ESSEX-WINDSOR REGIONAL TRANSPORTATION MASTER PLAN

Technical Report

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With
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Transportation Solutions

Essex-Windsor Regional Transportation Master Plan

MAJOR STUDY FINDINGS & EXECUTIVE SUMMARY

PART 1: MAJOR STUDY FINDINGS

Official Plan policies of both the County of Essex and the City of Windsor acknowledge that comprehensive regional transportation policies and implementation strategies are needed to effectively address regional transportation needs now through to 2021. This is needed because during this time period, the City and County combined are expected to grow by about 92,000 more residents and 53,000 jobs. The location and form of this growth will have a significant impact on the capability of the existing transportation system, and specifically the major roadway system, to serve the added travel needs.

Coupled with this is the overall background growth in trip-making throughout the Essex-Windsor region, and the amount of cross-border traffic moving through the region. This is why the regional transportation plan has taken a very integrated transportation/land use planning approach, with as much emphasis on demand-side issues such as trip-making characteristics and travel mode choice, as on the more traditional supply-side alternatives dealing with major roadway widenings and extensions.

The transportation planning approach used in this study emphasizes the integration of land use and transportation planning in Essex-Windsor region. Continued regional growth will put pressure on strategic parts of the transportation system, reducing its ability to move people and goods safely and efficiently in these parts of the region. Other transportation system needs will continue to grow in response to growth in international cross-border traffic, and are addressed more specifically in the *Lets Get Windsor-Essex Moving* initiatives, the Detroit River International Crossing Study and the Windsor Gateway Report prepared for the City of Windsor by Sam Schwartz Engineering PLLC and released in January 2005.

The Schwartz Report represents the current position of Windsor City Council on the subject of cross-border traffic in the City in both the short and long terms, and the actions that Windsor City Council intend to take in resolving cross-border related traffic problems in the City. The findings, conclusions and recommendations of the Regional Transportation Master Plan were prepared independent of the Schwartz report, but are not inconsistent with recommendations arising from the Schwartz report.

Major findings of this regional transportation study facing the Essex-Windsor region to 2021 are summarized as follows, and discussed further in this Executive Summary and the accompanying main Technical Report of the Essex-Windsor Regional Transportation Master Plan:

1. The Regional Transportation Master Plan builds and expands on the City's 1999 Windsor Area Long Range Transportation Study (WALTS). WALTS considered Windsor and area growth and transportation needs to 2016 to County Road 8 to the south, and County Road 27 to the east;

2. One important transportation planning principle being used in the regional study is to optimize the region's existing roadway network carrying capacity, through access management and corridor protection, before investing in road widenings, extensions and new roads. This principle does not hinder the development of new roadway infrastructure deemed necessary to solve urgent, special problems created by border traffic. In fact, the Schwartz Report appropriately recommends the opposite approach, or "thinking big" to deal with this longstanding international transportation problem. The Regional Transportation Master Plan has attempted to distinguish between the local and regional needs of the County of Essex and the City of Windsor which are the focus of this study, and the international border traffic problem which is the focus of other studies and initiatives;

3. 80% of all trips in the region use automobiles. As expected, most County roads in rural and semi-rural locations are experiencing relatively low traffic volumes, with higher volumes found in LaSalle, Tecumseh, Lakeshore and the City, and on Highways 401 and 3. The result is that today, poor level of service and congestion conditions are being experienced on a number of key City roadway sections, including Tecumseh Road, Wyandotte Street, Howard Avenue, Walker Road and Riverside Drive. In the County, the roadway level of service remains good except for deteriorating conditions on parts of County Roads 19, 22, 11 and 3, all in close proximity to the City boundary;

4. One approach to dealing with growing traffic volumes and reduced level of service in the urban parts of the region is to extend public transit services to these suburban communities in LaSalle, Tecumseh and Lakeshore. Extension of Windsor Transit service beyond the City of Windsor service area is the main transit issue identified in this study;

5. In 2021, with the expected growth and distribution of regional population and employment but no changes in trip-making behaviour, development form or roadway network capacity, severe roadway congestion is forecast on a number of key County Roads including 9, 19, 22, 42, 11 and 9 in the LaSalle, Tecumseh and Lakeshore areas, and on County Roads 20 and 31 near Leamington. In its existing two lane configuration, the entire length of Highway 3 will also have deficient capacity to accommodate future travel demands. In the City, major capacity deficiencies are forecast on sections of key routes including the E.C. Row Expressway, Huron Church Road, Cabana Road/Division Road, Tecumseh Road, Wyandotte Street, Ouellette Avenue/Dougall Avenue and Howard Avenue.

6. The regional transportation study included an extensive assessment of options to address the region's transportation system needs to 2021. These options fall into four distinct categories of improvements:

    a. Supply-Side Options to enhance the capacity of the regional road network through strategic road widenings, extension, new roads, geometric improvements and traffic diversion;

    b. Supply-Side Options to optimize the capacity of existing regional roads and intersections through signal optimization, access restrictions and other Transportation Operations Management (TOM) techniques;

    c. Demand-Side Options that uses various Transportation Demand Management (TDM) techniques to shift more trip making to transit and non-motorized modes, and encourage ride-sharing and off-peak period trip making; and

    d. Demand-Side Options that use land use planning and urban design techniques to reduce the length of trips and the amount of trip-making by reducing the distance between home and work, and providing for more transit, cycling and walking-friendly neighbourhood designs.

7. A series of strategic roadway capacity enhancements, mainly in the form of important road widenings, are required in the region to solve localized route capacity deficiencies at a total capital cost in the order of $270 M by 2021, or about $17 M per year. While these capacity enhancements will address deficiencies in specific locations, they will not be effective in addressing all roadway capacity deficiencies by 2021. Some portions of the road network in the urbanized Windsor, LaSalle, Tecumseh and Lakeshore areas will remain deficient in traffic carrying capacity and level of service.

8. The evaluation of demand-side options in this study shows that a combination of strategic roadway capacity enhancements with a 25% reduction in average trip lengths through more intensified and mixed use urban development forms would have the greatest long-term benefits to the regional transportation system. This particular planning option provides the most effective transportation system in 2021, with the lowest amount of travel distance, time and delays. It also supports the extension of transit service beyond the City of Windsor into adjacent suburban service areas.

9. In order for the County, City and Towns to plan for an acceptable level of transportation service to year 2021, the focus of regional transportation planning should be on a combination of selected roadway capacity enhancements, AND changes to development forms in urban areas that offer alternative transportation choices and reduced transportation needs for Essex-Windsor residents.

10. This Regional Transportation Master Plan identifies a Regional Road System that should be protected from any conditions that would reduce the capability of this system to serve regional travel needs. It is also recommended that to fund their part of the recommended roadway capacity enhancements, the County should consider further the establishment of a development charge. In terms of cost-sharing of regional roadway system costs, any apportionment of costs between the County and lower tier municipalities should be based on a clear understanding of local versus County benefits.

11. Although the planned Leamington bypass is included as the only South Shore project in the recommended capacity enhancement strategy in this Master Plan, this does not diminish the importance of the South Shore area in the regional transportation system. It also does not diminish the need to minimize potential future deficiencies along the recommended Regional Road System within the South Shore area by implementing this Master Plan, and pursuing issues such as corridor management and Smart Growth that will be critical to the future sustainability of the South Shore.

12. Opportunities exists through the application of "Smart Growth" land use principles and Transportation Demand Management to minimize or avoid the need for physical capacity improvements resulting from planned growth in the region. If through these initiatives, roadway capacity deficiencies cannot be adequately addressed, the ongoing monitoring of the Master Plan will "trigger" the requirement to update the Plan to define physical capacity improvement projects that can address the deficiency.

13. The Essex-Windsor region is dependent on future improvements to Highway 3 capacity and operations as the primary inter-municipal corridor through this part of Essex County. Regular monitoring and review of the Plan will be required to ensure that all municipalities within the region are benefiting from the transportation capacity optimization and enhancement recommendations, and the TDM strategy recommended in this Master Plan. Should these benefits not evolve as planned by 2021, then the regular Plan review process will have to consider strategic amendments to this Plan.

PART 2: EXECUTIVE SUMMARY

1. INTRODUCTION

According to the Regional Transportation Study Terms of Reference, the main purposes of a new Essex-Windsor regional transportation plan are to:

- Protect existing and identify new and/or expanded transportation corridors within the region to meet the transportation needs of residents, businesses and visitors;
- Protect and enhance these transportation corridors to also accommodate projected growth in vehicular traffic from outside the region;
- Establish fair and equitable funding mechanisms to finance growth and non-growth related regional transportation improvements;
- Provide a transportation policy framework that can be used to regulate and control vehicular access, building locations and setbacks and land uses adjacent to regional roads;
- Show how to increase the availability and use of alternative transportation modes, by describing feasible means of making transit, cycling and walking more attractive to regional residents;
- Describe how to reduce total kilometres traveled per household by automobile in the region; and
- Develop a consistent regional road classification system and associated set of design standards.

The study goal was to develop a new comprehensive Regional Transportation Master Plan for the Essex-Windsor region with recommended policies and an implementation strategy that will serve the needs of this region to year 2021. The objectives of the study include:

1. Fairly and equitably manage, coordinate and finance growth and non-growth related region-wide transportation improvements, with a balance of capacity enhancements and demand management that best benefits the region;

2. Have the region develop in a coordinated manner that will be effective in minimizing traffic congestion and associated environmental impacts, protecting and managing required transportation corridors and achieving the region's transportation management goals;

3. Increase the availability of "viable" transportation options by making public transit, cycling and walking more attractive for Essex-Windsor residents;

4. Identify achievable strategies, in the context of the County of Essex and the City of Windsor, to reduce the number of kilometres traveled by the private automobile per household by creating more compact built forms, mixed-use neighbourhoods and developments, and by adopting transit, cycling and pedestrian-supportive land use planning and urban design policies and plans;

5. Formulate the Regional Transportation Master Plan in an integrated, inclusive and comprehensive manner; and

6. Satisfy Phases 1 and 2 of the Municipal Class EA process dealing with transportation system needs and alternative planning strategies respectively.

2. EXISTING REGIONAL TRANSPORTATION SYSTEM

Transportation Planning Principles - The following Principles were established for this Plan based largely on the Terms of Reference, plus analysis of existing regional transportation conditions and community input through public meetings and stakeholder discussions at the outset of the project:

Principle #1: Optimize Arterial Roadway Network Capacity – Give priority to optimizing the capacity of the existing arterial roadway network within the urban and rural areas before investing in new major capital improvements such as road widenings, extensions and new roads. Capacity optimization will require access management and corridor protection to control access, building locations and land use along "regionally" important roads.

Principle #2: Select Appropriate Levels of Service and Standards – The Level-of-Service provided by the regional roadway network will vary depending on the urban, suburban or rural area being served.

Principle #3: Ensure Transportation Improvement Affordability – The ability of the City, County and local municipalities to fund major transportation projects over the next 20 years may be limited. This being the case, transportation planning may have to consider the implications of reduced investment scenarios on the level of transportation service.

Principle #4: Ensure Transportation System Sustainability **–** To sustain the existing regional transportation system, development decisions must use integrated transportation/land use planning. Responding to the Smart Growth approach to planning, this principle includes re-urbanization and intensification, in appropriate locations, to reduce the impacts of urban growth on the roadway network.

Principle #5: Ensure Roadway Network Enhancement Achievability **–** In order to satisfy Phase 2 of the Class Environmental Assessment process, the Transportation Master Plan study must objectively identify all possible alternatives to address transportation system needs over the next 20 years. However, alternatives that are not considered to be feasible and reasonable based on current Official Plan policies, Provincial Policy Statements, community character, expected impacts and public costs should be screened out early from further consideration.

Existing Regional Travel Characteristics - Household travel survey data collected in 1998 as part of the Windsor Area Long Range Transportation Study (WALTS), and augmented by surveys conducted in Essex County in 2002 show that 53% of trips by regional residents are within their local area, 27% are to Windsor and 20% are to other areas either inside or outside the County. Most trips are Home-Work trips (25%), followed by Home-School trips (22%), Shopping (9%), Recreation (4%) Personal Business (2%) and Other purposes (12%). Amherstburg residents made the most trips to Windsor (39%) compared to the other local municipalities in the County.

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Trips in the region are very auto-dominated, accounting for about 80% of all trips made in the PM peak Period (3-6 PM), followed by walking (10%), school buses (4%), Transit Windsor (3%), cycling (2%) and 1% other modes (i.e. taxi, motorcycle). Public attitude questions asked of County residents in 2002 suggested they were generally happy with the transportation system, but comments were made about transit availability within the County.

Major Roadway Network – Average Annual Daily Traffic (AADT) data collected between 1998 and 2002 shows that AADT's in the County vary from less than 5,000 vehicles per day (vpd) up to 30,000 vpd on Highway 401. Some County Roads experience AADT's up to 20,000 vpd, but with the majority experiencing 5,000 or less, which are considered low volumes of traffic. A few County Roads have moderate volumes in the 10,000 to 15,000 vpd range, and up to 30,000 on CR 20 in LaSalle and CR 22 west of CR 21 in Tecumseh.

Highway 401 within the County has AADT's of 20,000 or more for the entire length from east of Tilbury to the tunnel/bridge split at Windsor. The highest AADT on Highway 401 within the County occurs between Highway 77 and County Road 25 linking to Leamington, Kingsville and Essex. Highway 3 from Windsor to Leamington experiences AADT's of greater than 5,000 for its entire length, with the highest volume experienced between County Road 9 and Highway 401, just outside Windsor. In response, MTO has completed an Environmental Assessment and preliminary design for the improvement of Highway 3 between Windsor and Leamington.

Other high volume County Roads of note are on County Road 20 from County Road 18 in Amherstburg into Windsor, County Road 20 and 34 through Leamington and the sections of County Road 9 and 11 immediately south of Windsor. These County Road sections are currently experiencing AADT's of between 10,000 and 15,000 vpd. The highest AADT volumes recorded to date on County Road 19/Manning Road are 15,000-20,000 vpd between CR 2 and CR 42.

In Windsor, the busiest route is the EC Row Expressway where AADT volumes reach 50,000 in some sections. High AADTs over 30,000 are also found on sections of Huron Church Road, Ouellette/Dougall Avenue, Tecumseh Road, Walker Road and Lauzon Road. AADT volumes of between 20,000 and 30,000 are also found on most of Tecumseh Road and major sections of Wyandotte Street, Riverside Drive and Ojibway Parkway. Trucks make up less than 2.5 % of traffic on the majority of County roads, with the highest percentage being on Highway 401, Highway 77 between County Road 14 and Highway 401, and on County Road 37 between County Roads 14 and 34, all of which have 30% or more truck traffic. Highway 3 experiences commercial traffic volumes of greater than 5% for its entire length and other areas of note are County Road 20 between County Roads 31 and 33 with between 20 and 30% trucks, and County Road 42 between County Road 31 and Highway 77 with 15-20% commercial vehicle traffic.

In response to the Terms of Reference, this Plan recommends a new roadway classification system for the region with the following hierarchy and types of roads to differentiate between urban and rural facilities:

Urban	Urban in Rural Setting	Rural	Provincial Highway
Expressway			Freeway
Rural Highway		Regional Road	Highway
Class I Arterial	Major Arterial	Secondary Road	
Class II Arterial	Minor Arterial	Tertiary Road	
Class I Collector	Major Collector		
Class II Collector	Minor Collector		
Local	Local	Local	

This classification system was assigned to regional roads based on criteria including land use being served, road function, traffic volume, traffic flow characteristics, running speed, vehicle types and connections. Basic design standards for each classification are also included in the Master Plan, as well as planning capacities (number of vehicles that can be accommodated per lane per hour). When these capacities are compared with actual traffic volumes counted on regional roads, the resulting Volume/Capacity ratio and related Level-of-Service (LOS) rating shows that the vast majority of region roads are currently operating at a good LOS, but with some important exceptions operating at or near congested conditions.

These deficient County Road sections include CR 11 from Highway 401 to South Talbot Road in Oldcastle, a short section of CR 3/Malden Road from Todd Lane to Normandy Street, CR 22 from Banwell Road to Patillo Road, CR 2/Tecumseh Road from Lesperance Road to CR 19 and Riverside Drive from Lesperance Road and CR 19. The key sections of deficient roads in the City are found on Tecumseh Road east of Ouellette Avenue, major sections of Riverside Drive east and west of the downtown (mainly because the capacity assigned to Riverside Drive as a Civic Way is half of what it is for a Class II Arterial) on Wyandotte Street west of Ouellette and on sections of Howard Avenue, Lauzon Parkway, Dominion Blvd., Campbell Avenue, Walker Road and Cabana Road.

The existing transit system involves conventional fixed route schedule bus services seven days a week to most developed areas of the City of Windsor only. Transit Windsor desires to increase ridership in part through careful expansion of service into adjacent municipalities. Although the service lost riders in the mid-1990s for various reasons out of Transit Windsor's control, it has been experiencing a slow recovery since 2000, with about a 3% increase in ridership from 2002 to 2003. The key issues facing Transit Windsor in continuing to improve transit service and associated ridership growth involve service extensions to neighbouring communities in LaSalle, Tecumseh and Lakeshore with an associated funding framework, and the need for a stronger, more supportive transit policy framework in Official Plans.

Walking and cycling are typically characterized by shorter trips under two kilometres, but still make up about 12% of all trips in the PM Peak Hour. These modes of transportation are mainly accommodated by the system of trails and bikeways in the City, and the Chrysler Canada Greenway in the County as well as local routes and facilities in the local municipalities. In terms of rail transportation, most of the road/rail conflicts in the region are found in Windsor and the Town of Essex, plus in Tecumseh and Lakeshore associated with the high speed VIA line. Windsor's rail problems are being addressed by a Community Based Strategic Rail Study being initiated by the City and associated stakeholders to investigate rail rationalization, consolidation and modal integration opportunities.

When asked what the major transportation issues are facing the Essex-Windsor area, members of the public, agencies and stakeholder group listed a variety of issues dealing with transportation system operations, cross border transportation, Transportation Demand Management (TDM), impacts of transportation and transportation affordability, all of which are reported in the Master Plan.

3. REGIONAL TRANSPORTATION SYSTEM NEEDS AND OPPORTUNITIES

Regional Growth Potential - All municipalities except Windsor used the County Official Plan high growth population and employment forecasts developed for 2016 as their "baseline" 2021 forecast for the purposes of this plan. The City of Windsor population at 2021 was estimated to be 237,671 as a "constrained growth" baseline forecast, plus 21,461 added to traffic zones in the new Tecumseh annexation area. With the City's residential growth constraint removed by the provision of this new residential and employment land supply, the new baseline population forecast for Windsor by 2021 is 244,811. The County is expected to grow from 162,756 people in 2001 to 218,940 by 2021. Overall, the Essex-Windsor region must accommodate an estimated 92,000 additional residents and 53,000 added jobs by 2021.

The demographics of this population growth will also affect transportation needs in the future. Typical of most Canadian regions, effects of the "Baby Boom and Bust" have the most growth in the 45-64 and 65+ age groups, which are also the largest auto users. Conversely, the 15-24 and 25-34 age groups that tend to be the highest users of public transit and non-motorized travel modes because of their youth, financial ability and personal philosophy will grow at a slower rate to 2021. However, this will change further after 2021 as the 65+ age group continues to grow, but with decreasing auto use and more reliance on specialized transportation modes. The Essex-Windsor transportation system must prepare for longer term transit and specialized transportation service improvements to meet the needs of changing demographics.

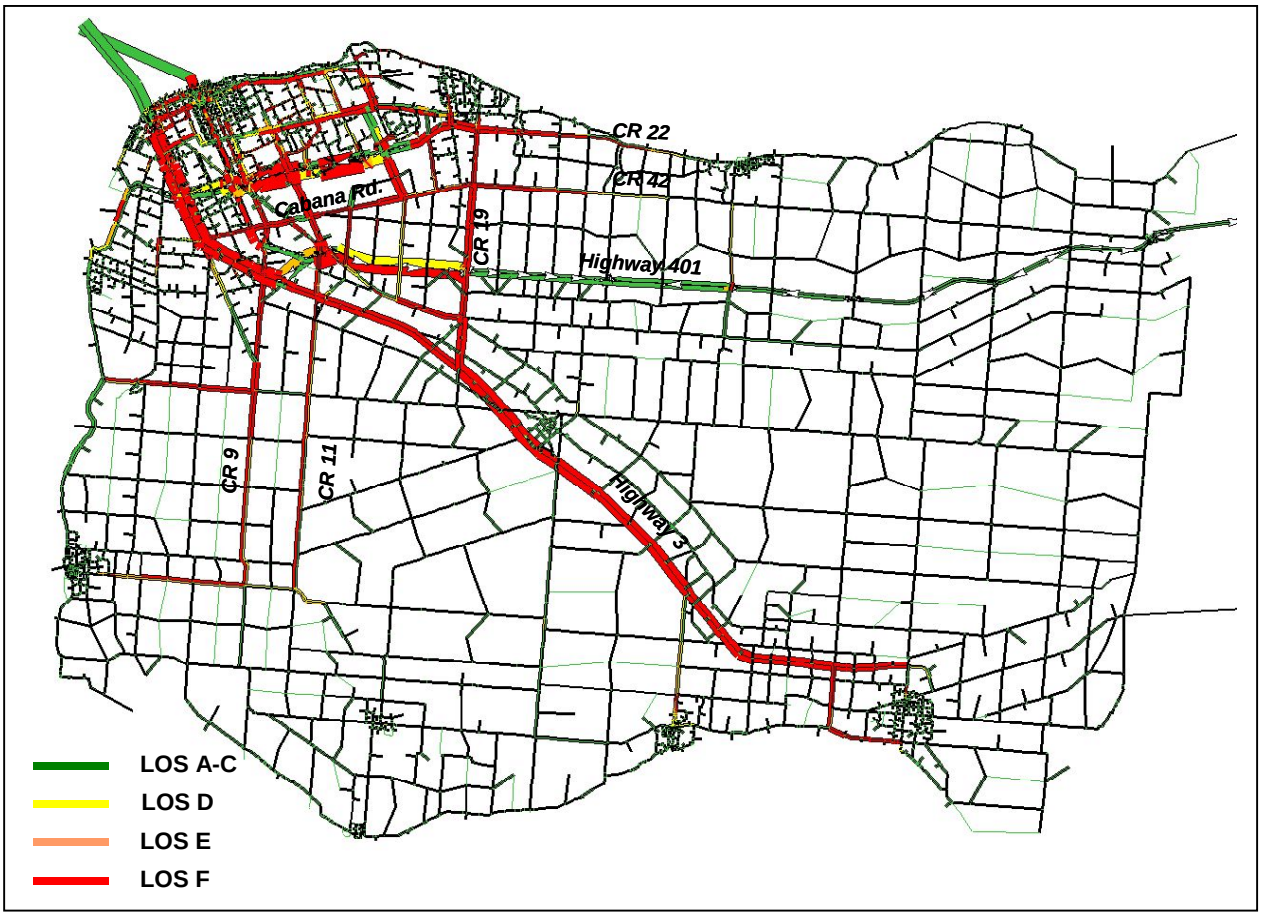
Future Baseline 2021 Roadway Network Deficiencies - Using the population and employment forecasts provided by the study area municipalities, the total amount of PM Peak Hour travel demand at 2021 was projected across the Essex-Windsor region using the City and County's TransCad demand forecasting model. The results of this baseline forecast show that assuming no transit service extension beyond the City, continued auto dominance and low vehicle occupancy, the City of Windsor will experience a 15% growth in PM Peak Hour traffic volume by 2021, from about 62,000 trips in 2001 to 71,500 trip in 2021. As expected, most of this growth will be in the Annexed Lands (Tecumseh Lands) which will experience the large rate of trip growth resulting from area development. Significant trip-making growth is expected in the seven local municipalities resulting from a combination of high population and employment growth.

By year 2021 in the baseline Do-Nothing scenario, the Essex-Windsor roadway network will experience significant capacity deficiencies on a number of key routes owing to forecasted population and employment growth and distribution. The most notable of these deficient routes are listed below in the City and County (not in any order of priority):

City of Windsor (not inclusive)	County of Essex
• All of Huron Church Road; • All of Ouellette Avenue/Dougall Avenue; • Howard Avenue from Dougall Parkway to Tecumseh Road; • Sections of Riverside Drive; • Major sections of Wyandotte Street and Tecumseh Road; • Major sections of EC Row Expressway; • All of Cabana Road/Division Road; • Walker Road from Highway 401 to Tecumseh Road; • Sections of Division Road/Provincial Road; • Lauzon Parkway from Forest Glade Drive to Division Road, and Lauzon Road from Wyandotte Street to Tecumseh Road; • Sections of Ojibway Parkway; • Highway 401 eastbound from Walker Road to CR 19/Manning Road, and westbound from Highway 3/Talbot Road to Walker Road; and • 8th Concession Road from Division Road to Highway 401.	• CR 43/Banwell Road from CR 22 to CR 42/Division Road; • Lesperance Rd., St. Thomas Street to CR 22; • CR 19/Manning Road from Tecumseh Road to Highway 3; • CR 11/Walker Rd from Highway 401 to CR 18; • CR 9/Howard Ave from Highway 3 to CR 18; • CR 8 from CR 20 to CR 9; • CR 18 from Amherstburg to CR 9; • CR 2/Tecumseh Road from Banwell Road to Lesperance Road; • CR 22 from EC Row Expressway to Renald Line Road; • CR 42 from CR 19/Manning Road to CR 25; • CR 46 from Highway 401 to CR 19 Road; • Highway 3 from Highway 401 to Highway 77 at Leamington (assuming no MTO widening) • CR 27 sections, Belle River to Highway 401; • CR 31 from CR 20 to Highway 3 at Leamington; and • CR 20 from CR 31 to Erie Street in Leamington.

These existing deficient roadway sections are shown on Exhibit E.1 forecast for 2021 under baseline conditions using roadway network capacities and continued high auto-oriented travel characteristics with no transit service extensions beyond the City. Level of Service (LOS) E conditions are nearing full capacity, while LOS F conditions are at full capacity. Both are considered to be capacity deficiencies requiring rectification.

Exhibit E.1 – 2021 Baseline Level-Of-Service Forecasts



Public Transit - The most often noted, and most likely public transit expansion opportunities for the region in the short term are extensions of Transit Windsor service into Tecumseh and LaSalle. Some examples of short term service expansions that appear feasible include a new route connecting the University area, Ojibway Industrial area, LaSalle urban area, St. Clair College and Devonshire Mall. An existing route extension or new route in the east could connect Tecumseh Mall, the East Riverside community and adjacent areas of Tecumseh. A future regional express bus service could connect Tecumseh with major activity centres in Windsor and LaSalle along the EC Row Expressway. For smaller fringe areas with low ridership potential, Alternative Service Delivery methods such as TransCab service (contracted cab service) could be extended from the end of a fixed bus route.

Supporting policies are also needed to expand the role of transit in Essex-Windsor over the next 20 years. This includes planning bus routes as part new subdivision designs, and providing greater transit priority at intersections along heavy transit routes such as Tecumseh Road, Ouellette Avenue, Wyandotte Street and University Avenue. Policy support is also needed to provide pedestrian connections to bus stops in new development areas, control the amount and cost of downtown parking to encourage more transit use to these core areas, and provide employee bus passes. More long term transit opportunities in the region centre on additional inter-municipal express bus service between Windsor and LaSalle, Leamington, Amherstburg, Tecumseh and Belle River. As the City grows, and if intensification occurs at strategic urban locations, opportunities may also evolve for higher order transit service along rail corridors if they become available for alternative uses. Finally, more transit-supportive and TDM opportunities need to take place in the region, such as a universal bus pass for University and College students, having more cyclists and wheelchairs on buses and the management of carpooling programs from outlying communities to major employment destinations such as the larger automobile plants.

Walking & Cycling - The greatest demand for walking and cycling in the Essex-Windsor region is expected in the urbanized areas where the population base and higher densities exist. It is here that a shift to non-motorized modes for short distance trips should be encouraged, with "shot distance" being less than 2.5 km based on walking and cycling research. With limited financial resources to spend on non-motorized transportation, it is important that investments are made in locations where the largest possible usership and benefit is or will be available. This includes new "brownfield" redevelopment projects in the City and any outlying suburban area that provide opportunities to extend existing trails and bikeways, as well an extension of the Chrysler Greenway as the spine of rural walking and cycling routes. As growth in the periphery of the City and abutting municipalities continues, other opportunities should be found to link the Greenway and County trails with the City's bikeway and trail network. Walking and cycling routes also need to be linked with transit to encourage modal shifts to all three modes.

Rail Network – Rail rationalization and consolidation are opportunities the City and involved stakeholders are pursuing through the Community Based Strategic Rail Study, and this could bring a number of significant benefits to the Essex-Windsor region in terms of developing its long-term transportation plan. The Windsor Gateway Study by Sam Schwartz Engineering (January 2005) also recommends rail rationalization in the City as an element of fast track recommendations, along with development of a new rail passenger station and multi-modal facility at Windsor Airport off a shared CP line. Private sector plans have been developed to convert both of the existing rail tunnels at Windsor to a truck route, with construction of a new double-stacked rail tunnel in the same general area. This could bring more traffic to the CPR alignment, and make the right-of- way very busy.

4. FUTURE TRANSPORTATION STRATEGY

Strategic Transportation Planning Options – In addition to the baseline Do-Nothing option for the Essex-Windsor roadway network in 2021, this Plan evaluated a total of 14 additional strategic options to address forecasted LOS deficiencies in the regional road network. Ten (10) of these options involve structural improvements to increase the capacity of deficient roads through combinations of strategic roadway widenings and extensions. These include capacity improvements that are already approved and planned by the City and County, plus additional capacity enhancements identified to solve outstanding deficiencies that approved and planned projects cannot address. These other project options include widening and extending CR 19 and/or a Lauzon Parkway extension to Highway 3, widening the EC Row Expressway to six lanes, widening CR 42, introducing a new east-west route between Division Rd/CR 42 and Highway 401 and widening a CR 22/CR 42 couplet east of the City. Other structural options involve the extension of Highway 401 west to CR 20 in the area of CR 8 as either a freeway or arterial facility, and an east side arterial bypass of Leamington from CR 34 to CR 33.

In addition, four (4) of the strategic options involved demand-side measures to change and reduce the amount of trip-making in the region, involving a 5% increase in overall roadway network capacity through various capacity optimization measures (intersection operations and access management). Other options included a 5% or 10% reduction in auto travel demand owing to TDM initiatives such as increased transit ridership, telecommuting and more carpooling. The final strategic option looked at the impacts of a 25% reduction on trip lengths brought about by more intensified land use forms and mixed land uses to reduce the home-work travel distance.

The comparison of LOS forecasts in 2021 for each strategic option clearly shows that the ten structural options have limited abilities to address forecasted roadway LOS deficiencies by 2021. It also shows that only the reduction in auto travel demand, and reduction in overall trip lengths through TDM and urban form initiatives respectively have the potential to significantly reduce the amount of roadway LOS deficiencies forecast on the regional network by 2021. The Plan concludes that:

> … in order for the County, City and Towns to plan for an acceptable level of transportation service to year 2021, the focus will have to be on a combination of selected roadway capacity enhancements, and changes to development forms in the urban settings that offer alternative transportation choices and reduced transportation needs.

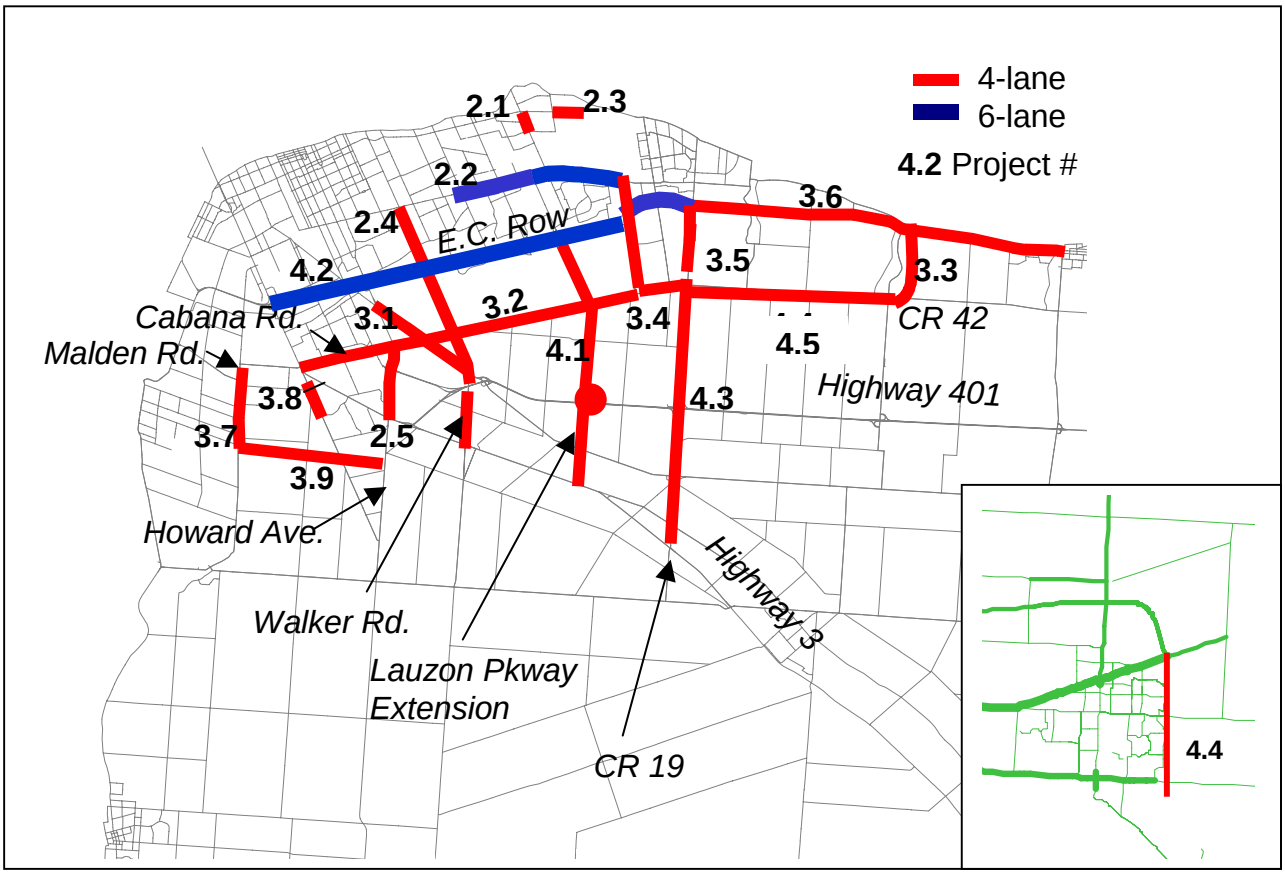
5. REGIONAL TRANSPORTATION MASTER PLAN

The Regional Transportation Master Plan is based on four very distinct types of planning strategies; 1) Capacity Optimization of regional roads, 2) Capacity Enhancement of regional roads, 3) Transportation Demand Management of the regional transportation system and 4) Land Use Planning to provide forms of urban development that generate less auto trip-making and shorter trip lengths.

Capacity Optimization Strategy – The Plan recommends a number of policies and standards to improve arterial road operations, dealing for example with new traffic signals, signal coordination, pedestrian crossings, exclusive turn lanes and use of unsignalized intersection stop controls (stop signs). It also includes access management recommendations dealing with mutual driveways in rural areas, design of subdivision road networks and limiting access to provincial highways only at intersecting regional roads.

Capacity Enhancement Strategy – This strategy recommends the preferred list of capacity enhancements projects shown on Exhibit E.2 to eliminate as many LOS deficiencies in the roadway network as possible by 2021. The capital cost of these projects is estimated in the order of $270 million by 2021, or an average of $17 million per year. Of this total capital cost, $133 M would be associated with County roads, $113 with City of Windsor roads and the remaining $23 M to other municipal (LaSalle and Leamington) roads. Note that Class Environmental Assessments conducted to implement the projects recommended on Exhibit E.2 may result in modifications to these projects and associated costs.

Exhibit E.2 – Recommended Regional Roadway Capacity Enhancement Projects to 2021



Transportation Demand Management (TDM) Strategy - Research shows that for many TDM initiatives to succeed in the County's goal to reduce the number of kilometres travelled per household by automobile, they require a combination of dedicated government support, private sector business support, and broader public support. This compares to the trend in most mid-sized municipalities of increased Single Occupant Vehicle use and growing traffic congestion. TDM measures have been developed and implemented with varying degrees of success. Some of the most successful large-scale applications show encouraging results in reducing Single Occupant Vehicle usage through individualized "Social Marketing" campaigns. Other important TDM lessons for Essex-Windsor include promoting both the transportation and non-transportation benefits of TDM, providing financial incentives and disincentives, gaining grass roots TDM support and accepting that changing travel patterns in the region will take considerable time.

The Plan also recognizes barriers against TDM in place in the region, including relative ease of travel, transit service limitations, inexpensive and ample parking and relocation of employment away from core areas. The Regional Plan addresses the County's objective to reduce kilometres of travel per household by the automobile through a number of recommendations. First, a more integrated planning approach is needed that combines the effects of built form and land use on travel patterns. Reducing trip-making, shortening trip lengths and reducing auto use all require changes to how the region has been growing, using hard urban edges to control urban sprawl, more direct and efficient roadway patterns, more mixed use nodes and corridors, more tele-commuting, road design standards that encourage non-motorized transportation and more ride-sharing through organized carpooling and ride-sharing programs.

To help reduce greenhouse gas emissions also requires a reduction in kilometres travelled, higher fuel and parking costs, more fuel efficient and alternative fuel vehicles, more use of non-motorized modes and increased public awareness of the problem. Finally, to make choices for more sustainable development will require the public to make more educated lifestyle choices about where they live and work and how they travel, plus a more efficient transportation system, increased fuel efficiency, enhanced public consultation and more equitable funding for alternative transportation modes.

Regional Road System – The Plan recommends a regional road system, for transportation planning purposes only, formed by urban and rural roads that by themselves or in combination with other regional roads, provide inter-regional connectivity within the regional planning area and to adjacent municipalities. This inter-regional connectivity within the Essex-Windsor area is recommended as the prime service function criteria in designated regional roads. Roads or road sections that may serve high traffic volume but do not provide inter-regional connections are not designated as regional roads.

