, the City has been implementing an operational review program named TOPS (*Traffic Operations Public Service*). Through TOPS, City staff investigate residents' complaints on issues such as requests for installation of traffic signs, traffic signals, or requests for traffic calming.

The City also has a program in effect named PEEP (*Public Education and Enforcement Program*), which is an educational program for local drivers and is implemented by the City through radar speed posting boards.

York Region has a multi-disciplinary approach to road safety known as the "Save a Life" program.

This program brings together engineering, enforcement, and education specialists to develop strategies to improve road safety at the local and regional level.

Traditional road safety management programs have been very effective in identifying and treating hazardous locations. However, this reactive approach is expensive and requires a significant collision data history before any action can be taken. Such programs are, of course, too late for those involved in the collisions that generated the data. Several research studies have argued that the "reactive safety management" program is perhaps not the best method to address road safety effectively.

To address this problem, the "safety planning" process is introduced to complement the traditional or reactive methods. Safety planning is a proactive approach that incorporates road safety at the planning stage.

The safety planning strategy addresses a range of activities, including:

- Programming safety improvements to address roadway "hotspots" or collision-prone locations;
- Introducing multi-disciplinary programs (i.e. integrating engineering, enforcement, and educational activities);
- Reflecting road safety considerations as a key decision-making parameter in evaluating projects and programming;
- Expenditures; and
- Establishing inherently safe transportation networks or safety conscious planning.

At present, the City has a safety assessment procedure which includes the four core processes, i.e. identification of problem location (network screening), diagnosing the safety problem, selection and implementation of countermeasures, and monitoring. There is an opportunity to enhance this program through implementation of:

- A road safety management program for improved problem identification and prioritization at a network level;
- An integrated road infrastructure management system, building on their current systems to better link collision data, volume data, and road characteristics to allow for more detailed analysis of collision causes;
- A program for safety-based planning, which could include safety impact studies to assess safety implications of proposed developments requiring road improvements, and a multi-disciplinary safety review team integrating engineering, enforcement, and educational expertise; and
- A more formal approach to consideration of safety during the design process using a road safety audit process at the early stages of design for capital projects.

Details on the safety programs currently in place in the City and recommendations for enhancements can be found in **Appendix M**.

4. Implementing the New Mobility Plan

4.1 Life Cycle Costs and Asset Management

A large part of the current and past work involving the City of London (City) *Transportation Master Plans* (TMP) has dealt with the capacity needs of the future road system. Most of the focus has been spent documenting growth and changes in traffic modes as our society's demographics change over time, related system expansion within a growing city, and changing network needs. Equally as important, is the condition of the existing system, the requirements to maintain future systems over time, the system's future cost, and user (public) expectation and satisfaction.

The funneling of more trips from the network into strategic corridors on buses will increase wear and tear on those corridors. Heavy loading from buses will increase deterioration on specific Bus Rapid Transit (BRT) lanes. Maintenance of those lanes will require that the City utilize the best maintenance procedures available and follow asset management rationales while keeping an eye on user costs associated with downtime of the BRT system.

The basic principles of asset management entail answering five basic questions:

1. *What do we own?*
2. *What is it worth?*
3. *What do I need to do to maintain it at a certain performance level?*
4. *What is the cost of maintenance now and in the future?*
5. *What are my competing interests, and do I have enough money to meet today's and future funding needs while maintaining a performance level?*

The City is currently reviewing its existing asset management practices in a parallel process to the TMP as a means of combining several existing programs into one readily accessible tool. **Appendix J** documents the current asset management system, details some of the challenges the City will face in the future, and provides direction as to factors the City should review during the realignment of its asset management systems. Key recommendations include:

- Preventative maintenance should be theoretically used as much as possible when Pavement Quality Index (PQI) 60 is reached. However, holding strategies should be employed to keep pavements for deteriorating below PQI 20. The two principles behind preventative maintenance and holding strategies are diametrically opposite.

  - When PQI 20 is reached and holding strategies deployed, caution should be practiced to ensure the project scope does not expand through project creep to include throw away costs.
- Priority should be given to parts of the network that are more strategically visible and used:
  - Downtown Arterials
  - Gateway Arterials
  - Arterials with bridge crossings
  - Future BRT routes
- The public expects that implementation of the TMP will improve connectivity, mobility, and flow on the City's integrated transportation networks, increasing safety and reducing travel time. The reliability of consistent travel times is a function of the management of the network.
  - All system improvements and maintenance activities on major arterial roads should have consideration as to user costs, including consideration for project timing, transit routes and stops, signage strategies, temporary coverings for excavations, work methodology, and use of night work.
  - The City should ensure coordination of work to reduce multiple impacts of several projects and ensure closed lanes are reopened when the work schedule permits.
  - Users of the system should be impeded as little as possible. Education for crews and City staff planning maintenance work is a vital component of meeting user perceptions and expectations.
- Staff should be encouraged to try new emergent technologies that can provide benefits to affordability, user impacts, and technical needs on a trial basis.
- Senior levels of government are stressing that future funding will be linked to the creation and maintenance of a good quality asset management system. Proponent municipalities will be expected to demonstrate an understanding and a commitment to the concepts of asset management.

4.2 Financing Infrastructure, Transit Service, and Transportation Demand Management Programs

In the preparation of the TMP, the City sets an integrated and sustainable transportation strategy for the next 20 years that will lead to the transportation vision for the next 50 years. This vision incorporates the assessment of many potential alternatives that were screened using criteria for environment, economy, and technical considerations, albeit at a macro (high) order of magnitude.

Specific individual Municipal Class Environmental Assessments (Class EAs) will be prepared for road segments and BRT corridors to determine opportunities and constraints, needs, impacts, costs, and required mitigation measures.

Detailed design work will also be required to specify the final design choices and prepare final cost estimates. The City and London Transit Commission (LTC) will have significant choices as to specific standards for the construction and operation of new assets, such as BRT lanes, BRT stations (stops), queue–jump lanes, types of buses, signage, branding, and frequency of service of both BRT and other connecting transit routes. Table 17 summarizes the 20 year capital cost estimates (in 2012$) to implement the key recommendations of the TMP.

Table 17. 20 Year Capital Costs of Transportation Master Plan

Transportation Element	20 Year Capital Costs *(millions of $)*	
	1% Growth	2% Growth
BRT infrastructure (roads, stations, signs, miscellaneous)	378	491
Active transportation and associated parking	44 (20 + 24)	56 (24 + 32)
Municipal roads other than BRT	827	1,092
Intersection improvements and minor road widening	60	60
Total Capital Costs	**1,309**	**1,699**

Sensitivity analyses were undertaken to define what further road network improvements would be needed to support a higher rate of growth (2% annually vs. 1%). These analyses have found that the proposed road network can accommodate the high growth forecasts if the target policy mode shares can be achieved.

In the event that the higher growth rate is achieved, combined with lower than planned mode shares, additional road improvements may be required beyond those identified in the TMP. Base model runs for the Scenario 3 land use, showed little change in the estimated mode shares compared to Scenario 2 and additional policy intervention may be required to achieve these targets, as discussed previously in this report. As a result the automobile demands could be up to 23% higher if the policy mode split targets are not realized.

Maintaining the System

Operation and maintenance costs for roadways are generally dependent upon maintenance quality standards, age, annual average daily traffic, and localized construction quality issues or material issues. The TMP provides estimates in the order

of magnitude of expected operation and maintenance costs, considering general direction as to procedures and activities that may be reviewed later.

Similarly, operational costs for transit are highly dependent on the hours of service provided, fleet related replacement costs, cost of fuel, other operational costs, and actual revenue generated from ridership and other sources.

Table 18 summarizes the 2030 operation and maintenance cost estimates (expressed in 2012$) upon full implementation of the key recommendations of the TMP.

Table 18. 2030 Operation and Maintenance Costs

Municipal Road and/or Transit Element	2030 O&M Costs *(millions of $)*	
	1% Growth *Transit R/C = 52%*	2% Growth *Transit R/C = 61%*
Roads	35.70	36.60
Transit – Gross	*29.70*	*37.10*
Transit – Net*	14.30	14.50
Active transportation, transportation demand management, and parking	7.25	7.25
Total O&M Cost – Net	**57.25**	**58.35**

**Costs tracked are net costs in order to remove any contributions by senior government agencies.*

The Need for Funding Assistance

There is significant cost associated with a fully implemented BRT and it is likely only possible to build the whole system if senior levels of government match funding that has been extended to other municipalities. Template funding mechanisms from Kitchener/Waterloo or Vaughan suggest that a one third share could be allocated to the province, the federal government, and the municipality.

To position itself in a proactive manner, the City and LTC should prepare a business case and promotional materials in order to successfully present the value of the project and spin off benefits that may be accrued through to the project's completion.

The business case will need to confirm the financial feasibility of the BRT strategy developed as part of the TMP, and will provide the broader economic rationale for the City to prioritize this initiative as an investment in improved mobility and related economic, social, and environmental outcomes. This will provide the rationale for a sustained and ongoing commitment by Council to the full range of initiatives which must be pursued to realize the BRT strategy.

The business case will also explain why the residents and businesses in the City should be willing to fund the BRT investment both through the fare box (as transit users) and through their contribution to property taxes, development charges, and other revenue sources available to the City.

The business case must first and foremost meet the requirements to secure capital funding commitments from both the federal and provincial governments. It is clear that the City cannot afford this initiative on its own. In our experience, officials in both levels of government will look first for a benefit-cost analysis as the tool of choice for justifying the BRT investment. This means estimating the additional monetized benefits and costs under the BRT strategy as compared to a business-as-usual or reference case over the lifecycle of the project.

The business case for senior level funding should demonstrate that the project will make a significant net contribution to the City and southwestern Ontario's growth prospects and economic competitiveness. The senior levels of government will want to know that the City and key stakeholders in the region, including transit users and businesses, are committed to making the investment happen.

The economic backdrop for the City and southwestern Ontario as a whole has been very challenging in recent years with the recent recession. In this challenging economic environment, it is essential that the business case for the BRT strategy demonstrates how it will improve the growth prospects and competitiveness of the City and southwestern Ontario.

Demonstrating that the core benefits exceed the costs represents a productivity gain which would add to the competitiveness of the City and the southwestern region of Ontario. Capturing and expressing these broader economic benefits will be key to attracting the attention and support of senior levels of government.

The context for provincial funding of municipal transportation projects has evolved considerably since the government of Ontario made significant capital funding commitments to two municipal projects which can be considered important reference points for the City's BRT strategy.

In the case of the Ottawa Light Rail Transit (LRT), the provincial government committed $600 million in capital funding for the $2.1 billion project in December 2009. In June 2010, the provincial government committed $300 million in capital funding for the Waterloo LRT, the capital cost for which is estimated at $818 million.

These commitments were made in the wake of the financial crisis of 2008-09, when federal and provincial governments implemented multiple infrastructure stimulus programs. While neither of these funding commitments were part of the short-term stimulus spending, both were made in an environment conducive to senior government support for infrastructure spending in general and transit infrastructure in particular.

However, the provincial budget balance has deteriorated substantially since 2010, with the result that the provincial government is now taking corrective fiscal measures to restrain public sector spending. In this constrained fiscal environment, the question arises as to how capital funding requests are viewed by the transportation economists and public finance officials who review the projects and advise senior government officials.

Ottawa Light Rail Transit

The results of the original business case for the Ottawa Light Rail Transit published in March 2010 suggested that the project could not be justified on a strict cost-benefit basis.

However, the original business case did not take into account of the impact of the light rail transit in terms of travel time and cost savings for road users (as a result of traffic diverted to the Light Rail Transit).

A revised business case taking the road impacts into account showed that the transportation and environmental benefits were just sufficient to cover the capital and operating costs.

Sources:
MKI Business Case: Downtown Ottawa Transit Tunnel Project, March 2010;
MKI Ottawa Light Rail Transit Updated Business Case, June 2011

The Ottawa LRT is an example of a business case with solid fundamentals, because it is built on the success of the Ottawa Bus Rapid Transitway – Canada's first BRT service. This is a network that has reached capacity and is ripe for an investment that takes the service to a higher-order transit solution.

The Waterloo LRT business case is unlikely to be viewed in the same way by transport economists, because the project does not break even when viewed from a public sector perspective, strictly on the basis of the incremental transportation user benefits and environmental benefits. Clearly, this would be a more challenging business case to justify in the current fiscal environment.

Waterloo, however, had the advantage of being within the province's *Places to Grow* growth plan for the greater golden horseshoe area. In addition to which, the municipality had already implemented strong policy measures (within their regional growth management strategy and regional *Official Plan*) to curb urban sprawl and promote intensification within their "central transit corridor". Many policy measures related to intensification and station area densities developed in Waterloo were consistent with the ultimate policies that were released in *Places to Grow*.

Precedent has shown that a project which does not meet the strict cost-benefit test would need to demonstrate other compelling attributes to secure appropriate funding. Providing strong land use policy linkage to broader provincial growth management

objectives is an important consideration the province looks at in assessing the viability and merit of a transit project. The City is well positioned to make this case to the province as the land use policies within the TMP are aligned with the policy directions in the award-winning *Places to Grow* plan.

From a programmatic perspective, federal funding for transit capital projects is currently in transition. The infrastructure funding programs put in place by the last government – notably the $8.8 billion *Building Canada Fund* and the $4.4 billion *Canada Strategic Infrastructure Fund* – have already been committed.

However, it appears that the government is actively considering the next wave of infrastructure funding and the City's BRT project could be well positioned to secure funding with an effective business case.

Ottawa put together high quality LRT renderings for its business case

Another potential source of federal funding for the City's BRT is the $1.2 billion *Private-Public Partnership* (PPP) *Canada Fund*, which could provide up to 25% of the eligible costs of the project. This could be a valuable source of additional funding if the City is willing to entertain procuring the BRT project as a design-build-operate-maintain program delivered by a single concessionaire. This would not be an entirely new precedent for Canada, since the first phase of York VIVA was delivered under a similar procurement strategy. However, an analysis of procurement options (i.e. PPP vs. conventional delivery) would need to be preceded by a business case justification for the project.

4.3 The Transformation Strategy - Flexibility for Stronger Growth and Continual Advances in Transit Service

In section 2.4, the trip generation forecasts for 2030 demonstrated that achieving the Scenario 3 land use target could increase overall peak period travel demand in the City by up to 25%, compared to the base Scenario 2 land use. The road network assessment work summarized in Exhibit 22 and Table 14 noted that the road improvement needs established as part of the TMP can accommodate this higher level of growth, provided that the mode share targets are met. This provides the flexibility for

the City to pursue the stronger growth objectives of Council, while having a transportation plan that is positioned to accommodate this growth.