Funding Mechanisms – In addition to available federal and provincial funding programs, the Plan reviewed the existing means of sharing costs between the County and its local municipalities for operation and maintenance of the existing County road network, and considered it to be satisfactory. The principal focus of the review was to address the most appropriate means of cost apportionment for growth-related road expenditures. Four options were considered; 1) weighted assessment as the basis of the tax levy used to support major road expenditures (through debentures or own funds given revenues); 2) Development Charge (county-wide) wherein development pays a portion of the costs in the County; 3) Development Charge (county-wide plus area-specific); and 4) actual cost allocated to each municipality based on benefits-received. This requires determining the level of benefits to each municipality from road development. Each benefiting lower tier municipality would pay on the basis of its level of benefit. This is difficult to achieve and is open to considerable debate as to level of benefit.

Outside of the use of area-based DCs for growth-related costs, the only other area-specific approach is case-specific cost sharing based on agreements reached between municipalities who likely have a local component to the road. In this case, the County would contribute only where there is a regional benefit. If local municipalities expect that their road construction projects should be partly funded by the County, it is recommended that the County clearly establish the County-wide benefits of these localized projects. If benefits are mainly localized, cost-sharing agreements with the specific lower tier municipality in question may not be appropriate. The apportionment of cost should be based on a clear understanding of local versus County benefits.

Plan Implementation – Appropriate policies and recommendations from the Regional Transportation Master Plan should be integrated into the Official Plans of the involved municipalities. These include the regional transportation goal and objectives, the transportation planning principles, road classification system and regional road plan, regional road LOS expectations, transportation corridor protection principles, the role of Public Transit, need for capacity optimization and need for regular travel demand forecasting and traffic impact studies as part of major development proposals.

The Plan should be monitored annually by all involved County departments and related stakeholders (i.e. Transit Windsor) on how well it meets the needs of the County and local municipalities, and with updates on traffic volume counts, trends and technologies, optimization measures and public and private sector initiatives. The Plan further recommends that a joint transportation planning and coordination group such as a Regional Transportation Management Committee be established to coordinate joint municipal planning and budgeting for regional transportation. The Plan should also be updated every five years, preferably in association with required County Official Plan updates, including updates on household travel survey data.

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1. INTRODUCTION

1.1 Study Background

In 2003, the County of Essex completed development of a new draft Official Plan that acknowledges the strong relationship between roads, their function, land use and development within the County. This new Official Plan also directed that a detailed study be completed to establish future regional road classifications and related policies, and to provide direction on addressing regional transportation needs and issues currently, and over the next 20 years. Since this detailed study was to be regional in nature and scope, the City of Windsor was invited to have "meaningful" participation in the study development.

The new Official Plans in both the City and County acknowledge that a comprehensive regional transportation policy and implementation strategy is needed to effectively address existing system needs, and manage, coordinate and finance regional transportation infrastructure and services to serve regional, provincial and international travel over the next 20 years.

Previous to the regional study commencement, the City of Windsor had adopted their comprehensive municipal transportation master plan in late 1999, termed the Windsor Area Long Range Transportation Study, or WALTS. The recommendations of that plan also reflect the complex interface between urban growth and the transportation system, with a long term planning strategy based on land use control, use of Transportation Demand Management measures appropriate to the community, adjustments to road levels-of-serve and enhanced transportation system capacity. The main policy directions of WALTS were incorporated into the new City of Windsor Official Plan, and this Regional Transportation Master Plan build on WALTS to develop a full regional plan.

In May of 2002, the Study Steering Committee and Essex County Council confirmed the retention of Stantec Consulting Ltd. and Paradigm Transportation Solutions Ltd. to prepare the Essex-Windsor Regional Transportation Master Plan (EWRTMP). In September of that year, the Stantec project manager joined the firm of IBI Group, and continued as project manager on contract to Stantec, with IBI Group as the prime consultant responsible for Plan preparation.

1.2 Study Purpose

According to the Regional Transportation Study Terms of Reference included in the **Technical Appendix**, the main purposes of a new regional transportation plan and policy are to:

- Protect existing and identify new and/or expanded transportation corridors within the Essex-Windsor region to meet the transportation needs of residents, businesses and visitors (by accommodating the travel needs of an estimated 90,000 new residents and 54,000 new employment opportunities over the next 20 years);

- Protect and enhance these transportation corridors to also accommodate projected growth in vehicular traffic from outside the region that uses the region's roads for cross-border trade and commerce;

- Establish fair and equitable funding mechanisms to finance growth and non-growth related regional transportation improvements;

- Provide a transportation policy framework that can be used to regulate and control vehicular access, building locations and setbacks and land uses adjacent to regional roads;

- Show how to increase the availability and use of alternative transportation modes, by describing feasible means of making transit, cycling and walking more attractive to existing and future regional residents;

- Describe how to reduce the total kilometres traveled per household by automobile in the region through Transit-Oriented Development (TOD) urban design, transit-supportive planning and cycling and pedestrian-friendly land use policies and plans where appropriate within the region; and

- Develop a consistent regional road classification system and associated set of design standards across the region (County and City) based on an agreed upon functional hierarchy of roads under the jurisdiction of the County and City.

1.3 Transportation Planning Approach

The transportation planning approach used in developing this Plan was based heavily on the land use/transportation planning interface, whereby most regional transportation needs are expected to result from the type, location and extent of growth in the region. Other needs will continue and expand as a result of growth in inter-regional and international through traffic. As a result, the original study schedule was extended by the need for extensive growth planning throughout the region, and the translation of this population and employment growth into associated trip-making, system needs and alternative solutions.

One result of this need for comprehensive transportation planning is that the role of municipal transportation planning has undergone a major change in the past 10 years. Previously, transportation planning attempted to provide basic transportation infrastructure – road, transit, marine and air. Today, transportation planning is much more inclusive and complex, and is considered part of larger societal strategies to, for example, improve air quality, provide access for jobs, stimulate economic development and enhance the quality of life. This more integrated planning approach is also seen in the new County Official Plan.

As a result, the public and their decision-makers now require and expect transportation solutions that go beyond the ability of any one agency or mode to solve. This expansion of purpose requires today's transportation planning approach be focused as much on mobility management as mobility infrastructure. For example, in order to address the Terms of Reference objective to reduce vehicle kilometres traveled by automobile, and achieve associated air quality improvements, the Regional Transportation Master Plan must show how existing transportation resources can be managed better, balanced with the need to better connect modes and make capacity enhancement investments.

1.4 Transportation Goal and Objectives

The following goal and objectives for the Essex-Windsor Regional Transportation Study were developed based on the original study Terms of Reference of February 2002:

TRANSPORTATION PLAN GOAL - To develop a new comprehensive Regional Transportation Master Plan for the Essex-Windsor region with recommended policies and an implementation strategy that will serve the needs of this region for a twenty year planning horizon.

TRANSPORTATION PLAN OBJECTIVES

1. Fairly and equitably manage, coordinate and finance growth and non-growth related region-wide transportation improvements, with a balance of capacity enhancements and demand management that best benefits the region;

2. Have the region develop in a coordinated manner that will be effective in minimizing traffic congestion and associated environmental impacts, protecting and managing required transportation corridors and achieving the region's transportation management goals;

3. Increase the availability of "viable" transportation options by making public transit, cycling and walking more attractive for Essex-Windsor residents;

4. Identify achievable strategies, in the context of the County of Essex and the City of Windsor, to reduce the number of kilometres traveled by the private automobile per household by creating more compact built forms, mixed-use neighbourhoods and developments, and by adopting transit, cycling and pedestrian-supportive land use planning and urban design policies and plans throughout the region;

5. Formulate the Regional Transportation Master Plan in an integrated, inclusive and comprehensive manner; and

6. Satisfy Phases 1 and 2 of the Municipal Class EA process dealing with transportation system needs and alternative planning strategies respectively.

1.5 Study Area

This Regional Transportation Master Plan encompasses the County of Essex, its seven (7) local municipalities and the City of Windsor as shown on Exhibit 1.1. Since travel patterns and transportation needs are not influenced by or respond to municipal boundaries, the study scope encompassed the entire study area, with no specific emphasis on any particular part or municipality except where required by transportation system function and need.

Furthermore, the study recognized the four road jurisdictions and associated agencies responsible for transportation infrastructure within the study area, namely:

County of Essex Roads	City of Windsor Freeways, Arterials & Collectors	Municipal/Town Arterial & Collectors Roads	Provincial Freeways (401) & Highways (3, 77)	Provincial Ferry Service
Transit Windsor	The Canadian Transit Company (Ambassador Bridge)	Detroit-Windsor Tunnel Corp.	Canadian Pacific Railway	Canadian National Railway
	The Port of Windsor	The Windsor International Airport	Essex Terminal Railway	

Exhibit 1.1 – Study Area

1.6 Conformance Municipal Class Environmental Assessment Process

The Regional Transportation Master Plan was prepared following the Master Planning Process of the *Municipal Class Environmental Assessment Process.* The Plan is a stand-alone document with a broad level of assessment to describe the Essex-Windsor transportation system, and provides the context for implementing specific projects within this system by satisfying Phases 1 and 2 of the Process dealing with the system problems and opportunities, and alternative solutions respectively. More detailed investigations will be required for specific Schedule B and C projects recommended in this Master Plan.

Schedule B projects will require the filing of the project file for public review, while Schedule C projects will have to fulfill Phases 3 and 4 of the Class EA process prior to filing an Environmental Study Report (ESR) for public review. In both cases, the public review period includes a Part II Order appeal mechanism (formally known as a "bump-up"), where an individual can make a written request to the Minister of the Environment to extend the project to a higher level of EA investigation. **Note:** A Part II order request can only be made on a project-specific EA, and not on a Master Plan on which such a project is based.

1.7 Official Plan Amendments

A number of key recommendations of this Master Plan will need to be translated into amendments to associated Official Plans, especially involving regional roadway network delineation, any new road hierarchy and classification changes (i.e. major arterial, minor arterial), road system maps (i.e. to show recommended roadway extensions), and new policy statements dealing for example with access management, transit extension and service, Transit-Oriented Development (TOD) and Transportation Demand Management (TDM). These recommendations for Official Plan integration are described in Section 5.6.1of this Plan.

1.8 Study Direction

The Master Plan was prepared under the direction of an administrative Steering Committee made up of the following representatives from Engineering/Public Works and Planning Departments of all involved municipalities, the Ministry of Transportation and Transit Windsor:

Tom Bateman, County Engineer, County of Essex (replacing Stu Kelch in 2004)	Richard Fazecash, County of Essex	Bill King, Manager Planning Services, County of Essex
Hilary Payne, CAO, Town of Amherstburg	Chad Jeffery, Planner, Town of Essex	Cindy Prince, Planner, Town of Lakeshore (also representing Town of Kingsville)
Tracey Pillon-Abbs, Planner, Town of Leamington	Larry Silani, Director of Planning, Town of LaSalle	Brian Hillman, Director of Planning, Town of Tecumseh
John Tofflemire, City Engineer, City of Windsor	Bob Hayes, City Planner, City of Windsor	Alex Shinas, Planner, City of Windsor
Wes Hicks, Manager of Transportation Planning, City of Windsor	Steve Bittner, Transportation Planner, City of Windsor	Michael Swim, Senior Project Engineer, MTO
Steve Kapusta, Planner, Transit Windsor/City of Windsor	Rob Larret, Planning Manager, Transit Windsor	

The primary members of the Consulting Team who worked with the Steering Committee to prepare this Master Plan included:

1. Don Drackley, MCIP, RPP, MITE, Project Manager/Transportation Planner (Stantec Consulting and IBI Group);

2. Jim Mallett, P. Eng., Demand Forecasting (PTSL);

3. Jonathan Hack, MCIP, RPP, Financial Analysis (IBI Group);

4. Michael Kieran, Rail Transportation (IBI Group); and

5. Bill O'Brien, P. Eng., Transit Analysis (PTSL).

2. EXISTING REGIONAL TRANSPORTATION SYSTEM

2.1 Transportation Planning Principles

Planning principles form the strategic foundation for development of transportation master plans. They reflect the basic, essential directions of the region on developing a regional transportation system. Being strategic in nature, the Principles are not intended to fully describe associated needs and actions. This will be done through further development of plans and policies required to implement each Principle.

The following five (5) Principles are based largely on the study Terms of Reference, analysis of existing regional transportation conditions and initial community input provided through public meetings and stakeholder discussions at the outset of the project.

Principle #1: Optimize Arterial Roadway Network Capacity – Based on experience elsewhere, regional residents are expected to want a safe, convenient and effective transportation system. The County of Essex, its local municipalities and the City of Windsor have a responsibility to provide a functional transportation system with an appropriate Level-of-Service (LOS) for the safe and efficient movement of people and goods.

In response, and where appropriate in the region, priority should be placed on optimizing the carrying capacity of the existing arterial roadway network within the urban and rural areas before investing in new major capital improvements such as road widenings, extensions and new roads. Arterial optimization will focus on access management and corridor protection along "regionally" important major routes through regulation and control of vehicular access, building locations, land use types, turning movements, side road access and driveway access. It must be noted that this principle is **not** intended to hinder the development of new roadway infrastructure deemed necessary to solve urgent, special problems created by border traffic.

Principle #2: Select Appropriate Levels of Service and Standards – Before making major roadway network improvements, the road or roads in question should be analyzed to determine the appropriate Level-Of-Service and design standards that match the need and character of the area being served. This principle is required in a mixed urban/rural region such as Essex-Windsor because the urban and rural character is extremely different. In predominantly rural areas, County roads typically have low traffic volumes. This trend is expected to continue into the future, and so most of the County road system is not expected to experience Level-of-Service problems. Conversely, there are several County roads near Windsor within urban communities that are already experiencing congestion. When roadway improvements are considered in these areas, they should be examined from the perspective of community need, traffic volumes and Level of Service measurements.

Principle #3: Ensure Transportation Improvement Affordability – The ability of the City, County and local municipalities to fund major transportation projects over the next 20 years may be limited by funding limitations and competing needs. This being the case, transportation planning may have to consider the implications of reduced investment scenarios on the level of transportation service, as measured by criteria such as travel time and LOS changes. The Transportation Master Plan must prioritize recommended system improvements, including structural, operational and TDM measures, in order to respond to funding limitations or targets.

Principle #4: Ensure Transportation System Sustainability – To sustain the existing transportation system in the Essex-Windsor region, decisions should be made using integrated transportation/land use planning. This approach responds to the Smart Growth approach to land

use and density distribution, using re-urbanization and intensification in appropriate areas to reduce the impacts of urban growth on the roadway network. In both the City of Windsor and County of Essex, this principle could extend so far as to allow urban development only where and when adequate transportation services and capacities are made available. The common measurement of the regional transportation system's sustainability will be the vehicle kilometres of travel being conducted. Under the sustainability principle, this measurement should not increase over the next 20 years, and preferably decrease in appropriate areas such as the urban communities. This principle can be accomplished through a balance of roadway capacity optimization and enhancement that provide for high connectivity and travel efficiency throughout the region, coupled with demand management measures that encourage more sustainable travel characteristics by regional residents (i.e. alternative modes, travel times and home-work proximity) and a closer home-work relationship (i.e. through moiré mixed use and intensified development forms).

Principle #5: Ensure Roadway Network Enhancement Achievability – In order to satisfy Phase 2 of the Class Environmental Assessment process, the Transportation Master Plan study must objectively identify all possible alternatives to address transportation system needs over the next 20 years. However, alternatives that are not considered to be feasible and reasonable based on current Official Plan policies, Provincial Policy Statements, community character, expected system and community impacts and public costs should be screened out early from further consideration. This principle applies equally to capacity-based projects such as road improvements, and demand-based projects such as transit service extensions and TDM programs.

2.2 Existing Transportation Policy Foundation

The basis of a comprehensive Essex-Windsor regional transportation policy and implementation strategy is currently found in the transportation sections of the respective municipal Official Plans. A comparison of relevant policy areas in each Plan is summarized as follows, showing various complimentary County and City transportation policies. All recommendations made in the Regional Transportation Study should be compatible with these policies:

2.2.1 TRANSPORTATION PRINCIPLES / GOALS

County of Essex

To connect urban areas with each other and other communities outside this area by providing space for efficient, cost effective and safe movement of people, goods, energy and information without disrupting community integration and function.

To provide cost effective and environmentally sound municipal services.

City of Windsor

Sustainable, effective and efficient infrastructure.

Optimal use of existing infrastructure.

An accessible, affordable and available transportation system.

An environment in which all modes of transportation can play a balanced role.

2.2.2 ROADS

County of Essex

Designated Provincial Highway, County Arterial and County Collector Road system.

When considering matters of land use planning, the County shall (abridged):

i) consider need to improve regional traffic

City of Windsor

Roads and Bikeways system policies include; Controlled Access Highway, Class I Arterial, Class II Arterial, Scenic Drive, Class I Collector, Class II Collector and Local Roads.

Other road-related policies for:

flow in the vicinity of the City;

ii) minimize conflict between local and non-local traffic by protecting County arterial system;

iii) consider whether resources are available;

iv) encourage integration of transportation facilities provided by local municipalities, adjacent municipalities and the Province;

v) review road corridors to determine necessary changes in classification.

vi) encourage safe, convenient and visually appealing pedestrian facilities where appropriate along arterial and collector road systems;

vii) minimize direct access and limit access to arterial roads where local road access is available;

viii) ensure traffic impact studies for development proposals likely to generate significant traffic;

ix) address the matter of cross boundary traffic with adjacent municipalities;

x) prepare a County Roads Policy Manual.

xi) provision of public transit is encouraged, and is a local matter.

Turning Lanes & Special Features

Road Maintenance

New or Additional Rights-of-Way

Guidelines for New Roads

Residential Areas

New Development

2.2.3 BORDER CROSSING

County of Essex

The County's Official Plan Section 2.9.2 states that if the preferred solution involves a transportation route in Essex County, additional planning policies and an Official Plan amendment may be required, and would also need to be satisfactory to the local host municipality and its Official Plan policy direction.

City of Windsor

Council shall maximize the economic development potential provided by cross-border traffic…

Council shall ensure construction of an additional border crossing has minimal negative social, environmental and economic impacts on Windsor.

2.2.4 OTHER TRANSPORTATION SERVICES:

County of Essex

<u>Pedestrian and Bicycle Policies:</u>

Local municipalities are encouraged to consider development of pedestrian walkways and bicycle paths…that ensures their interconnectivity where possible with

City of Windsor

<u>Transit Policies:</u>

Council shall require all proposed developments and infrastructure undertakings to provide facilities for public transportation wherever appropriate.

existing and proposed paths includes those in the City of Windsor	Pedestrian Network Policies: Require all proposed developments and infrastructure undertakings to provide facilities for pedestrian movement wherever possible. Make pedestrian movement safer and more convenient by requiring sidewalks on both sides of all roads except Local Roads, and at least one side of Local Roads… Cycling Network Policies: All proposed development and infrastructure provide facilities for cycling movement and storage wherever appropriate. Provide for development of a Bikeway Implement, monitor and update a cycling master plan. Install cycling supportive facilities…
Rail Policies: Local municipalities encouraged to develop policies that consider safe and reasonable pedestrian movement across tracks.	Rail Transportation Policies: Minimize conflict among rail, vehicle and pedestrian movement by working with various public agencies and private organizations for appropriate use of level crossing controls, grade separated crossings and construction of fencing adjacent to railway ROW or rail yards. Encourage reuse of abandoned railway rights-of-way for enhancement of the transportation, Greenway System and other uses as appropriate.

2.3 Existing Regional Travel Characteristics

As part of this study, in October, 2002 a household travel survey was conducted via telephone in the part of the County outside the previous WALTS study area previously surveyed in April/May of 1997. The purpose of the survey was to gather supplementary information regarding the PM Peak Period (3 PM to 6 PM) travel characteristics of the suburban/rural population in the County of Essex. The survey gathered information regarding the type of household, number of occupants in the household, employment status, trips made during the PM peak and the frequency of those trips. At the end of the survey, several attitudinal questions were asked in regards to the road system, the bicycle system, pedestrian system, traffic conditions and transit facilities. More detailed information on this survey is located in the **Technical Appendix** to this Master Plan.

Response to the survey was lower than expected based on experience with similar surveys elsewhere, even though radio and print advertising was utilized and prizes were offered for the completion of the survey. A total of 146 surveys were completed over the course of two weeks. From these surveys, information was collected for a total of 267 trips (one-way). The table below shows 53% of the trips made by the residents were within the local area where they reside, 27% of the trips were made to Windsor and 20% were made to other areas both within and outside of the County.

Trip Breakdown		
Trips within own area	142	53%
Trips to Windsor	72	27%
Trips to other areas	53	20%
Total trips	**267**	**100%**

Trip Purpose - The majority of the trips were work based home trips as shown below. These account for 26% of the total trips made. School based home trips account for 22% of the total while shopping based home trips account for 9% of the total. Almost half, or 48% of the trips made between 3 PM and 6 PM are by people returning from work or school, with few non-home based trips occurring during this time period.

Trip Purpose	
Work to Home	26%
School to Home	22%
Shopping to Home	9%
Home to Shopping	6%
Home to Work	4%
Home to Recreation	4%
Work to Shopping	3%
Home to School	2%
Home to Other	2%
Home to Personal Business	2%
Shopping to Shopping	2%
Recreation to Home	2%
Other to Home	2%
Visit Friends to Home	2%
All others	12%

Trips To and From Windsor - The survey data was also examined to determine how many trips were being made to and from Windsor, showing that the residents of Amherstburg made more trips to/from Windsor than the other surrounding areas and the residents of Leamington made the least. This can be attributed to Amherstburg being closer to Windsor. Note that the further from Windsor the area is located, the fewer trips were made.

Trips to/from Windsor by Area		
Amherstburg	28	39%
Essex	15	21%
Kingsville	12	17%
Lakeshore	11	15%
Leamington	6	8%
TOTAL	**72**	**100%**

Travel Mode – In April/May 1997, the Household Travel Survey of 6,300 Windsor and surrounding area households conducted as part of WALTS found that in the 3-6 PM Peak Period, autos accounted for about 80% of all trips made. Walking was second at about 10%, followed by 4% using school buses, 3% using Transit Windsor, 2% cycling and 1% using other modes (i.e. taxi, motorcycles). An example of how this compares to travel mode shares in other comparable and larger centres in shown on Exhibit 2.1. The conclusion from that survey was that the Windsor and surrounding area is generally a highly auto-dominated travel environment characterized in part by higher than average walking and cycling use for an urban area if this size, and lower than average transit use due in part to the lack of transit service beyond the City of Windsor.

Exhibit 2.1 – Comparison of Travel Modes Shares (%age of PM Peak Period Trips)

Mode	Windsor Area	London	Hamilton	Winnipeg
Auto Driver/Passenger	80	83.6	76	76.4
Transit	3	6.9	8	15.2
School Bus	4	-	-	-
Walk	10	6.9	10	6.3
Cycle	2	0.4*	2	1.4
Other	1	2.2	4	0.7
TOTAL	100	100	100	100

* The London Household Travel Survey was conducted in November when cycling use would be reduced.
Source: WALTS, London Transportation master Plan 2004, Transportation Association of Canada

The 146 completed Household Travel Surveys conducted for the EWRTMP Study in October, 2002 were used to augment this earlier WALTS data to include more rural travel characteristics and attitudes. Since there is little to no public transit service provided outside the original WALTS survey area, and the rural nature of Essex County necessitates more auto use compared to cycling and walking over short distances, it was felt that the EWRTMP data would slant the WALTS survey results across the entire Essex-Windsor study area towards increased auto use. As a result, the extra EWRTMP travel mode data was used only in the context of rural travel.

Public Attitudes - The attitudinal questions garnered a very good response rate. Of the completed surveys, 138 responses were received regarding the road system, a response rate of 95%. The transit facilities question received the lowest response at 38, for a rate of 26% which can be attributed to the lack of transit in the areas outside Windsor. For all questions, the “Satisfied” answer ranked first, with “Somewhat Satisfied” ranking second, with the exception of Transit Facilities where “Very Dissatisfied” ranked second. This indicates that the residents of Essex County are generally happy with the transportation system. Comments were received regarding the transit service and at the top of the list was the desire to have transit readily available in all areas.

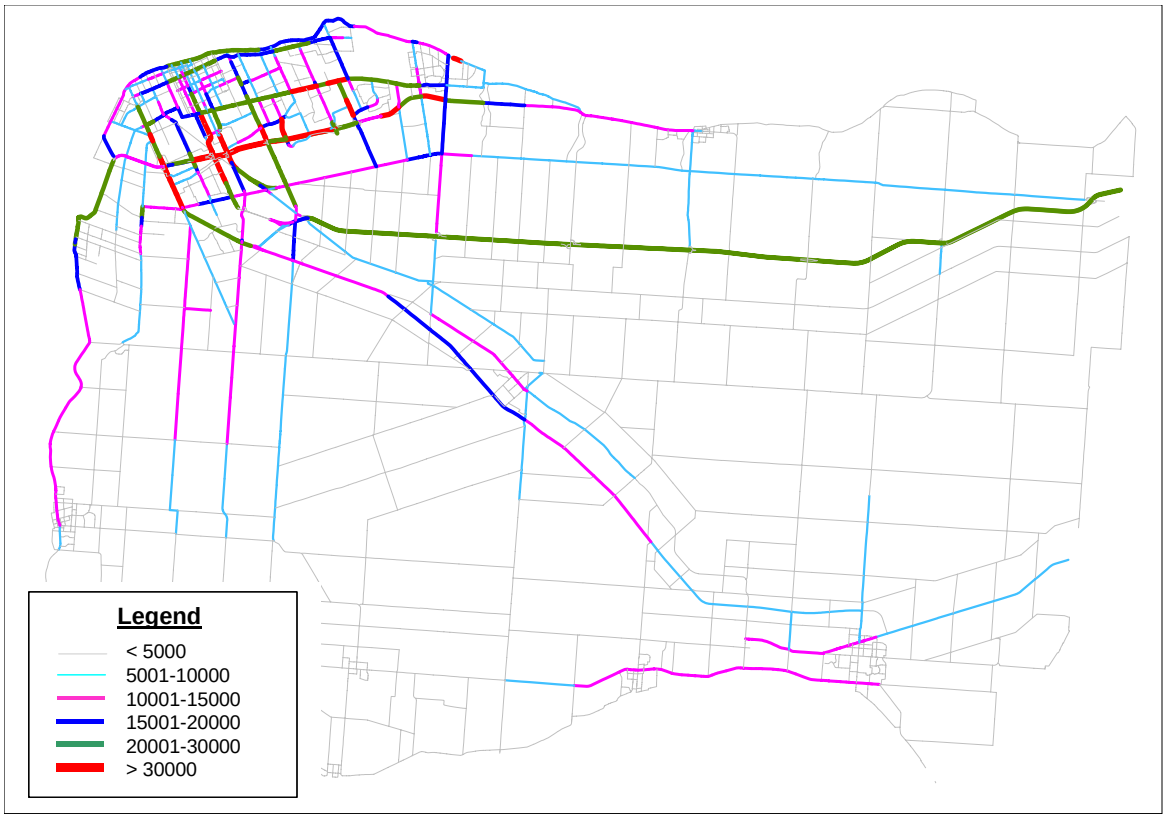
2.4 Major Roadway Network

2.4.1 TRAFFIC VOLUME

The major roadway network in the Essex-Windsor area comprises a provincial freeway (Highway 401) and two provincial highways (3 and 77), a network of County Roads and urban arterials, and associated collector and local streets throughout the urban and rural areas. Existing traffic volumes on the County Roads were provided from1998 average annual daily traffic (AADT) counts, supplemented by updated 24 hour counts conducted in 2002 at 25 additional County Road locations. The 1998 County data was factored up to 2002 volumes by applying a factor of 1.053 (total growth of 5.3% in four years, or 1.3% per annum). This factor was derived by comparing the 1998 count data to the data collected in 2002.

The Ministry of Transportation provided 2002 AADT data for 12 locations on Highway 3, 11 locations on Highway 401 and five locations on Highway 77. The City of Windsor provided traffic data from their annual traffic count program. The combination of County, MTO and City of Windsor traffic volume data is summarized on the existing major roadway network on Exhibit 2.2.

Exhibit 2.2 – Major Roadway AADT 1998-2002



This recent traffic data provides the following general conclusions about current traffic volumes on major County roads, highways and City of Windsor arterials:

a. AADT's in the County vary from less than 5,000 vehicles per day (vpd) up to 30,000 vpd on Highway 401. The County Roads, excluding Highways 3 and 401, experience AADT's up to 15,000 vpd.

b. The majority of the roadways within the County are currently experiencing AADT volumes of 5,000 or less, which are considered low volumes of traffic, with a few occurrences of moderate volumes in the 10,000 to 15,000 vpd range, and up to 30,000 on CR 20 in LaSalle and CR 22 west of CR 21 in Tecumseh.

c. Highway 401 within the County has AADT's of 20,000 or more for the entire length from east of Tilbury to the tunnel/bridge split at Windsor. At this point, the majority of Highway traffic enters the tunnel route. The highest AADT on Highway 401 within the County occurs between Highway 77 and County Road 25, which link to the communities of Leamington, Kingsville and Essex.

d. Highway 3 from Windsor to Leamington experiences AADT's of greater than 5,000 for its entire length, with the highest volume experienced between County Road 9 and Highway 401, just outside Windsor. In response, MTO is completing an Environmental Assessment and preliminary design of Highway 3, and will seek environmental approval for improvements to Section 2 and 3 of the Highway from Todd Lane/Cabana Road in LaSalle/Windsor south to Leamington described as follows:

Section 2: Highway 401 Interchange to Maidstone – addition of one through lane per direction and a continuous two-way left turn lane, plus pavement rehabilitation, intersection and illumination improvements and realignment of the Oldcastle Road intersection;

Section 3: Maidstone to Leamington – addition of two additional through lanes south of the existing highway to create a four lane highway with a wide grassed median, plus pavement rehabilitation, illumination improvements, additional traffic signals and turning lanes and introduction of strategic intersection closures and realignments.

e. Other high volume routes of note are County Road 20 from County Road 18 at Amherstburg north into Windsor, County Road 20 and 34 through Leamington and the sections of County Road 9 and 11 immediately south of Windsor. These County Road sections are currently experiencing AADT's of between 10,000 and 15,000 vpd.

f. The highest AADT volumes record to date on County Road 19/Manning Road are 10,000-15,000 vpd between CR 2 and CR 42.

g. The busiest route sections in Windsor with AADTs over 30,000 were reconfirmed to be on EC Row Expressway, Huron Church Road, Ouellette/Dougall Avenue, Tecumseh Road East, Walker Road and Cabana Road.

Where commercial traffic volume data were available, it consisted mainly of heavy trucks, with little recreational vehicle or bus traffic. The percentage of commercial traffic on the road system is based on the total daily traffic as shown on Exhibit 2.3, with the following observations noted:

a. The majority of County roads experience commercial volumes of less than 2.5%. The highest percentage of commercial traffic in the County is experienced on Highway 401, Highway 77 between County Road 14 and Highway 401, and on County Road 37 between County Roads 14 and 34, all with 30% or greater commercial traffic. Cross-border traffic is seen as a contributing factor to the high volume of commercial traffic on Highway 401;

b. Highway 3 has commercial traffic volumes of greater than 5% for its entire length; and

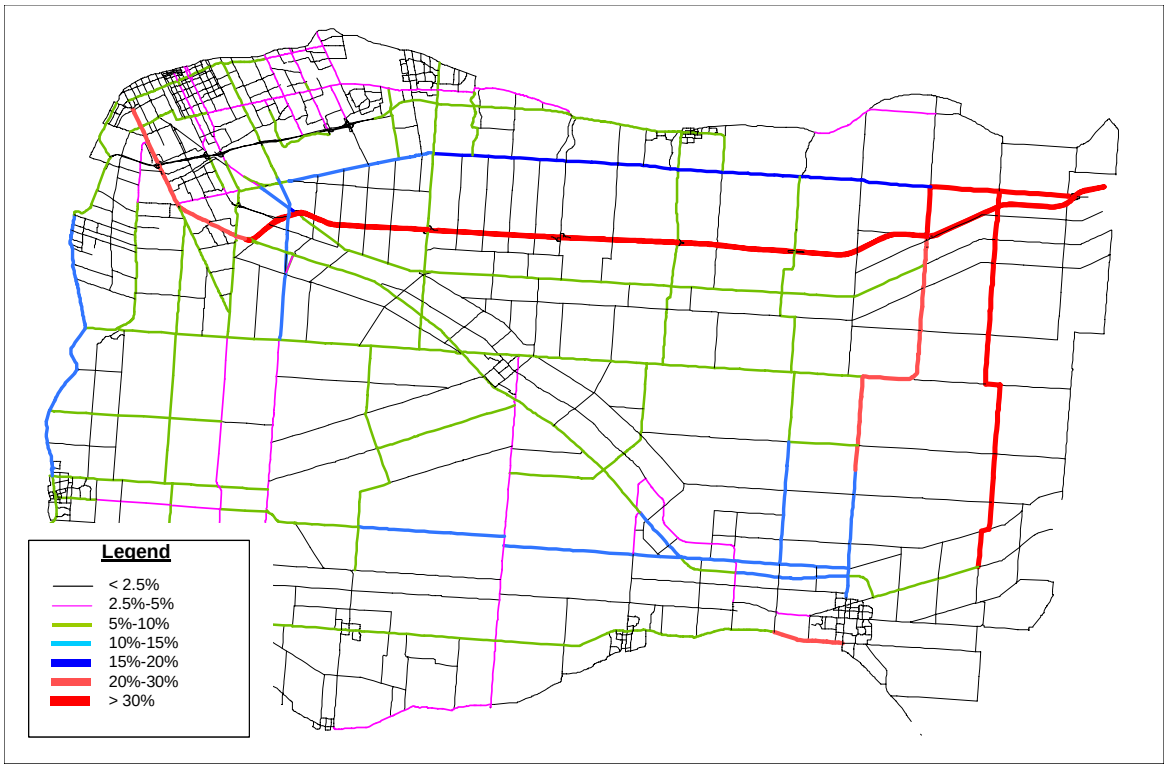
c. Other areas of note that experience heavier commercial traffic volumes are County Road 20 between County Roads 31 and 33, which currently experiences between 20 and 30% trucks and County Road 42 between County Road 31 and Highway 77, which currently experiences between 15% and 20% commercial vehicle traffic.

d. In the City, the percentage of commercial traffic over 5% is found on Huron Church Road (20-30%), Division Road and south section of Walker Road (see Exhibit 2.3).

2.4.2 RECOMMENDED ESSEX-WINDSOR ROADWAY CLASSIFICATION SYSTEM

The Terms of Reference for this study asked that "*a consistent classification system and set of standards across the County and City"* be developed and applied based on "*an agreed upon functional hierarchy of transportation corridors".* In response, the study developed this more extensive and consistent roadway classification system for the Essex-Windsor region as shown on Exhibit 2.6. Additional information on the rationale and criteria used to develop this classification system is documented in the **Technical Appendix**, and is based largely on the following important planning conclusions:

Exhibit 2.3 – Existing Commercial Traffic Volumes



1. **WALTS Planning Capacities are reasonable** – and consistent with those use in recent transportation planning models developed in Ontario.

2. **Smaller Communities require/expect a higher LOS** – larger urban centres are planning to LOS E, but this is not acceptable in smaller urban centres. For example, Guelph, St. Thomas and Peterborough base their future planning on LOS D, meaning they are committed to roadways improvements at a lower threshold volume.

3. **Provincial Highways should follow MTO method** – Since there are provincial highways within the study area that are under the direct control of the Ministry of Transportation, the best way to reflect the LOS on these facilities is to use the province's method of determining LOS. This will ensure that public information regarding provincial facilities and future need will be based on similar decision-making processes.

Most travel involves movement through a network of roads that can be categorized by functional classification. Base criteria for classifying roads in Ontario are available from three official sources:

- Ministry of Transportation Geometrical Design Standard Manual;
- Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads; and
- Minimum Maintenance Standards for Municipal Highways (Regulation 239/02 of the Municipal Act).

Examples of classification systems were also reviewed in other Regional Municipalities that, like the Essex/Windsor area, combine both urban and rural features. The one common factor in all classification systems is the recognition that all types of roads perform two basic functions:

- To provide mobility by facilitating travel between points of origin and destination; and
- To provide land access.

To identify the classification that should be assigned to any road, a series of service, function and operational criteria were considered as described below:

Land Use to be Served - The intensity of access needs provided by a road changes with the type and intensity of land use being served. This is the main reason why the geometric requirements for roads in a low density rural setting are different from those of urban roads in more intense residential, industrial or commercial areas. This is partly attributed to the types of vehicular traffic prevalent in the traffic stream of urban compared to rural settings. It is also important to recognize that roads in predominantly residential areas, particularly the locals and collectors, are designed to achieve many objectives other than the provision of vehicular access.

These objectives range from minimizing unnecessary through traffic volumes, to encouraging walking and cycling and providing space for social interaction that enhances the quality of life in residential areas. Similarly, rural land use patterns need roads to accommodate locally prevalent vehicles such as agricultural machinery or gravel trucks. Changes in land use resulting from rezoning and redevelopment can create the need to alter the classification of a particular road. Geometric changes may be desirable to better meet the vehicular, pedestrian and other requirements associated with the altered land use.

Roadway Service Function - All roads provide service to traffic, access to land, or both, but do this to varying degrees. Freeways, expressways and arterials provide for the movement of urban and inter-urban through traffic. Local roads and public lanes are used exclusively for access. Collectors provide for both the movement of through traffic and access.

Traffic Volume - Freeways, expressways and arterials carry high volumes of traffic while low volumes are associated with collectors and locals. However, the volume range for each classification is wide and can overlap that of other classifications (see Exhibits 2.4 and 2.5).

Note: Traffic volume can be incorrectly used as the main criteria to determine roadway classification (i.e. the greater the volume, the higher the classification). This primary correlation between volume and classification should be avoided for two important reasons:

1. Roadway traffic volume is not a reflection of the roads role in the total roadway network. Rather, it is an indicator of how the road is being used to serve travel needs in a particular part of the network. For example, a collector connecting two arterial roads may exhibit high traffic volumes owing to its connection role, but this does not justify its design and designation as an arterial road; and
2. High traffic volumes on collector and/or local roads is usually an indication of capacity deficiencies in the arterial grid. In most cases, enhancement of the arterial grid capacity will alleviate connecting road congestion. This is one of the principles behind “traffic calming”.

Traffic Flow Characteristics – The desired characteristics of traffic flow have a major influence on determining roadway classification. For example, road primarily serving traffic movement such as freeways and arterials are expected to have uninterrupted traffic flow characteristics. Conversely, traffic flow on minor collectors and local roads is expected to provide full land use access, and so is necessarily restricted by intersections, driveways, pedestrians and other road users, as well as parked vehicles.

Running Speed - The average running speed of traffic operating under off-peak volume conditions varies on roads of the same classification depending on the type and condition of the surface, intensity of adjacent land development, access to the roadway, vehicle types, and traffic flow controls. Running speeds generally increase from locals to collectors, arterials and freeways.

Vehicle Types - The proportion of passenger cars, buses and trucks using a roadway is generally dependent on the purposes of the roadway and is, therefore, related to the road classification. This is seen in the current roadway classification policies of the County of Essex Official Plan that include a clear distinction between "passenger" and "commercial" vehicles. Passenger cars and small trucks predominantly use local and collector roads, while freeways and arterials generally carry a higher proportion of commercial vehicles.

Connections - In an ideal road network, local streets connect with collectors, collectors with arterials, and arterials with expressways and freeways. Therefore, it is preferable to restrict the interconnection of local streets with arterials, and collectors with expressways and freeways.

The basic roadway classification standards recommended for use across the Essex-Windsor region are summarized on Exhibit 2.4 and 2.5, with the recommended system shown on Exhibit 2.6:

Exhibit 2.4 – Rural Road Classification Standards

Criteria	FREEWAY / EXPRESSWAY	HIGHWAY	REGIONAL ROAD	SECONDARY ROAD	TERTIARY ROAD
Land Use Served	does not serve land use	land access is secondary consideration	connects urban areas	rural development areas	access to individual properties
Land Service	no access	limited access	limited access	full access	access primary consideration
Service Function	Optimum mobility	optimum mobility	Traffic movement primary consideration	Traffic movement/land access equally important	Traffic movement is secondary consideration
Traffic Volume AADT	more than 10,000	more than 10,000	1,000 – 20,000	200 – 10,000	not applicable
Traffic Flow Character	free flow	uninterrupted flow except at signals	uninterrupted flow except at signals	interrupted flow	interrupted flow
Design Speed (not posted speed)	100 -120 km/h	80-100 km/h	80 –100 km/h	60 – 100 km/h	60 – 80 km/h
Average Running Speed	80 – 120 km/h	80-100 km/h	60 – 100 km/h	60 – 90 km/h	50 – 80 km/h
Vehicle Type	all types, heavy trucks average 20 – 30%	all types, heavy trucks average 20 – 30%	all types, up to 20% trucks	all types up to 30% trucks mostly single unit type	predominantly passenger cars and light to medium trucks and occasional heavy trucks
Connects to	Freeways arterials	freeways arterials	freeways arterials collectors	arterials collectors locals	collectors locals

Exhibit 2.5 – Urban Road Classification Standards

Criteria	FREEWAY / EXPRESSWAY	HIGHWAY	ARTERIAL (Major/Minor, Class I, Class II	COLLECTOR (Major/Minor, Class I, Class II)	LOCAL
Land Use Served	does not serve land use	land access is secondary consideration	connects districts & development nodes	internal area connections	Access to individual properties
Land Service	no access	limited access	limited access	full access	access primary consideration
Service Function	Optimum mobility	optimum mobility	Traffic movement primary consideration	Traffic movement & land access equal importance	Traffic movement is secondary consideration
Traffic Volume AADT	more than 75,000	more than 50,000	5,000 – 50,000	1,000 – 20,000	not applicable
Traffic Flow Character	free flow	uninterrupted flow except at signals	uninterrupted flow except at signals	interrupted flow	interrupted flow
Design Speed (not posted speed)	100 -120 km/h	80-100 km/h	80 –100 km/h	60 – 100 km/h	60 – 80 km/h
Average Running Speed	80 – 120 km/h	80-100 km/h	60 – 90 km/h	60 – 70 km/h	40 – 60 km/h
Vehicle Type	all types, heavy trucks average 20 – 30%	all types, heavy trucks average 20 – 30%	all types, up to 20% trucks	all types	predominantly passenger cars and light to medium trucks
Connects to	Freeways arterials	Freeways arterials	freeways arterials collectors	arterials collectors locals	collectors locals

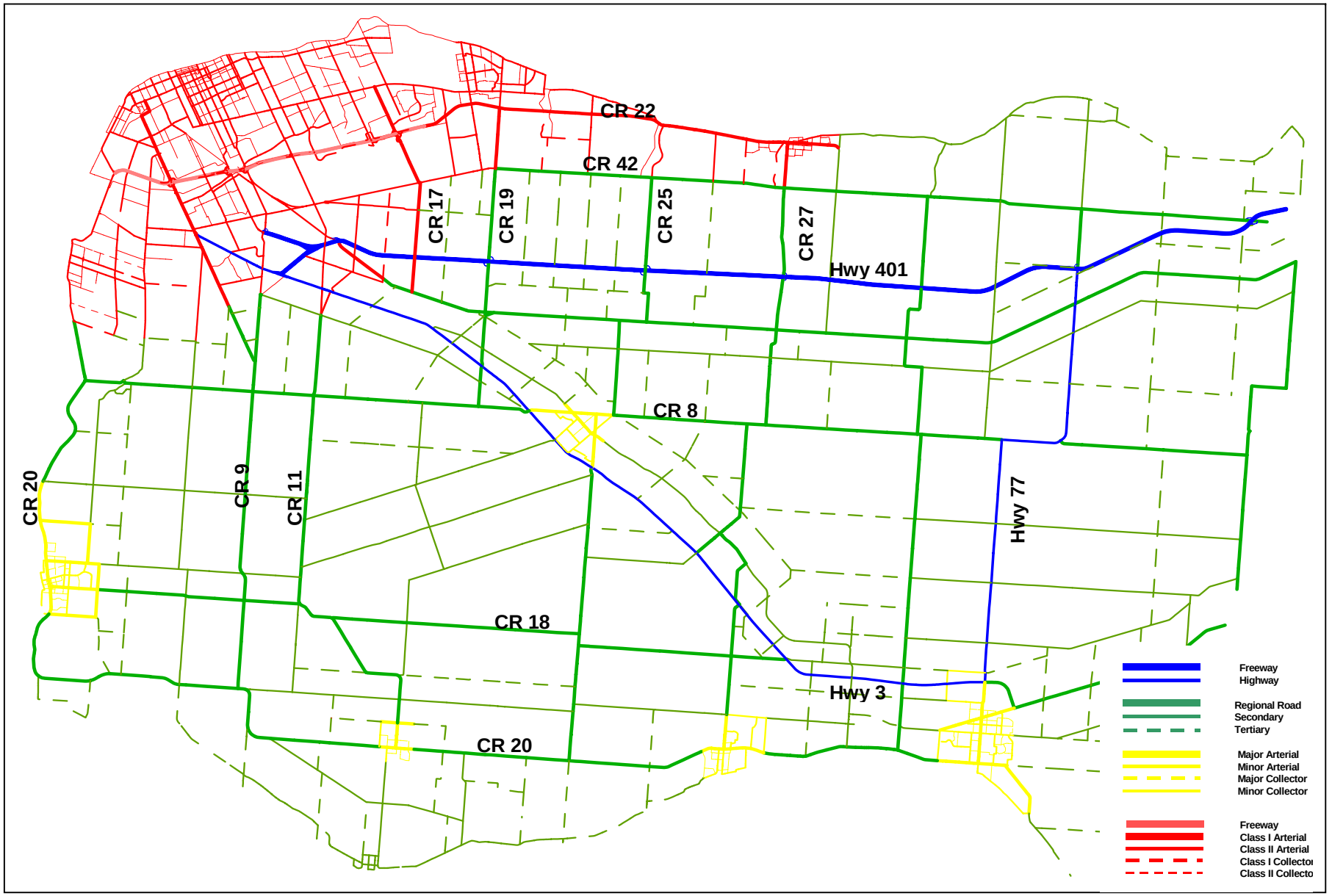
2.4.3 EXISTING ROADWAY NETWORK CAPACITY

At the outset of this study, roadway planning capacities adopted for use in demand modelling came directly from WALTS. Using this approach, all County Roads were considered to be “rural highways” and therefore assigned a planning capacity equivalent to 22,000 vehicles/day for a two-lane County Road and 44,000 vehicles/day for a four-lane County Road. However, after reviewing the resulting volume/capacity ratios and LOS measurements, it became evident that this methodology understated the identification of roadway LOS deficiencies. As such, it was decided by the project team that a more conservative approach was required. At that time it was decided to adopt the Ministry of Transportation (MTO) method with respect to estimating service flows.

The main difference between the WALTS and MTO methods is that WALTS assumed all County Roads operated with the same capacity (11,000 vehicles/day/lane), while the MTO method recognized that different types of rural roads operate with different planning capacities. If these differences could be incorporated into the LOS calculations, then the results would be more sensitive to the public’s expectations of traffic volumes in various types of rural areas.

Based on this need to evaluate LOS on different types of rural roads, and with information collected from other jurisdictions, the Essex-Windsor Regional Transportation Master Plan area was divided into three categories for transportation study purposes. As shown next on Exhibit 2.7, which is a representation of Official Plan policies, this approach reflects the three most basic types of study area characteristics, which are also reflected on the Exhibit 2.6 Recommended Roadway Classification System:

Exhibit 2.6 – Recommended Essex-Windsor Roadway Classification System

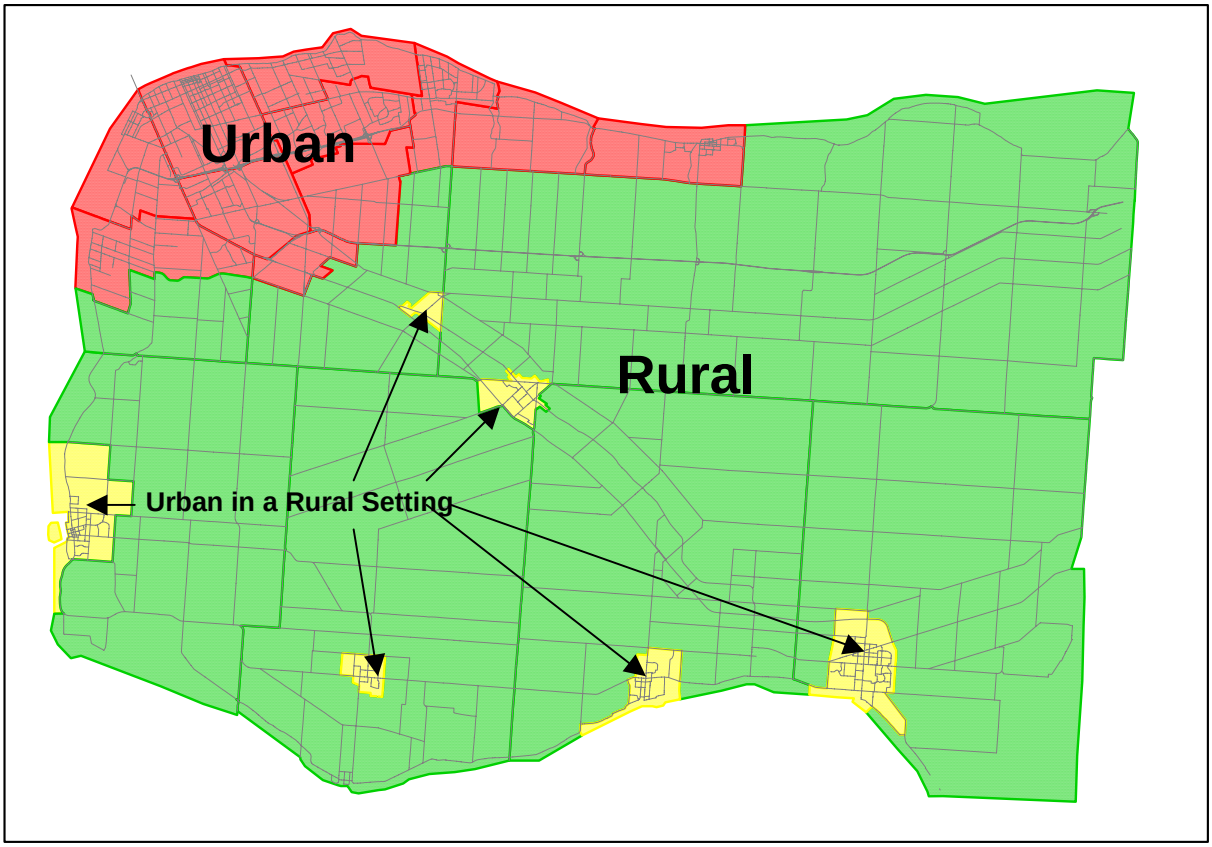


Urban - The red area in the northwest has been classified as the major "Urban" component of the study area. This area is the "area of influence" of the greater-Windsor "commutershed" and essentially functions as one expanded urban area from a **transportation** perspective. It is generally the limit of urban development and is characterized by areas of higher employment and population concentrations. The roadways in this area are characterized by significant adjacent commercial, industrial and residential development. Driveway density is higher than in the rural areas, and major intersections are usually controlled by traffic signals.

Urban in a Rural Setting - The yellow areas on Exhibit 2.7 have been classified as the "Urban in a Rural Setting" components of the study area. These areas are typically smaller urbanized town and village centres that are isolated within the general rural character of Essex County. Development within these areas is typically urban with higher densities of population and employment than the surrounding rural area. The roadways in this area are characterized by adjacent commercial, industrial and residential development. Driveway density is higher than in the rural areas and major intersections may be controlled by traffic signals.

Rural - Green areas on Exhibit 2.7 are classified as the "Rural" component of the study area. Development within these areas is sparse with very low densities of population and employment. Roadways in this area are generally characterized by adjacent agricultural development, driveway density is very low and major intersections are occasionally controlled by traffic signals.

Exhibit 2.7 – Roadway Planning Capacity Areas



Harrow, Kingsville and Leamington, reflecting a desire to have less delay and less traffic compared to the major urban area. The "Rural" area of Essex County connects urban areas. The extreme right columns are for the Provincial Highway system, and are applied irrespective of geographical considerations since that is not a required consideration in the Province's method.

Note that the following functional classification does not necessarily mean the assigned designation would ultimately be the Official Plan designation for these facilities. Rather, it is an attempt to capture the function of these roads in the overall road system to reflect their roles in the system. The complete roadway classification system is shown on Exhibit 2.6 based on existing conditions, Official Plan designations and the classification criteria.

Exhibit 2.8 – Regional Roadway Planning Capacities (vehicles/lane/hour)

Urban			Urban in Rural Setting			Rural			Provincial Highway		
Class	Lanes	Max Volume/ Direction (LOS E)	Class	Lanes	Max Volume/ Direction (LOS E)	Class	Lanes	Max Volume/ Direction (LOS E)	Class	Lanes	Max Volume/ Direction (LOS E)
Expressway	4	3600							Freeway	4	3000
Rural Hwy	2	1100				Regional Road	2	1000	Highway	2	1250
	4	2200					4	2000		4	2500
Class I Arterial	2	900	Major Arterial	2	800	Secondary	2	800			
	4	1800		4	1600		4	1600			
Class II Arterial	2	800	Minor Arterial	2	700	Tertiary	2	700			
	4	1600		4	1400						
Class I Collector	2	650	Major Collector	2	600						
	4	1300		4	1200						
Class II Collector	2	500	Minor Collector	2	450						
	4	1000		4	900						
Local	2	400	Local	2	300	Local	2	300			

2.4.4 EXISTING (2001) ROADWAY SYSTEM LEVEL-OF-SERVICE

Roadway Level of Service (LOS) is defined by six levels or grades of generalized traffic conditions, characterized as follows, and is a commonly used measurement of overall transportation system operations for links and intersections:

LOS	V/C Ratio	Generalized Traffic Conditions
A	<+0.79	Free flow traffic with average overall travel speed in the upper range.
B	<+0.79	Reasonably unimpeded operations at average travel speeds, with reasonable delays.
C	<+0.79	Stable operations with acceptable delays, but ability to maneuver and change lanes in midblock locations may be more restricted than at LOS B, and longer queues may contribute to lower average travel speeds.
D	0.80 - 0.89	Approaching unstable flow where delays may become extensive and with overall average travel speeds in the lower range.
E	0.90 – 0.99	Unstable flow with continuous backup of approaches to intersections, significant delays and low average travel speeds.
F	>=1.0	Unacceptable conditions where vehicle demand exceeds available capacity, resulting in extremely low speeds and intersection congestion.

As traffic LOS on roadways and at intersections worsens, associated socio-environmental impacts result from the restricted traffic flow, indicated by the following measures of roadway effectiveness:

a. Vehicle emissions increase and concentrate along more congested roadway sections as engines run less efficiently (i.e. idling);

b. Vehicle hours of delay increase;

c. Vehicle kilometres of travel increase as traffic attempts to find less direct alternatives to congested routes;

d. Vehicle hours of travel time increase because of the long travel distances, diversions to alternative routes, slower speeds and delayed conditions;

e. Fuel consumption increases owing to these less efficient travel characteristics;

f. Driver frustration and unsafe practices increase as motorists deal with reduced LOS.

Measuring roadway (LOS) involves a comparison of the planning capacity of all links in the roadway network to carry vehicles in a prescribed time period (peal hour, peak period or daily), and the actual number of vehicle trips measured or forecast to occur on these links during these periods. The resulting ratio is assigned a LOS grade as previously listed from A to F by translating ratio to grade as follows; LOS A-C <=0.79, LOS D 0.80-0.89, LOS E 0.90-0.99 and LOS F >=1.0.

Exhibit 2.9 shows the existing LOS on the Essex-Windsor major roadway network when the planning capacities (Exhibit 2.8) and functional classifications (Exhibit 2.6) established for this project are compared against recently measured and extrapolated traffic volumes on the City and County road network. This shows that the vast majority of County Roads are currently operating at a LOS C or better, which is considered acceptable.

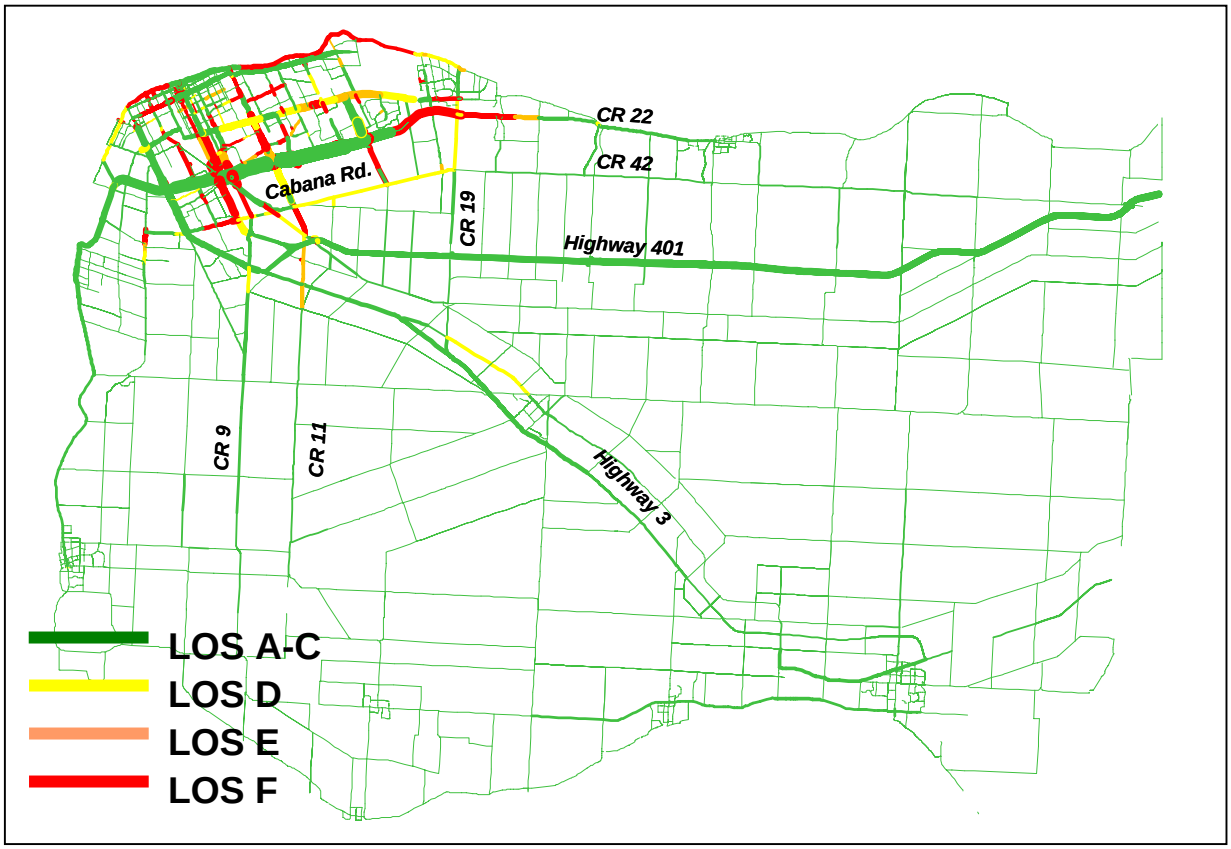
However, there are also some key sections of County Roads in the vicinity of the City currently operating at an unacceptable LOS E and F that are requiring current capacity enhancement and operational improvement measures, notably:

Existing Deficient County Roads:

- CR 11 from Highway 401 to South Talbot Road in the Oldcastle area (LOS E);
- CR 3/Malden Rd. from CR 6/Todd Lane to Normandy St. (LOS F);
- CR 22 from the Banwell Rd. to East Pike Creek Rd. (LOS F) and from East Pike Creek Rd. To Patillo Rd. (LOS E);
- Tecumseh Rd. from Lesperance Rd. to CR 19/Manning Rd.; and
- Riverside Dr. at Lesperance Rd. and CR 19/Banwell Road (LOS E).

Furthermore, a number of critical arterial roadway sections are providing a poor peak period LOS in the City as plans continue to enhance capacity and operations within the arterial network. Sections operating at LOS E are already experiencing unstable conditions that are expected to worsen over time if the growth in traffic volumes continues unabated, and measures are not implemented or effective in better managing the demand for, and operation of the transportation system. Alternative means of addressing these system problems will be further described and evaluated in Section 4 of this report.

Exhibit 2.9 – 2001 Roadway Network Level-of-Service



As shown on Exhibit 2.9, Windsor roadway sections at LOS E and F that require immediate attention to optimize existing capacity, add additional capacity, reduce demand and/or improve operations include the following notable key routes:

Existing LOS E Deficient City Roadway Sections on:

- Tecumseh Rd. East;

Existing LOS F Deficient City Roadway Sections on:

- Riverside Dr. east and west of the downtown (owing to reduced "Civic Way" capacity);
- Wyandotte St. between Huron Church Rd . and Ouelette Ave.;
- Howard Ave., Dougall Ave., Cabana Rd., Tecumseh Rd East and Lauzon Parkway;
- Dominion Blvd. and Campbell Ave.; and
- Walker Rd.

2.5 Public Transit Service

2.5.1 EXISTING SERVICE DESCRIPTIONS

The primary public transit service within the Essex-Windsor study area is the Transit Windsor services within the City of Windsor. These services consist of conventional fixed route schedule bus services that provide service seven days a week to most of the developed area of the City.

Transit Windsor is fully owned and funded by the City of Windsor, reporting to a Board of Directors whose members are appointed by City Council.

The primary exceptions to transit service in developed areas in the City are the Ojibway Industrial area in the southwest corner of the City and a portion of the East Riverside and Lakeview residential developments in the east end. The transit services tend to be focused on the downtown area of Windsor with a major City Centre Transit Terminal that provides connections between City routes and also with inter-city bus services using the terminal. Transit Windsor also operates three services just outside the City boundaries, as follows:

- The Tunnel Bus provides a connection from the City Centre Transit Terminal to downtown Detroit with connections to public transit services throughout Detroit and southeastern Michigan. This service is utilized heavily by commuters traveling between Windsor and Detroit as well as for recreational travel to Joe Louis Arena, Comerica Park, Ford Field and the Cobo Convention Complex.

- Route 8 extends to the Oldcastle industrial area in Tecumseh around Walker Rd and North Talbot Rd to accommodate Windsor residents traveling to and from employment opportunities in that area. This is a minor route extension that has been accommodated within the regular route schedule.

- Route 6 extends to the Windsor Crossing Premium Outlet mall in the Town of LaSalle immediately south of the Talbot Road/Highway 34 boundary to accommodate Windsor residents traveling to shopping opportunities at that location. This is a very short route extension that does not have a significant cost to the transit system.

Transit Windsor does have a public vehicle license that permits public transit operations into Tecumseh, LaSalle and Lakeshore. It is also noted that public transit services have been provided to the suburban area in the past. As recently as the 1980s, bus services extended into the former municipalities of Sandwich West (now LaSalle) and Sandwich South (now Tecumseh). At that time, the suburban municipalities funded the net costs of the services within their jurisdiction.

Today, the goals and objectives of Transit Windsor for 2004-2006 are[1]:

1. *To increase the profile of public transit within our municipality.*

2. ***To increase ridership both within our municipality and by careful expansion of public transit service into our adjacent municipalities.***

3. *To investigate the potential of a merger between Transit Windsor and Handi-Transit.*

The primary components of the existing Transit Windsor network are the City Centre Transit Terminal and satellite depots located at Devonshire Mall near the south central area, Tecumseh Mall in the east end and the College Avenue Community Centre, which provide for passenger transfers between routes. The main bus routes are the Transway 1A providing service to Devonshire Mall and the Howard Ave. corridor, The Transway 1C on the University Ave., Ouellette Ave. and Tecumseh corridors, and the Crosstown 2 along the Wyandotte St corridor.

Transit Windsor currently provides about 6 million (5,560,000 - 2003) annual passenger trips for a service area population of about 2,000 persons (Service Area 190,000, Municipality 210,000. This represents a ridership level of about 30 annual trips per capita, which is an average level for a city of this size as shown on Exhibit 2.10.

[1] Chair's 2004-2006 Goals and Objectives, Transit Windsor Board of Directors, February 26, 2004

Transit ridership in Windsor was considerably higher in about 1989/90, with ridership levels of almost 12 million trips annually. Transit ridership declined in the mid-1990s owing to:

- provincial funding cuts;
- employment decentralization in the Windsor area;
- the economic turndown;
- the low density form of suburban growth;
- an ample supply of low cost parking;
- reductions in two Bus Pass programs by Social Services and the Board of Education; and
- registered farebox technology installed in 1991 revealed that the number of actual Bus Pass riders were lower then previously estimated.

During the late 1990's, Transit Windsor began to experience a slow recovery in ridership , followed by a gradually improving trend since 2000. The most recent available statistics indicate a 2.8 % increase in ridership from 2002 to 2003.

Exhibit 2.10 – Comparable Annual Transit Ridership Per Capita

Niagara Region:	16.5
Kitchener/Waterloo:	27.5
Windsor:	**30**
Hamilton:	41
Oshawa:	45
London:	46

The fares on Transit Windsor are currently $ 2.35 for an adult cash fare, $ 2.30 per ticket (strip of 10 tickets) and $ 75.00 for a monthly pass. Reduced fares are provided to seniors and students. The system has an overall revenue to cost ratio of about 63%, which is relatively high in comparison to other similar sized transit systems.

Transit Windsor operates 37 accessible buses within a total fleet of 96 buses, dispersed over 6 of its' 15 fixed routes. In addition to the conventional and accessible transit services operated by Transit Windsor, there are specialized transit services provided for persons with disabilities who are unable to use the conventional transit service. These services are operated by Handi-Transit Windsor, a not-for-profit agency that is funded by the City of Windsor. The service has about 2250 registered clients and provides about 40,000 annual door-to-door trips primarily within Windsor.

Outside the City of Windsor, the following public transit services have been identified:

- The Town of LaSalle has some service provided to persons with disabilities by Handi-Transit Windsor and pays that agency directly for the net cost of those trips.
- The Town of Tecumseh has a limited service referred to as Shoreline Transit that is operated by a service club for seniors and persons with disabilities. Funding support is provided by the Town to support the service.

- The Town of Leamington's Community Services Department operates a conventional bus service on two routes within the urban area of the Town. This service operates weekdays and Saturdays from about 9:00 AM to 5:00 PM on a 60-minute frequency. The service is modified slightly in summer to meet changing ridership patterns.

2.5.2 EXISTING PUBLIC TRANSIT ISSUES

Extended Transit Services - The lack of a public transit service connecting suburban communities in Tecumseh, Lakeshore and LaSalle to the activity centres within the City of Windsor is the primary transit issue identified in this study. These municipalities tend to contain largely residential developments that are linked to employment, education, medical and business services within the City of Windsor. The lack of an established public transit service has created an auto-dependency pattern for travel by the residents of these suburban and rural communities. This lack of public transit service is also noted in the other outlying municipalities of Essex County, but with their non-contiguous development patterns and greater distances from Windsor, opportunities for transit service are not as feasible and urgent as in the communities adjacent to Windsor.

Transit Funding Framework – Currently there is no funding framework in place for transit services operating within Windsor to be extended into the adjacent municipalities. Funding of suburban services by the City is not feasible if the services primarily benefit the taxpayers in the adjacent municipalities. At the present time, Transit Windsor can only justify transit service expansion beyond the City boundaries where there is a clear benefit to the City taxpayers that justifies such expansion. For the orderly planning and provision of public transit service expansion to the three contiguous municipalities in the County, an acceptable framework is needed between these municipalities for the planning of services and funding the net costs of the services.

For local municipalities, there is a new opportunity now available through gas tax funding to expand transit services outside of Windsor by applying for funds under the gas tax program to expand (Leamington) or establish (LaSalle, Tecumseh) transit services. For example, the Town of LaSalle's Gas Tax funding was included in Windsor's funding envelope based on the service provided in LaSalle by Handi Transit.

Transit Policy Framework - The existing Official Plans of the County, City and local municipalities do not make significant provision or recognition for public transit at the present time. The City of Windsor Official Plan sets out goals of "an accessible, affordable and available transportation system" and "an environment in which all modes of transportation can play a balanced role". The plan sets out the objective regarding public transportation as "To establish and maintain a viable public transportation network." It contains specific policies that require proposed development and infrastructure undertakings to provide facilities for public transportation wherever appropriate. The Plan also requires proposed development and infrastructure undertakings to provide easy access to public transportation.

These Official Plan provisions regarding public transit indicate that this service is viewed primarily as a basic service that may be utilized by persons without other readily available travel options. They do not represent a strong statement that public transit is viewed as a significant alternative to private automobile travel. Conversely, the Windsor Transportation Master Plan (WALTS) suggests an expanded role for public transit services over the life of that plan.

The WALTS study proposes that public transit can double its PM peak period mode share from 3% of trip now to 6% by 2016 through transit service improvements and related supporting policy measures. In actual fact, significant improvements in public transit services have been very difficult for municipalities to support because transit services are currently funded through the fare box and

local property taxes. Ridership growth on Transit Windsor services has taken place in the past several years but at a lower rate than population growth, indicating a reduced rate of transit use. While costs have been controlled, fares have risen and present a further disincentive to transit ridership growth.

To guide the planning of future transit services beyond the current City boundaries, a public transit policy framework needs to be articulated and adopted that recognizes the following principles:

1. Affordable, convenient and reliable pubic transit service enhances the mobility within a community and improves quality of life for persons who do not have access to an automobile or can not drive.

2. Public transit service can offer a reasonable alternative to private automobile travel and contribute to reduced negative impacts of automobile traffic such as neighbourhood disruption, noise, vehicular emissions and the need for roadway improvements.

3. The travel patterns within the Essex-Windsor study area are relatively independent of municipal boundaries. As such, public transit services should be planned and developed on a regional basis.

4. There must be a funding mechanism established so that communities benefiting from public transit services contribute a fair and equitable share of the cost of providing these services.

5. Transit services must be convenient and provide frequencies of service that are attractive to potential users.

While an increase in the transit modal share in the Windsor area may have the potential to reduce the extent of some roadway improvement requirements (this will be tested in Section 3), the actions required to achieve a particular modal share target are not known. Rather, it is suggested that the public transit policy framework should be based on the four Transportation Planning Principles established in Section 2.1 for this plan. As alternative improvement strategies are considered, the identification of a modal share target may be further considered. However, without explicitly accepting these basic policy principles, it would not be a particularly meaningful exercise to identify an arbitrary public transit modal share target.

2.6 Walking & Cycling Systems

Walking trips are typically characterized by shorter trip lengths under two kilometres. For distances over two kilometres, the percentage of trips made by walking decreases dramatically. Cycling can be used for recreational and/or utilitarian (i.e. commuting) purposes. Most trips tend to be less than four kilometres in length, and use decreases after than based on longer trips lengths and seasonal conditions. Both non-motorized forms of transportation are encouraged by City and County Official Plan policies (see Section 2.2.4).

The predominant walking and cycling facility in the Essex-Windsor region, outside of the City of Windsor's parks and trails system, is the Chrysler Canada Greenway. Owned by the Essex Region Conservation Authority, the 50 km abandoned railway corridor has been transformed into a multi-use recreation trail, underground utility corridor and a natural green space. It extends from the

Oldcastle area of the Town of Tecumseh south to Harrow and then east through Kingsville to Ruthven at Colasanti's Tropical Gardens. The trail connects natural areas and historically significant features, and links to 25 otherwise separate natural areas and three watersheds within the County.

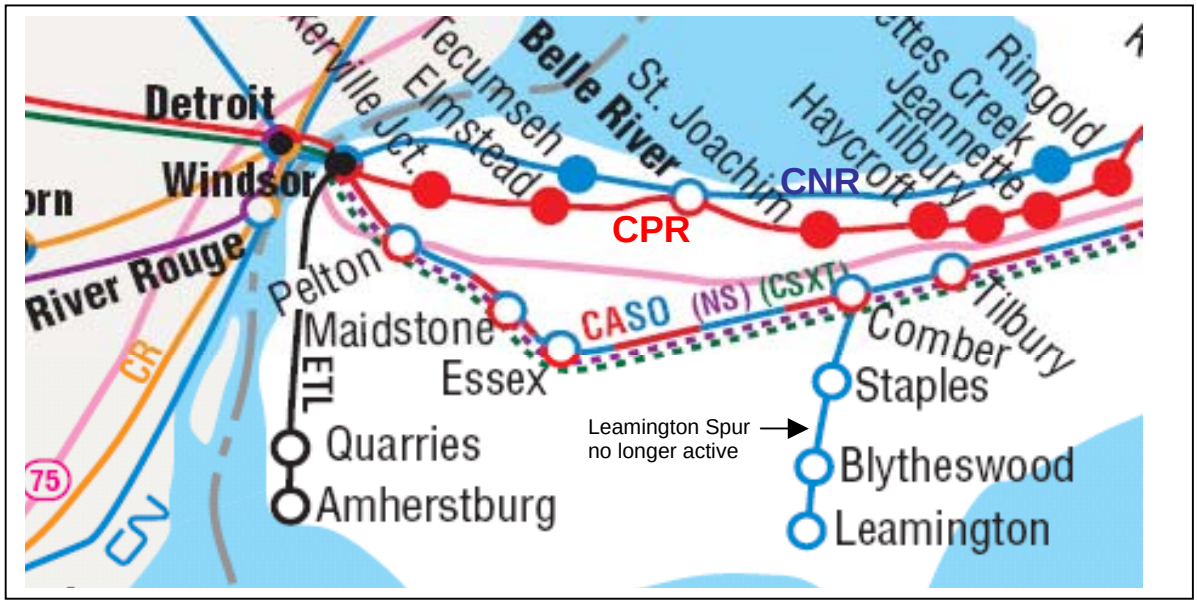
Additional pedestrian and cycling facilities, including trail networks such as the Town of LaSalle's multi-purpose recreation ways, are also found within the urban settlement areas of the County as part of parks, open space and natural areas system. In the City of Windsor, there are presently six trail routes open to the public, plus eight neighbourhood walking paths. The Bicycle Use Master Plan calls for a cycling network of bike lanes, multi-use trails and signed bike routes.

2.7 Rail Transportation System

There are six railway companies serving the Essex-Windsor region as shown on Exhibit 2.11, namely CN, CPR, the Essex Terminal Railway (ETR), VIA, Norfolk Southern (NS) and CSXT. The Detroit River Tunnel Project (DRTP) also owns the Canada South (CASO) line from the Detroit River rail tunnel to 8th Concession Road just south of Highway 401. The busiest line in the County is the CPR mainline that runs on a fairly direct tangent alignment into Windsor and then onto the Detroit railway tunnels. This line handles all of CPR's import and export traffic from the Port of Montréal, plus all of the automotive industry related traffic (machinery and electronics, auto parts and finished vehicles) in the Windsor and Detroit areas. There is also a significant amount of general manifest freight traffic (e.g. forest products).

CN rail service to Windsor is primarily to serve local Windsor industry, including automotive, the agri-food industry and salt mines. Its long distance trains operate across the border at Sarnia-Port Huron. Arrangements between the railways exist such that CPR also operates some of its long distance domestic intermodal trains to Chicago through the Sarnia Gateway with about 14 trains per week each way. CN through-trains at Windsor enter the tunnel from the CASO alignment and proceed into the tunnel via the Van der Water Yard. Until recently, CN and CP owned the tunnel jointly, however, CN sold its interest in the tunnel to Borealis Infrastructure Funds. CPR now operates the Detroit River Tunnel through its partnership arrangement with Borealis.

Exhibit 2.11 – Existing Essex-Windsor Rail System



Source: Canadian Railway Atlas 2003

Trains coming into Canada from the US follow the CASO alignment to the Pelton Spur and turn back towards the river near Walker Road and the Highway 401. The Pelton Spur runs parallel to Walker Road between it and the airport, and connects with the CPR mainline. CN runs for about two km on CPR line through the automotive plants, and then turns back on its own track near Shawnee Park to travel through Windsor and then connect again with the Chatham Subdivision to go back north towards Chatham and London.

VIA Rail Canada operates its trains on the CN Chatham Sub right through Essex-Windsor to the station located near the foot of Walker Road. The Essex Terminal Railway is a local switching railway in the Windsor area. It interchanges with all four Class 1 railways (CN, CPR, NS, and CSXT) to serve local industries in the area.