That being said, one of the keys to the success of this transformation strategy is a continued and consistent focus on investing in the infrastructure, implementing the policies, and monitoring the performance in achieving these targets.

Carpooling is becoming a common occurrence in major urban centres

A continual advancement in the provision of transit service in the community is a critical component of establishing the credibility of the plan and demonstrating the commitment of the City towards implementation. To that extent, the City in consultation with LTC should begin the process of implementing the initial transit service improvements and transit priority initiatives in the proposed BRT corridor as soon as possible to start the process of building ridership on the critical routes.

The implementation of BRT services along two major corridors will likely be phased-in over a period of time allowing the growth in the service to relate to the growth in the ridership in the corridors. Each of the implementation phases needs to consider several components of BRT service including frequencies of service, types and branding of vehicles, new technologies for the vehicles and right-of-way priorities, fares and fare technologies, and corridor infrastructure requirements, including enhanced pedestrian and cycling provisions within the context of creating “green streets”.

I-Express Fast Facts:

- *37 km route, 13 stops*
- *Transit priority at 17 intersections*
- *15 minute service during peaks*
- *30 minute service off-peak*
- *8,000 daily riders (2009)*
- *15-19% of riders shifted from automobile mode*
- *85% on time arrival vs. 60% for other Grand River Transit routes*
- *500-1,000 daily users of web based trip planner*
- *52% of riders access on foot, 39% transfer from other routes, 9% via bike/park-n-ride*
- *Real-time information at stops, mobile alerts*
- *$9.2 million implementation cost*

Higher overall quality service, to start building ridership and immediately increase transit modal share will be provided by the initial stages of:

- Express branded buses along the planned BRT corridors;
- Shared lanes with high occupancy vehicles (HOV);
- Improved use of technologies such as transit signal priority and automotive vehicle location; and
- A “green street” right-of-way.

The Region of Waterloo implemented their I-Express service in their future "central transit corridor" in 2005, well in advance of completing the necessary studies for implementation of their rapid transit vision. Supported by federal funding, through the urban transportation showcase program, the purpose of this showcase project was "to shift modal share from single-occupant motor vehicle use to transit use, thereby reducing greenhouse gas emissions, improving air quality, enhancing safety, reducing operating costs, and preparing the Region's population for higher-order transit".

HOV lanes shared by carpools and busses is a great transition to kick-start the City's BRT

The I-Express service featured more frequent, high quality, limited stop service along the route within the central transit corridor. The 13 stations along the route were chosen to attract riders from three segments of the population including post-secondary students, downtown employees, and retail / service customers.

The service was implemented with standard *Grand River Transit* buses, although these where distinguished through distinct I-Express branding. Advanced transit technologies were provided including transit signal priority, automatic vehicle location systems (for schedule adherence and real-time schedule reporting), and automatic passenger counting systems. The LTC already has much of this technology in use today and is ready to move forward with implementation of express bus services as a first start towards implementation.

Amenities such as web based trip planning services, real-time schedule information at stations and to mobile devices, and enhanced shelters, seating, and lighting and pedestrian / cyclist facilities at stations were provided to improve the customer experience and encourage modal integration.

The initial cost of the I-Express program was $9.2 million and after four years ridership on the route averaged 8,000 passengers per day (800-900 in the peak periods), with 15-19% of these riders shifting from the automobile mode of travel.

4.4 Phasing Strategy and Medium-Term (2020) Needs

In Table 14, the list of road improvement projects recommended in the TMP were categorized by implementation time horizon, with 0-5, 5-10, 10-15, and 15-20 year implementation priorities identified. Exhibit 31 and Exhibit 32 illustrate the road improvement projects to be implemented between 2012 and 2020 and between 2021 and 2030, respectively.

Capital cost summaries for the entire recommended program, including road works, BRT capital costs, investments in active transportation, parking infrastructure, new bus purchases, and transit priority treatments / intersection improvements are summarized in Table 19 and Table 20.

In the 2012 - 2020 horizon, the total capital cost estimate (in 2012$) is close to $650 million, or just over $65 million per year. For the 2021 - 2030 horizon, the required investment (in 2012$) is $426 million, or just over $42 million per year. The assumed share of BRT funding to come from the provincial and federal government is over and above these cost summaries, with an added $252 million required within the 2012 - 2020 horizon if the full BRT is to be opened by 2020 as outlined in the TMP.

Table 19. 2012 – 2020 Capital Costs (0-5 and 5-10 horizons)

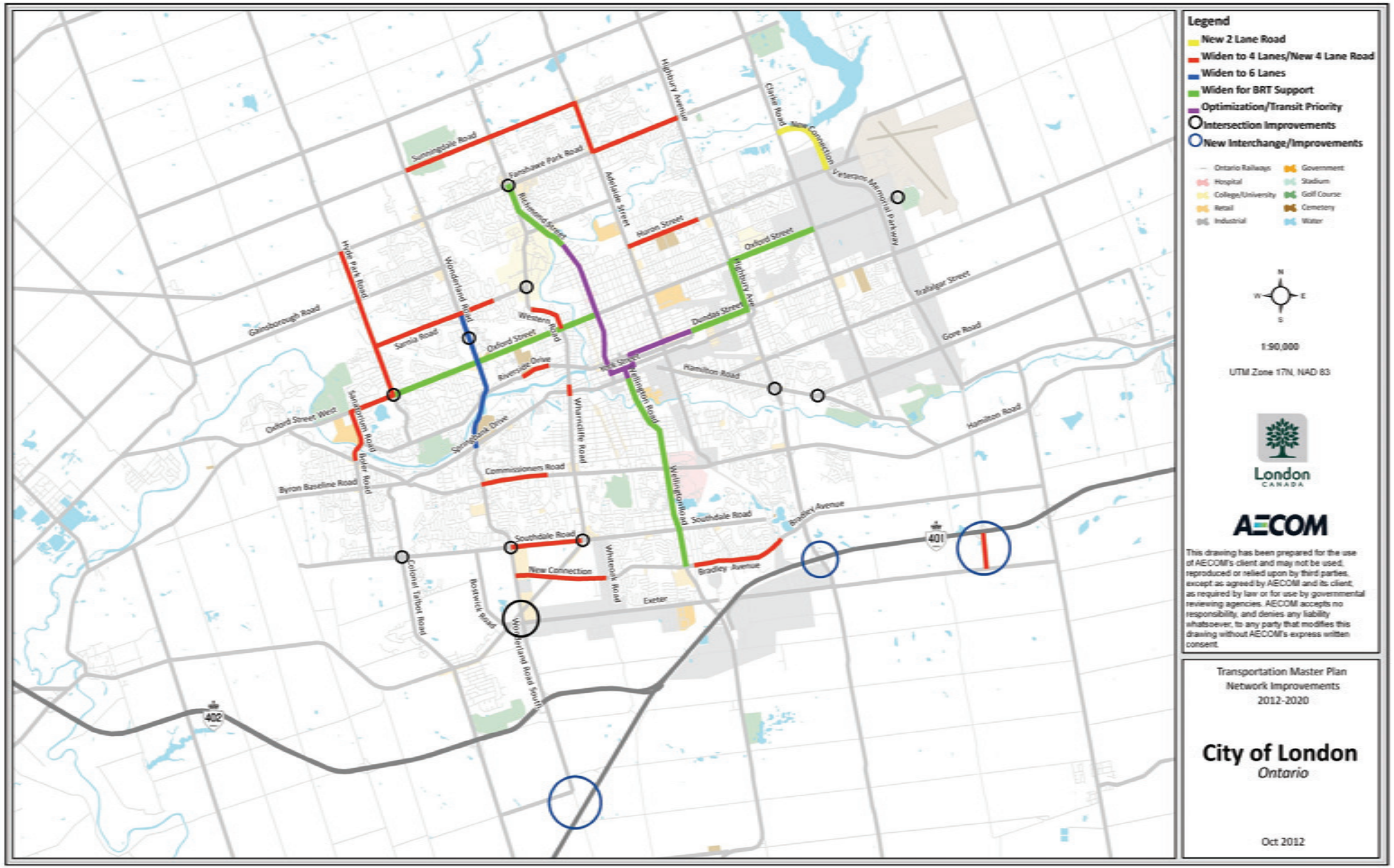
2012-2020	Capital Cost Summary *(in millions of 2012$)*
Bus rapid transit capital	$126,000 *(City share)*
New buses (non bus rapid transit)	$12,000
Active transportation + parking	$20,000
Road widening	$436,800
Transit priority and intersections	$60,000
Subtotal	$654,800
Annual	$65,480 / yr