The main rail routes for potential conflict with roads at level crossings are the CN mainline as far as the VIA station, the CPR mainline right to the tunnel, and the CASO line crossing Howard Avenue, Cabana Road and Walker Road in the City, and throughout the County. In the absence of a rail rationalization plan, all three of these routes would pose conflicts with road and highway expansion in the years ahead. Within the City, there are five key areas of concern, as follows:

- Howard Avenue near the Devonshire Mall;
- A number of possible conflicts near where Walker Road intersects with the CPR mainline, although the rail crossing at Grand Marais Road is one of the initial five projects recommended for implementation in the new *Let's Get Windsor-Essex Moving Strategy*;
- a number of conflicts in the vicinity of Greater Windsor Industrial Estates, including Jefferson Blvd. and Clemenceau;
- a major conflict at the CPR/Howard Avenue at-grade crossing just south of Memorial Drive; and
- Lauzon Parkway and Lauzon Road intersecting with the CN line.

These are only the main areas of concern between rail/road operations. There are a number of others that would arise if the rail traffic volume on the CN Chatham connectors were to increase. The issue is not simply the passage of trains, but because this is a highly industrialized area with numerous switching activities, roadway traffic delays are possible on account of trains parked waiting for clearance.

Federal railway regulations allow trains to block roads for an indefinite period of time as long as they are not stopped for more than a five minute period, or else the train would have to be broken apart to allow traffic to pass and then reassembled when ready to go. This is a major inconvenience for train crews.

Outside of Windsor, the main rail/road problem areas are in the community of Essex where the CASO line crosses County Road 8 twice in a fairly short space, and in the Tecumseh/Lakeshore area relating to high speed VIA trains at numerous level crossings. Also, the VIA trains currently come into Windsor on CN track and terminate outside the downtown core area at the foot of Walker Avenue. This does not have direct access to the tunnels going through Detroit, and it is a less desirable location than the former CPR station, which is much closer to downtown and can be more easily accessible to the tunnel in the case of future expansion of train services to Detroit. International passenger trains now operate through the Sarnia Gateway, and this is likely to continue to be the route for long distance passenger trains in the foreseeable future, so this point may be moot.

The CPR mainline is the most direct rail alignment into Windsor connecting with the Detroit tunnel. It also carries the largest traffic volume at this time and is the logical candidate as the focal line in the event of future rail or route rationalization in the Windsor-Essex area.

2.8 Major Regional Transportation Issues

Major transportation issues facing the Essex-Windsor area were identified in the Regional Transportation Study Terms of Reference. Most of these issues continue to face the area while others have grown in magnitude, especially those associated with cross-border transportation planning and local municipal growth and development. Furthermore, input from external agencies, stakeholder groups and the public has helped reconfirm some of these issues, and introduce other more specific transportation concerns and expectations. In 2005, many of these issues will be addressed on the City of Windsor as part of the *Community Based Strategic Rail Study* to be conducted by the City and involved partners.

This agency, stakeholder and public input, plus more recent transportation-related planning and decision-making in the Essex-Windsor region have all combined to present a series of high priority key transportation issues to be addressed, to the degree possible, in the Regional Transportation Study. These issues fall into five categories;

Transportation System Operations

Cross Border Transportation

Transportation Demand Management (TDM)

Transportation Impacts

Transportation Affordability, Financing and Implementation

2.8.1 TRANSPORTATION SYSTEM OPERATIONS

1. There is a need to maintain a Level-of-Service (LOS) on all County Roads and Windsor arterial roads that moves people and goods safely and efficiently, thereby reducing socio-environmental impacts of vehicular traffic. LOS is measured by the observed volume of vehicular traffic on roadways compared to their operational capacity. This capacity can become constrained by roadway geometry, driveways, intersections and abutting land use.

2. Where appropriate and required, existing and new region-wide transportation corridors need to be protected for multi-modal vehicular, transit, cycling and pedestrian use, plus possible utility alignments (hydro, pipeline, rail) to accommodate demands over the next 20 years. On “regionally important” corridors, this corridor protection requires a coordinated program of County Road/Arterial Road Capacity Optimization that includes; 1) Access Management, 2) Signalized Intersection Operations and 3) Zoning/Site Plan Controls.

3. The County Road network needs to provide maximum connectivity with the Windsor and Chatham-Kent arterial roadway system, to the USA and to links to Pelee Island.

4. There has been a marked increase in the amount of heavy commercial goods movement in the Essex-Windsor area in response to the areas economic base and strategic cross-border location. Primary truck routes with adequate capacity are required to facilitate this commercial traffic without diversions to routes that are not capable of accommodating large commercial volumes.

5. The changing role of rail transportation in southern Ontario presents opportunities to rationalize and consolidate the Essex-Windsor rail network, with associated opportunities to reduce at-grade rail crossings and provide new opportunities for abandoned rail rights-of-way (see Section 2.7 of this Report).

6. Peak period roadway congestion is already evident on key County Roads in proximity to Windsor as shown on Exhibit 2.9 in this Report. Most notably is CR 22 as an extension of the E.C. Row Expressway, and CR 11 as an extension of Walker Road to South Talbot Road.

7. WALTS recommends operational and capacity improvements to Lauzon Parkway south of EC Row Expressway to Division Road, and further protection of a "Highway 401 East Long Term Corridor Protection Area" in this area connecting to Highway 401 that could include extension of Lauzon Parkway further south to Highway 401, subject to further study. A further extension to Highway 3 was also considered in the regional Master Plan to expand on the local and regional transportation benefits that such an extension offers.

8. The annexation of some 2,700 hectares of land in the Town of Tecumseh to the City of Windsor on January 1, 2003 introduced new transportation needs and opportunities in the southeast Windsor/County area. A Lauzon Parkway extension from the E.C. Row Expressway south to Highway 401 and Highway 3 would serve growth in this annexation area and lands to the east in Essex County. Also, by creating an additional link to Highway 401, a Lauzon Parkway extension offers the potential to not only reduce the impact of annexation area traffic on existing Windsor and County roads connecting to Highway 401, namely Walker Road, Provincial Road and Dougall Avenue and CR 19/Manning Road, but also provide an alternative to the high volume Lesperance Road and CR 43 (Banwell Road) routes.

9. Continuity is needed between the Essex-Windsor municipal roadway networks. This requires a consistent roadway classification system and set of standards for all local municipalities in Essex County that is also compatible with the City of Windsor's classification system. This regional classification system needs to address the overall regional roadway hierarchy and basic design standards (i.e. geometrics). Application of this system may require the transfer of a Town Road to a County Road, or reversed depending on the role and function of the road in question.

10. Highways 401, 3 and 77 are key routes within the regional transportation system for vehicular, commercial and possible transit services. Functional operations and access management along these routes will continue to be the responsibility of the Ontario Ministry of Transportation.

2.8.2 CROSS-BORDER TRANSPORTATION

1. Cross border trade and commerce have a significant impact on the Essex-Windsor transportation system. The Bi-National Partnership Study[2], the Schwartz Report (January 2005) and other initiatives recommend long-term solutions for new crossing capacities and operations that must be detailed through the environmental assessment process. These studies and initiatives are **not** part of this Regional Transportation Master Plan. The Regional Plan has attempted to distinguish between the local and regional needs of the County of Essex and the City of Windsor which are the focus of this Plan, and the international border traffic problem which is the focus of the other studies and initiatives.

[2] Canada-United States-Ontario-Michigan Transportation Partnership Planning/Need and Feasibility Study

2. With reductions in the level of service at the Windsor border crossings and connecting roadway network, some commercial traffic has been observed to divert to alternative routes within and adjacent to Windsor to access the crossings. Such diversions place added operational pressures and associated safety concerns on the alternative routes.

2.8.3 TRANSPORTATION DEMAND MANAGEMENT (TDM)

1. A regional transportation planning policy is required that has the region "*develop in a coordinated manner that will be effective in minimizing traffic congestion poor air quality and smog alter days while allowing the goals of improved public transit and less dependence on the automobile to be achieved."*[3] This can be an achievable goal in the urbanized parts of the Essex-Windsor using a variety of TDM measures including but not limited to:
   i. Extension of transit service;
   ii. Provision of expanded infrastructure and service for non-motorized travel modes;
   iii. Land use intensification and mixed land use forms at appropriate locations to provided shortened travel distances to a trip origins and destinations;
   iv. Follow *Smart Growth* principles in subdivision design including short blocks, multiple travel route choices and a variety of street types; and
   v. Increase the roadway network connectivity wherever possible throughout the region to provided for more efficient travel with resulting air quality benefits.

2. *Smart Growth* is a concept of policies that integrate transportation and land use decisions, for example by encouraging more compact development in appropriate locations, and discouraging low-density, auto dependent development at the urban fringe, in rural subdivisions and through extensive severances. Low-density, homogeneous forms of rural development are generally not capable of reducing the amount of travel by automobiles. A prime example in Essex County is the designated linear Settlement Area in the Town of Lakeshore extending along CR 22/CR 2 from Windsor east to Stoney Point that is contributing to increased traffic volumes and decreased Level of Service along CR 22.

3. While following TDM principles in urbanized areas, it must also be recognized that the low density rural nature of most of the Essex-Windsor region limits the realistic application of many TDM measures. Therefore, the TDM measures that may apply in rural setting must be feasible and achievable. Therefore Essex County, its local municipalities and the City of Windsor must all determine which TDM measures are appropriate for their community in response to the objectives to reduce auto dependence and improve air quality.

4. Although the role of public transit may be a key component of the ultimate regional transportation plan, County policy has defined the provision of this transportation mode as a "local matter" according to Official Plan Section 2.9.1.xi.

5. Whatever TDM programs are used in the Essex-Windsor area, they will require public education about alternatives to auto use, and the impacts of high auto use. A dedicated TDM Coordinator position may also be required to promote and manage programs.

6. Managing demands on the regional transportation system needs to serve the region's changing demographics and aging population.

[3] Terms of Reference, Essex-Windsor Regional Transportation Study

2.8.4 TRANSPORTATION IMPACTS

1. Effects of transportation systems on the environment are well documented, involving engine emissions, fuel consumption, noise and vibration, direct property impacts including possible impacts on environmentally sensitive areas. The County Official Plan and each municipal Official Plan designate natural heritage features intended for protection and conservation. Any introduction or enhancement of roadways or other transportation infrastructure through or along these areas can only be planned by taking into consideration environmental impacts, roadway network operations, land use patterns and implementation costs as required by the Environmental Assessment Act.

2. It must be recognized that failure to resolve poor roadway Level of Service through capacity optimization, capacity enhancement and/or TDM measures will create associated negative environmental impacts stemming from impacts such as traffic congestion, poor air quality concentrations and driver frustration.

2.8.5 TRANSPORTATION AFFORDABILITY, FINANCING AND IMPLEMENTATION

1. Essex-Windsor regional transportation demands are forecast to grow as a result of; 1) growth in background traffic not attributed to growth (i.e. minor increases in trip-making), 2) increase in traffic related to growth, and 3) increase in cross border through traffic although these volumes are concentrated on cross border access routes. Population and employment growth is typically the predominant reason for expanding and upgrading a transportation system. However, while growth in Essex County is generating the need for much of the County's transportation system needs, the County does not have access to Development Charges (DC) funding to fund improvement projects (see Section 5.5). Similarly, the County is not provided any DC transfer funds from its local municipalities where this growth is occurring. This brings into question the affordability of major transportation system expansion in Essex County. A fair and equitable funding mechanism is needed to finance growth and non-growth related system improvements. Funding options include County DC, local municipal DC transfers, a County transportation levy and an improvement reserve fund, user pay and federal/provincial funding sources.

2. The County, its local municipalities and the City may need to adopt selective amendments to their respective Official Plans to incorporate the planning and policy recommendations stemming from the Regional Transportation Study. This coordinated policy approach is needed in order to accomplish the study goal of a "regional" transportation planning policy.

3. Implementing this regional transportation policy may require some sort of regional transportation planning authority involving all member municipalities (see Section 5.6.2).

3. REGIONAL TRANSPORTATION SYSTEM NEEDS AND OPPORTUNITIES

3.1 Regional Growth Potential

3.1.1 POPULATION AND EMPLOYMENT FORECASTS

Most of the transportation system needs in the Essex-Windsor region will evolve over the next 20 years in direct response to the amount, location and form of population and employment growth during this period. As a result, a baseline 20-year forecast of these growth patterns was developed by the project Steering Committee based on the following important decisions about this growth forecasting, specifically for use in the Regional Transportation Plan development:

1. 2001 Census data by Traffic Analysis Zones (TAZ) was used as the population baseline;

2. 24 TAZ Superzones (SAZ-see Exhibit 3.2) define urban and rural growth patterns;

3. All municipalities except Windsor used the County Official Plan high growth population and employment forecasts developed for 2016 as the “baseline” 2021 forecast for the purposes of this project, and;

4. The City of Windsor’s residential growth constraint has been removed by the provision of the new Tecumseh annexation area for a residential and employment land supply, which has resulted in a new baseline population forecast of 244,811 for Windsor by 2021.

The final “baseline” summary of growth forecasts by superzones used in this study is presented on Exhibit 3.1, with the Windsor-Essex regional growing by some 92,000 additional residents and 53,000 jobs by 2021. The distribution of these superzones is shown on Exhibit 3.2, and was developed in association with the study municipalities using the following principles:

- base the delineation of urban areas on Schedule A of the County of Essex Official Plan, as much as can be accomplished within the traffic zone system established for this study;

- capture detailed traffic assignments within the urbanized areas of the County;

- provide for growth areas around each urbanized area;

- use county and important municipal roadways in developing the superzones;

- include long-term flexibility for use beyond this study; and

- include any boundary adjustment enacted since the study commencement in early 2003 (namely the annexation of Tecumseh lands).

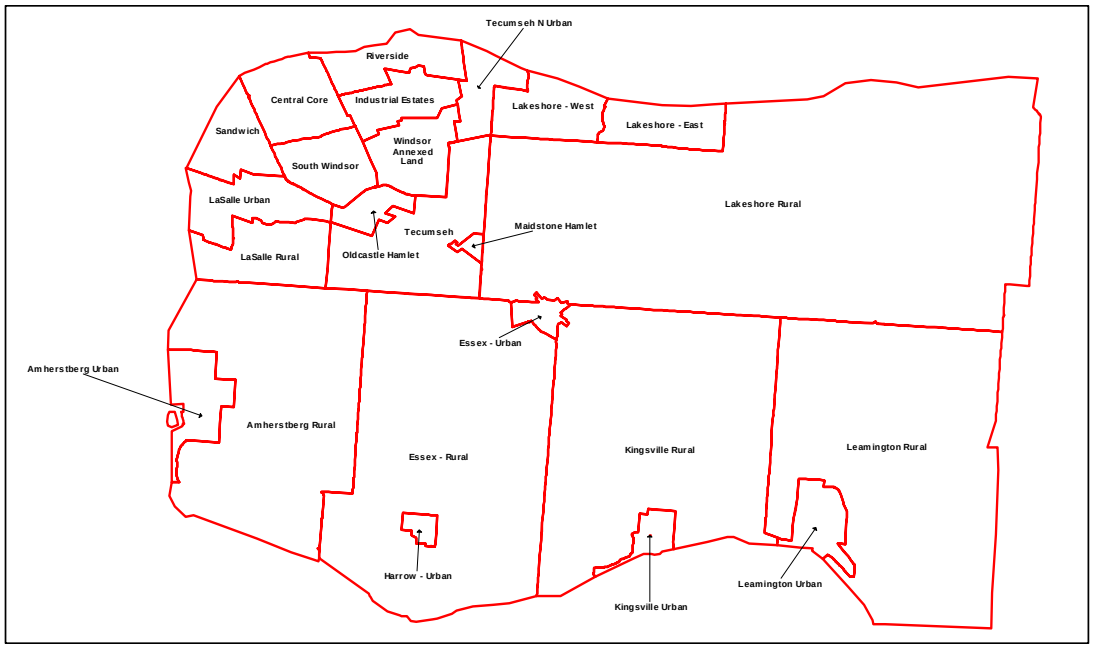
Another source of growth forecasting is the November 2001 Ministry of Municipal Affairs and Housing (MMAH) report entitled "Windsor-Essex Regional Analysis”. It has the seven local municipalities within Essex County projected to grow from 170,395 people in 2001, to 243,663 in 2021 at an annual growth rate of 1.9% from 1996 to 2021. It appears to have an Essex-Windsor

Exhibit 3.1 – Regional Population & Employment Growth by Superzones

SAZ	2001 pop	2021 pop	Growth	% Growth	% of Growth		2001 emp	2021 emp	Growth	% Growth	% of Growth
Amherstberg Rural	6958	10724	3766	54.1%	40.3%		1512	2869	1357	89.7%	47.0%
Amherstberg Urban	10367	15950	5583	53.9%	59.7%		2956	4486	1530	51.8%	53.0%
total	*17325*	*26674*	*9349*	*54.0%*	*100.0%*		*4468*	*7355*	*2887*	*64.6%*	*100.0%*
Essex Rural	10162	11164	1002	9.9%	21.2%		749	2255	1506	201.1%	26.5%
Essex Urban	7107	9534	2427	34.1%	51.3%		1877	4750	2873	153.1%	50.6%
Harrow Urban	2816	4120	1304	46.3%	27.6%		1110	2412	1302	117.3%	22.9%
total	*20085*	*24818*	*4733*	*23.6%*	*100.0%*		*3736*	*9417*	*5681*	*152.1%*	*100.0%*
Kingsville Rural	12296	15019	2723	22.1%	55.7%		2105	3471	1366	64.9%	49.0%
Kingsville Urban	6639	8809	2170	32.7%	44.3%		2190	3609	1419	64.8%	51.0%
total	*18935*	*23828*	*4893*	*25.8%*	*100.0%*		*4295*	*7080*	*2785*	*64.8%*	*100.0%*
Lakeshore East	9822	15949	6127	62.4%	63.5%		362	234	-128	-35.4%	-4.2%
Lakeshore West	5675	7992	2317	40.8%	24.0%		4020	6959	2939	73.1%	96.5%
Lakeshore Rural	14387	15596	1209	8.4%	12.5%		338	574	236	69.8%	7.7%
total	*29884*	*39537*	*9653*	*32.3%*	*100.0%*		*4720*	*7767*	*3047*	*64.6%*	*100.0%*
LaSalle Rural	3137	5172	2035	64.9%	21.6%		319	1244	925	290.0%	24.6%
LaSalle Urban	22148	29519	7371	33.3%	78.4%		3716	6553	2837	76.3%	75.4%
total	*25285*	*34691*	*9406*	*37.2%*	*100.0%*		*4035*	*7797*	*3762*	*93.2%*	*100.0%*
Leamington Rural	8009	10873	2864	35.8%	39.4%		0*	0*	0	0.0%	0.0%
Leamington Urban	18850	23260	4410	23.4%	60.6%		9480	15604	6124	64.6%	100.0%
total	*26859*	*34133*	*7274*	*27.1%*	*100.0%*		*9480*	*15604*	*6124*	*64.6%*	*100.0%*
Maidstone Hamlet	495	1047	552	111.5%	5.1%		146	121	-25	-17.1%	-0.6%
Oldcastle Hamlet	416	840	424	101.9%	3.9%		7798	10880	3082	39.5%	73.4%
Tecumseh	1678	1917	239	14.2%	2.2%		553	738	185	33.5%	4.4%
Tecumseh North Urban	21794	31455	9661	44.3%	88.8%		3251	4208	957	29.4%	22.8%
total	*24383*	*35259*	*10876*	*44.6%*	*100.0%*		*11748*	*15947*	*4199*	*35.7%*	*100.0%*
Industrial Estates	32239	33309	1070	3.3%	3.0%		29209	31431	2222	7.6%	9.2%
Riverside	49283	57941	8658	17.6%	24.2%		10271	10625	354	3.4%	1.5%
Sandwich	15491	15966	475	3.1%	1.3%		7328	8250	922	12.6%	3.8%
South Windsor	38379	42123	3744	9.8%	10.5%		12612	14281	1669	13.2%	6.9%
Central Core	73033	74869	1836	2.5%	5.1%		56430	58726	2296	4.1%	9.5%
Windsor Annexed Land	645	20603	19958	3094.3%	55.8%		1450	18034	16584	1143.7%	69.0%
total	*209070*	*244811*	*35741*	*17.1%*	*100.0%*		*117300*	*141347*	*24047*	*20.5%*	*100.0%*
Grand Total	*371826*	*463751*	*91925*	*24.7%*			*159782*	*212314*	*52532*	*32.9%*	

***** Data provided by the municipality showed no employment in Rural Leamington

Exhibit 3.2 – Superzone System



combined area population by 2016 of between 400,949 and 440,867, and is referenced in the Essex Official Plan background discussion papers on growth. The MMAH County population forecast of 243,663 by 2021 compares to 218,940 developed for this study in Exhibit 3.1.

The MMAH data was provided to this Essex-Windsor Regional Transportation Master Plan (EWRTMP) a regional Essex-Windsor population source that was also used in the Bi-National Study modeling. However, the MMAH growth forecasts where not used in the EWRTMP because it was compiled from secondary data sources, and does not conform to City, County and Town/Township growth forecasts.

The growth forecasts in Exhibit 3.1 were developed by the County and the local municipalities specifically for this Transportation Study, and include updates from previous forecasts provided by new 2001 census data, additional growth information relating to approved development plans in the municipalities and estimates of growth to 2021 in the Tecumseh annexation area of the City of Windsor. The resulting City/County regional population by 2021 used in this study compares as follows to other forecasting sources:

Exhibit 3.3 – 2021 Population Forecast Comparisons

EWRTMP	Essex County OP	Ministry of Finance	MMAH
463,750	422,607	457,310	433,118

3.1.2 DEMOGRAPHIC CHANGE

Regional transportation needs over the next 20 years will also be affected by changing population demographics, which in term influences how and when people travel. An indication of demographic changes is provided by Ontario Ministry of Finance projections for the Essex demographic area as summarized in Exhibit 3.4.

Exhibit 3.4 – Projected Demographic Change by Age Group

Year	**0-14**	**15-24**	**25-34**	**35-44**	**45-64**	**65 +**	**Total**
2001	74,450	51,690	58,840	62,890	86,580	49,250	383,700
2011	71,470	56,600	58,260	63,530	113,920	57,720	421,500
2021	73,980	53,240	63,280	63,170	126,670	76,970	457,310
Change	- 0.6%	+ 3%	+ 7.5%	+ 0.4%	+ 46%	+ 56%	+ 19%

Source: Ontario Ministry of Finance

Typical of most Canadian regions, effects of the “Baby Boom and Bust” have the demographic changes over the next 20 year in the Essex-Windsor area decreasing or growing slowly for the 15-24 and 25-34 age groups that tend to be the highest users of public transit and other non-motorized travel modes because of their youth, financial ability and personal philosophy. Conversely, much stronger growth is projected in the 45-64 and 65+ age groups that combine to have the high amount of auto use. However, this will change further after 2021 as the 65+ age group continues to grow, but with decreasing auto use and more reliance on specialized transportation modes. The outcome of this demographic projection is that the Essex-Windsor transportation system should prepare for a longer term need for improved transit and specialized transportation services to meet the needs of this changing public demographic.

3.2 Transportation Forecasting Model Development

In addition to existing transportation needs in the Essex-Windsor region previously discussed in Section 2, future needs and opportunities will evolve for roadways, public transit, cycling, walking and rail service through to 2021. This is all expected in response to the forecasted amount and location of population and employment growth, along with possible shifts in public expectations, municipal policy directions, associated travel characteristics and Transportation Demand Management (TDM) initiatives. These future needs and opportunities may also result from possible changes in urban, suburban and rural planning policies involving density and development forms, and strategies to enhance transportation capacity and choice.

In selecting the most appropriate transportation forecasting tool, the consultants considered all forecasting model software, and recommended that TransCad be the model used in the Essex-Windsor Transportation Study. It is already used by SEMCOG, and the Windsor model has been converted to TransCad by the Bi-National study team.

Using this modelling software, forecasting existing traffic patterns into the future is an essential component of transportation master planning. The resulting model covers the entire Essex-Windsor area and replicates all City arterials and major collector roads, and all County Roads in the study area. Through the use of mathematical relationships, this model forecasts traffic volumes based on this existing major roadway network, plus changing local demographics, evolving land use patterns and local travel characteristics.

The regional model was next calibrated to demonstrate how well it replicates existing travel characteristics. Because this calibration showed the model replicates actual conditions very well, it is a valuable tool for forecasting future travel demands under various transportation network alternatives. Development of the forecasting model began by dividing the Essex-Windsor regional planning area into the extremely detailed network of traffic zones, combining into the 24 Superzones previously shown on Exhibit 3.2. The subsequent modeling exercise involved four successive steps.

Trip Generation - In this first step, the model simulates the number of trips entering and leaving each traffic zone based on the volume and type of activity in the zone, such as the population, number of households and/or number of employees. This simulation is done for a 2001 base year so the results can be compared, or calibrated, with actual 2001 traffic counts. Forecasted trips were simulated to a 20-year planning horizon using the population and employment distribution shown on Exhibit 3.1, with a modeling area population of 463,750 by year 2021.

Trip generation relationships developed in the previous WALTS study, which were based on a comprehensive Household Travel Survey of Windsor and Area residents, were used to predict the number of trips produced in and attracted to the various municipalities in the regional study area. Further, cross-border survey data collected by the Ministry of Transportation in August 2000 was used to supplement the external travel demands.

Trip Distribution - In distributing trips through the region, the transportation forecasting model simulated where trips originated and where they ended up based on the location of potential origins and destinations, and on the relative travel time between zones. The full set of volumes or trips going from each zone to each zone is determined by the model and passed on to the next step.

More specifically, the model uses a gravity-based trip distribution program. The trip productions and attractions generated by the program are converted into a matrix (trip table) of trips between zone pairs. The program then uses zone-to-zone travel friction to estimate the probability that trips

produced from one zone will be attracted to another zone. This friction is calculated by the model's roadway network programming. Trips are then distributed throughout the zones of the roadway network in an iterative process by trip classification, trip period, trip purpose, trip type and trip group. The final result is a trip table produced for each trip type.

For the Essex-Windsor model, the fundamental relationships developed and calibrated in the WALTS effort were used directly to predict the distribution of internal trips.

Baseline Travel Mode Split - The model simulates the allocation of trips to cars, transit buses, cycling and walking. This is based on actual mode splits derived from the WALTS household travel survey and more recent survey of outlying County areas, and also takes into consideration the influence of the service provided by each mode (transit, cycling, walking) based on the attractiveness of the mode. For example, in the 2021 forecast under "baseline" conditions, the transit mode split is non-existent beyond the existing Transit Windsor service area because it is not currently provided in these areas. Alternative "what if" scenarios are described in the next section of this report to determine the impact of alternative travel model strategies.

Traffic Assignment - To assign future traffic, the model simulates the routing of trips on the urban arterial and County Road network based on the influences of congestion and delay, taking into consideration the number of lanes, the traffic volume versus the roadway capacity, number of border crossings, etc. This provides the final transportation network loading for the model, which is the number of vehicles on each part of the network. It also provides associated information such as travel time and total vehicle miles traveled. This is all useful information in evaluating the impacts of various alternative transportation projects.

Specifically, the model uses an "equilibrium-seeking" assignment methodology where assigned routes are adjusted "en-route" through a feedback process that provides updated travel impedances throughout the trip.

In summary, the above-noted process is well established in comprehensive transportation master planning across North America. It is recognized both by the Ontario Ministry of Transportation, and the Transportation Association of Canada. The City of Windsor and the County of Essex will be able to maintain the TransCAD model for future use.

3.3 Future Regional Transportation Needs and Opportunities

3.3.1 BASELINE 2021 ROADWAY NETWORK DEFICIENCIES

Using the population and employment forecasts provided by the study area municipalities, the total amount of PM Peak Hour travel demand at 2021 was projected across the Essex-Windsor region using the TrasCad demand forecasting model. The results are tabulated on Exhibit 3.5 for 2021. This overall demand was combined with cross-border demands stemming from the August 2000 MTO survey and most recently used in the Bi-National study. Exhibit 3.5 illustrates the total amount of auto travel demand produced and attracted to each municipality in 2001 and 2021 in the PM Peak Hour under baseline (Do Nothing) conditions delineated to the 24 Superzones. Baseline conditions assume no change between 2001 and 2021 in the roadway network capacity through capacity enhancements such as road widenings and extensions, no optimization of operational capacity and no changes in travel characteristics such as mode choice, travel time or auto occupancy. The resulting trip generation will be used as the baseline condition on which to compare the performance of various strategic transportation planning alternatives discussed in Section 4 of this report.

Exhibit 3.5 – Projected 2021 Baseline Trip-Making (PM Peak Hour)

SAZ	2001 pop	2021 pop	Growth	% Growth	% of Growth	2001 emp	2021 emp	Growth	% Growth	% of Growth	2001 Person-Trips	2021 Person-Trips	Growth
Amherstberg Rural	6958	10724	3766	54.1%	40.3%	1512	2869	1357	89.7%	47.0%	1239	1910	671
Amherstberg Urban	10367	15950	5583	53.9%	59.7%	2956	4486	1530	51.8%	53.0%	1901	2924	1023
total	*17325*	*26674*	*9349*	*54.0%*	*100.0%*	*4468*	*7355*	*2887*	*64.6%*	*100.0%*	*3140*	*4834*	*1694*
Essex - Rural	10162	11164	1002	9.9%	21.2%	749	2255	1506	201.1%	26.5%	1687	1853	166
Essex - Urban	7107	9534	2427	34.1%	51.3%	1877	4750	2873	153.1%	50.6%	1679	2253	574
Harrow - Urban	2816	4120	1304	46.3%	27.6%	1110	2412	1302	117.3%	22.9%	736	1077	341
total	*20085*	*24818*	*4733*	*23.6%*	*100.0%*	*3736*	*9417*	*5681*	*152.1%*	*100.0%*	*4102*	*5183*	*1081*
Kingsville Rural	12296	15019	2723	22.1%	55.7%	2105	3471	1366	64.9%	49.0%	2008	2453	445
Kingsville Urban	6639	8809	2170	32.7%	44.3%	2190	3609	1419	64.8%	51.0%	1439	1909	470
total	*18935*	*23828*	*4893*	*25.8%*	*100.0%*	*4295*	*7080*	*2785*	*64.8%*	*100.0%*	*3447*	*4362*	*915*
Lakeshore - East	9822	15949	6127	62.4%	63.5%	362	234	-128	-35.4%	-4.2%	1161	1886	725
Lakeshore - West	5675	7992	2317	40.8%	24.0%	4020	6959	2939	73.1%	96.5%	1762	2481	719
Lakeshore Rural	14387	15596	1209	8.4%	12.5%	338	574	236	69.8%	7.7%	1815	1967	152
total	*29884*	*39537*	*9653*	*32.3%*	*100.0%*	*4720*	*7767*	*3047*	*64.6%*	*100.0%*	*4738*	*6334*	*1596*
LaSalle Rural	3137	5172	2035	64.9%	21.6%	319	1244	925	290.0%	24.6%	547	902	355
LaSalle Urban	22148	29519	7371	33.3%	78.4%	3716	6553	2837	76.3%	75.4%	3803	5069	1266
total	*25285*	*34691*	*9406*	*37.2%*	*100.0%*	*4035*	*7797*	*3762*	*93.2%*	*100.0%*	*4350*	*5971*	*1621*
Leamington Rural	8009	10873	2864	35.8%	39.4%	0	0	0	0.0%	0.0%	900	1222	322
Leamington Urban	18850	23260	4410	23.4%	60.6%	9480	15604	6124	64.6%	100.0%	5131	6331	1200
total	*26859*	*34133*	*7274*	*27.1%*	*100.0%*	*9480*	*15604*	*6124*	*64.6%*	*100.0%*	*6031*	*7553*	*1522*
Maidstone Hamlet	495	1047	552	111.5%	5.1%	146	121	-25	-17.1%	-0.6%	70	149	79
Oldcastle Hamlet	416	840	424	101.9%	3.9%	7798	10880	3082	39.5%	73.4%	1314	2653	1339
Tecumseh	1678	1917	239	14.2%	2.2%	553	738	185	33.5%	4.4%	352	402	50
Tecumseh N Urban	21794	31455	9661	44.3%	88.8%	3251	4208	957	29.4%	22.8%	3292	4752	1460
total	*24383*	*35259*	*10876*	*44.6%*	*100.0%*	*11748*	*15947*	*4199*	*35.7%*	*100.0%*	*5029*	*7956*	*2927*
Industrial Estates	32239	33309	1070	3.3%	3.0%	29209	31431	2222	7.6%	9.2%	12183	12587	404
Riverside	49283	57941	8658	17.6%	24.2%	10271	10625	354	3.4%	1.5%	10612	12476	1864
Sandwich	15491	15966	475	3.1%	1.3%	7328	8250	922	12.6%	3.8%	4660	4803	143
South Windsor	38379	42123	3744	9.8%	10.5%	12612	14281	1669	13.2%	6.9%	10881	11943	1062
Central Core	73033	74869	1836	2.5%	5.1%	56430	58726	2296	4.1%	9.5%	23705	24301	596
Windsor Annexed Land	645	20603	19958	3094.3%	55.8%	1450	18034	16584	1143.7%	69.0%	169	5394	5225
total	*209070*	*244811*	*35741*	*17.1%*	*100.0%*	*117300*	*141347*	*24047*	*20.5%*	*100.0%*	*62210*	*71504*	*9294*
Grand Total	*371826*	*463751*	*91925*	*24.7%*		*159782*	*212314*	*52532*	*32.9%*		*93046*	*113697*	*20651*

Exhibit 3.5 shows the projected growth in regional trip-making, as well as the share of this total growth in each municipality. Some notable results include:

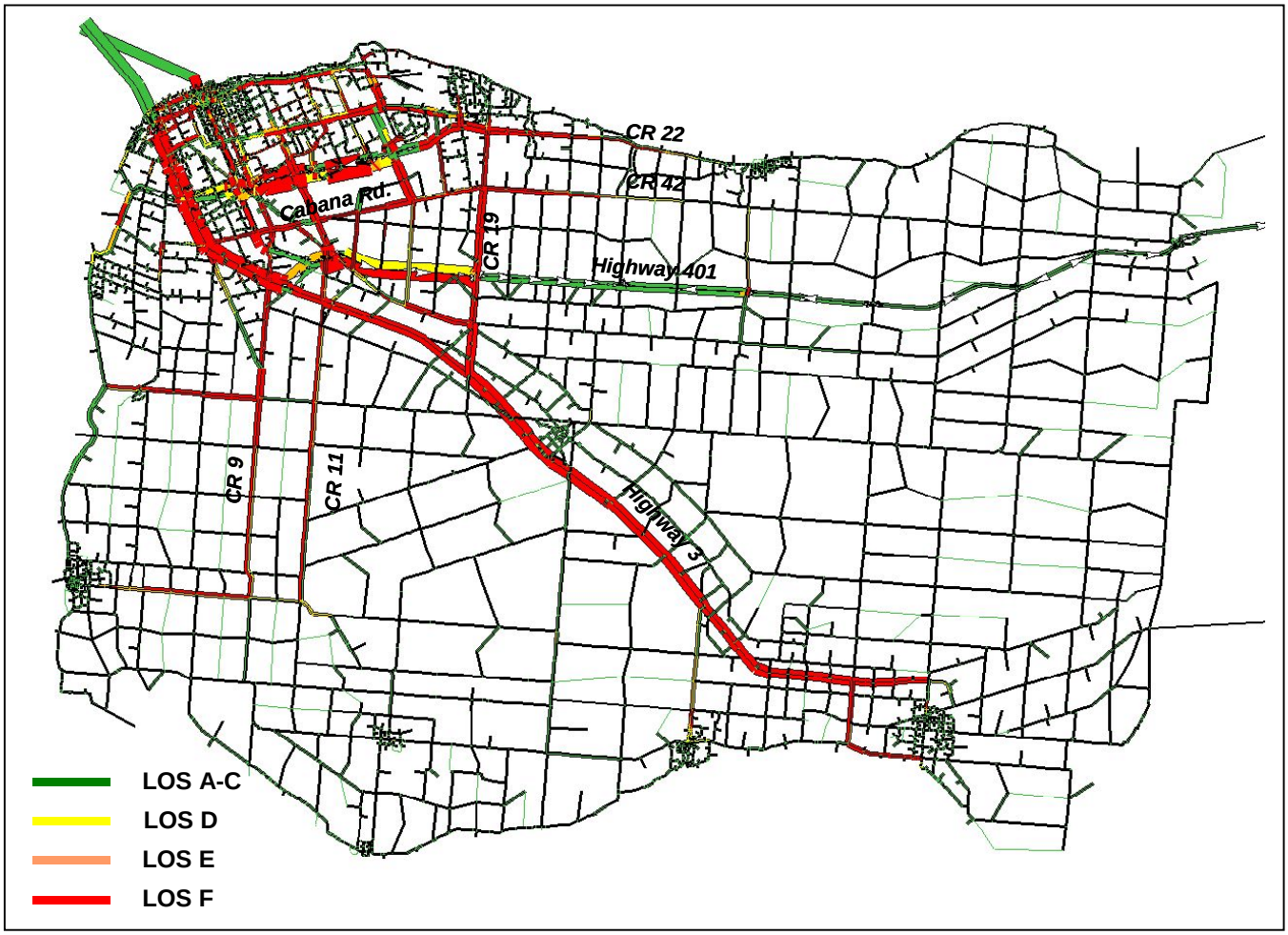
- The City of Windsor is expected to experience a 15% growth in PM Peak Hour traffic volume by 2021, from about 62,000 trips in 2001 to 71,500 trip in 2021. As expected, most of this growth will be in the Annexed Lands (Tecumseh Lands) which will experience trip growth from less than 200 in 2001 to over 5,000 by 2021 resulting from area development;

- Significant trip-making growth is expected in the seven local municipalities, ranging from 54% in Amherstburg to 26% in Kingsville and 25% in Leamington; and

- Trip-making growth in some rural areas is expected to be relatively high, resulting from a combination of high population and employment growth for example in Amherstberg Rural (54%), and the Urban Harrow area of Essex Township expected to double its employment (43%). Others such as the Maidstone Hamlet area of Tecumseh Township show a high trip-making growth rate, but the actual number of trips still remains relatively small through the planning horizon.

This PM Peak Hour trip-making data was then fed into the forecasting model to predict the overall future traffic volumes on the model roadways. Exhibit 3.6 illustrates the resulting future LOS experienced by the Essex-Windsor area road system in 2021 under baseline conditions using existing network capacity and high auto-oriented travel characteristics (no transit service beyond Windsor and low 1.1 persons/vehicle average auto occupancy).

Exhibit 3.6 – 2021 Baseline (Do Nothing) Level-of-Service



The forecasted roadway LOS plot on Exhibit 3.6 shows that by year 2021 in a baseline Do-Nothing scenario, the Essex-Windsor roadway network will experience significant LOS E and F capacity deficiencies on a number of key routes owing to forecasted population and employment growth and distribution. The most notable of these deficient routes are listed below in the City and County, with an (*) noting which sections were also forecast as deficient by 2016 in the WALTS study, noting that WALTS did not consider updated cross border traffic forecasts of the impacts of growth in the Tecumseh annexation area of Windsor:

Exhibit 3.7 – Baseline 2021 Deficient Roadway Sections

(*) also forecast as deficient in WALTS, 1999

City of Windsor (not inclusive)	County of Essex
• All of Huron Church Road; • All of Ouellette Avenue/Dougall Avenue; (*partial) • Howard Avenue from Dougall Parkway to Tecumseh Road (*partial);	• CR 43/Banwell Road from CR 22 to CR 42/Division Road; • Lesperance Road from St. Thomas Street to CR 22; • CR 19/Manning Road from Tecumseh Road

- Sections of Riverside Drive (*);
- Major sections of Wyandotte Street and Tecumseh Road (*partial);
- Major sections of EC Row Expressway;
- All of Cabana Road/Division Road;
- Walker Road from Highway 401 to Tecumseh Road (*);
- Sections of Division Road/Provincial Road;
- Lauzon Parkway from Forest Glade Drive to Division Road, and Lauzon Road from Wyandotte Street to Tecumseh Road;
- Sections of Ojibway Parkway (*);
- Highway 401 eastbound from Walker Road to CR 19/Manning Road, and westbound from Highway 3/Talbot Road to Walker Road; and
- 8th Concession Road from Division Road to Highway 401.

to Highway 3;

- CR 11/Walker Road from Highway 401 to CR 18;
- CR 9/Howard Avenue from Highway 3 to CR 18;
- CR 8 from CR 20 to CR 9;
- CR 18 from Amherstburg to CR 9;
- CR 2/Tecumseh Road from Banwell Road to Lesperance Road;
- CR 22 from EC Row Expressway to Renaud Line Road;
- CR 42 from CR 19/Manning Road to CR 25;
- CR 46 from Highway 401 to CR 19/Manning Road;
- Highway 3 from Highway 401 to Highway 77 at Leamington (assuming no MTO widening)
- Sections of CR 27 from Belle River to Highway 401;
- CR 31 from CR 20 to Highway 3 at Leamington; and
- CR 20 from CR 31 to Erie Street in Leamington.

3.3.2 PUBLIC TRANSIT

The primary public transit opportunity for consideration in the Essex-Windsor region is the utilization of Transit Windsor as a transit service provider over the broader “Urban Area” that encompasses the City of Windsor and the adjacent urban areas of Tecumseh, LaSalle and Lakeshore. Transit Windsor has licenses in place that would enable services to be provided in these municipalities and the service funding model used for transit service extensions in the past could be utilized to ensure that each municipal jurisdiction was responsible for funding the net marginal costs of transit services provided to that municipality. The level of service and the funding could be mutually agreed through a form of service contract between Transit Windsor and each municipality receiving transit services. For example, in 2004 LaSalle's Gas Tax funding was included in Windsor's funding envelope based on the service provided in LaSalle by Transit Windsor’s Handi Transit. There are other examples of this type of arrangement working well between adjacent urban areas in Ontario.

Short Term Transit Service Opportunities - The public transit service opportunities identified to date are discussed below in terms of short term (i.e., over the next 5 to 10 years) and long term (i.e., 10 to 20 years and beyond).

The most often noted and most likely public transit opportunities in the short term are extensions of Transit Windsor service into the immediately adjacent areas of Tecumseh and LaSalle. Some service expansion examples that appear to be reasonably feasible in the short term are as follows:

Transit Service Extensions

- A new transit route connecting the University area/College Ave Community Centre, Ojibway Industrial area, the Malden Plaza area of LaSalle, St Clair College and Devonshire Mall would meet a number of current transit service needs in both Windsor and LaSalle. It would likely be initiated as a weekday peak period service and upgraded as ridership develops.

- An extension of an existing route or a new route in the east end connecting Tecumseh Mall, the new East Riverside residential development and the adjacent areas of Tecumseh would meet some identified service needs in both Windsor and Tecumseh. An issue that would require further consideration by both municipalities is the determination of the future bus route and ensuring that the roadway network in the general area provides reasonable continuity of routes.

- A future regional express bus route connecting Tecumseh, major activity centres within Windsor (e.g., Tecumseh Mall, Twin Oaks Industrial area, Devonshire Mall, Ojibway Industrial, University of Windsor) and LaSalle along the E.C. Row Expressway would meet a number of identified regional travel needs within the area. Through connections at established terminals it would enable transit service to other activity centres such as downtown). This service could be initiated as a weekday peak period service without a major investment and upgraded as ridership developed.

- A different service concept for small fringe areas with very low ridership would be a TransCab service (I.e., contracted taxi service) that would connect to the end of an established Transit Windsor bus route. TransCab services are used in a number of communities (e.g., Peterborough, Welland, Hamilton) to provide low cost service to newly developing areas with low ridership as an initial step towards eventually implementing a regular fixed route bus service.

There are a number of areas where more transit supportive municipal policies could also improve the current transit services and provide feasible expansion opportunities. Some potential options are as follows:

Supportive Policies

- In the urban boundary areas of municipalities, the potential future bus routing should be investigated as new subdivisions are planned to ensure that the arterial and collector roadway network will accommodate effective and efficient transit routing. Without a reasonably direct continuous route for buses through these areas, the cost of providing transit service will be higher and the designation of acceptable routes in local neighbourhood areas will be more difficult.

- Greater operational priority for public transit vehicles along heavy transit corridors can improve the operational efficiency of transit services and the reliability of schedules. Priority can be provided in many ways such as removing on-street parking for a reasonable merge distance downstream of bus stops, exempting public transit vehicles from turn restrictions, providing transit priority in the traffic signal timing along heavily used routes and providing minor improvements to enable traffic queues to be bypassed. Corridors for consideration could include Tecumseh Rd, Ouellette Ave, Wyandotte St and University Ave. Experience in other areas has demonstrated that the most effective transit priority programs are usually developed through a working partnership between the traffic and transit authorities.

- Pedestrian connections should be planned in residential areas to increase access to and from bus stops. While pedestrian walkways may also create security problems, they also are important to ensure reasonable walking distance to and from the bus service. Walkways should be considered in new developments where they will improve accessibility to bus

stops. The potential closure of walkways due to other concerns should carefully consider the impact on public transit access as part of the decision.

- Provision for public transit in new development plans is important to the future provision of transit services in an orderly manner. Since Transit Windsor is the likely operator of transit services to the suburban municipalities in future, they should have opportunities for input to land use development proposals.

- Central area parking policies can also be a tool to encourage greater use of public transit. Particularly in "downtown" or core areas where land is at a premium, the municipal policies governing the provision of all-day employee parking should consider the extent to which public transit can offset the need for all-day employee parking. Policies that favour reduced employee parking while ensuring that there is sufficient short-term business oriented parking will provide greater incentive for increased public transit use.

- Employee bus pass programs offer a further mechanism for all large employers to encourage transit use. For example the City of Windsor or Windsor Casino might be interested in a partnership with Transit Windsor to offer a payroll deduction pass program to employees to encourage greater transit use.

Long Term Transit Opportunities - The foregoing transit improvements are potential short range options for improving public transit within the regional context. In the longer term as more growth occurs outside the City of Windsor, consideration may be given to more significant improvements to public transit services. Some potential options for further consideration are outlined below.

Express Services

The use of express bus service at a regional scale particularly for weekday peak period employment trips and post-secondary education trips, is an efficient means of offering an effective alternative to private automobile travel. Potential corridor alternatives include:

- A cross-town express along the E.C. Row Expressway connecting east to Belle River and west to LaSalle with stops at major employment centres and connections to the local Windsor bus service at key terminals.

- An inter-municipal express service along the Highway 3 corridor from Leamington and Essex to the University and downtown Windsor.

- A route along County Rd 20 corridor from Amherstburg, through LaSalle to the University and downtown Windsor.

- An extension of the existing Riverside- Wyandotte express route into Tecumseh to provide a direct route into the central area.

These routes all offer the longer term potential of generating weekday peak period ridership and would provide a reasonable alternative to growing automobile traffic in these corridors. Express bus service can be initiated in a phased manner without a major capital investment and the service levels increased as ridership is built up.

Higher Order Transit

In the very long term, the possible utilization of existing rail corridors for Bus Rapid Transit (BRT) busways or Light Rail Transit (LRT) routes may be considered in and between higher density and more intensified parts of the region. One possible rail corridor that tends to follow regional travel patterns is the CN VIA rail line from the east that ends at the current Windsor VIA station and also has connection to the Essex Terminal Railway line through the City and to the south. The other

possible future corridor is the Essex Terminal Railway line from the south through LaSalle past the University area and around the central area of the City.

At the present time these corridors are still being used for rail operations. However, if the rail operations were abandoned or relocated (see Section 3.3.4), the possible use of these corridors for public transit or other transportation uses should be considered. The development of a busway or LRT will require a major capital investment that may be beyond the scope and time frame of this study. However, the potential future use of rail corridors for some transportation use should be considered as a longer possibility. It is also important to stress that from an operational feasibility and cost affordability perspective, cities with enhanced LRT or BRT systems tend to have a service population of at least 500,000.

Transit-Supportive & TDM Opportunities - In addition to the suggested expansion of regular bus services, there are a number of opportunities for travel demand management initiatives within some parts of the region. Some possible candidates for these types of projects are outlined below:

- The introduction of a universal student pass for University of Windsor and St Clair College students would provide a means to improve student mobility and to broaden the choices for student housing while also encouraging increased public transit use. This type of pass could help deal with current parking problems at the University of Windsor by shifting travel demand to public transit. It would also assist St Clair College students that have a greater tendency to reside at home in the greater Windsor area. Universal university and college passes have been introduced at a number of Ontario institutions and have proven popular with students and effective in increasing public transit use.

- Transit Windsor has over 20 wheelchair accessible low floor buses equipped with bicycle racks in the fleet. These vehicles offer the opportunity to accommodate cyclists for longer distance trips from suburbs as well as being able to accommodate passengers with physical disabilities transferring from local specialized transit services.

- For longer distance trips to major employment centres, such as the larger automotive plants, from the outlying municipalities such as Leamington, Kingsville and Essex organized car pools represent an option that is efficient for the users and reduces vehicular traffic. Car pools have been used successfully at some large employment centres in USA and may have some applicability in this area. Successful carpool programs are likely to need some active participation from the employers involved to offer some incentives to employees to participate. The municipal authorities will need to pursue these initiatives with large employers to identify potential projects and to provide some assistance. One form of assistance could involve developing some car pool lots along major corridors in outlying areas to facilitate organization of carpools.

3.3.3 WALKING AND CYCLING OPPORTUNITIES

The greatest demand for walking and cycling in the Essex-Windsor region is expected in the urbanized areas where the population base and higher densities exists. It is here that a shift to non-motorized modes for short distance trips should be encouraged, with “shot distance” being less than 2.5 km based on walking and cycling research.

With limited financial resources to spend on non-motorized transportation, it is important that investments are made in locations where the largest possible usership and benefit is or will be

available. This includes new inner city redevelopment areas, "brownfield" projects[1] and suburban developments that provide opportunities to extend existing trails and bikeways, as well an extension of the Chrysler Greenway that forms the spine of rural walking and cycling routes. As growth in the periphery of the City and abutting municipalities continues, other opportunities should be found to link the Greenway and County trails with the City's bikeway and trail network. Walking and cycling routes also need to be linked with transit to encourage modal shifts to all three modes.

3.3.4 RAIL NETWORK OPPORTUNITIES

Rail Rationalization - The Detroit River Tunnel Partnership (DRTP) proposal to convert both of the existing rail tunnels at Windsor to a truck route are well known as one of the elements of the federal provincial nine-point Action Plan for the Windsor Gateway, and is not supported by the City of Windsor. These plans also involve construction of a new double-stacked rail tunnel in the same general area. This would likely bring more traffic to the CPR alignment, and make the right-of- way very busy with rail and truck traffic.

CN will be continuing to provide competition with CPR in serving the automotive industry in Windsor and Detroit and will likely retain existing running rights on CP track. It is reasonable to assume that CN would be very positively disposed towards rail rationalization with CPR, gaining much more intensive access to the CPR alignment and associated business opportunities. There is an opportunity, through rail rationalization, for CN to save operating and maintenance costs, and potentially improve service, by securing running rights over CPR's line between Chatham and Windsor. CN and CP rationalization is an interesting opportunity to pursue, and could bring other significant benefits to the Essex-Windsor region in terms of developing its long-term transportation plan.

Grade Crossings and Grade Separations - The existing rail/road pressure points have been noted above. The Rail Infrastructure Directorate of the Rail and Marine Branch of the Canadian Transportation Agency publishes a number of guides in respect of design, construction funding and standards for railway crossings and grade separations. The legislative basis is Inspection 100 and 101 of the Canada Transportation Act and various sections in the Railway Safety Act. Transport Canada also established an exposure index used in determining the need for grade separated crossings based on the number of trains times the roadway AADT at a crossing. Accident rates and site geometrics are also considered.

Cost sharing arrangements are usually agreed between the road authorities and the railways. On projects due primarily to road development the normal apportionment of funds is 85% to the road authority and 15% by the railway company. If the two parties fail to reach an agreement then either one can apply to the Canada Transportation Agency to apportion the cost of the grade separation project.

Transport Canada's grade crossing improvement program also exists to provide funding assistance to upgrade, relocate or close railway crossings. The department can finance up to 80% of the total cost of the improvement, with the balance provided by the railways, municipalities or provinces. Over the last nine years, total funding under this program has averaged around $8 million per year.

[1] Brownfield projects involve property that contains potential environmental contaminants either in the ground or buildings due to a previous use, rendering the property vacant, under-utilized, unsafe , unproductive or abandoned.

Opportunities for New Rail Facilities - The main rail-related transportation opportunity currently being explored in the Essex-Windsor region is a new railway tunnel in the general vicinity of the existing railway tunnels that would have direct access from both the CPR and CASO routes.

The main rail-related opportunity for Essex-Windsor in working with the railways is to stimulate rationalization of railway operations and facilities in the County and in the City of Windsor to focus on a smaller number of routes that could be set to fairly high standard of traffic services for both rail and road users with grade separations.

A rationalization of this nature could also free up parts of some of the railway right-of-way for higher order public transit service. This could be done either through time-sharing of the rail trackage as is the case with the O-train in Ottawa where their commuter services operate in the daytime and freight trains use the track at night, or dedicating part of the right-of-way to light rail service as is the case in Calgary. Montréal is also trying a hybrid solution with its VIABUS service that operates in an active rail right-of-way as bus rapid transit (BRT). On part of the route the rail service has been abandoned and bus has exclusive use of the property, and over another part of the route the busway is in the rail right-of-way adjacent the railway track. This project is under development at this time.

One significant consideration in examining the potential for Essex-Windsor rationalization of rail facilities is that all four railways would retain good access to the automotive industrial plants in Windsor with some degree of control over the level of service that they can achieve. Not only the railways, but also the industrial customers would also insist on this. This means that the trackage that is currently used for industrial switching is less acceptable to rationalization for alternative uses than the mainlines of CP, CN and CASO lines coming into Windsor.

4. FUTURE TRANSPORTATION STRATEGY

4.1 Strategic Transportation Planning Options

With future roadway network deficiencies forecast to 2021 in Section 3.3.1 assuming a baseline Do-Nothing scenario (designated Option 1), four (4) transportation planning options were identified and evaluated for the Essex-Windsor region by 2021. The strategies involve both the supply-side of transportation planning dealing with network capacity, and the demand side dealing with the amount and type of trip-making. These strategies are listed below, and then described with associated 2021 roadway LOS deficiency forecasts in the following sub-sections:

Supply Side	**Demand Side**
1. Structural Roadway Capacity Enhancement	3. Transportation Demand Management
2. Roadway Capacity Optimization	4. Land Use Planning and Urban Form

4.1.1 STRUCTURAL ROADWAY CAPACITY ENHANCEMENT

The effects of a series of optional roadway capacity enhancements are included in ten (10) optional strategies, from Option 2A through to 4C. These options involve various combinations of "structural" capacity enhancement using various combinations of strategic road widenings and extensions. At the same time, the travel characteristics (trip-making, travel mode, time of trip and auto occupancy patterns) by the Essex-Windsor public are all assumed to remain constant at current levels over the next 20 years. For example, the regional travel modes previously reported in Section 2.3 are assumed to not increase the percentage of trips by transit, cycling and walking, but also not increase the amount of auto use. Forecasted LOS deficiencies on the roadway network for each option are addressed with the addition of roadway network capacity using a combination of:

Structural Capacity Enhancement:	Addition of Travel Lanes	Add Bicycle Lanes
	Extension of Roads	Improved Roadway Geometry
	Build New Roads	Traffic Diversion

The following types of structural capacity enhancement options were evaluated to test their capabilities to reduce forecasted LOS deficiencies in the regional network. Descriptions of the capacity enhancement projects are listed in the following tables and exhibits, including forecasts of roadway capacity deficiencies measured as LOS E and F at 2021 for each strategy:

Option 2A: Approved Roadway Improvements – having Environmental Assessment approval and/or having otherwise been approved by the County of Essex, City of Windsor or MTO at the time of this evaluation, and expected to be completed within the planning period to 2021:

MTO Projects:

a) Highway 401 widening to three lanes per direction from 0.4 m east of Highway 3 to 1 km east of CR 42 including interchange improvements.

Note: the planned Highway 3 widening and improvements had not received EA clearance at the time of the forecasting, so were included in Option 3A as a planned project.

City of Windsor Projects:

1. Widen Lauzon Road to 4 lanes from Edgar to Wyandotte;

2. Widen Tecumseh Road East to 6 lanes from Jefferson to east City limit at Banwell Road;

3. Extend Wyandotte Street east of the Little River into the Riverside East community, including construction of a free-spanning bridge over Little River;

4. Widen Walker Road to four through lanes plus turn lanes from Tecumseh Road to south City limit, including construction of a Walker Road rail grade separation at Grand Marais Road; and

5. Widen Howard Avenue to four through lanes from Highway 3/Talbot Road to Dougall Parkway, three lanes from there to Cabana Road, and then four lanes from Cabana to Provincial Road.

County of Essex Projects:

The widening of CR 11/Walker Road from the City boundary to Highway 3 is assumed to be completed in this option.

These Option 2A projects are shown on Exhibit 4.1, along with the resulting 2021 roadway network LOS deficiencies. They show that except for the Highway 401 widening near the City and the Walker Road widening, the approved projects will have little impact on resolving forecasted LOS deficiencies by 2021.

Option 3A: Approved Plus Planned Roadway Improvements – include the above-noted Option 2A Approved projects, plus a number of roadway projects shown on Exhibit 4.2 that were in various stages of the planning process during the evaluation period, and were expected to be implemented during the planning period to 2021, including all Option 2A Approved Projects plus:

City of Windsor Projects:

1. Widen to four through lanes Provincial/Division Road from Howard Avenue to south City limit; and

2. Widen to four through lanes Cabana Road from Huron Church Road to Provincial Road, and Division Road from Provincial Road to east City limit.

County of Essex Projects:

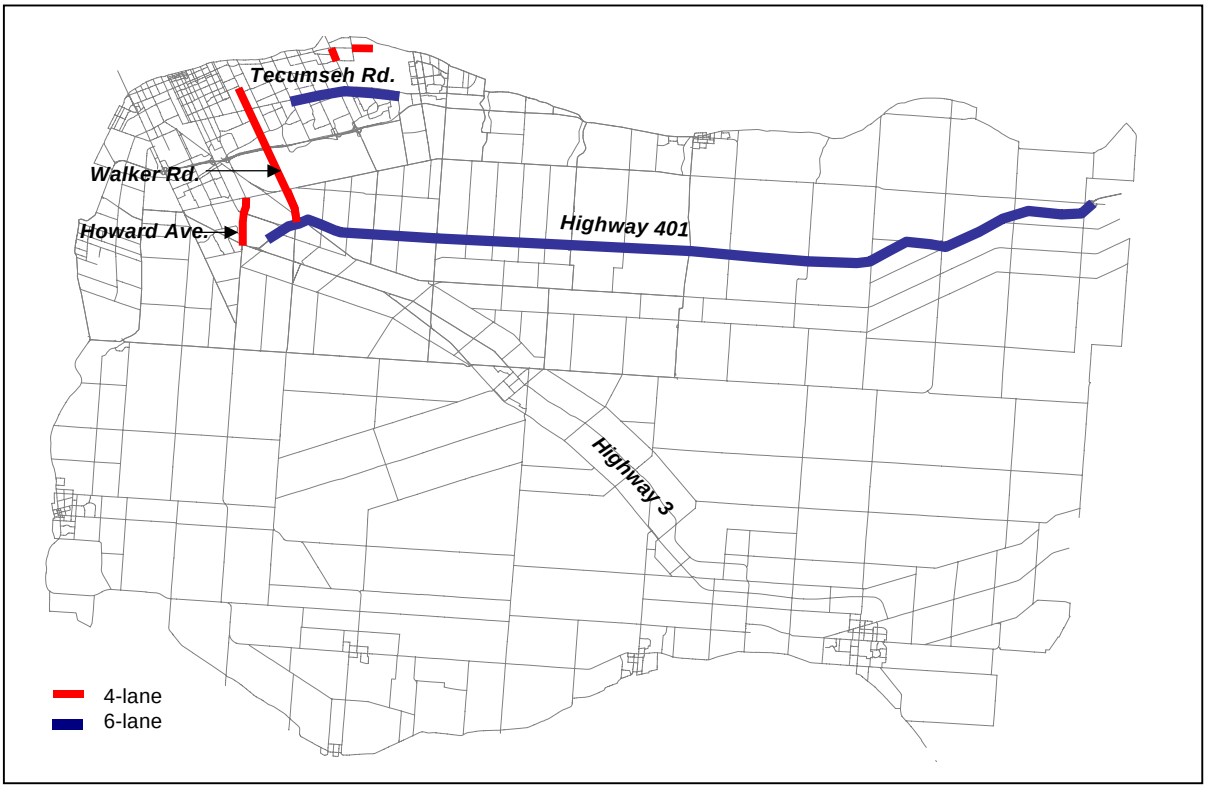
3. Realignment of CR 25 near Wallace Woods;

4. Widen CR 43 (Banwell Road) to four through lanes from City boundary at CPR tracks to CR 42 (noting that the City's plan to continue the widening of Banwell Road north to Tecumseh Road is reflected in later Option 4A3);

5. Widen CR 19 (Manning Road) to four through lanes from CPR tracks to Jamesyl Drive; and

6. Widen CR 22 from the existing four to six through lanes from CR 43 (Banwell Road) to CR 19 (Manning Road), and from the existing two to four through lanes from CR 19 to CR 25 (East Puce River Road), and with addition of a dual LT centre lane further east to West River Road at Belle River.

Exhibit 4.1 – Option 2A: Approved Roadway Improvements



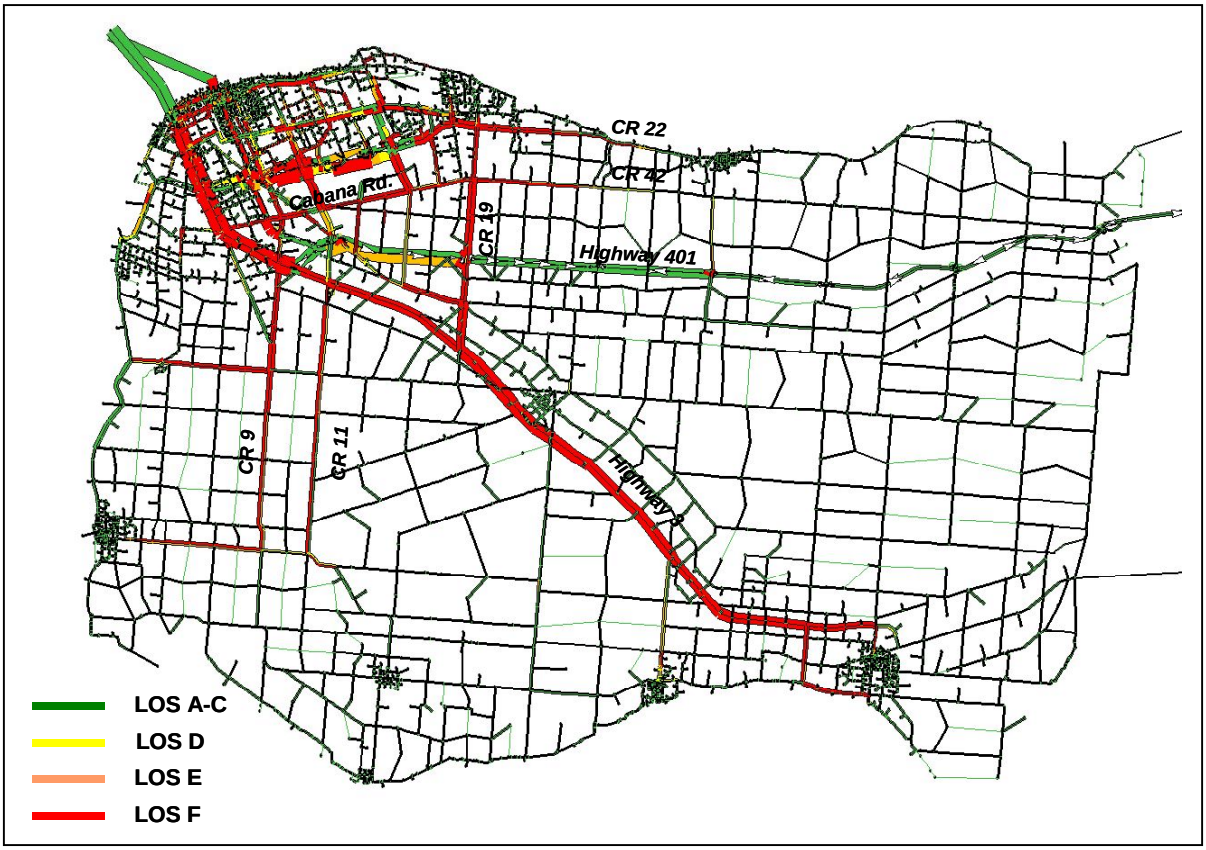
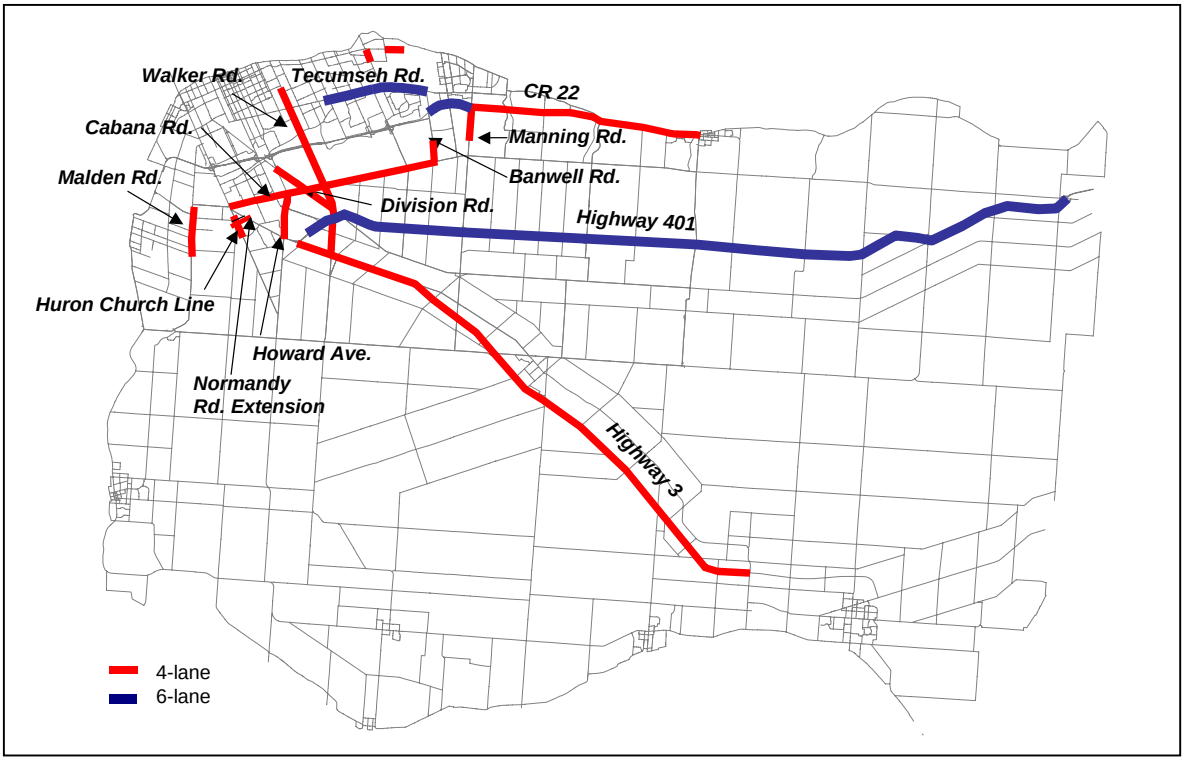
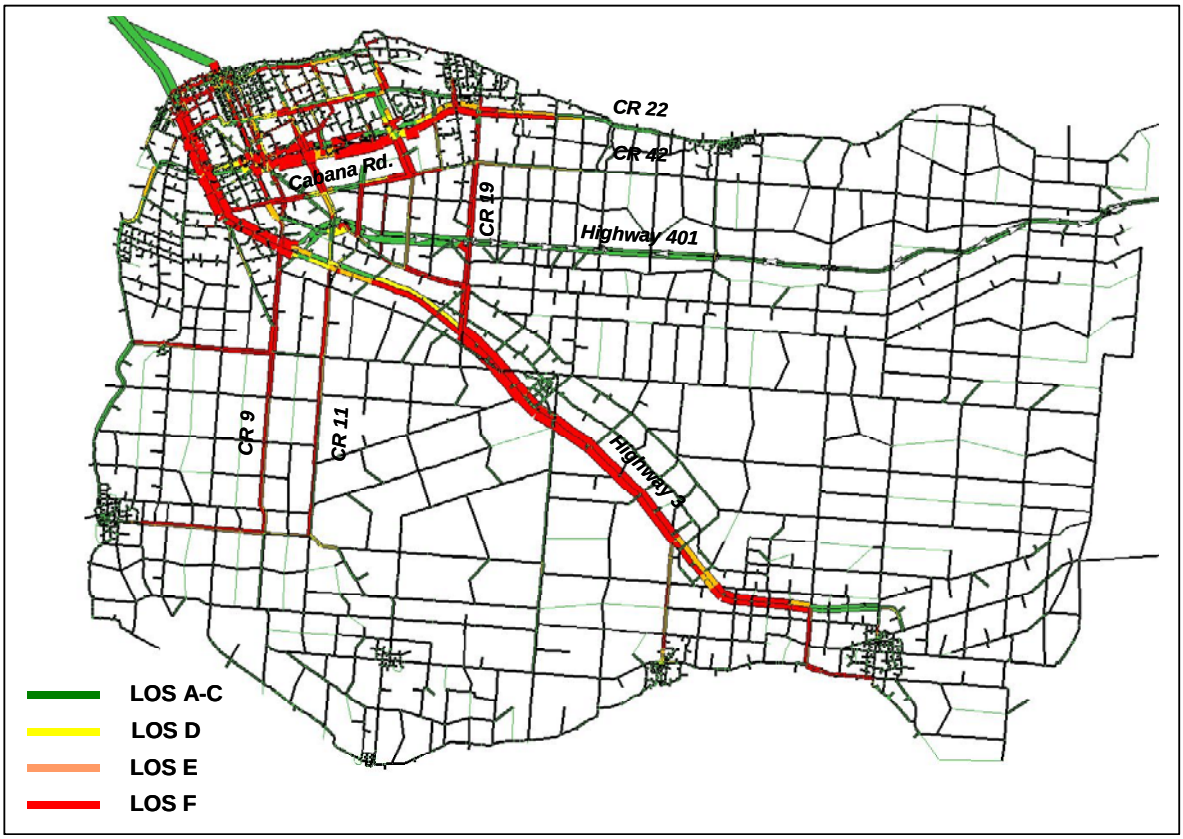


Exhibit 4.2 – Option 3A: Approved Plus Planned Roadway Improvements





Town of LaSalle Projects:

7. Widen Malden Road to four through lanes from Todd Lane to limits of sanitary sewer area;

8. Widen Huron Church Line to four through lanes from Highway 3 to planned Sandwich West Parkway; and

9. Extend four-lane Laurier Road from CR 3/Malden Road to CR 9/Howard Avenue.

MTO Projects:

Highway 3 operational improvements and widening to a basic four lanes from Todd Lane/Cabana Road in LaSalle/Windsor to CR 34 near Leamington.

The Option 3A projects shown on Exhibit 4.2 with resulting roadway LOS plots show that even with the planned Highway 3 widening and improvements, major sections are still expected to experience LOS E and F conditions by 2021. Similarly, LOS F conditions remain on CR 8, 9, 11, 18 and 19 near the City. The planned widening of Cabana Road/Division Road is expected to result in some LOS improvements along this route and CR 42. Congestion on Highway 3 at Leamington will also be alleviated by the planned highway widening.

Option 4: Approved Plus Planned Roadway Improvements with Additional Projects – involves a series of additional capacity enhancement possibilities as increments or additions to the approved and planned projects, some of which were suggested by the Study Steering Committee. The focus of the Option 4 projects varies as follows:

Option 4A adds to Option 3A a full widening of CR 19/Manning Road to four lanes from the CPR tracks south to Highway 3, plus an extension of a four lane Lauzon Parkway from the EC Row Expressway to Highway 3 to solve N-S capacity deficiencies forecast on both routes shown on Exhibit 4.2. It also includes a widening of the EC Row Expressway by one lane per direction from Huron Church Road to Banwell Road at the east City boundary with added capacity to serve growth in the Tecumseh annexation area, the Tecumseh/Lakshore urban area and the overall local and regional demands for east-west travel through the City. The resulting LOS forecast on Exhibit 4.3 shows this combined N-S and E-W capacity enhancement on the east edge of the City will solve forecasted deficiencies on CR 19 and the EC Row Expressway, and extending Lauzon Parkway to Highway 401 and 3 will attract high traffic volumes. With an extended Lauzon Parkway providing an additional access route to Highway 401, it is expected to divert traffic off Highway 3 near the City, but other LOS deficiencies are expected to remain in this option as shown on Exhibit 4.3.

A number of sub-options to Option 4A were tested to determine potential affects of various capacity enhancement alternatives. The resulting LOS forecast plots of these sub-options are include in the **Technical Appendix**, and are summarized as follows:

Sub-Option 4A2 - had Option 3A projects plus the Lauzon Parkway extension shown at right added to determine if a full widening of CR 19 would still be required. The conclusion is that both projects will be required, as CR 19 will remain deficient by 2021 if not widened, even with the Lauzon Parkway extension.