Table 20. 2021 – 2030 Capital Costs (10-15 and 15-20 horizons)

2021-2030	Capital Cost Summary *(in millions of 2012$)*
New buses (non bus rapid transit)	$12,000
Active transportation + parking	$24,000
Road widening	$390,200
Subtotal	$426,200
Annual	$42,620 / yr
Total transportation capital *(City share)*	$1,081,000 including $24 M in buses
Bus rapid transit share from senior government	$252,000

.

Exhibit 31. 2012 – 2020 Road Network Improvements



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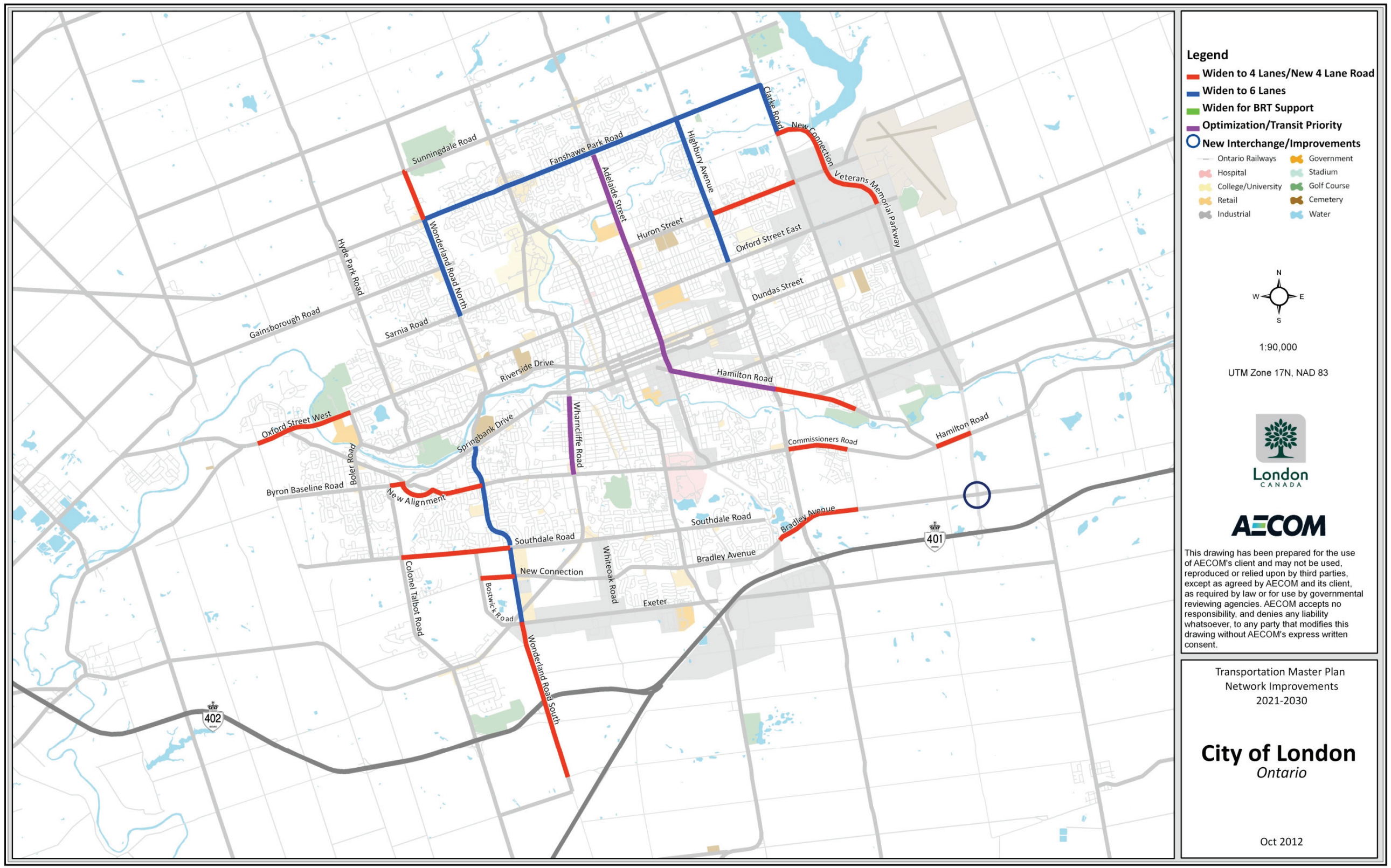
Phasing Strategy and Medium-Term (2020) Needs

Exhibit 32. 2021 – 2030 Road Network Improvements



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4.5 Short-Term Priorities and Immediate Action Plan

There is much work to be done over the next couple of years to move forward aggressively on the BRT initiative, to approach senior levels of government as prospective funding partners and address their requirements, and to more generally begin the lengthy process to transform transportation in the City.

To kick-start TMP implementation, an immediate action plan for Council has been developed – comprised of the 12 points listed in Table 21.

Table 21. Immediate Action Plan for Council

Action Plan Point	Timing	Rationale
1. Cement *Transportation Master Plan* Foundations	2012 – 2013	A revised growth strategy, *Centres and Corridors Urban Structure Plan*, *Downtown Master Plan*, and new *Official Plan* are all cornerstones for the *Transportation Master Plan*. All four initiatives are well underway but need to be completed expeditiously.
2. Develop Proposal for Provincial and Federal Funding of Bus Rapid Transit	2012 – 2013	A compelling business case will need to be developed to secure funding commitments, so that the net cost to Londoners is affordable.
3. Pursue Revisions to *Development Charges Act*	2013	The ability to secure additional development charges for transit, active transportation, and transportation demand management initiatives will also help to minimize costs to City taxpayers.
4. Initiate Class Environmental Assessments for Bus Rapid Transit Corridors	2013 – 2014	Securing environmental approvals for the bus rapid transit network is the next step in the implementation process. Through Class Environmental Assessments route alignments, station locations, terminal requirements, roadway configurations, and property needs will be finalized. Transit vehicle requirements will also be determined and cost estimates refined.
5. Initiate Corridor Land Use Planning Studies	2013 – 2014	In coordination with the Class Environmental Assessments, corridor land use planning studies will identify specific opportunities and constraints for intensification and develop guidelines for transit-oriented development.
6. Refine and Implement Short-Term Transit Improvement Plan	2012 – 2014	A short-term transit plan for the bus rapid transit corridors is needed so that service improvements can be realized quickly in order to start building ridership and increasing transit modal share.
7. Undertake Transit Route Restructuring Study	2014	The future bus rapid transit network will become the backbone of the London Transit Commission network. A route restructuring study will be needed to ensure that the effectiveness of the bus rapid transit network is maximized from a total London Transit Commission system perspective.