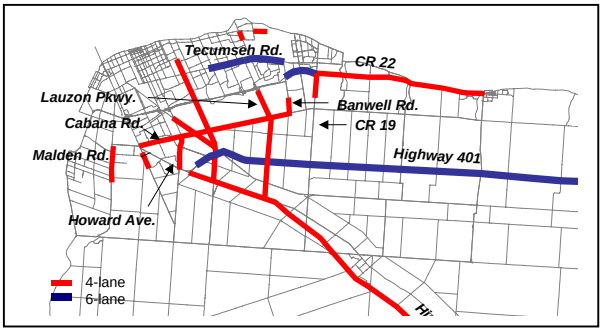
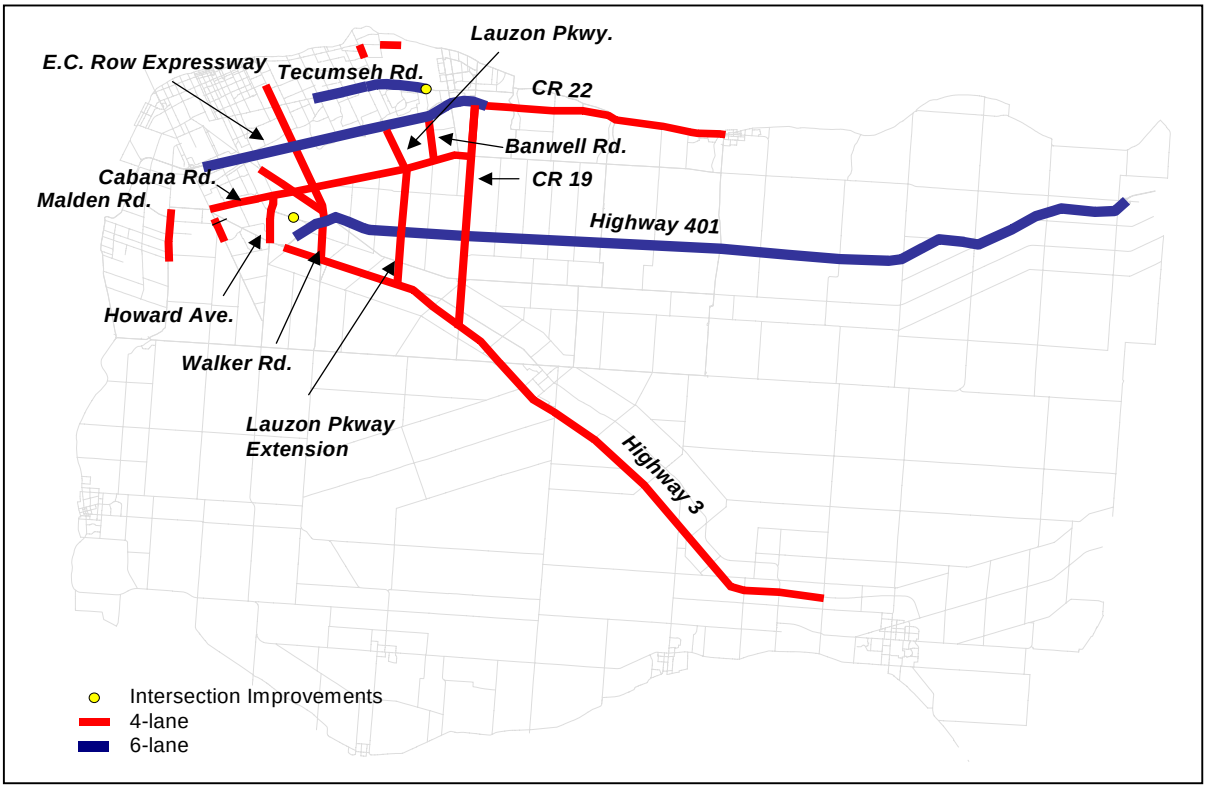
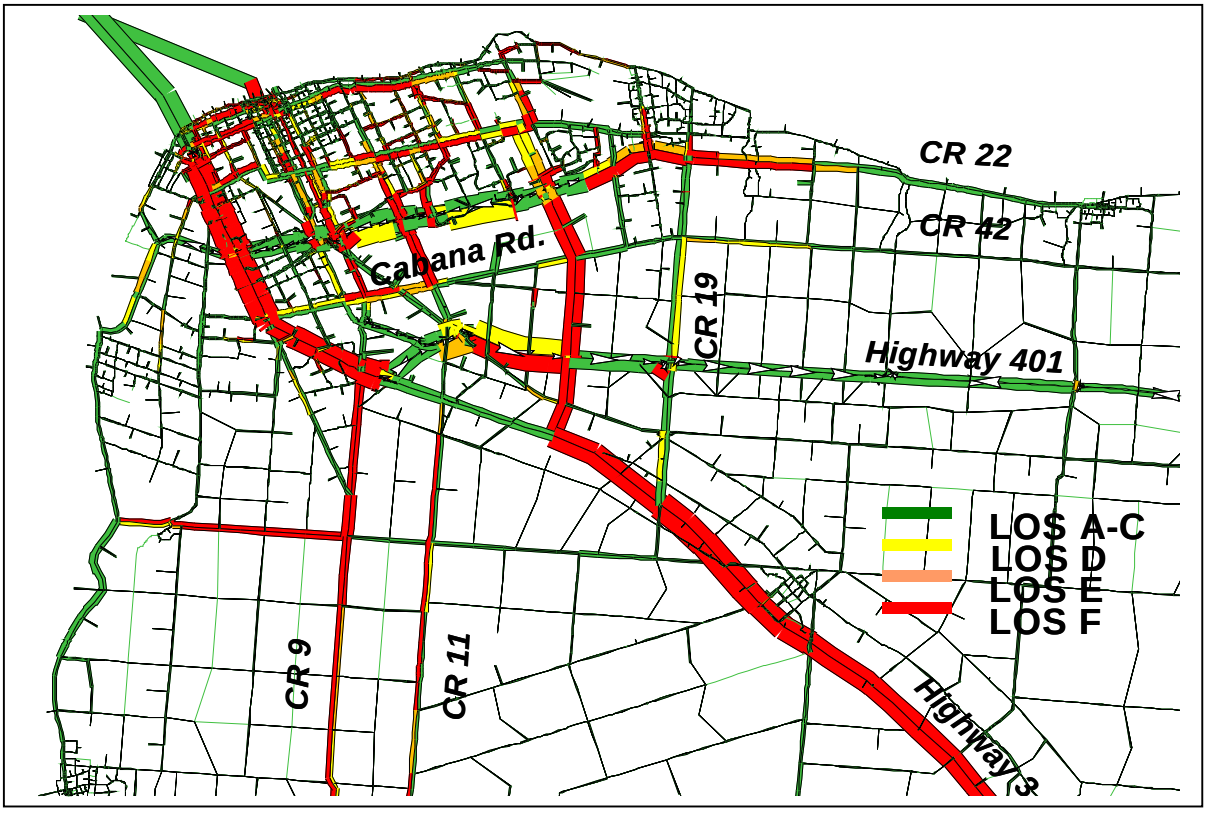
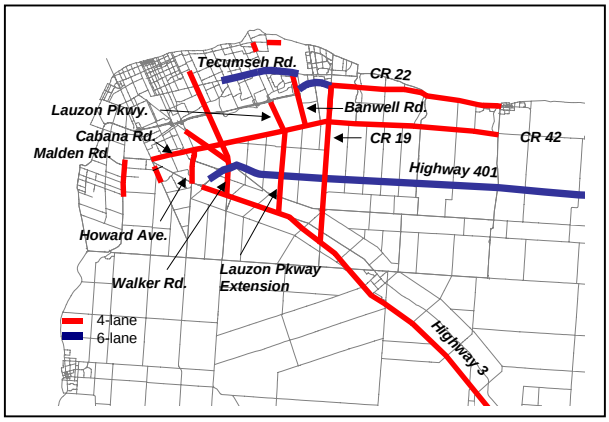


Exhibit 4.3 – Option 4A: Approved Plus Planning Roadway Improvements with CR 19 & EC Row Widening, Lauzon Parkway Extension

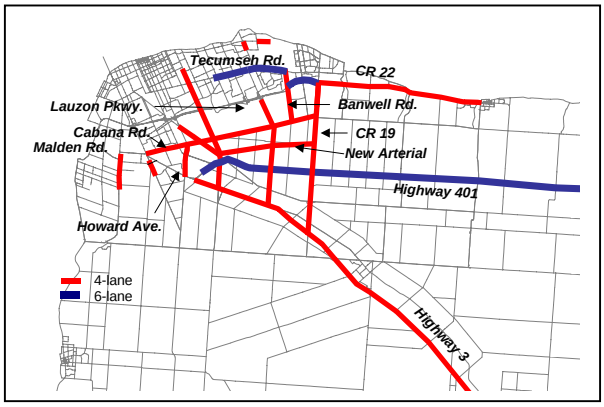




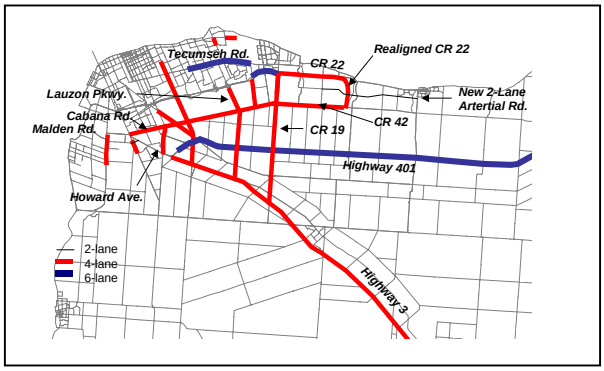
Sub-Option 4A3 – had Option 3A projects plus the widening of CR 42 to four lanes from CR 43/Banwell Road to CR 27 south of Belle River, and a widening of Banwell Road in the City from the CPR tracks to Tecumseh Road to determine if a widened CR 42/22 couplet is required to address E-W traffic volumes east of the City. Some LOS E-F conditions were forecast on CR 22 east to Wallace Line Road, suggesting this section should be planned for six lanes in the long term. LOS forecasts also had low traffic volumes attracted to the widened CR 42, suggesting it may not be required if CR 22 is widened to six lanes to Wallace Line by 2021. This conclusion was tested in Sub-Option 4A4.



Sub-Option 4A4 – tested the Option 3A LOS with an extended four lane widening of Cabana Road/Division Road west along CR 42 to CR 19/Manning Road, and with the addition of a new E-W arterial between Division/CR 42 and Highway 401 from Walker Road east to CR 19/Manning Road. The LOS forecast concluded that this Sub-Option would offer no appreciable improvement to E-W LOS in the south Windsor area, and that a new E-W arterial is not required by 2021. However, the Sub-Option does stress the importance of widening Cabana/Division/CR 42 to four through lanes along its entire length from Huron Church Road to CR 19/Manning Road, of planning CR 22 with six through lanes from Banwell Road to Wallace Line Road by 2021 and extending Lauzon Parkway to Highway 3.

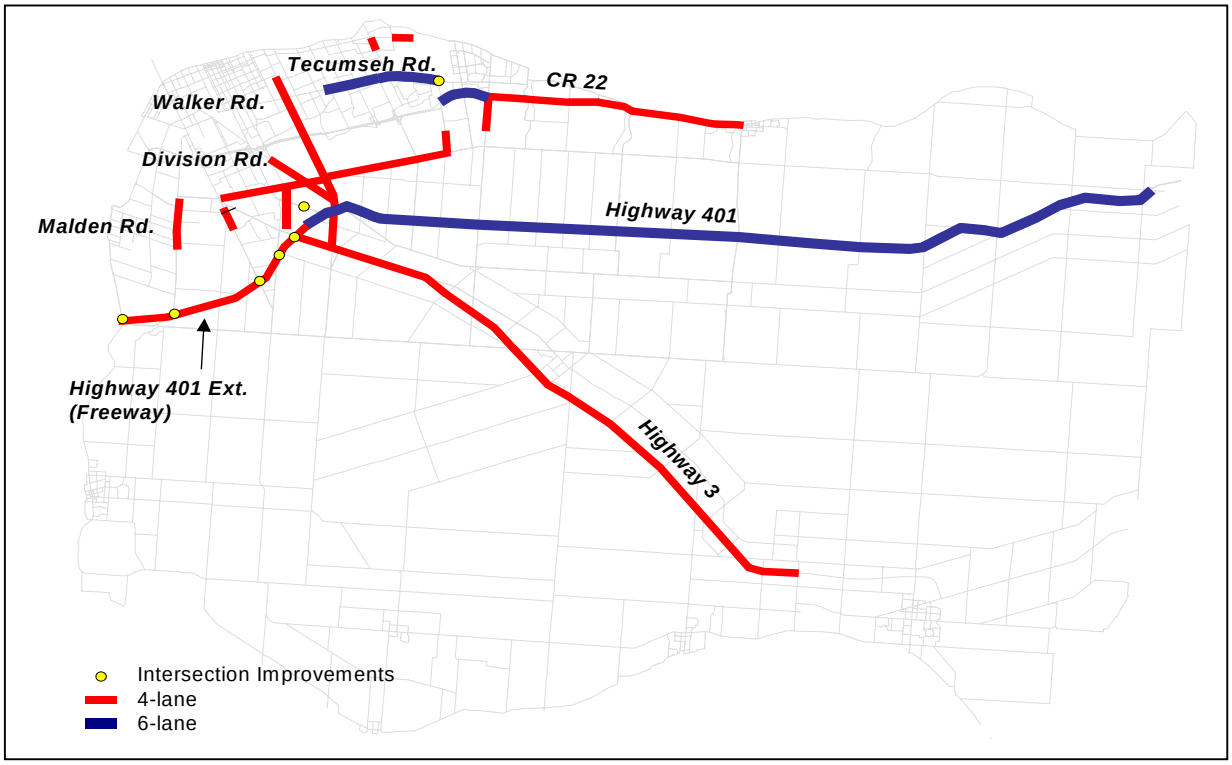


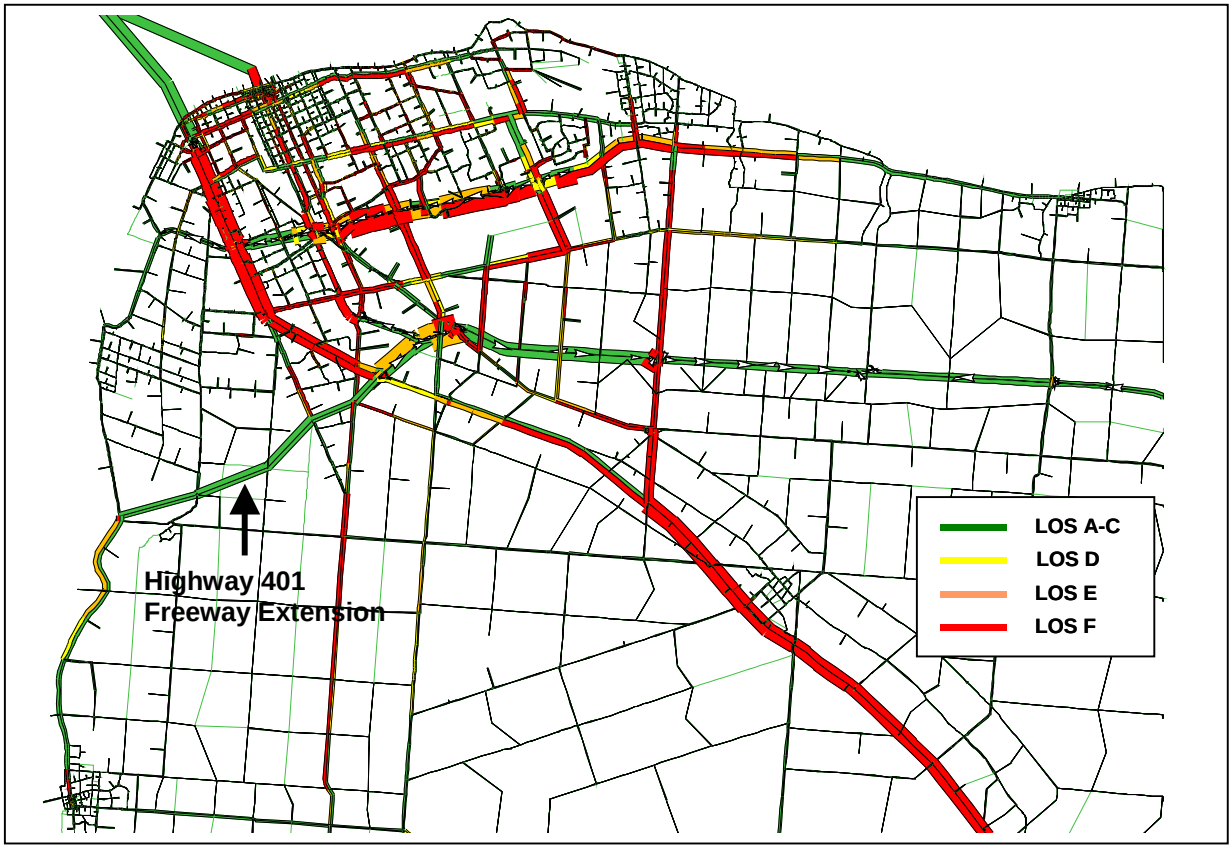
Sub-Option 4A5 – tested the Option 3A LOS to determine if deficiencies east of Windsor could be addressed by extending a four lane arterial loop along CR 22 and CR 42 connected by a link along West River Road, and by introducing a new two lane arterial between CR 22 and 42 from Patillo Road east to Belle River Road as shown at right. The resulting LOS forecast suggested that no appreciable improvement to Sub-Option 3A would be made with these additional projects.



Option 4B involves all of the Option 3A roadway capacity enhancement projects, plus the extension of Highway 401 west from Highway 3 to CR 20 in the vicinity of CR 8 on the south edge of LaSalle as a four lane arterial with at-grade intersections (Sub-Option 4B), or as a four lane freeway with grade-separated interchanges (Sub-Option 4B2). This facility would have interchanges at Highway 3, Howard Avenue, Disputed Road, Malden Road and CR 18 along this route. There are a number of possible purposes for this type of conceptual link; 1) provide an alternative to the Howard/Cabana improvements in Option 4A, 2) divert regional traffic off existing County and municipal roads south of Windsor.

Exhibit 4.4 – Option 4B2: Approved Plus Planned Roadway Improvements with Highway 401 Freeway Extension to CR 20





This option was tested on the basis of a possible longer term border crossing facility being located on the south edge of LaSalle, connected to Highway 401 by this extension. The forecast shows a freeway extension would have the capability to also solve some LOS deficiencies on CR 8, 9, 11 and 18 in the LaSalle and Amherstburg areas by 2021 as shown on Exhibit 4.4.

Option 4C includes all of the Option 3A projects plus the completion of a Leamington arterial bypass with four through lanes extending from the CR 33 intersection on CR 34 (Talbot Street), south to CR 20 (Seacliffe Drive) and CR 33 (Bevel Line Road). Comparing the 2021 LOS forecast for the Leamington area in this option and in the Option 3A Approved/Planned Projects below shows that the Leamington bypass has the potential to solve deficiencies on CR 31 (Albuna Township Road) west of the community, and on CR 20 (Seacliffe Drive) through the southern part of the community.

Option 4C was found to have only localized benefits within the Town of Leamington. Most significant of these was the ability to reduce peaked volumes on the western sections of CR 20 (Seacliffe Drive), CR 48/Oak Street and CR 34 (Talbot Street West) and to provide more balanced flows within the Town.

Option 3A

Option 4C with Leamington Bypass

4.1.2 ROADWAY CAPACITY OPTIMIZATION (OPTION 5A)

An alternative to roadway capacity enhancements to solve LOS deficiencies is to optimize the capacity of the existing roadway network before considering the additional of structural enhancements (widenings, extensions). Two types of capacity optimization techniques are generally used, as further discussed in Section 5.1:

- Roadway Access Management – involves controlling the amount of intersecting roadway and driveway access onto and off major roads by limiting access in urban conditions, and restricting access, for example with mutual driveways, in rural conditions; and

- Intersection Optimization – using various stop control and turning movement improvements such as left turn signal phases, exclusive turn lanes, transit priority operations and signalization improvements and coordination to optimize the capacity of signalized intersections.

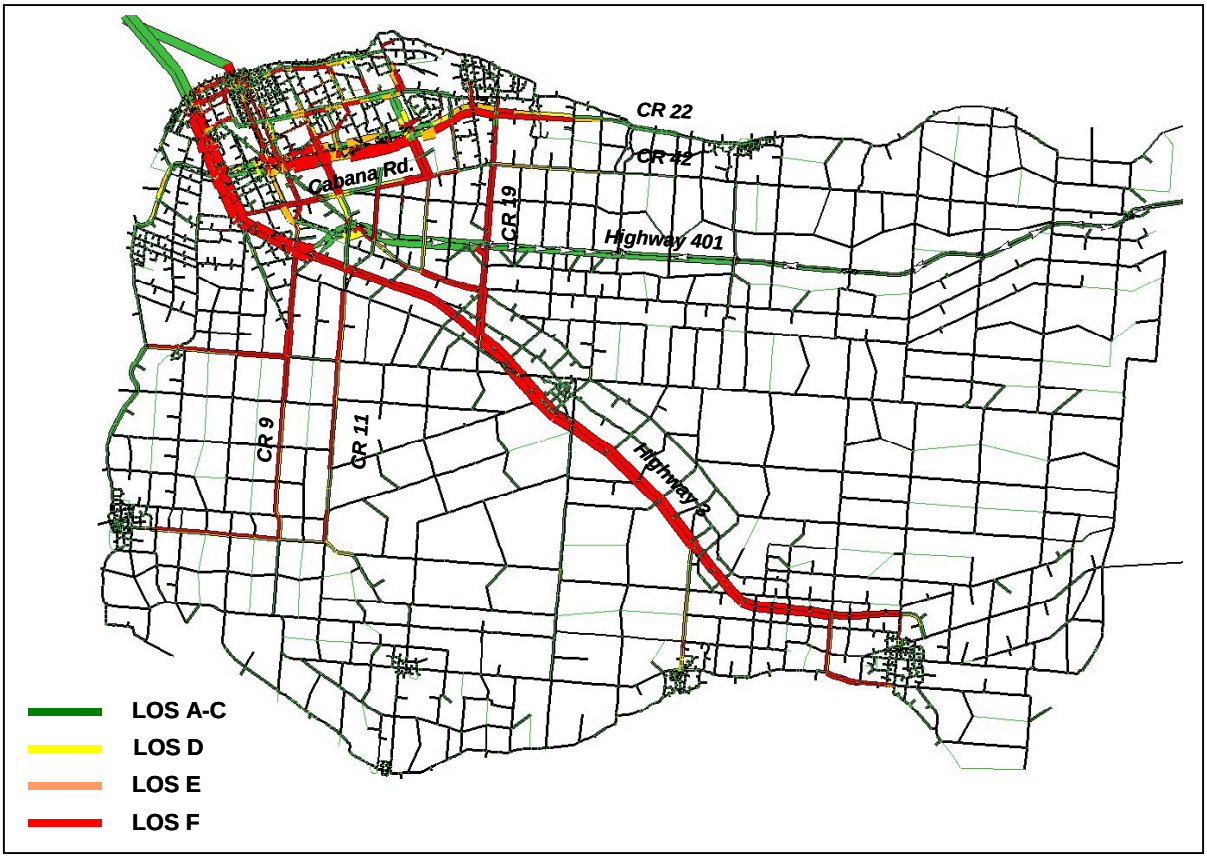
This option planned for a generalized, average 5% increase in capacity across the system through effective application of various access management policies and measures on major County and City roads, primarily involving intersection operations and access controls. In some applications the benefit could reach a 25-30% increase in capacity at a particular location or along a particular link, while in other cases the benefit could be almost nil. In terms of the planning model used for this

project, a 5% increase on overall network capacity represents a very small increase in capacity of any given link. Initial model runs were unable to illustrate the potential benefit of these types of improvements as the LOS is simply not a sensitive enough measure. That is, a 5% increase in capacity does little to eliminate the need for roadway capacity enhancement projects.

However, that is not to suggest that this is not an important objective with significant potential benefits. It is suggested that the benefits that can be garnered from these type of improvements can realistically only be measured at a traffic operations level. For this master planning project, this detailed level of analysis was outside the scope of work. However, these benefits will best be illustrated in the evaluation phase of the project reported next in Section 4.2 where detailed measures of effectiveness (i.e. travel time, delay, etc.) will be added to the evaluation matrix.

For the purposes of evaluating alternative transportation strategies for the Essex-Windsor region, **Option 5A** set a strategic target of increasing the overall roadway network capacity by 5%, which is considered an acceptable and achievable overall average target for the regional network. **Option 5A** shows the effectiveness of combining this 5% optimization target with the approved and planned roadway improvement projects in Option 3A. The comparison concludes that in the context of the Essex-Windsor region, a 5% increase in network capacity would have little effect of the forecasted 2021 LOS deficiencies as shown below on Exhibit 4.5.

Exhibit 4.5 – Option 5A LOS Forecast at 2021
Approved/Planned Projects with 5% Capacity Optimization



4.1.3 TRANSPORTATION DEMAND MANAGEMENT –TDM (OPTION 6)

This option investigated the potential benefit of reducing the total travel demand that is placed on the transportation system by eliminating the need for certain trips and further shifting demand away from Single Occupant Vehicles (SOV) to High Occupancy Vehicles (HOV) such as public transit.

The study Terms of Reference also expressed a desire to reduce the overall amount of trip-making during the peak versus shoulder time periods in the County, which is largely a by-product of a congested roadway network. Reduced trip-making may also be achieved in urban areas by applying some of the transportation policies, restrictions and incentives associated with Transportation Demand Management (TDM), Transportation Operations Management (TOM) and Transit Oriented Development (TOD). These strategic transportation planning choices are reviewed in Section 5.2 of this Master Plan.

However, in the rural context of Essex County, travel demand management and reduced trip-making is unlikely achievable as the vast majority of the roadway network operates at relatively uncongested conditions during the peak hours, and most trips involve significant travel distances that practically limit the use of alternatives to the private automobile.

Specifically dealing with TDM in the context of Essex County, what is expected to be more achievable in the Essex-Windsor region is the concept of **"living with congestion"** if and where it occurs. This is an essential policy direction for this Master Plan to consider. i.e. "**What amount of congestion are we willing to accept to achieve the goal of reduced trip-making,** or in other words, **how far is the City, County and Local Municipalities willing to go to achieve traffic conditions that result in real changes to local travel patterns, habits and preferences?**"

Overall, TDM policies and programs must be reasonably achievable in order to provide a sound basis for the Transportation Master Plan. Further, the supporting policies and associated budgetary implications must also be fully understood if the plan is to be achieved. There are possible incentive-based TDM opportunities that could be explored for particular sections of the regional network, for example:

- Work with area employers to offset their work arrival and departure times to reduce the peak impacts on the roadway system.
- Auto occupancy is likely the most effective systemic element that can have region-wide benefits and at the same time the most elusive to achieve. The transportation planning model can test the benefits of a change in auto occupancy from the current 1.3 to 1.2, or some other policy objective. These values vary by time of day and trip purpose with work trips having the lowest value and with "home-based other" trips having the highest value.
- Determine what the impact of a modal shift to transit can have on trip-making and future roadway LOS. In the rural areas, this must be applied more judiciously since no transit exists currently. Given experience in other jurisdictions, the maximum market share that could reasonably be expected from an extension of Transit Windsor's service in its current form in the "Urban" area of the region (City and partial LaSalle, Tecumseh and Lakeshore) would be up to 5% of all trips, compared to 0 to 3% today.

Transit Extension Assumptions

In this strategic option, the mode share for LaSalle and Tecumseh was adjusted to reflect a mode share to transit of 5% by 2021, which is a significant increase from no transit service in 2004. No other adjustments were made as it was felt that extension of conventional road-based scheduled transit service in the current form would be inefficient outside of the Windsor and fringe area. To reach the rest of the Urban in Rural Setting communities in Lakeshore, Essex, Kingsville, Leamington and Amherstburg would require a regional line-haul type operation which Windsor

Transit is not designed or mandated to provide, and would more likely operate as a community-based private sector service using schedule inter-community links to nearby Amherstburg, Essex and Belle River area, and on-demand Alternative Service Delivery Methods such as Trans-Cab service to the outlying communities.

However, as an academic exercise, a trial test was run that assumed by 2021 that the forecast automobile demand to/from LaSalle and Tecumseh could be reduced by 5% with the expansion of Transit Windsor's service to the area. Referred to as **Option 6A,** Exhibit 4.6 shows that with the approved and planned roadway improvement projects in place, the overall LOS in 2021 would be largely unaffected by this 5% decrease in auto travel demand in LaSalle and Tecumseh. This indicates that as a minimum, the approved and planned capacity enhancement projects will still be required to 2021, and further that additional road projects are likely be needed even if a 5% reduction in auto trip-making is achieved.

Notwithstanding the LOS forecasts for Option 6A, a second sub-option was tested that assumed the approved and planned projects are in place by 2021, but that forecasted auto trip-making would be decreased by 10% compared to 2001 through the combination of expanded transit service and use of various TDM policies and incentives (see Section 5.2). Exhibit 4.6 shows that in this case, the network LOS in 2021 with **Option 6B** is largely unaffected by the 10% travel demand reduction, indicating that as a minimum, the approved and planned roadway improvement projects will still be required by 2021, and further roadway capacity enhancement projects will likely be required to meet future travel demands in the region.

The **Option 6A and 6B** LOS exhibits show that an emphasis on TDM, while an appropriate part of any future regional transportation strategy, is not expected to have a noticeable affect on forecast LOS deficiencies, largely because the region is very auto dominated, and so 5-10% reductions in auto travel demand will still leave a significant volume of traffic on the regional road network.

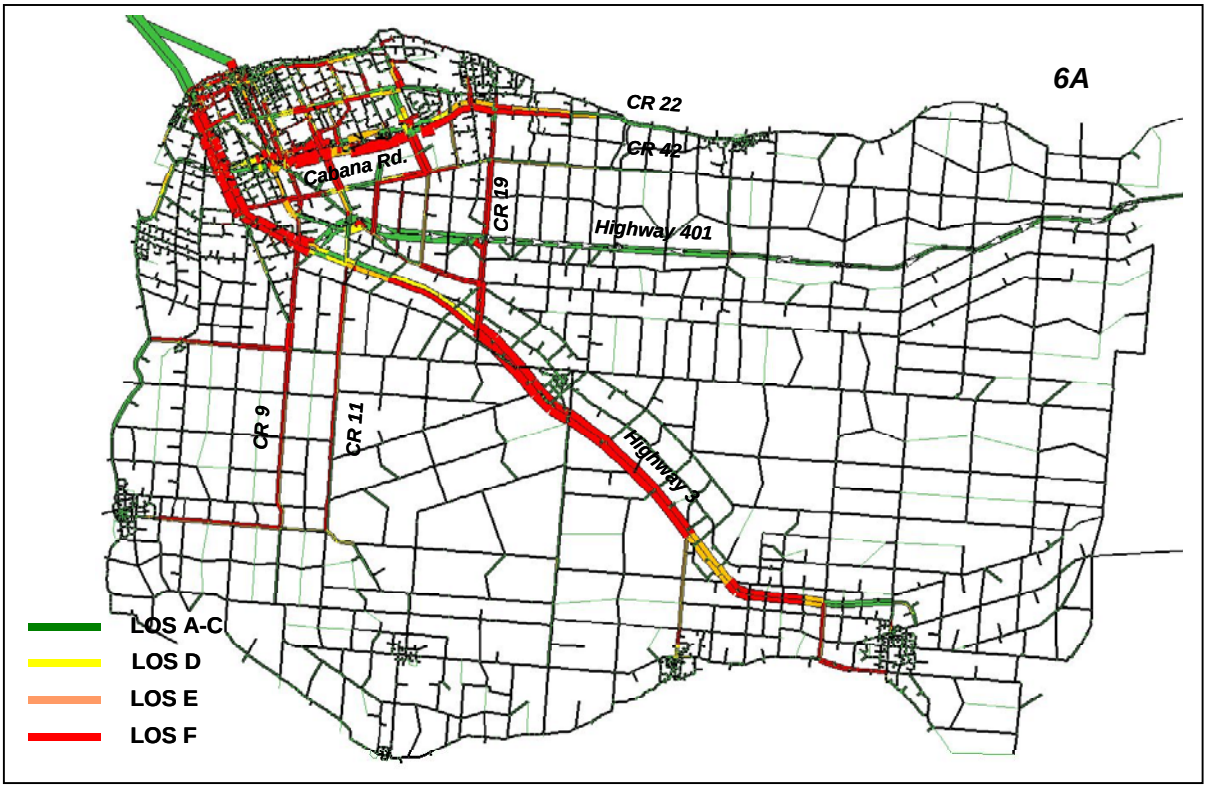
4.1.4 LAND USE PLANNING AND URBAN FORM (OPTION 7A)

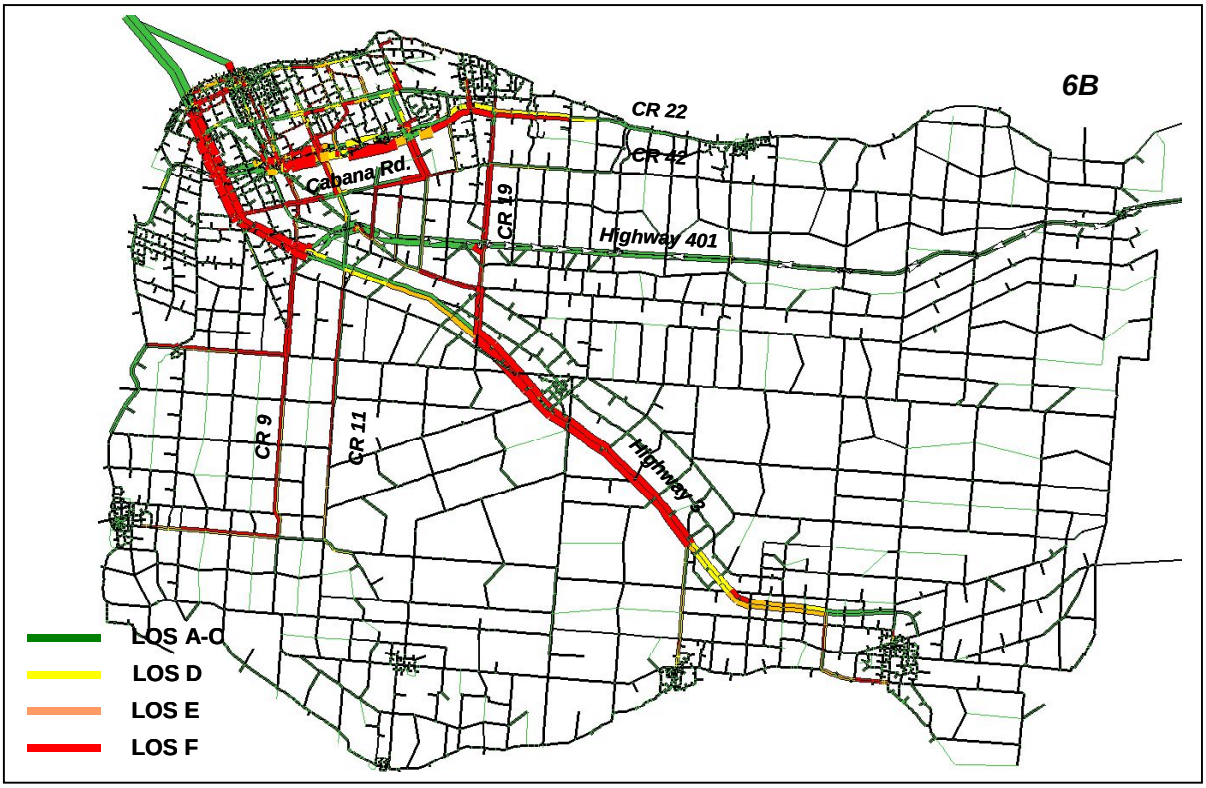
Several of the key objectives of this project identified in the Terms of Reference would require changes to the fundamental relationships of travel currently within the Essex-Windsor region, including when and how people travel. That is, some external force would need to be in place to influence the demand for travel, for example reducing the number of kilometres travelled per household. This requires that opportunities to work, to play and to purchase goods and services be located closer to people's place of residence such that the need to travel longer distances (kilometres) is reduced. This external force would require changes in residential and employment land use and urban form characterized by:[1]

- More intensive, mixed-use development that brings activities closer together and increases the potential for walking, cycling and transit use;
- Higher densities that increase the number of potential transit passengers per kilometre, which leads to more cost-effective transit service, and in turn, higher transit service levels;
- Higher densities will also support a range of services such as entertainment, shopping and personal services, which tends to make streets more lively and attractive for walking and cycling; and

[1] The Canadian Guide to Promoting Sustainable Transportation Through Site Design, Canadian Institute of Transportation Engineers, IBI Group, September 2003.

Exhibit 4.6 – Option 6 LOS Forecast at 2021
Approved/Planned Projects with: 6A - 5% TDM Reduction / 6B - 10% TDM Reduction





- Site planning standards that allow for reduced lot sizes, reduced or "maximum" off-street parking standards, redevelopment and intensification of underutilized brownfield and grayfield property and road layouts with more closely spaced arterial and collector patterns that ensure that the majority of land is within 400 metres of a transit stop.

A project Steering Committee member asked that a "What If" scenario that considers the benefits of promoting these types of land use planning and urban form changes be prepared. All of the previous LOS forecasts for each strategic option incorporated the maximum amount of benefit that could be gained from the status quo land use and urban form patterns in the Essex-Windsor region. That is they represent the maximum benefit that can be derived from the planning principles that have gone into developing the current projected population and employment distribution.

This is a sound approach since in the case of Essex County, the land use pattern is largely fixed over the next 20 years, based on the growth data provided that includes continued low density suburban growth in LaSalle, Tecumseh and Lakeshore. However, there are exceptions to the status quo urban form, for example in LaSalle's *Bouffard and Howard Planning District Secondary Plan* with it's emphasis on a wider range of housing choices, closer distances between land uses and a more balanced transportation system with an inter-connected road pattern and shorter blocks.

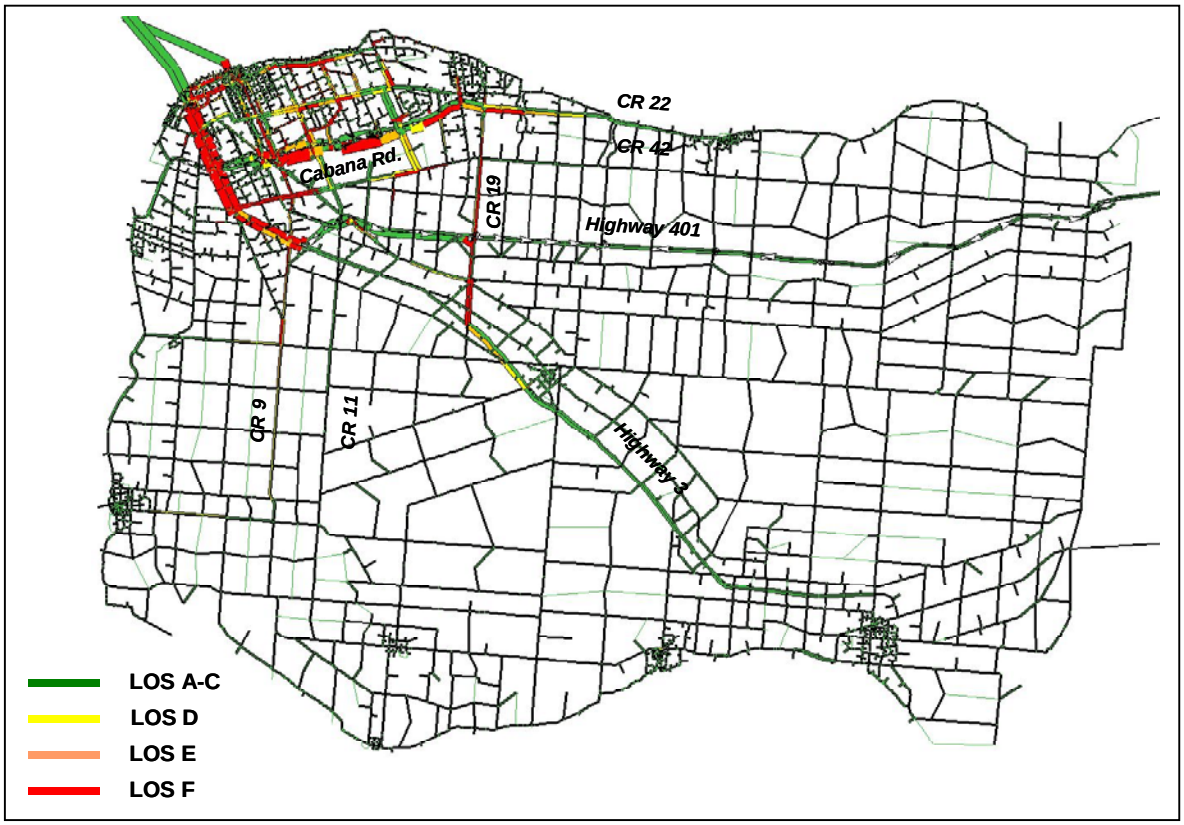
Therefore, to determine the potential impact of these new urban forms, two methods were identified to forecast even further reductions in long-distance travel; 1) analyse an alternative and more intense land use concept that would take advantage of the forecasting model's characteristics to assign trips to shorter distances by providing more employment opportunities in close proximity to residential areas, or 2) impose an external force upon the basic demand for travel (i.e. some external conditions change such that people are unwilling to travel longer distances to work, shop and play).

In discussions with the Steering Committee, it was apparent that in the first option, a further "intensified" land use scenario cannot realistically be achieved within the 20 year planning horizon. The Committee therefore directed that the basic fundamental relationships on which the forecasting model was calibrated be altered to create the "external force" to change people's travel behaviours. This action took this exercise into the realm of an "**academic what-if**?", that is…. "**What are the implications on the projected deficiencies, if people in 2021 were not willing to travel as far to work, shop or play**" because of traffic congestion, travel time, fuel costs or parking costs? This what-if question does not include the municipal policy framework and economic conditions that would be required to ensure that this change comes to fruition.

To answer this what-if question, the forecasting model was adjusted to include the same amount of population and employment growth as used in the other options, but with a 25% reduction in trip lengths based on assumed land use and urban form changes towards more intensification and mixed use where appropriate in **"Urban"** areas, such as in designated nodes and along designated corridors. This higher probability for short trips (a 25% increase in short trips) and a lower probability for longer trips requires changes to urban form, with more mixed use development, closer home-work relationships and reduced trip-making frequency and length. As shown on Exhibit 4.7, **Option 7A** has the potential to significantly reduce LOS deficiencies in the Windsor area roadway network by 2021, compared to the preceding LOS scenario forecasts

In the **"Urban in a Rural Setting"** parts of the region, more mixed use development forms in more self-sufficient communities would reduce the need for commuting and longer travel distances. Some intensification of core areas in these communities with appropriate, but higher density designs would also contribute to reduced trip-making. The extreme low density nature of **"Rural"** areas makes them inappropriate candidates for any changes in development form.

Exhibit 4.7 – Option 7A LOS Forecast at 2021
Approved/Planned Project with Urban Form & Land Use Planning Changes



4.2 Comparative Measures of Effectiveness

This section of the Transportation Master Plan has used roadway LOS as the representative measure of transportation system effectiveness now and in the future. LOS F is identified as deficient roadway capacity, and LOS D-E considered as approaching deficiency and requiring action. However, as shown next on Exhibit 4.8, the demand forecasting model also generated other "measures of effectiveness" for the 15 strategic options tested, described as follows:

- **Vehicle-Trips –** the total number of vehicle trips taken in the regional network in the 2021 PM Peak Hour as an indicator of total trip-making. This measure remains constant at about 110,000 trips in 2021, except in Options 6A and 6B that involve reduced trip-making;

- **Vehicle Kilometres** – the total distance travelled by the Essex-Windsor public during the PM Peak Hour. This measurement is relatively high compared to comparable municipalities owing to its regional scale. Peak vehicle kilometres traveled is forecast to be well over 1 million in 2021, compared for example to a total maximum peak distance of no more than 720,000 kilometres in London. This shows that the very nature of regional travel in Essex-Windsor makes any reduction in trip length a great challenge;

Average Trip Length – remains constant at about 14 kilometres in the PM Peak Hour, except in Option 7A which reduces the length using land use and urban form changes;

Exhibit 4.8 – Comparison of Strategic Option Measures of Effectiveness in 2021

Strategic Option	Baseline	Approved Projects	Approved + Planned Projects	3A + Manning/Lauzon/EC Row	3A + Lauzon Only	3A + CR 42/Banwell	3A + CR 42/Banwell + E-W New Arterial	3A + CR 42/Banwell + CR 22 Loop	3A + 401 Arterial Extension	3A + 401 Freeway Extension	3A + Leamington Bypass	3A + 5% Capacity Optimization	3A + 5% TDM	3A + 10% TDM	Urban Form
Measure of Effectiveness (MOE)	1A	2A	3A	4A	4A2	4A3	4A4	4A5	4B	4B2	4C	5A	6A	6B	7A
Veh-Trips	109577	109577	109577	109577	109577	109577	109577	109577	109577	109577	109577	109577	108395	98618	109577
Veh-kms	1564699	1565906	1559275	1562017	1560745	1562195	1561009	1563412	1559086	1559227	1547304	1560298	1536149	1399787	1116274
Average Trip Length (km)	14.3	14.3	14.2	14.3	14.2	14.3	14.2	14.3	14.2	14.2	14.1	14.2	14.2	14.2	10.2
Veh-hrs	23514	23464	22699	22352	22391	22357	22355	22398	22520	22516	22555	22635	22295	19882	17222
Average Speed (km/h)	66.5	66.7	68.7	69.9	69.7	69.9	69.8	69.8	69.2	69.2	68.6	68.9	68.9	70.4	64.8
Delay	2822	2760	2138	2o54	2070	2059	2059	2067	2110	2106	2133	2051	2058	1521	1637
veh-km LOS A-C	655765	697165	712665	793496	724413	761092	767766	756534	739834	767917	707604	748815	714850	733325	753045
veh-km LOS D-E	184856	184856	225677	217730	216656	220003	211425	225599	233669	220895	230873	237484	233979	220226	145447
veh-km LOS F	724078	676326	620933	550791	619676	581100	581819	581279	585583	570414	608827	573998	587320	446237	217782

Change Compared to Baseline:

Veh-kms	0	1207	-5424	-2682	-3954	-2504	-3690	-1287	-5613	-5472	-17395	-4401	-28550	-164912	-448425
Veh-hrs	0	-51	-815	-1162	-1124	-1157	-1159	-1116	-994	-998	-959	-879	-1219	-3632	-6292
Delay	0	-62	-684	-768	-752	-763	-763	-755	-712	-716	-690	-771	-764	-1301	-1185
veh-km LOS A-C	0	41400	56900	137731	68648	105327	112001	100769	84069	112152	51838	93050	59085	77560	97280
veh-km LOS D-E	0	0	40821	32874	31801	35147	26569	40744	48813	36039	46018	52629	49124	35370	-39408
veh-km LOS F	0	-47752	-103145	-173287	-104402	-142978	-142259	-142799	-138495	-153664	-115251	-150080	-136758	-277841	-506296

Network LOS:

veh-km LOS A-C	42%	45%	46%	51%	46%	49%	49%	48%	47%	49%	46%	48%	47%	52%	67%
veh-km LOS D-E	12%	12%	14%	14%	14%	14%	14%	14%	15%	14%	15%	15%	15%	16%	13%
veh-km LOS F	46%	43%	40%	35%	40%	37%	37%	37%	38%	37%	39%	37%	38%	32%	20%

- **Vehicle Hours of Travel -** is a prime indicator of overall travel efficiency and LOS in the regional roadway network because the more congestion experienced, the longer the overall travel time. Hours of travel also result in other environmental implications such as higher vehicle emissions and fuel consumption;

- **Average Speed –** is also a prime measurement of overall travel efficiency and system performance, and represents other social issues such as emergency responsiveness. The average speed in the regional road network by 2021 remain relatively constant at 66-70 km/h, except in Option 7A that further reduces the average speed owing to its emphasis on land use planning and urban form to alter travel patterns;

- **Delay –** is measured as the overall time in the PM Peak Hour when traffic is in delayed rather than free flow conditions, usually represented by LOS E and F conditions; and

- **LOS –** is the forecasted measure of roadway network performance based on the traffic volume to capacity ratio as previously described in Section 2.4.4. The objective of the Transportation Master Plan should be to maximize the amount of acceptable LOS A-C conditions, maintain the amount of LOS D-E problem conditions and avoid the amount of unacceptable LOS F deficiencies.

4.3 Preferred Future Transportation Strategy

The comparative measures of effectiveness for each of the 15 strategic options shown on Exhibit 4.8 result in the following important transportation planning conclusions for the Essex-Windsor region:

1. In a baseline Do-Nothing scenario, with no further capacity enhancements for TDM measures being implemented in the region, 46% of the regional road network would be deficient (LOS F) by 2021 in the PM Peak Hour. This can be reduced to between 38-40% with the completion of various optional capacity enhancements, but most are effective at addressing localized problems that still leave a large proportion of the network deficient in 2021. As summarized on Exhibit 4.9, only construction of all approved and planned capacity enhancement projects along with a high emphasis on TDM measures (see Section 5.2) and especially changes to urban form that reduce travel distances and needs have the capability to significantly reduce capacity deficiencies in the regional road network;

Exhibit 4.9 – Measures of Effectiveness Summary (PM Peak Hour)

Measure	Baseline Option 1A	Approved Projects Option 2A	Approved + Planned Projects Option 3A	3A + 10% TDM Option 6B	3A + Urban Form Option 7A	Other Options
LOS A-C	42%	45%	46%	52%	67%	46-51%
LOS D-E	12%	12%	14%	16%	13%	14-15%
LOS F	46%	43%	40%	32%	20%	35-40%
Veh-Km	1.56M	1.56M	1.56M	1.40M	1.11M	1.56M

2. Capacity enhancement projects already approved by the County and local municipalities mainly address existing problems, and little long term impact on the roadway network;

3. Regarding the objective to reduce the total number of kilometres traveled by household, this can best be accomplished with the approved and planned capacity enhancement projects, in association with changes to urban form that would reduce average trip lengths by 25%;

4. If the Essex-Windsor region is not able to change its urban form to reduce trip lengths (Option 7A) or institute TDM measures with that capability to reduce travel demand by up to 10% compared to today (Option 6B), then "Other" roadway capacity enhancements will be required in addition to currently approved and planned projects (Option 3A) including:

   a. widen CR 22 to six travel lanes from CR 19/Manning Road to Wallace Line Road;

   b. widen CR 19/Manning Road to four travel lanes from CPR tracks to Highway 3;

   c. extend Lauzon Parkway as a four lane arterial from EC Row Expressway to Highway 3;

   d. extend a Leamington arterial bypass from CR 34/Talbot Street to CR 33/Bevel Line;

   e. complete further capacity enhancement and operational improvement projects already planned as part of the Canada/Ontario Windsor Gateway Action Plan, including:

      - Windsor-Detroit Tunnel Plaza traffic management improvements;
      - Huron Church Road Overhead Pedestrian Bridge
      - Howard Avenue and Walker Road rail grade separations;
      - Improvements to Industrial Drive/Huron Church Road intersection to support development of a pre-processing border facility;
      - Implementation of ITS systems along transportation corridors leading to the border crossing; and

   f. complete the Tecumseh annexation area master planning, including the transportation system concept for major roadways, transit service, and cycling and walking corridors.

Preferred Strategy

In conclusion, to minimize or avoid the need for further capital improvements to the Essex-Windsor regional transportation system by 2021, a 25% reduction in average trip lengths accomplished through more intensified and mixed use urban form should be targeted in association with the roadway improvements being recommended in this Plan (see Section 5.2). Together, these strategies provide the greatest long-term benefits to the regional transportation system. This conclusion is represented by **Option 7A,** offering the best measures of transportation effectiveness of all of the 15 options evaluated, including the least vehicle-kilometres traveled, vehicle-hours traveled and vehicle-hours of delay. It also offers the highest level of good LOS A-C conditions on the roads, and the lowest level of poor LOS F congestion.

The main conclusion reached from the evaluation of these strategic options is that in order for the County, City and Towns to plan for an acceptable level of transportation service to year 2021, the focus will have to be on a combination of selected roadway capacity enhancements, and changes to development forms in the urban settings that offer alternative transportation choices and reduced transportation needs.

5. REGIONAL TRANSPORTATION MASTER PLAN

5.1 Capacity Optimization Strategy

Although an average 5% increase in overall roadway capacity in the Essex-Windsor region (Option 5A) was shown to result in only slight improvements to overall regional network performance by 2021, it remains important for the County and local municipalities to look to all possible ways of optimizing this capacity wherever possible, in association with other capacity enhancement measures (widenings, extensions). Roadway capacity optimization involves a number of the following techniques associated with in two types of initiatives; 1) Arterial Road Operations Management, and 2) Access Management.

5.1.1 ARTERIAL ROAD OPERATIONS MANAGEMENT

New Signalized Intersections - Signalization at short, irregular intervals based on development decisions are in conflict with the efficient operation of the arterial road network. This ultimately will be detrimental to the arterial and the adjacent developments. Typically, a distance of 215 metres between signalized intersections will allow sufficient recognition and reaction by the motorists to each device, but is not sufficient to provide good coordination.

The introduction of a new intersection will produce delays to traffic flow. When a traffic analysis is conducted for a new intersection, it should consider that the pattern of deceleration, decreasing headways, stopping, accelerating, adjusting to increased headways and repeating this pattern at the new intersection may produce unacceptable delays and poorer levels of service.

Therefore, in order for a new signalized intersection to be considered at a location less that 215 m from an existing signalized intersection, a traffic study should be submitted which demonstrates that the benefits of the installation clearly outweighs the disbenefits.

Signal Coordination - Coordination can enhance traffic signal operations by reducing vehicle stops and delay. The following techniques should be considered when establishing control areas for coordination between traffic control signals:

- Typically signalized intersections can be grouped by the type of surrounding land use such as a downtown, a suburban subdivision or a rural industrial area. For example, CBD type intersections usually require lower cycle lengths due to, for example to high pedestrian demand;

- Barriers such as freeways, rivers, railways, and parks often provide an easily identified natural break for establishing control area boundaries, since the road environment may disrupt traffic flow;

- As a rough guide, it is often difficult to maintain coordination at signal spacing 800 metres or more due to platoon dispersion;

- Common roadway and intersection geometrics can constrain feasible signal timings, limiting the ability to coordinate signals. For example, minimum cycle lengths can be limited based on required phasing and pedestrian minimum phase lengths. A common cycle length is a requirement for coordination;

- Signal coordination priority is provided typically in the direction of heaviest travel by time of day. Changes in traffic flow patterns can provide opportunities to establish control area boundaries. For example, a significant drop in through traffic volumes due to the presence of a major mid-block destination such as a retail centre may identify a logical control area boundary;

- Signal coordination strategies may vary depending on the level of congestion. Changes in volume or volume per lane can be used to separate control areas, For example, large turning movements to and from a major cross-street may influence the choice of intersections within a control area. In other words, the “downstream” or “upstream” intersections may not be on a linear path;

- Coordination may reduce stops at a particular intersection, but it may also increase overall intersection delay at a location not operating near its optimum cycle length (i.e. cycle length is too high or low);

- Ideally coordination on two crossing arterial networks can be accommodated (i.e. eastbound and southbound coordination). Cycle length requirements on one arterial roadway may differ from that on the crossing arterial. As a result, a decision is required to either operate the two arterial roadways at the higher cycle length for coordination, or separate the two arterial roadways into independent control areas. Occasionally the signalized intersection at the intersecting arterial roadways is heavily congested and may require a higher cycle length due to this congestion, and to accommodate additional phasing. As a result, it may prove beneficial to operate this intersection in isolation;

- At locations with limited site distance, rigorous coordination may be required to enhance safety. Coordination with adjacent signals may be sacrificed to provide the required level of coordination at the signals with limited sight distances, and hence the closely spaced signals will form an independent control area;

- Intersection approaches with limited storage space may require coordination strategies with adjacent traffic signals not required at adjoining traffic signals (i.e. simultaneous ambers to prevent queue spill back);

Signal Re-Timing - A new ITE study, *Traffic Signal Timing State of the Practice,* identifies some deficiencies in traffic signal timings procedures and practices. One finding was that nearly half of the jurisdictions re-time their signals at intervals of at least three years. The results of the study suggest that this target is reasonable.

Therefore, to support this guideline that the traffic signal timings be reviewed at least once every three years, intersection traffic counts should be conducted at all intersections at least once every three years. This will ensure up-to-date data is collected and signal timings adjusted accordingly to fit any intersection volume changes. Some methods to ensure this are:

- Availability of resources to conduct these signal timings. Staff and funding should be allocated for the data collection, and the analysis of the timings.

- Training and education of the staff responsible for updating these timings.

Pedestrian Crossing Operations - It is recognized that pedestrian safety is of the utmost importance in the operation of a signalized intersection. Most municipalities base this practice on OTM Book 12, Section B. In normal operations, pedestrians do not expect an immediate termination of a Walk indication that has just started. For this reason, a minimum Walk display time (t_{walk}) of 7.0 seconds is desirable at all traffic control signals. OTM Book 12 indicates that a minimum Walk duration of 5.0 seconds is the Acceptable Minimum. Typically, a minimum Walk duration of 10.0 seconds may be used. Additional pedestrian Walk time may be required depending on operational objectives and observations. Additional considerations that may indicate the need for additional timing would include:

- Presence of school-aged children, elderly pedestrians, and pedestrians with disabilities;
- Volume of pedestrians impacts the time to clear the curb at the start of the crossing; and
- Volume of pedestrians justifies additional pedestrian capacity.

It is important to have an accurate measurement of the pedestrian crossing distance. The pedestrian crossing distance is defined as the straight-line, curb-to-curb distance down the centre of the longest pedestrian crosswalk. This measurement must be completed in the field, for all pedestrian movements, whenever there have been changes to the intersection geometry. Rural intersections without curbs and gutters should be investigated to determine an appropriate crossing distance, which allows the pedestrian to clear the intersection and reach a safe pedestrian waiting area. For example vehicles making permissive right turns may drive on part of the shoulder, which effectively increases the intersection width and pedestrian crossing requirement.

Minimum Pedestrian walk speeds are commonly found to be between 1.0 m/s and 1.25 m/s. However, these speeds should be determined through site-specific observations, as these values may differ significantly from place-to-place. In particular, slower walk speeds (1.0 m/s) are generally found at intersections where there are high pedestrian volumes, significant numbers of seniors, and/or significant numbers of school children. The presence of a significant proportion of these users will identify the need to use a slower pedestrian walk speed in the calculation of pedestrian signal timing. In general, a walk speed of 1.25 m/s should be used.

If a pedestrian clearance interval has not been installed at the intersection, the following equation can be used to determine pedestrian Walk timing:

$t_{walk} = d_w / v_{ped}$, $t_{walk} \geq 7$ seconds

where:

t_{walk} = the pedestrian Walk time

d_w = the pedestrian crossing distance on longest crossing (m)

v_{ped} = the pedestrian crossing speed 1.25 m/s

The t_{walk} value is then rounded up to the next whole number

Pedestrian Walk values should be checked whenever there have been changes to the intersection geometry. Slower pedestrian crossing speeds may be used where appropriate.

Left Turn Lanes - Left Turn lanes are provided to accommodate heavy Left Turn movements without disruptions to through and right-turning vehicles. The provision of an exclusive left turn lane (or lanes) allows for the use of protected Left turn phasing and provides storage for queued Left Turn vehicles without disruption to other flows. The following suggestions are made concerning the provision of exclusive Left Turn lanes:

1. Where fully protected Left Turn phasing is to be provided, an exclusive left turn lane should be provided;

2. Where space permits use of a Left Turn lane, it should be considered when left turn volumes exceed 100 vph. Left Turn lanes may be provided for lower volumes as well on the basis of the judged need;.

3. Where Left Turn volumes exceed 300 vph, provision of a double Left Turn lane should be considered; and

4. The length of the storage bay should be sufficient to handle the turning traffic without reducing the safety or capacity of the approach.

Right Turn Lanes - At signalized intersections, the storage lane length should accommodate about 1.5 times the average number of vehicles to be stored per cycle for roadways with design speeds of 60 km/h or less, and about twice the average number of vehicles for design speeds greater than 60 km/h.

The storage length calculated above should be checked against capacity analysis to ensure an acceptable level of service. When the capacity of the intersection is influenced by the Right Turn volume, consideration should be given to providing a right turn lane based on capacity analysis.

The Transportation Association of Canada's (TAC) Geometric Design Guide for Canadian Roads (1999) recommends:

- Right Turn lane without separate signal indication when the volume of right turning traffic is 10% to 20% of the total approaching volume;

- Right Turn lane with separate indication when right turn traffic is greater than 20% of the total approaching volume.

Unsignalized Intersection Stop Control – Most Canadian municipalities employ a formal policy for installation of stop signs, and the common practice is to adhere to the warrants for stop control (signs and signals) outlined in the Canadian Manual of Uniform Traffic Control Devises (MUTCD). Based on a review of existing municipal practices, and current legislation, manuals and research, the following primary considerations should be taken into account when considering any addition or removal of stop controls in the Essex-Windsor region:

- Stop Control Warrants – In many rural areas, there are numerous unsignalized intersections that operate under the statutory right-of-way rules of the road. These locations are typically at intersections of two low volume rural roadways. On higher volume roadways or those located in urban or built-up areas, the motorist expects some form of traffic control to be present at an intersection. i.e., a yield sign, stop sign, all-way stop or traffic signal. As such, the majority of municipalities do not have policies on implementing two-way stop control, as it is a "given" since it is considered the lowest form of traffic control to be provided at an intersection, regardless of volume or potential conflicts. Conversely, all-way stop control warrants, policies and criteria are common in many municipal jurisdictions.

- Compliance - Driving, cycling and walking tasks require constant reassessment of the travelling environment, and response to potential conflicts and conditions. The cause of many collisions at unsignalized intersections coded by the police is "disobeyed traffic control device" or "failed to yield". Motorist non-compliance and disregard for traffic control devices, such as stop controls and traffic signals, are in some cases deliberate, and in others the motorist was ill prepared to perceive and react to the traffic control.

- Enforcement - Unwarranted stop control at an intersection, especially, all-way stop control can result in low motorist compliance. The motorist must feel that there is a reasonable probability that there will be conflicting traffic, cyclists or pedestrians at the stop control location. Given the sheer size of the County's road network, police services cannot effectively compel motorists to stop at an unwarranted location. Properly applied and warranted traffic control will increase the probability of compliance.

- Uniform Application of Stop Control - In urban areas or busy roadside environments, a motorist's attention may be overloaded and they may not be able to perceive and react to the traffic control in a timely manner. On high speed rural roadways, the driving task may be complicated by a motorist' inattention due to infrequent conflict points, low information processing needs and reduced perception-reaction times. A road user's reaction to "unexpected events" is generally slower, providing less time to recognize the eminent decision and to properly react to it. Uniform application of traffic control devices simplify road user tasks and aids in timely recognition and understanding of situations.

  Accordingly, standards and guidelines have been developed to provide uniform implementation of traffic control devices. The Manual of Uniform Traffic Control Devices for Canada (Canadian MUTCD) provides standards and guidelines for the design and use of traffic control devices, including stop controls. The use of a "standard" traffic control device or sign does not by itself constitute uniformity or a typical installation. In fact, a standard device used in an inappropriate application or location may cause confusion among the various road users, contribute to poor decisions and increase conflict potential. Warrants and guidelines have been developed by jurisdictions and agencies to guide the consistent application and installation of stop controls.

- Safety and Security – In many cases, stop signs and all-way stop control are viewed as the "cure all" for many of the operational and safety concerns on our road networks. In many cases, the original intent of the request was to "improve safety". However, if incorrect measures are applied, the net safety of the location may be reduced, i.e., one road user assuming the other user will yield the right-of-way.

- Two-Way Stop Control - As previously noted, municipal-specific warrants and criteria for two-way stop control are not prevalent. The Canadian and US Manual of Uniform Traffic Control Devices (Canadian MUTCD and US MUTCD) and Book 5 of the Ontario Traffic Manual provide guidance on the proper application and installation of two-way stop control. Provided below is a general summary of the instances where stop control may be warranted, based on these guiding documents:

  1. At intersections where use of the normal right-of-way rule would be unduly hazardous;
  2. Minor roads entering a through road;
  3. At an unsignalized intersection in a signalized area; and
  4. On roads with less volume of traffic at an intersection where all road are of the same functional classification.

5. In the Canadian MUTCD where three or more reportable right-angle collisions per year have occurred, in OTM Book 5 where three or more right angle or turning movement collisions per year have occurred over a period of three years.

- All-Way Stop Control – The primary purpose of an All Way Stop is to assign the right-of-way at an intersection where volumes are high enough that a two way stop control is not sufficient. The use of all-way stop control to address vehicle speeds, traffic infiltration and pedestrian safety has received considerable attention in Ontario, Canada and many other North American jurisdictions. Its ease of implementation (via a municipal by-law and installation of signs), makes all-way stop control a resident and elected-official remedial solution to numerous traffic issues.

  The warrants for All-Way Stops developed by Canadian, US and other local authorities have attempted to define situations where the net benefit of all-way stop control to all road users can be achieved. Given the extensive attention that all-way stop control has received, there is a wide-range of warranting factors and thresholds values included in jurisdictional guidelines. Exhibit 5.1 provides a summary of major warranting factors:

Exhibit 5.1 – All-Way Stop Warrant Criteria

Criteria	Warranting Value/Measure	Jurisdiction Examples
Minimum vehicular volumes on all approaches	Function of roadway type and hours of count. Typically 500 vehicles per hour for the peak 7 to 8 hours of the day (arterials) and 180 to 350 vehicles per hour for local roadways	Most jurisdictions
Minimum vehicular volumes on minor street	Function of roadway type and hours of count. Typically 80 to 200 vehicles per hour for the peak 7 to 8 hours of the day (arterials) and 50 to 80 vehicles per hour for local roadways	Most jurisdictions
Volume split between major and minor roads	70/30 to 65/35 depending on roadway type and configuration	OTM Book 5, Canada MUTCD, US MUTCD,
Collision frequency	3 to 5 collisions correctable by all-way stop control per 12 month period	OTM Book 5, Canada MUTCD, US MUTCD,
Sight restrictions	Various	Markham, Nepean, Ottawa, Ajax, Winnipeg
Maximum number of lanes on approach	Maximum of 2 lanes	OTM Book 5, US MUTCD, Canada
Minimum traffic control spacing	250 to 300 metres on arterial roads	Most jurisdictions

Other criteria include cases where all-way stop control should not be used such as:

1. Where off-set intersection, poor geometry or more than four-legs exist;
2. Where progressive signal timing systems existing;
3. Solely as a speed control device;
4. Solely to protect pedestrians, especially school aged children;
5. Solely to reduce traffic infiltration potential; and
6. Higher speed roadways.

It is recommended that the Essex-Windsor region municipalities maintain the existing Canadian MUTCD warrants for installation of stop controls. Both the Canadian MUTCD and OTM Book warrants provide a sound basis for determining appropriate traffic control at unsignalized

locations. Although there are some provisions for lower volume roadways in the respective guidelines, there may be cases where the warranting procedures may be too restrictive for some of the intersections along the County's rural road network.

5.1.2 ACCESS MANAGEMENT

Unsignalized Intersection Spacing - Unsignalized intersections, whether at a public street or a private driveway, are much more common that signalized intersections. The typical minimum spacing between adjacent intersections along a **collector** road is 60 metres. The minimum spacing between four-legged intersections along **local** roads is normally 60 metres. For three-legged adjacent intersections, a minimum spacing of 40 metres is acceptable.

Mutual Driveways - Direct access to an arterial road (Class I and II Arterial in Windsor, plus major and Minor Arterials and Rural Regional Roads as shown in the Exhibit 2.6 Recommended Regional Roadway Classification System) must be minimized, and therefore, all proposed driveways must be justified. The developer or landowner must first pursue alternate access arrangements as follows:

- Obtain access from the collector or local road network;
- Negotiate mutually-shared access arrangement with adjacent property owners; or
- Develop private "commercial service roads" on-site, with adjacent property owners, to manage traffic circulation needs on-site.

In many rural municipalities, mutual driveways are encouraged or required to minimize the number of driveways onto rural arterial roads. Mutually-shared driveway arrangements reduce the number of direct access points to the arterial road, and minimize the opportunity for turning conflicts to occur. This type of access can also be beneficial in providing flexibility to meet local municipal objectives relating to such things as parking, loading facilities and landscaping

Some municipalities also register a 0.3 metres (1foot) easement along the edge of these road allowances to prevent the addition of a driveway in a case where mutual driveway users disagree on its use, with each wanting their own access. Similarly, easements can be used in the County of Essex to prevent unauthorized additions of driveways onto arterial roads.

Driveway Spacing - The spacing of driveways is related to the number and location of existing adjacent driveways and the number of new unsignalized intersections (driveways) proposed to serve a property. Two key factors influencing minimum spacing requirements are; 1) traffic activity to/from the arterial road, and 2) the specific design elements of the proposed driveway. Spacing criteria seek to achieve the following objectives:

- Clearly identify which property the driveway is serving;
- Minimize the conflict areas between vehicles that enter/exit the proposed driveway, existing driveways, and the arterial road;
- Maintain usable boulevards between driveways for the placement of utilities, traffic control devices and road amenities.

Strict applications of traffic engineering criteria may place desirable spacing requirements at 150 metres. However, this type of spacing is mostly unacceptable in several urban and suburban environments. Typically, a spacing of 30 – 60 metres is used. The minimum spacing between two driveways should be the sum of the minimum curb radii (R), and a 3-metres tangent (T). The radii are determined by the type of land use

Subdivision Road Network - A Plan of Subdivision usually entails the redevelopment of a substantial parcel of land such that a local road network is required to service the lands. The development of a local road network is encouraged so that traffic activities are organized at specific access points. Direct access to a new parcel of land must be obtained from a local road network that connects to the arterial road. Direct access to an arterial road must be minimized, and therefore, all proposed driveways must be justified. t is important that volumes be very low and the speeds be low in local residential streets. These can be limited by assigning a maximum length for cul-de-sacs and local streets as follows:

- Suggested maximum for cul-de-sacs are 225 metres and 25 dwelling units; and
- Suggested maximums for other local streets are 395 metres and 50 to 75 dwellings.

Access to Highways – The at-grade intersection of a County Road or municipal road with Highway 3 and 77 in Essex County often has the potential to attract transportation-related development such as service stations, transportation support facilities and retailing. These at-grade intersections also serve the highway transportation needs of the surrounding population. Conversely, in order to maintain a high level of service on its highways, MTO is concerned that development at County Road and municipal road at-grade intersections may result in traffic volumes that warrant more signalization, thereby diminishing the ability of the highway to efficiently carry high volumes of traffic. This Highway 3 operation is key to the future growth of Leamington, Kingsville and Town of Essex.

MTO has policies and procedures in place to help protect highway intersections from types of access that would detract from the safe and efficient operation of the intersection. In most cases, it is preferable that access at an intersection be provided to the County Road, not the highway, except in cases where the distance to the County Road is excessive or there is intervening property that does not permit development of a service road. This Master Plan supports the use of development restrictions at at-grade highway intersections in rural areas to prevent growth in traffic that would result in more signals. However, this approach would not be feasible in the designated settlement areas of the County where Official Plan policies encourage development at County Road/highway intersections.

This Master Plan supports the principle that when signals are warranted on a provincial highway, they should only be located only at intersections with Regional Roads, and placement of highway signals at low volume municipal roads should be discouraged. Signals and highway access can also be controlled through the use of access management guidelines presented in this Master Plan, and associated reference sources (Ontario Highway Traffic Act, Manual of Uniform Traffic Control Devises, ITE Traffic Engineering Handbook, TAC Geometric Design Guide for Canadian Roads).

5.2 Capacity Enhancement Strategy

Section 2.4.4 and Exhibit 2.9 in this report have determined that based on the roadway classification and capacity standards set for the Essex-Windsor region, compared to actual traffic volumes recorded, a number of key arterial links in the regional network are considered to be capacity deficient in 2001, operating at LOS F and requiring short term priority capacity

enhancement. Furthermore, Section 3.3.1 and Exhibit 3.6 show the impact of traffic growth under the baseline Do-Nothing scenario by 2021, measured as additional roadway sections with deficient LOS. While capacity optimization measures may address certain localized problems, for example at key signalized intersections, and the impacts of decreased auto use through transit service expansion and related TDM efforts have the potential to reduce traffic growth over the next 20 years, an number of routes will remain congested and require further capacity enhancement through widenings and extensions. While this Plan has endeavoured to minimize the extent and number of capacity projects, those recommended in Exhibit 5.2 and shown on Exhibit 5.3 are expected to be required by 2021 based on forecasted regional growth, existing roadway network capacity and establish travel behaviour.

In response, the Capacity Enhancement Strategy is intended to accommodate regional growth while sustaining the current level of transportation service to which regional residents are accustomed (not to exceed LOS E in the City and D in the County). While this is achievable in the Rural and Urban in Rural Setting areas of the region, as shown by the LOS forecasts evaluated in Section 4, the reality is that some chronic capacity deficiencies in the City are expected to remain, and cannot be solved strictly through capacity enhancements. As shown in Enhancement Option 4A (Exhibit 4.3), even extensive enhancement projects will not solve forecasted LOS F on sections of major routes such as Huron Church Road, Wyandotte Street, Tecumseh Road, Cabana Road and CR 22. In such cases, further LOS improvements, beyond that available from this Capacity Enhancement Strategy, can only be achieved through two extremely important added initiatives:

Windsor Gateway Projects

- Implementation of Windsor Gateway improvements through the federal/provincial *Let's Get Windsor-Essex Moving* strategy. These projects will focus on the regional routes most affected by growth in cross-border rail and vehicle traffic, including Huron Church Road, Walker Road, Howard Avenue and the Tunnel Plaza. While there is some minor project overlaps between this strategy and this Capacity Enhancement Strategy, most of the latter projects have been identified independent of the Windsor Gateway improvements; and

Land Use Planning and TDM

- In order to further reduce LOS deficiencies in the regional network by 2021 and beyond, targets will have to be met in the reduction of trip-making and trip length brought about through regional growth management, more mixed use development forms and higher intensification of development and redevelopment projects in appropriate and feasible locations. As previously shown by Option 7A, these and other land use and TDM initiatives, when combined with basic capacity enhancements, have the greatest potential to minimize roadway network deficiencies in the region.

NOTE: Owing to the difficulty in implementing land use and TDM changes, and the amount of time require to see results from such initiatives, this Master Plan must still recommend that the City, County and other involved local municipalities plan for the recommended capacity enhancement projects over the short, medium and long term as presented in Exhibit 5.2. As this Master Plan undergoes regular reviews and updates, decisions can be made on modifying the project list as required by changing demands and needs

The recommended enhancement projects in Exhibits 5.3 and 5.5 are intended to address three types of transportation needs in the region:

- Existing Capacity Deficiencies with Projects that Have Council and/or Environmental Assessment Approval (Approved Projects);
- Further Short-to-Medium Term Capacity Deficiencies with Localized Planned Projects (Planned Projects); and

- Medium-to Long Term (2021) Capacity Deficiencies with Additional Enhancement Projects (Other Projects)

Since responsible for addressing capacity and operational needs on provincial highways rests with the Ministry of Transportation, their approved, planned and possible projects are not include in the County/City strategy. Also, subsequent project-specific Environmental Assessments for each of the recommended capacity enhancement projects and associated cost estimates in Exhibits 5.3 and 5.5 may result in modifications to the recommended projects and costs.