Action Plan Point	Timing	Rationale
8. Implement On-Street Priority Cycling Routes	2013 – 2014	To bring the City's on-street cycling routes up to par with its off-street trail network, four continuous on-street cycling routes have been identified for early implementation.
9. Finalize a Downtown Parking Strategy	2014	Short and long-term parking strategies for the downtown area should incorporate pricing structures to support transit and make it easier for more people to come downtown.
10. Identify Opportunities for Park-and-Ride Facilities	2014	Park-and-ride facilities at the extremities of the bus rapid transit lines will boost ridership and reduce automobile usage. Due to the need for property acquisition or negotiation of shared parking use with others such as shopping mall owners, additional time will be required. A park-and-ride plan in the near term will ensure that such facilities can be put in place as quickly as possible.
11. Finalize and Implement a Short-Term Transportation Demand Management Plan	2012 – 2014	Various initiatives have been recommended for short-term implementation. These need to be detailed in the context of existing programs and consolidated into a cohesive program.
12. Develop a Communications Plan to Build Community Support	2013	A level of momentum has been created through the *Transportation Master Plan* process, but this needs to be continued and expanded to ensure *Transportation Master Plan* success.

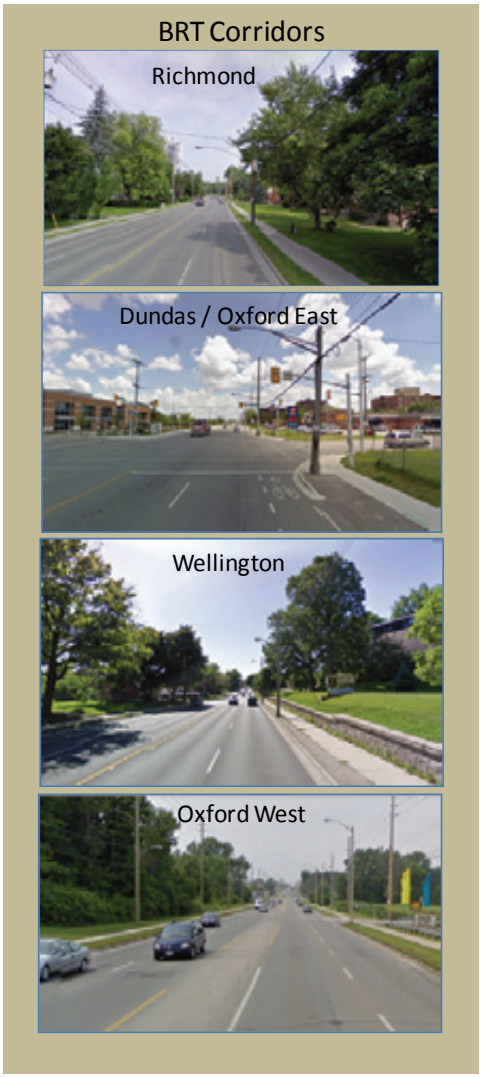
4.5.1 Cement Transportation Master Plan Foundations

The completion of the TMP is not the end of the planning process for land use and transportation in the community. The first action item recommended for immediate implementation is actually a series of recommendations aimed at updating other City policy documents to "cement the TMP foundations".

The revised land use direction described in the TMP will need additional work to refine it to suit the nodes and corridors where additional growth will be directed. The City is currently embarking on their *Official Plan* update, entitled *ReThink London*, which among other objectives will incorporate the TMP land use and transportation policies into the *Official Plan*. This not only confirms the City's commitment to the TMP recommendations, but gives the land use and transportation policies legal force under the Planning Act, so that the City can ensure individual development applications and area growth plans are consistent with the plan directions.

An updated *Centres and Corridors Urban Structure Plan*, and completion of the *Downtown Master Plan* will take the TMP recommendations and refine them or build upon them as appropriate to allow for implementation within land use and transportation planning projects across the City.

All of these initiatives are well underway but need to be completed expeditiously.



4.5.2 Develop Proposal for Provincial and Federal Funding of Bus Rapid Transit

The LTC, with support from the City, are proactively preparing a business case and promotional materials, in order to successfully present the value of the project and spin off benefits that may be accrued through to the project's completion. This is a key step required to seek funding from the provincial and federal government.

The business case will need to confirm the financial feasibility of the BRT strategy developed as part of the TMP, and will provide the broader economic rationale for the City to prioritize this initiative as an investment in improved mobility and related economic, social, and environmental outcomes. This will provide the rationale for a sustained and ongoing commitment by Council to the full range of initiatives which must be pursued to realize the BRT strategy.

4.5.3 Pursue Revisions to Development Charges Act

The ability to secure additional development charges for transit, active transportation, and Transportation Demand Management (TDM) initiatives will help to minimize costs to City taxpayers. Current rules under the *Development Charges Act* limit the amount of funding that the development industry has to contribute to new initiatives or strategies where a municipality is improving service levels beyond what they have traditionally provided. Under the current rules, it doesn't matter that this increase in service may offset some of the costs needed for road improvements, and as a result the development industry's contributions are in essence capped at the level that the

municipality has funded these types of services in the past, and a 10% reduction in applicable costs are applied as well.

The Ontario government adopted amendments to the *Development Charges Act* to revise how York Region and the City of Toronto can calculate development charges for the Spadina subway extension project.

The new amendments allow the two municipalities to use the planned LOS for the forthcoming 10 years as the benchmark for calculating development charges for the subway extension. The amendments also exempt the project from the 10% discount restrictions that restrict municipalities to collecting Development charges for a maximum of 90% of the capital costs of transit projects. Under the amendment, York Region and the City of Toronto will be allowed to recover 100% of the growth related costs of the subway extension. At a minimum, the same rules should be made available to other municipalities contemplating new "higher order" transit services in their communities.

4.5.4 Initiate Class Environmental Assessments for Bus Rapid Transit Corridors

Securing environmental approvals for the BRT network is the next step in the implementation process. Through Class EAs the preferred route, alignments, station locations, terminal requirements, roadway configurations, and property needs will be finalized. Transit vehicle requirements and any specialized facilities for maintaining and servicing the BRT vehicles can also be determined and cost estimates refined.

This TMP study followed phases 1 and 2 of the Class EA process as set out in the *Municipal Engineers Association Municipal Class EA* document (October 2000, as amended in 2007 and 2011).

Class EAs for the north-south and east-west corridors will be planned following the approval of the TMP under the *Environmental Assessment Act of Ontario*. Depending on the nature of the corridors, the project may qualify to utilize the new Transit Project Assessment Process (TPAP) which was initiated to improve the efficiency and speed to plan and design new transit projects.

Transit Project Assessment Process

The TPAP process was enacted under Ontario Regulation 231/08, *Transit Projects and Greater Toronto Transportation Authority Undertakings* (transit projects regulation) to revise the planning and approvals process for transit projects in Ontario. Under the regulation, all public transit projects are exempt from the *Environmental Assessment Act* and from the requirements under Part II of the *Environmental Assessment Act*, covering individual Class EAs.

The regulation creates a process that certain projects must follow in order to be exempt. The TPAP is a proponent-driven, self-assessment process and does not require that a transit project be approved by the Minister of the Environment before proceeding.

The transit projects regulation provides a framework for focused consultation and objection processes. This is a new process and differs from the traditional Class EA framework that has existed in Ontario for more than 30 years. Proponents must complete the prescribed steps of the TPAP within specified timeframes, so that the assessment of potential environmental effects and decision-making can be completed within six months.

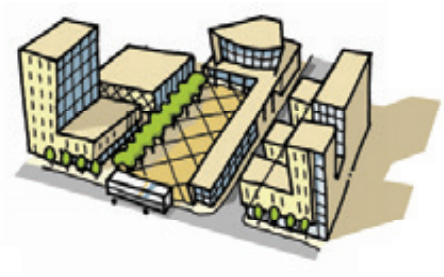
TPAP is a focused impact assessment process that includes consultation, an assessment of potential positive and negative impacts, an assessment of measures to mitigate negative impacts, and documentation. Unlike Class EAs, the regulation does not require proponents to look at the rationale and planning alternatives or alternative solutions to public transit or to the particular transit project.

The regulation only applies to dedicated facilities or services that are used exclusively for transit. For example, an LRT line or BRT facility that is separated completely from general vehicular traffic would be eligible for the exemption, but the widening of a road to accommodate buses or a HOV designation would not be eligible.

The inclusion of facilities or services such as sidewalks, crosswalks, designated lanes on roadways, or active transportation facilities in a transit project does not preclude the project from taking advantage of the exemption.

4.5.5 Initiate Corridor Land Use Planning Studies

In coordination with the Class EAs, corridor land use planning studies should be undertaken along the proposed BRT routes to identify specific opportunities and constraints for intensification along the transit corridors, in station areas, and to develop guidelines for transit oriented development around future nodes.



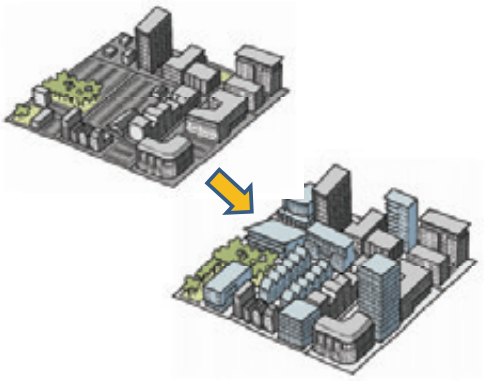
Sample Design of a Node

The land use planning studies should include an assessment of urbanization and intensification potential within each transit corridor and station area including development of targets for densities, development massing, and the mix of uses within each corridor and at each node. A

node is a place that:

- Hosts one or more transit routes;
- Is considered for enhanced transit service;
- Has a city-wide destination or draw;
- Has market demand to attract supportive levels of mixed-use development – office, residential, commercial;
- Has land available for different types of development;
- Is a unique visitation or tourist destination;
- Is pedestrian and cyclist friendly;
- Exhibits potential for an attractive public gathering place; and
- Provides parking in underground or structured locations.

A Car-Oriented Downtown (top) versus a Compact, Pedestrian-Friendly Downtown (bottom)



The land use planning studies should include a review of opportunities to incorporate "complete streets" planning principles into the corridors and nodes to begin the transformation process and set the framework for more detailed planning studies, road / transit Class EAs, or individual development site plans.

The transformation and change process for intensification corridors and development of intensification nodes can often be troubling for some residents and property owners. These studies will need to include proactive consultation and visioning approaches to seek feedback and input from the community and build support for the ultimate plan.

4.5.6 Refine and Implement Short-Term Transit Improvement Plan

Despite the need to complete a number of additional studies prior to implementation of the BRT service, there are a number of improvements that can and should be made in the interim to begin the process. A short-term transit plan for the BRT corridors is needed so that service improvements can be introduced early and the benefits realized quickly in order to start building ridership and increasing transit modal share.

The Region of Waterloo implemented their I-Express service in their future "central transit corridor" in 2005, well in advance of completing the necessary studies for implementation of their rapid transit vision. The I-Express service featured more frequent, high quality, limited stop service along the 37 km route.

The initial cost of the program was $9.2 million and after four years ridership on the route averaged 8,000 passengers per day (800-900 passengers in the peak periods), with 15-19% of these riders shifting from the automobile mode of travel.

The LTC should consider implementing a similar express type service in the proposed BRT corridors in the short-term. This will begin the shift towards the ultimate BRT corridor vision. Early implementation will pay off in demonstrating early and immediate benefits of enhanced transit services in the community. These benefits will help in maintaining support for continued funding of the long-term program and provide service improvements to maintain current riders and attract new ones.

The service plan for this initial implementation does not need to be extravagant, but it must show a tangible difference in service compared to existing conditions. Focusing this short-term transit plan on establishing semi-express services on the identified BRT corridors is recommended. The semi-express routes should feature a reduced number of stops compared to conventional service with headways of 15 minutes or better. Implementation of traffic signal priority measures should also be considered for key intersections along the routes to improve transit running times. An initial corridor for implementation could be the #18 Masonville Route, which LTC has been considering for implementation in 2013. Investments in branding and enhanced stop / amenities could follow.

LTC has established a capital program totalling $2.3 million (supported by provincial gas tax monies) to provide initial "seed money" to complete some of the early work associated with the implementation of the BRT strategy.

Region of Waterloo's I-Express Service

London Transit Commission current Current Bus Service

Bus Priority Signal Similar to Contemporary Signals Except for Additional Light

4.5.7 Undertake Transit Route Restructuring Study

The future BRT network will become the backbone of the LTC network. The "spine" of the network will consist of four distinct route segments branching out to provide service to the north, south, east and west portions of the City. There is significant opportunity to integrate other routes into this BRT "spine" to provide seamless transfers across the City.

In medium sized communities, where traffic congestion is relatively modest, the additional delays due to transfers can significantly impact the overall journey time for transit users. Where there are too many transfers required to make a trip; or where transfers are inefficient or not timed well, users may not be attracted to the service and will find better alternatives for their trip. One of the goals of the route restructuring study should include a strategy to reduce the need for, or reduce the impact of, transfers within the system.

The introduction of BRT corridors can also provide a significant benefit for conventional services running along the same routes, or portions of them. With dedicated BRT lanes on key arterials such as Richmond Street, Wellington Road, Oxford Street, and Dundas Street, other transit routes using these segments of the corridor can access the BRT lanes to save time and improve schedule adherence and stop at the BRT stops to provide for seamless transfers. Opportunities to "interline" the conventional routes and BRT services along these corridors represent a significant advantage of BRT over LRT systems, and should be explored during the route restructuring study.

The BRT corridors will also replace or eliminate the need for certain bus routes that already provide transit services in these corridors. The addition of new BRT routes presents the opportunity to modify, reduce, or eliminate some of the existing routes and re-deploy the existing resources to extend or enhance service to other areas of the City. Of course care

Multi-modal crossover points add connectivity and visual interest. Here road, bike path, trail, and river meet at one place.

The City has been vigorously pursuing the *Bicycle Master Plan*, retrofitting 40 km since its launch.

needs to be taken to ensure that potential changes to routes are done in consultation with users, and information is provided well in advance so that users can adjust their patterns and schedules.

4.5.8 Implement On-Street Priority Cycling Routes

To bring the City's on-street cycling routes up to par with its off-street trail network, four continuous on-street cycling routes have been identified for early implementation.

As a network, these priority routes would provide nearly 100 km of continuous bike routes serving major City destinations, increasing the amount of dedicated bike routes by approximately 70 km (currently 30 km). Each route would be named and colourfully marked, and signed to enhance their recognition and utility with City residents and the cycling community. The proposed priority routes make use of approximately 28 km of existing on-street bike infrastructure to extend and enhance connectivity to each quadrant of the City.

Portions of the priority routes along Richmond Street, Sarnia Road, Riverside Drive, Hyde Park Road, and Oxford Street could be implemented in conjunction with road works identified in this TMP, particularly those projects identified for implementation in the 0-5 year horizon. The remaining portions of this priority network should be programmed for implementation within the next three years and a dedicated funding program for implementation should be considered within the City's annual budget process.

To be viable as a year-round mode of transportation, a higher level of maintenance should be considered on the priority active transportation facilities across the City; for both on road and off road facilities. During the winter, this would have to include snow-clearing, ice removal, and trail lighting for off road facilities (owing to fewer daylight hours) to maintain user safety and security.

4.5.9 Finalize a Downtown Parking Strategy

Short and long-term parking strategies for the downtown area should incorporate pricing structures to support transit by making transit attractive and easy for more people to come downtown.

London currently offers relatively low daily parking rates.

Past studies that have examined downtown parking have expressed two differing views on parking supply and demand:

1. Support downtown businesses by adding more parking to exceed demand;
2. Support transportation mode options by closely managing parking supply and demand.

Currently there are about 14,300 parking spaces in the City's downtown area, which includes a series of municipal and public lots and structures, private parking lots, and on-street parking spaces. A 2008 parking utilization survey showed that on a typical weekday the peak parking demand is just over 10,000 vehicles.

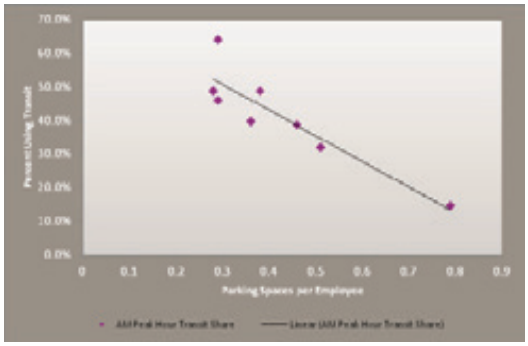
The City's parking lot pricing is relatively inexpensive compared to the average rate for many other Canadian municipalities. There is often pressure to keep parking rates low to compete with free parking offered in suburban malls. Past studies have noted that the existing City pricing practices may encourage long-term parking with reduced all day rates, while discouraging short-term parking with high per hour or half-hour rates. Additionally, the City's average monthly parking rates are cheaper than a monthly bus pass, and as a result, there is no financial incentive to use transit to access the downtown area.

The modeling work undertaken for the TMP revealed that additional policy based interventions may be required to achieve the mode share targets outlined in the plan, specifically the 60% automobile mode share target. Achieving this target will reduce the capital investment required in the road program and in the event that growth reaches the goal of 2% per year, this could represent up to $265 million over the 2030 horizon. Increasing the cost of long-term (all day) parking in the downtown area and introducing parking charges

Comparison of Parking Rates

Location	Average Monthly Parking Rates
London	$75
Kitchener-Waterloo	$100
Ottawa	$195
Saskatoon	$158
Winnipeg	$190
Halifax	$153

Parking Supply vs Transit Mode Share



Source: Morrall and Bolger (1996)

Large areas of downtown are currently used as temporary parking facilities. This is an example of underdeveloped opportunities in the waiting.

in key transit nodes would increase the attractiveness of transit, thereby reducing the municipal subsidy of the transit system and potentially reducing the road works associated with growth.

4.5.10 Identify Opportunities for Park-and-Ride Facilities

As noted previously in section 1.3, there are an estimated 23,350 daily trips made by residents in the communities surrounding the City for work, school, shopping, or other personal business. Some of these trips could potentially be attracted to use the new BRT system, particularly those destined for the downtown area, if formal park-and-ride facilities were to be provided at the end of the rapid transit corridors.

Options for Surface Parking Are Facilities, Carpooling, and Satellite Park-and-Ride Lots

Park-and-ride facilities at the extremities of the BRT lines can play a role in boosting BRT ridership and reducing the influence of external traffic through the City, as well as encouraging commuters who live in the fringe of the City to use BRT. Due to the need for property acquisition or negotiation of shared parking use with others such as shopping mall owners, additional time will be required to implement this recommendation. The need for park-and-ride facilities may also evolve over time, as the BRT system is implemented. Planned BRT stations at the White Oaks Mall, Masonville Mall, and Oakridge Mall could make use of some of the surface parking. Depending on demand, opportunities for structure parking could also be explored as the system matures and the actual need for park-and-ride spaces can be better quantified.

Parking at the terminus BRT stations may also attract local trips to use the BRT system, particularly in new development areas where local transit services are evolving to meet future demand. One potential area where this may be beneficial is the planned southwest development area (Exeter Road / Wonderland Road), which is only forecasted to partially build-out by 2030.

In the longer term, the need for park-and-ride lots in the vicinity of Highway 401 and Highway 402 may be required to support the TDM recommendations outlined in the TMP. The City will need to coordinate with the Ontario Ministry of Transportation (MTO)

to plan for suitable locations and potentially secure property for new facilities as part of future MTO planning and design projects.

The development of a park-and-ride plan in the near term will ensure that opportunities and priorities can be identified so facilities can be put in place as quickly as possible.

4.5.11 Finalize and Implement a Short-Term Transportation Demand Management Plan

TDM is a key component that can support and enable the transition from an automobile oriented, to a transit focused transportation system.

The city-wide target mode share for active transportation by 2030 is 15%, which represents a 6% increase over today's share. This is an aggressive target and requires immediate action to begin the implementation process.

This shift is also supportive of the "transit focus" future proposed for London, which prioritizes a fundamental shift in the way the City shapes its urban structure and integrates it with the development of its transportation system. A greater focus on active transportation and TDM helps to strengthen transit, revitalize the downtown area, and support the creation of hubs of urban growth and economic vitality within transit corridors. Active transportation mode share targets for nodes and corridors and the central area are 17.5% and 20.0%, respectively.

Various initiatives have been recommended for short-term implementation to begin this process, and a base funding level of $20 million (roughly $1 million per year) has been recommended in the TMP to provide "seed money" for these initiatives to occur. In the short-term, 21 specific recommendations are outlined in Table 12. These need to be detailed in the context of existing programs and consolidated into a cohesive program, ideally with a business plan supporting the investments and the anticipated results.

www.ottawalightrail.ca

www.rapidtransit.regionofwaterloo.ca

4.5.12 Develop a Communications Plan to Build Community Support

A level of momentum has been created through the TMP process and strong public support has been expressed through the consultation program for this

project. This needs to be continued and expanded to ensure the TMP success and to maintain support for the major initiatives recommend in the TMP, which may take some time to implement.

As the TMP recommendations enter the implementation phase the City is advised to strategically plan a proactive consultation program to engage the public in assisting with the more detailed implementation decisions that will undoubtedly arise. Subsequent Class EAs for the BRT system, or for the recommended road improvement projects, will require consultation with agencies and the public. Similarly, the *Official Plan* review is including an extensive consultation program with residents and other stakeholder groups in the community. An integrated communication strategy incorporating all of the supporting and connected initiatives would aide in the public understanding how the various initiatives are connected and supportive of the broader vision.

Through public consultation, the City should continue to utilize visualization techniques, similar to those illustrated below, to help the public visualize the improvements that are being discussed and how the various elements fit together within the context of supporting the vision.

Visualizing the Transformation

4.6 Continuing the Collaborative Approach

Engaging and consulting the public and key stakeholders have been a critical part of the TMP work and have played a key role in the success of the project. During the course of the TMP study, four sets of meetings have been held. In each case, the initial workshops were held with the User Vision Group and the Sustainable Transportation Roundtable, and those were followed up with full public workshops. Overall, participants at the meetings were very supportive of the TMP work and the team's willingness to listen to and address comments and concerns. At the final meetings held in May 2012, there was strong support for the draft TMP presented.

Another positive aspect of the TMP effort has been the inter-disciplinary approach taken by the City with the ongoing coordinated involvement of City Planning and LTC under the leadership of the Engineering Department. This has ensured that all technical perspectives have been considered and that all on-going City and LTC initiatives have both contributed to the TMP and have been informed by the work of the TMP.

As the TMP moves forward to the implementation stage, this collaborative process needs to be continued. Stakeholder and public consultation is a key part of the Class EA process and City officials should continue to put a strong emphasis on these components. Similarly, the sustained partnership among LTC, City Planning, and City Engineering will be critical in providing a strong united front throughout the coming environmental and funding approval processes.

Building awareness and gaining further support for the "New Mobility" TMP, in order to brand the BRT initiative, will be particularly important for the City and LTC. As the TMP implementation process unfolds, the City should exploit all opportunities to convey the TMP new mobility themes. One such opportunity would be the recently launched *ReThink London* process. Marketing the vision to build community support will be critical in facilitating the environmental and funding approval processes and demonstrating a strong local commitment to the City's expected funding partners – the senior levels of government.

4.7 Measuring Success

The success of this TMP will depend upon achieving a major transformation in how Londoners travel. Since changing travel behaviour will take considerable time, monitoring key travel indicators on a continuous basis will be necessary to ensure that adequate progress is being made, or if it is not, to take appropriate actions to get back on track. A transportation monitoring program has therefore been developed to assist the City in this regard. This will allow staff to expand on its annual progress report to Council. One of the key indicators to be measured is travel modal share and as noted

previously, targets have been set for transit, active transportation, and automobile modes as part of this TMP. As outlined in Table 22 below, the recommended program includes conducting household travel surveys similar to the 2009/10 survey conducted as part of this TMP, counting vehicular and person travel by all modes across pre-defined screenlines and cordons, completing travel time surveys by mode for pre-defined typical trips, and also completing attitude surveys of transit riders, pedestrians, and cyclists. The estimated average annual cost to complete this monitoring program is $145,000. Refer to **Appendix P** for more details.

Table 22. Recommended Transportation Monitoring Program

Monitoring Program Element	Target Information	Frequency	Cost per Survey
1. Comprehensive Household Survey	• Trip origins and destinations • Trip purposes • Trip rates • Time of trips • Mode of travel • Household demographics	5% sample every 10 years (smaller 2- 3% sample on intervening 5 years)	$150,000 ($100,000)
2. Cordon Count Program *(at 75 pre-defined counting stations, crossing cordons, and screenlines)*	• Trips by vehicle classification by direction for 15 minute periods throughout the day • Vehicle occupancies and person trips by mode and time of day • Walk and cycling trips by direction and time of day	Every 2 years	$150,000
3. Travel Time Surveys *(for 12 pre-defined typical trips)*	• Actual time taken for typical trips by various modes of travel at different times of day	Every 2 years	$10,000
4. Attitudinal Surveys *(focusing on transit, but could include active transportation as well)*	• User comments about existing facilities, services, and programs • User ideas for improved facilities, services, and programs	Every year	$40,000

Reports on the monitoring program will serve as key inputs to future TMP updates and the data will allow the City's transportation model to be recalibrated to current conditions on a regular basis.

5. Conclusion

The SmartMoves project provided the City of London (City) with a vision and implementation plan to proactively respond to the way the City's future population move, live, work, and play. The *Transportation Master Plan* (TMP) is all encompassing and has embraced current provincial initiatives, sound engineering, financial prudence, and emergent planning principles that are shaping municipal growth across Ontario.

Embracing the TMP will enable the City to adjust to major societal shifts that have been long predicted by major economists, demographers, scholars, and politicians. This shift includes a movement away from an automobile focused society with an economy based on industrial production, to a different knowledge and service based economy that integrates all City functions into smaller activity nodes. This is a phenomenon that is fast becoming a reality for all North American population centres.

The cost of following the previous century's growth model is increasingly becoming unsustainable. This obsolete model based on outward peripheral expansion is swiftly being replaced by nodal redevelopment within the existing developed areas of cities.

The change from the old to the new is being influenced by factors outside of individual City's control, such as:

- shifting employment demands;
- family size;
- population growth;
- immigration;
- lifestyle choices;
- attitudes towards the automobile;
- increasing legislation identifying and protecting susceptible environments; and
- increasing servicing costs for water, sewer, and road projects.

These factors contribute to pressure for redevelopment and intensification of existing developed land. Continuing to facilitate the previous patterns of outward growth will become ever increasingly difficult, expensive, and environmentally challenging, while also using valuable time and effort that could be marshalled and focused on facilitating oncoming changes. The City can best transition itself into a successful urban centre that attracts new and vibrant growth through acceptance and preparation for the consequences of these oncoming changes.

By proactively identifying designated areas in the City for redevelopment, the scramble to rezone, acquire, and re-designate underutilized lots will be reduced. Through early

identification, the City can provide direction and preserve cultural and natural assets, as well as ensure there is a balance between public and private space. This will facilitate choice for future City dwellers, business operators, and service providers to allow for the efficient placement of well-planned infrastructure, take advantage of services already installed, create a vision for the new-old areas, and create a sense of identity and place to their inhabitants.

Ultimately, nodal development reduces pressure on the City's engineered systems and budgets and allows for early identification of needs for just in time delivery, sound long-term financial planning, the ability to approach senior government partners, the appropriate allocation to development charges, and the potential to develop public-private relationships. Additionally, nodal development allows the market to dictate and respond to issues of built form, choice, and profitability of related development opportunities within the nodes themselves.

The SmartMoves report identifies the major capital needs required for the immediate, interim, and long-term transportation needs of the City, the policy required to support a sustainable transportation system, the other emergent programs required to support the shift from the automobile based transportation system, and estimates for both capital and operational costs. Transitional considerations and phased in implementation has been commented upon with recommendations that will limit investment to match immediate emergent ridership, while allowing the City to take advantage of economies of scale for target aspiration goals.

The implementation of the TMP has been well thought out and modelled for a wide variety of growth scenarios. The transportation model can be kept up-to-date through monitoring ridership on the bus rapid transit network and congestion on arterial network streets. An up-to-date transportation model will play a factor in predicting and adjusting the City's financial investment over time.

The construction of the bus rapid transit will keep the City on track and will minimize future capital outlay until a time that it is absolutely necessary or financially advantageous to invest, target future senior government programs, allow for local private developments to proceed with their projects confidently, reform London Transit Commission bus routing to compliment the bus rapid transit, and launch transportation demand management programs and advertising campaigns to target the population with the news about the success of the project. This will build ridership with service and ensure targets are met in a financially wise manner. The vision set by Council in the TMP will be met in a manner that is flexible to market conditions and responsive to public acceptance of the bus rapid transit, while responding to greater outside forces shaping North American society.