Capital Cost Estimation - Capital cost estimates are based on a very conceptual application of the following unit costs to the estimated length of recommended projects, for master planning purposes only to give a range-of-magnitude indication of possible required investment associated with the projects. Each cost will have to be developed in greater detail based on preliminary designs as part of the Environmental Assessment process:

Exhibit 5.2 – Conceptual Per Unit Cost Factors

Existing X-Section	Proposed X-Section	Unit	Unit Cost
Widening:			
2-lane rural arterial	4-lane rural arterial	M	$1,950
	4-lane urban arterial	M	$2,050
2-lane urban arterial	4-lane urban arterial	M	$2,150
4-lane urban arterial	6-lane urban arterial	M	$1,750
New Construction:			
2-lane rural arterial		M	$1,900
4-lane urban arterial		M	$2,650

Typical urban cross-section includes concrete sidewalks and asphalt bikepaths on both sides, street lighting, traffic signals, concrete curb and gutter, ROW drainage only, asphalt and granulars, engineering (13%) and contingency (10%)

Exhibit 5.3 – Capacity Enhancement Strategy Projects, Costs & Schedules

	Capital Cost Estimate $ M		
Project Description	**0-5 Yrs**	**5-10 Yrs**	**10-20 Yrs**
Option 2A: Approved Roadway Improvements: Projects with EA approval and/or approved by the proponent at the time of evaluation and expected to be completed by 2021			
City of Windsor			
2.1 Widen Lauzon Road to 4 through lanes from Edgar to Wyandotte	$1.6 M		
2.2 Widen Tecumseh Road to 6 through lanes from Jefferson Blvd. to Banwell Road/CR 43	$7.2 M		
2.3 Extend Wyandotte Street east of Little River into Riverside East community (cost not including new free-span bridge)	$4.6 M		
2.4 Widen Walker Road to 4 lanes plus turn lanes from Tecumseh Road to south City limit (cost not including rail grade separation)	$14.0 M		
2.5 Widen Howard Avenue to 4 lanes from Highway 3 to Dougall Parkway, 3 lanes Cabana Road and then 4 lanes to Provincial Road.	$5.4 M		
Sub-Total City of Windsor	**$32.8 M**		

Other Municipality			
4.4 Extend 4 lane arterial bypass from CR 34 to CR 20 (Leamington)		$8.5 M	
Option 3A: Planned Roadway Improvements: Projects in various stages of planning during the evaluation process and expected to be completed by 2021			
City of Windsor			
3.1 Widen Provincial/Division Road to 4 through lanes from Howard Avenue to south City limit	$9.2 M		
3.2 Widen Cabana/Division Road to 4 through lanes from Huron Church Road to east City limit		$12.4 M	
3.4 Widen Banwell Road from Tecumseh Road to City limit including at-grade intersection improvements	$6.3 M		
Sub-Total City of Windsor	**$15.5 M**	**$12.4 M**	
County of Essex			
3.3 Realign CR 25 near River Ridge		Developer	
3.4 Widen CR 43 to 4 through lanes from City boundary to CR 42	$5.8 M		
3.5 Widen CR 19 to 4 through lanes from CPR tracks to Jamesyl Drive	$2.9 M		
3.6.a Improve CR 19 (Manning Rd) from CNR tracks to Sylvestre Drive	$9.9 M		
3.6.b Widen CR 22 to 6 though lanes from CR 43 to CR 19	$3.3 M		
3.6.c Widen CR 22 to 4 through lanes from CR 19 to CR 25		$18.5 M	
3.6.d Widen CR 22 to 4 through lanes from CR 25 to West River Road			$17.9 M
3.6.e Bridge Reconstructions		$2.8 M	$2.8 M
3.7 Widen CR 3/Malden Road to 4 though lanes from Todd Lane to south limit of sanitary sewer area	$8.6		
3.8 Widen CR 7/Huron Church Line to 4 through lanes from Highway 3 to Sandwich West Parkway		$4.0M	
Sub-Total Essex County	**$30.5 M**	**$25.3 M**	**$20.7 M**
Other Municipality			
3.9 Extend 4 lane Laurier Drive from CR 3/Malden Road to CR 9/Howard Avenue (costs provided by Town of LaSalle)	$2.9 M	$11.7 M	
Other Recommended Projects: Additional projects recommended from this Regional Master Plan			
City of Windsor			
4.1.a Widen Lauzon Parkway to 4 lane arterial from EC Row Expressway to Division Road/CR 42		$4.1 M	
4.1.b Extend new 4 lane arterial Lauzon Parkway from Division Road/CR 42 to Highway 401 (including $ 9 M interchange)		$17.6 M	
4.2 Widen EC Row Expressway to 6 lanes from Huron Church Road to Banwell Road/CR 43			$31.0 M
Sub-Total City of Windsor		**$21.7 M**	**$31.0 M**
County of Essex			
4.1 Extend Lauzon Parkway as 4 lane arterial from Hwy 401 to Hwy 3		$6.6 M	
4.3 Widen CR 19 to 4 through lanes from the CPR south to Highway 3		$20.5 M	
4.5 Widen CR 42 to 4 through lanes from east City limit to CR 25			$29.0 M
Sub-Total County of Essex		**$27.1**	**$29.0 M**
TOTAL ESTIMATED CAPITAL COSTS	**$81.7 M**	**$106.7 M**	**$80.7 M**

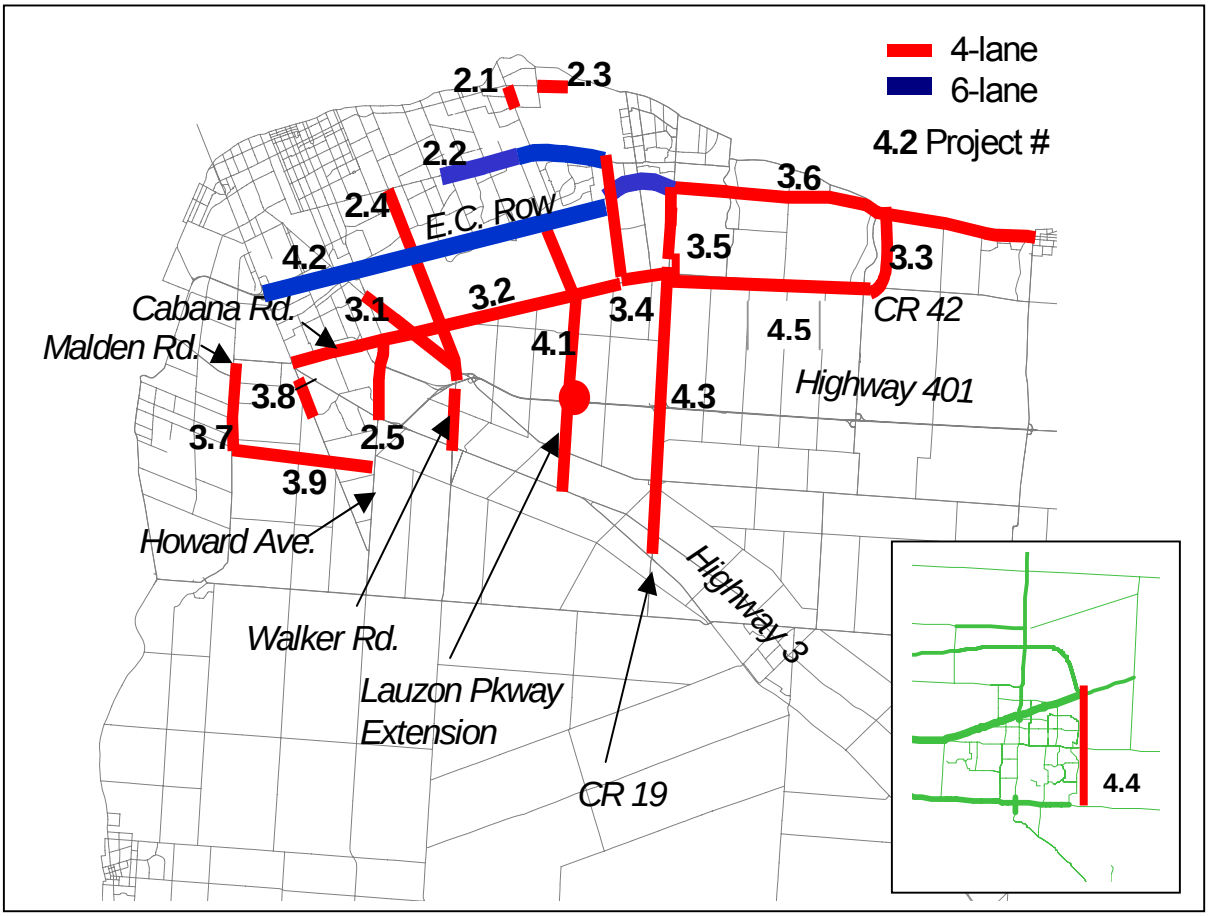
These estimated capital costs for long term improves to the regional road network require a total expenditure in the order of $200 M over the next 20 years, or an average of $10 M per year is allocated to the involved municipalities as follows:

Exhibit 5.4 – Estimated Capital Cost by Involved Municipality

Municipality	0-5 Years	5-10 Years	10-20 Years	TOTAL
County of Essex	$30.5 M	$52.4 M	$49.7 M	$132.6 M
City of Windsor	$48.3 M	$34.1 M	$31.0 M	$113.4 M
Other Municipality	$2.9 M	$20.2 M	-	$23.1 M
TOTAL	**$81.7 M**	**$106.7 M**	**$80.7 M**	**$271 M**

It is important to remember that these are very basic capital cost estimates for strategic roadway improvements only, and not include the capital or operation costs for transit service extension (i.e. one new transit bus = $500,000), cycling and walking route extensions and implementation of an effective regional TDM program.

Exhibit 5.5 – Recommended Regional Roadway Capacity Enhancement Projects



5.2.1 SOUTH SHORE LINKAGES

The regional roadway capacity enhancement projects recommended in the Essex-Windsor region over the next 20 years are focused on existing and forecasted LOS deficiencies identified primarily in the City of Windsor and the fringe areas on LaSalle, Tecumseh and Lakeshore. However, additional roadway and associated planning consideration must also be given to other parts of the region, including the "South Shore" municipalities of Amherstburg, Essex, Kingsville and Leamington.

As with all municipalities in the Essex-Windsor region, the South Shore communities contribute traffic to the regional road system, and therefore contribute to the existing and forecasted system deficiencies. As a result, the South Shore communities will also benefit from the regional road capacity enhancements recommended in this Master Plan. In addition, these communities will continue to require adequate LOS on their regional roads to serve resident commuting patterns, economic development opportunities and tourism accessibility. For example, implementation of the capacity optimization strategy offer in Section 5.1 of this Plan is important within the South Shore to ensure that the wine tours and access to Point Pelee National Park and Pelee Island are provide by a safe, efficient and convenient regional roadway system.

More specific examples of these South Shore needs that will require further monitoring and attention where and when required include:

Town of Amherstburg – LOS deficiencies forecast in 2021 for the Essex-Windsor region, as shown on Exhibit 3.6, include potentially deficient sections on County Roads 9, 11 and 18 linking Amherstburg with the Windsor area. If these deficiencies are not addressed, additional traffic pressures are expected by 2021 from the growth and operation of Amherstburg area traffic generators, such as the Smith Industrial Park and Amherst Quarries. If these deficiencies are not addressed, increases in traffic volumes and associated LOS problems can be expected on other routes linking Amherstburg to Windsor, most notably County Road 20.

While the preferred Strategic Option 7A has the potential to eliminate these deficiencies within the planning timeframe to 2021 through a combination of roadway capacity enhancements and changes to urban form, all the other Strategic Options include the County Road 9, 11 and 18 deficiencies. Therefore, Amherstburg is dependent on the success of urban form changes as documented in Section 4.1.4 of this Plan. It will be extremely important for the Town and County to continue monitoring traffic conditions on the critical South Shore roads in Amherstburg to confirm that the recommended combination of roadway enhancements and urban form changes do result in the desired LOS improvements. If either or both of these strategic improvements do not keep pace with traffic growth, and forecasted deficiencies on County Roads 9, 11 and 18 persist, then the recommended regular monitoring and updating of the Regional Transportation Master Plan will have to consider further regional roadway capacity enhancements, such as widening the County Road 9/ Howard Avenue corridor to improve the Amherstburg/Windsor linkage.

In conclusion, the Master Plan has identified several future deficiencies on roadways linking Amherstburg with the City of Windsor in a "Do Nothing" scenario based on projected growth in Amherstburg to the year 2021. The Preferred Transportation Strategy (Option 7A) recommended by the Plan demonstrates that opportunities exists through the application of "Smart Growth" land use principles and Transportation Demand Management to minimize or avoid the need for physical capacity improvements resulting from the planned growth for Amherstburg. If, through these initiatives, the deficiencies cannot be adequately addressed, the ongoing monitoring of the Master Plan will "trigger" the requirement to update the Plan to define physical capacity improvement projects that can address the deficiency.

Town of Essex – Other than the forecasted deficiency on County Road 11, the only other roadway capacity problem identified in the Town of Essex involves the Highway 3 alignment along the south edge of the Essex community. Exhibit 4.7 previously showed that the preferred capacity enhancement/urban form strategy, with high densities and more mixed use development, reduces associated trip lengths and LOS deficiencies on Highway 3 in 2021. However, Essex is dependent on the ability of this preferred strategy to address Highway 3 problems. If it does not, then the County and Town may have to address growing traffic volumes on roads that offer alternative routes for congested Highway 3 traffic. Similarly, if the planned Highway 3 capacity enhancements are not implemented as planned by MTO, then the entire role and function of Highway 3 through the County will have to be reconsidered in the form of a Transportation Plan Update, including investigation of alternative linkages via regional roads, as well as the potential designation of additional roads as part of the regional system.

Town of Kingsville – Questions about the future role and function of Highway 3 also apply through Kingsville, where capacity deficiencies on the Highway are expected to divert traffic to parallel routes such as County Road 34 and North Talbot Road. Note that County Road 34 is not included in the recommended Regional Road System (see Exhibit 5.7) as the system assumes completion of MTO's planned Highway 3 widening and improvements. As in the Town of Essex, the County and Kingsville would have to re-consider the entire regional road system should MTO not implement the planned Highway 3 enhancements.

The baseline 2021 LOS forecast also shows a poor LOS E condition on County Road 29 (Division Road) between the Kingsville community and Highway 3. This deficiency is eliminated in the preferred Option 7A, but is maintained in all of the other strategic options. This makes Kingsville dependent on the success of the preferred roadway enhancement/urban form strategy to maintain an acceptable LOS on its roadway network.

Municipality of Leamington – The Master Plan acknowledges that a major roadway network requirement in Leamington involves the provision of the East Side Arterial Road (ESAR), included as Project 4.4 on Exhibit 5.5, in part to address roadway deficiencies on County Road 31 (Albuna Township Road) and County Road 20 (Seacliffe Drive) west of the Leamington community. As with the other South Shore municipalities, Leamington is also dependent on implementation of MTO's planned Highway 3 enhancements extending southeast to County Road 34 near the community. Without this enhancement, consideration would have to be given to capacity enhancements on other roads in the Leamington urban area, most notably County Road 18 and 34 west of the community, and on County Roads 34 and 20 within the community that link with the planned ESAR.

In conclusion, although Project 4.4 (Leamington ESAR) is included as the only South Shore project in the recommended capacity enhancement strategy in this Master Plan, this does not diminish the importance of the South Shore area in the regional transportation system. It also does not diminish the need to minimize potential future deficiencies along the recommended Regional Road System within the South Shore area by implementing this Master Plan, and pursuing issues such as corridor management and Smart Growth that will be critical to the future sustainability of the South Shore.

Furthermore, each of the four South Shore municipalities are dependent on future improvements to Highway 3 capacity and operations as the primary inter-municipal corridor through this part of Essex County. As described in Section 5.6.2 of this Master Plan, regular monitoring and review of the Plan will be required to ensure that all municipalities within the Essex-Windsor region are benefiting from the transportation capacity optimization and enhancement recommendations, and the TDM strategy recommended in this Master Plan. Should these benefits not evolve as planned to 2021, then the regular Plan review process will have to consider strategic amendments to this Plan.

Such Plan amendments may be required because the conclusions and recommendations made in this Master Plan were based on the planned Highway 3 improvements proceeding. It is fully recognized that under a scenario where Highway 3 is not improved, and remains a two-lane highway, significant impacts will be experienced on many roads in the Region. The options to develop alternatives to deal with impacts resulting from this scenario are limited.

The potential impacts on the Region's road network resulting from deferral of improvements to Highway 3 by MTO are significant. Therefore, if MTO has not committed to undertake the planned improvements by 2010, or has indicated that they have abandoned plans for the improvements, the County of Essex will be required to investigate alternatives to address network deficiencies and related impacts including, but not limited to:

- development of new "greenfield corridors";
- re-development of existing transportation corridors; or
- a combination of the above

The Master Plan would require a major rework to recognize that the deficiencies noted on Highway 3 and other Regional Roads will not be addressed by the MTO project. The alternatives investigated for projects in lieu of Highway 3 expansion would be tested and impacts measured on the entire Regional Network.

This review would be comprehensive, as it would have far reaching impacts beyond the Highway 3 corridor and any new or improved corridor.

5.3 Transportation Demand Management Strategy

Section 4.1.3 and Strategic Options 6 and 7 introduced the potential role of Transportation Demand Management (TDM) in the Essex-Windsor region, including alternative growth management approaches, shifts to transit ridership and regional growth reallocation. TDM represents an alternative approach the region's transportation planning, either as a stand alone strategy, or in association with capacity optimization and enhancement measures. In fact, in order to address the study Terms of Reference, this Master Plan must be based on both a Capacity Enhancement Strategy and a Transportation Demand Management Strategy. The role of each strategy will be based largely on its potential effectiveness in addressing regional transportation objectives and needs, combined into this comprehensive transportation master plan. These two strategies are summarized as follows:

Capacity Enhancement Strategy – in Exhibit 5.3 where future transportation needs within the Essex-Windsor region planning area are addressed by structural enhancement and optimization of roadway capacity where required to increase the vehicle and people-moving capacity of the transportation system; and

Transportation Demand Management Strategy - where the extent of roadway network capacity enhancements may be altered or reduced through the implementation of achievable Transportation Demand Management (TDM) measures focusing in on trip-reduction, use of alternative modes and changes in land use relationships that generate trip-making:

Alternative Planning Strategy	Strategic Implementation Measures	
Capacity Enhancement:	Roadway Access Management Signalized Intersection Optimization Addition of Travel Lanes Extension of Roads	Build New Roads Add Bicycle Lanes Improve Roadway Geometry Traffic Diversion
Transportation Demand Management:	Economic Measures (parking pricing, user pay) Behavioural Measures (Transit Service, Telecommuting, Ride-Sharing, Peak Hour Shifts) Land Use Planning Measures (Intensification, Mixed Land Use)	

Research and experience shows that for many TDM initiatives to succeed in the County's goal to reduce the number of kilometres travelled per household by automobile, they require a combination of dedicated government support, private sector business support, and broader public support. This must be compared to the trend of most mid-sized municipalities of increased Single Occupant Vehicle usage and growing traffic congestion. TDM measures and programs have been developed and implemented to various degrees, and with varying degrees of success. Some of the most successful large-scale applications show encouraging results in reducing Single Occupant Vehicle usage through individualized "Social Marketing" campaigns. The following 10 important lessons learned from successful TDM programs are summarized as follows for consideration in Essex-Windsor:

1. **Social Marketing or Individualized Marketing** appears to represent the leading edge in terms of promoting a long-term change in the travel behaviour and habits of motorists. Rather than a "We know what is good for you" approach, the individualized marketing approach attempts to define the different motivating factors that influence key segments of the population. By customizing the promotional approach, the key messaging about TDM benefits and the packaging of viable TDM options for each segment of the population, jurisdictions using this program are realizing a promising level of success in generating public support and in modifying their travel patterns.

2. **Non-Transportation Benefits** have resulted from many TDM programs for various stakeholder groups, and this is an important point to consider in the development of TDM marketing campaigns. Some businesses have noted improved employee morale and productivity, which directly speaks to their bottom line as well as their environmental image.

3. **Quality of Life Benefits** of some TDM programs attract interest from the public such as more time at home with family, and flexible work schedules / hours. These have seen broader success in promoting change in the travel behaviour of individuals, compared with programs than appear to preach about reducing traffic congestion or improving air quality. While important benefits in their own right, these broader, global issues generally do not tend to entice the same level of public interest, support, or change than benefits targeted to individuals personal motivators.

4. **Financial Incentives and/or Disincentives** provided through TDM programs are important tools in promoting change, although it is important to ensure that adequate and competitive service and accessibility is provided for the alternative transportation choices to encourage real change. For example, it is of no use to offer discounted transit passes to a company that works on shift work, if the transit service is not available during shift change periods.

5. **Research and Homework** were common to almost all of the successful TDM case studies as part of the program development. From developing detailed employee travel surveys to gauging employee interest in alternative commuting choices and workplace or employee barriers that prohibit non auto commuting choices, to the collection of baseline data to measure change, each successful initiative sought to develop and understanding of the audience they were trying to reach.

6. **Promotion** is another key component of the most successful TDM programs. However, the promotional activities need to be varied in their approach (brochures, internet, financial incentives); actively, continuously, and consistently applied; and should target specific audiences with key messages that will appeal to the their motivations or concerns. Many jurisdictions have developed extensive websites to promote and market the benefits and information about TDM to the community at large. Features such as ride matching services, transit route maps and schedules, maps showing carpool lots, and bicycle / walking trail maps have grouped together on many TDM websites to offer a "one-stop" for alternative travel information. Some advance sites have also included customize trip planning web applications which show the user travel options between their specific origin and destination points. This feature was found to be an important personalized service that allows the user to overcome the barrier of not knowing what transportation options are available, what the cost of the services are, and how to access to services in the most efficient manner.

7. **Grass Root Support** of TDM is also a powerful motivator to encourage change. When individuals see their neighbours and friends actively involved in alternative travel modes, any social stigmas associated with transit use or carpooling can be eliminated. In many Essex-Windsor communities, there are numerous local stakeholders groups that could be partners and local champions to support and even lead certain TDM initiatives. Not only do these types of organizations offer a grass roots or "bottom up" approach to marketing TDM, they generally have extensive networks of members to facilitate getting the key messages out.

8. **Taking Time To Change Commuting Behaviour** is the most important lesson learned from many TDM programs in a free-choice environment. Success will not be achieved overnight, and it must be stressed that small successes are in fact large successes, in terms of invoking changes to Essex-Windsor travel attitudes and behaviours.

9. **Changing Travel Patterns and Attitudes are not just "City" Issues** and there are cases that show meaningful travel behaviour improvements can be made in small communities if the right initiatives are implemented to the right audiences, using the right messages and incentives. With that being said, it is also noted that actually achieving large-scale changes in behaviour are rare and the expectations for reductions in SOV usage as a result of TDM measures must accept that the process of change will be slow.

10. **Neighbourhood Sustainability and Air Quality** is more important at the macro urban structure level than the micro neighbourhood level in order to reduce air quality problems resulting from auto travel by neighbourhood residents. For example, Infill development has been proven to be more effective in moderating the growth of Green House Gas emissions than Greenfield development, even if the Greenfield development is "new urbanism" or "neo-traditional" rather than typical suburban design.[1]

[1] Greenhouse Gas Emissions from Urban Travel: Tool for Evaluating Neighbourhood Sustainability, IBI Group for CMHC and Natural Resources Canada, February 2000.

Like most mid-sized North American cities, Essex-Windsor must consider what role TDM should play in effectively and affordably meeting its 20 year transportation mobility and accessibility needs. Transportation planning principles established for this project support an expanded travel mode choices.

To service the local travel needs resulting from projected regional growth, making the non-driving options more attractive can be an important strategy in the new regional transportation plan. This will take more than the structural improvements of concrete, steel and rubber tires to bring about the challenging transportation future in Essex-Windsor described by the County Official Plan.

Barriers to TDM - To address these future transportation system needs in the context of Essex-Windsor, barriers faced by TDM must be recognized in the region relating to several key conditions:

- The Windsor area experiences one of the typical mid-sized regional transportation conditions that inhibits successful TDM, namely the absence of severe road congestion or other system-wide transportation problems except on a few critical routes associated with cross-border traffic conditions (i.e. Huron Church Road). In much larger metropolitan areas, commonly chronic traffic congestion forces the public to consider using alternative TDM measures.

- Limited local understanding of transit's available level of service, including, routes, schedules and fares, and lack of regional understanding since transit is not provided in outlying areas;

- Transit costs that exceed parking rates or are not competitive with free parking provided by employers and large retail centres (i.e. shopping malls, big box centres);

- Relocation of employment from the downtown to outlying lower-density employment areas such as the new big box areas;

- Supply of inexpensive off-street long term parking in the central business districts;

- Difficulty in finding carpool partners or maintaining consistent, dependable carpool partners;

- The sense of being "trapped" at work in the event of a home or personal emergency;

- Lack of personal confidence in cycling on busy roads;

- Lack of bicycle parking, showers and change facilities at workplaces;

- Limited public awareness of the health and economic benefits of walking and cycling;

- Cultural perceptions of driving as a higher status and more convenient activity than walking, cycling or riding transit;

- Home-work commuting patterns between new rural growth areas and the City of Windsor that is totally auto-dependent; and

- Ongoing development in outlying suburban areas of the City and designated rural growth areas, where transit service is minimal, densities are low and most travel beyond two kilometres is auto-dependent.

Common Elements of Successful TDM – Research into the subject of successful Transportation Demand Management programs suggests that successful TDM programs have a number of common elements that apply throughout the Essex-Windsor region:

- Workplace programs that improve commuter options for employees;
- School programs that encourage parents and students to walk, bike, take transit or carpool to school;
- Discounted transit passes sold at workplaces and major institutions (hospitals, universities, colleges) through payroll deduction or post-secondary student fees;
- Employer and internet-based ride-matching services that help carpoolers find compatible partners;
- Guaranteed ride home programs that help commuters get home if they work late, if they are stranded by their carpool, of if there is an emergency at home;
- Skills courses that train cyclists to ride with safety and confidence in traffic;
- Special events that encourage people to try new travel options, such as transit shuttle services at fairs and concerts;
- Campaigns that use positive messages and images to counter negative attitudes about walking, cycling and transit use;
- In-house programs to improve commuter options for municipal employees, demonstrating leadership by example;
- Economic measures including incentives like preferential tax treatment for employee transit benefits, or disincentives such as bridge tolls, parking levies or congestion pricing Examples of TDM measures;
- Inclusion of more employment opportunities within designated rural growth areas to make them more self-sufficient, and less dependent on out-commuting; and
- Application of site design principles and standards that promote sustainable transportation, such as more intense roadway patterns with higher street connectivity to serve transit and non-motorized modes of transportation (as exemplified by LaSalle's Bouffard and Howard Secondary Plan).

As noted in the study Terms of Reference, TDM in the context of the Essex-Windsor region must address three specific strategic objectives as follows:

1. *"Reduce the total number of kilometres traveled per household (by automobile) in the Essex-Windsor Region";*
2. *"There is a political commitment, through the preparation of this transportation policy and implementation strategy, to have this region develop in a coordinated manner that will be effective in minimizing traffic congestion, poor air quality and smog alert days while allowing the goals of improved public transit and less dependence on the automobile to be achieved"; and*
3. *"… respects our natural and human environment; reduces greenhouse gas emissions…"/.*

5.3.1 HOW TO REDUCE KILOMETRES TRAVELED PER HOUSEHOLD BY AUTOMOBILE

In consideration of the promotion of the health, well-being and quality of life of the residents of the Essex-Windsor region, one objective of the Transportation Master Plan is reduction in the total number of vehicle kilometers traveled per household. Achieving this goal requires an integrated approach that recognizes the combined effects of built form, activity and travel patterns, urban design and the need to promote sustainable transportation modes such as cycling, walking, and transit.

The Ministry of Transportation and Ministry of Municipal Affairs, in their *Transit-Supportive Land-Use Planning Guidelines* [2] list principles to achieve a reduction in vehicle-kilometers traveled, including:

- use of grid street networks instead of a discontinuous networks;
- street-oriented uses along arterial roads;
- a mix of higher density uses along arterial roads; and
- improved access between arterials and the interior of blocks. (1992, 5)

A CMHC Study on Greenhouse Gas emissions[3] found that the socio-economic variable with the strongest influence on vehicle-kilometers traveled (VKT) was the number of vehicles per household. Also, the number of jobs "within a 5-km radius of the neighborhood centroid" also contributes to a reduction in VKT. A study of neighborhood design variables confirmed the contribution of land-use planning to these reductions. Variables found to moderately reduce VKT when increased include housing density, mixing of housing types, rectilinear road layout, frequency of intersections, presence of local shopping opportunities, absence of wide arterial roads, and the presence of bike lanes.

These results suggest that the amount of vehicle-kilometres traveled per household is most affected by; 1) the family structure of households (i.e. both spouses working, working adult offspring at home), 2) the general financial capability of the household for auto ownership, 3) the home-work proximity and 4) neighbourhood design. The first two conditions involve personal choices, needs and capabilities that are beyond the capabilities of a transportation master plan to influence. The last two can be influenced by municipal policy and decision-making.

The evaluation of strategic transportation options for the Essex-Windsor region in Section 4 includes the impacts of three TDM scenarios on LOS deficiencies forecast at 2021, representing potential transportation demand changes achievable through:

- Option 7A - 25% reduction in average trip length through changes to urban form, including more mixed use development and density intensification, under the assumption that this in turn would create shorter travel distances; and
- Option 6 A and B - increase in transit mode share in LaSalle and Tecumseh from 0% today to 5% by 2021 with a 5 to 10% reduction in resulting auto travel demands.

[2] Transit-Supportive Land Use Planning Guidelines, Ministry of Transportation/Ministry of Municipal Affairs, by IBI Group, April 1992.
[3] Greenhouse Gas Emissions From Urban Travel: Tool for Evaluating Neighbourhood Sustainability, IBI Group for CHMC and Natural Resources Canada, February 2000.

In addition to these strategic options, and the associated implementation opportunities and constraints summarized above, a reduction in vehicle-kilometers traveled by households can be achieved through a number of other key choices as follows, each with implications for the Essex-Windsor Regional Transportation Master Plan (EWRTMP):

Growth Boundaries and Greenbelts - Growth boundaries and greenbelts, sometimes referred to as "hard planning edges", are intended to prevent urban/suburban development from extending outside of set limits. This planning approach encourages infill development and more intensive development forms within existing city limits, along existing city infrastructure and within "brownfield" redevelopment areas. Boundaries must be firm, with new areas beyond the limits opened for development only once desired densities have been reached in existing neighborhoods. Growth boundaries not only protect rural areas from urbanization, but they also actively promote a more compact urban form.

Locating residents within these boundaries places them closer to existing businesses and employment centers than if they are located in more peripheral developments, thereby reducing the distance that needs to be traveled to reach these destinations. The more compact urban form increases the chance that one might find desired services close-by or even within walking distance, and so reduces vehicle kilometers that must be traveled to meet basic needs.

The Ontario government has recognized the benefits of growth boundaries, and is currently studying their impact around the Greater Toronto Area in more detail as part of the Central Ontario Smart Growth initiative and the new Bill 27, the Province's Greenbelt Protection Act 2004 which will direct growth to municipalities outside of the GTA greenbelt, including Brantford, Cambridge, Guelph and Hamilton. Similarly, municipalities such as the City of London have established Official Plan policies that designate "urban services areas", beyond which no extension of urban services and related development will permitted within the timeframe of the Plan. Also, the Region of Waterloo recently approved a new Regional Growth Management Strategy based on hard limits to urban expansion, and intensification of growth within the existing urban area along a Central Transit Corridor planned for future enhanced transit service.

> **Implications for EWRTMP:** The County of Essex Official Plan already designates "Settlement Areas" where future growth and development will be directed in order to preserve agricultural and natural areas. This approach will also encourage more intensive development and redevelopment within these Settlement Areas to potentially shorten trip-making patterns and assist in reducing the average kilometres travelled in these Settlement Areas. Conversely, any future expansion of these Areas to accommodate further low-density, single use development opportunities will detract from the trip-reduction potential of the Settlement Areas.

Road Networks That Favour Direct Connections - Discontinuous, winding road networks are not only disorienting, but also increase distances to be traveled, as loops operate similar to detours. Subdivision designs with curvilinear street meant to make areas impermeable to through traffic usually result in more complicate access and egress. Non-vehicular mode users will feel these differences all the more acutely, as their speeds are typically lower and access through the subdivision more restricted. Grid and slightly altered grid street patterns (termed *Neo-Traditional or New Urbanism)* can be designed to keep automobile speeds low, while ensuring direct connections that reduce the overall distance to be traveled. Where curvilinear road patterns already exist, the introduction of mid-block passageways may be incorporated where feasible, to shorten travel distances and make non-motorized travel modes possible where their access would otherwise would be restricted.

Implications for EWRTMP: The regional scope of the EWRTMP study and its travel demand forecasting is too large to measure the specific area impacts and advantages derived from Neo-Traditional grid versus curvilinear subdivision design. However, the transportation-related benefits of the Neo-Traditional approach in supporting transit, cycling and walking within subdivisions is well-founded, with an excellent example in the EWRTMP area provided by the plans and policies of the Combined Development Plan for the Bouffard, Howard and Talbot Planning Districts in LaSalle.

Development of Mixed Use Nodes and Links - Concentration of higher activity uses increases the chances that several activities can be performed at the same destination. This reduces the number of trips necessary to accomplish several activities, and facilitates Transportation Demand Management options such as ridesharing. Furthermore, routes for non-motorized modes, including bike trails and pedestrian paths, can be designed to link these mixed use destination points, increasing their attractiveness over the personal vehicle.

Mixed use development can also contain a combination of uses that allows services and employment to locate closer to their clients and employees. A mix of uses at a neighborhood scale, or even at the scale of a building, allows complimentary urban functions to locate closer to each other.

While certain nuisance uses should not be located close to residential areas, convenience stores, offices for professionals such as medical doctors, day-care centers, or coffee shops can easily and strategically be integrated into the design of residential areas to increase their amenity. Furthermore, a variety in the type and size of spaces available may also allow different but complimentary uses to occupy adjacent locations. A printer, for example, located in a space adjoining office uses reduces the need to seek printing services at a greater distance. Similar reductions in trips can also arise from the appropriate location of specialty or food services, or the inclusion of a variety of housing types in all areas of the city.

Implications for EWRTMP: Travel demand forecasting conducted for the EWRTMP study can include factors that reflect altered trip-making resulting from assumed mixed use development patterns. However, in reality existing zoning regulations usually prevent, or at least discourage land use diversity, whether or not the neighbourhood would be willing to accept it. Furthermore, the locational policies and standards of many retail and service companies prohibit internal neighbourhood locations, preferring more visible and accessible locations along major routes or at major nodes on the edges of the community (i.e. fast food, coffee shops, convenience stores). Greater zoning diversity would be required to expand the range of land use opportunities within neighbourhoods, in part to reduce the overall number of vehicle kilometers traveled. But attempts to diversify neighbourhood land use often results in resident opposition to the associated impacts such as increased numbers of local trips on local residential streets.

Diversity in Places of Work and Residence - While the transportation advantages of mixed-use development are increasingly understood, they can also be encouraged as lifestyles features as well as land use features. Spaces themselves can be considered to have multiple complementary functions, allowing a reduction in travel between specialized places, especially home and work. Telecommuting, involving working from home all or part of the time, frees workers from the requirements of the daily commute. Not only does this allow for more flexible personal schedules, and therefore possible decreases in peak period roadway congestion, but it also reduces the absolute number of trips to work. Tele-work relies on the availability of high-tech communications devices such as high-speed internet, as well as employer support to “virtually” eliminate the distance between the workplace and home. These technologies are becoming increasingly affordable and reliable, and more available in rural areas.

Implications for EWRTMP: The EWRTMP plan encourages telecommuting as a key strategy in either reducing the absolute volume of home-work trips, or better spreading these trips out to shoulder periods beyond the peaks. While telecommuting is almost exclusively the responsibility of the employer, the local municipality can set an example to champion telecommuting where feasible and appropriate in its workplaces, with the understanding the telecommuting in local government is limited by the need to be available to serve the public.

Design Standards That Favour Active/Non-Motorized Modes - In both an urban and a rural setting, sustainable transportation can benefit from policies and designs that consider the needs of active/non-motorized modes. Mid-block connections, sidewalks, and appropriate lighting are examples of measures that will encourage people to walk or bike for shorter trips in an urban setting. Design standards can help increase natural surveillance along trails, paths and routes by reducing the incidence of blank walls. Paved shoulders on rural roads have been recognized as a way to accommodate cyclists comfortably with limited incremental capital cost.

Transportation infrastructure in settlement areas can also apply *Active and Safe Routes to School (ASRTS)* programs to enhance personal safety and encourage the use of active modes within the settlement. Smaller local services, meeting places and civic areas within the neighbourhood should be accessible without requiring an automobile. Urban design standards can guarantee the consideration of active modes, and greatly increase their attractiveness.

Implications for EWRTMP: Official Plan policies already encourage active/non-motorized modes of transportation in the EWRTMP region, but this should be augmented with further planning and urban design standards that enhance public safety so that these alternatives modes will be used in place of the relatively safety of the private automobile.

Carpooling and Ridesharing - The inclusion of HOV lanes, preferential parking for carpools, and coordinated ridesharing programs will motivate persons with similar travel paths to share vehicles, reducing the number of single-occupant vehicles (SOV) and the duplication in vehicle kilometers traveled by SOVs. A prime candidate for carpooling in the Essex-Windsor region is along Highway 3 to reduce the volume of commuting SOVs. To become successful, examples of effective ridesharing programs show that they must also become “institutionalized” in the form of support programs that arrange ride-sharing on a continuous basis. One of the most common reasons cited for not using ride-sharing is the concern people have of being stranded from their home or loved ones in the case of an emergency, or missing the shared ride. This problem can be addressed by organizing ride-sharing within the workplace or district.

Implications for EWRTMP: Once again, transportation policies usually have little affect on the use and effectiveness of ride-sharing programs. Their success is measured more by commitments and support services provided at the employer and community level. However, planning and urban design guidelines can be provided that encourage ride sharing for example through provision of preferential parking locations and costs. Similarly, the EWRTMP civic governments should provide positive example of ridesharing support in their own workplaces.

5.3.2 HOW TO CONTRIBUTE TO REDUCED GREENHOUSE GAS EMISSIONS

In many communities, there are growing concerns over climate change and the impact of greenhouse gas (GHG) emissions on the acceleration of the “greenhouse effect”. Transportation generates about a third of Canada’s GHG emissions, most of which are in the form of CO_2. Fuel consumption by vehicles carrying goods and people, energy sources used to construct roads and to build vehicles all contribute to levels of CO_2, the most common greenhouse gas.

GHG is a direct product of fuel consumption, even when processes are at their cleanest. Catalytic converters may reduce the emission of a number of noxious gases, but do not generally affect CO_2 production, making the reduction of fossil fuel consumed the only true means of curbing greenhouse gas emissions. These reductions in fuel consumption can be encouraged from a number of choices:

Reduce Vehicle Kilometers Traveled (VKT) - CMHC suggests VKT is a key determinant in assessing neighborhood sustainability and GHG production (CMHC 'Greenhouse Gas Emissions from Urban Travel: Tool for Evaluating Neighbourhood Sustainability', 2000).

Note: Most of the comments in this section on the potential of various choices to reduce GHG emissions are taken from the CMHC report unless otherwise noted.

Issues associated with land use, travel choice, pricing, and trip reduction through means such as telecommuting are previously discussed in Section 5. It should also be stressed that from a macro-level transportation planning perspective, the more efficient a transportation system operates in terms of travel time, distance and delay, the less VKT and related GHG emissions are generated. For example, an automobile operating in congested LOS E conditions at about 30 km/h on an expressway emits about three times the air pollution as a similar vehicle traveling at 90-100 km/h.[4]

Implications for EWRTMP: Air quality emissions should be used as one of the evaluation criteria in EWRTMP to compare the effectiveness and impacts of the various capacity enhancement and TDM alternatives. The regional travel forecasting model developed for EWRTMP can predict the kilograms of CO emitted in the network under these alternative scenarios based on the average travel speed in the network. The higher the average speed, the lower the emissions.

The *Smog Alert Action Plan* prepared for the Windsor area by the Great Lakes Institute for Environmental Research also includes an action recommendation to *"develop and implement a regional transportation plan with the view to improving air quality".* The EWRTMP plan responds to this recommendation.

Fuel and Parking Pricing - While higher fuel prices are expected to discourage some unwarranted travel, the proximity of the EWRTMP area to Detroit may encourage residents to travel outside of the Windsor-Essex Region to purchase gas at a lower rate, defeating the purpose of any price increase. Raising parking prices, adopting parking policies that discourage long-term commuter parking and limiting the supply of off-street parking in areas served by transit, most notably in downtown areas, are expected to encourage people to use transit or active modes in order to avoid high automobile parking prices.

According to the Victoria Transport Policy Institute: "Parking Management and Parking Pricing strategies are an effective way to reduce automobile travel, and tend to be particularly effective in urban areas where pollution problems are greatest. Charging motorists directly for parking tends to reduce automobile trips by 10-30% of affected trips. Parking management and pricing supports use of alternative modes, improves walkability, and encourages more efficient land use".[5]

[4] Canadian Auto Association, 2004
[5] VTPI, 2003

Implications for EWRTMP: The EWRTMP municipalities have no control or influence over the price of fuel, although they are expected to benefit from the new gas tax provisions. However, they can control the price of parking, and if desired, can implement parking rate structures that encourage short term parking and discourage long term "storage" parking in selected areas of the community, such as the downtown areas. This could be part of a parking management program in each municipality that would assess existing policies and standards relating to parking requirements, design, cash-in-lieu of parking, fare structures and alternative funding sources (i.e. taxes, levies, infractions rates). Other local parking-related initiatives that municipalities can consider include charging a parking stall tax on private development (although this would require an enabling provision be made in provincial legislation), developing TDM-friendly parking lots for example with preferential dedicated zones for ridesharing, and changing zoning bylaws to require maximum (not minimum) parking provisions to help control the supply of off-street parking.

Fuel Efficient / Alternative Fuel Vehicles. - Operating vehicles that use lower levels of fuel consumption, and alternative fuels such as power cells and hybrid vehicles, are expected to reduce the amount of fuel used for a given trip. Promoting the use of these alternative fuel vehicles for municipal fleets can help reduce the impacts of motorized travel, but encouraging the purchase of fuel-efficient vehicles is a delicate matter. Fuel-efficient vehicles are still the lesser of two evils, as auto-ownership increases VKT, and in general should be encouraged in association with non-motorized travel. Programs must therefore focus on the exchange of one vehicle for another.

Proper vehicle maintenance and standards also create a minimal but non-negligible increase in vehicle efficiency, particularly for older and less efficient vehicles. This maintenance should not be limited to the motor, as other details such as proper inflation of tires also impact vehicle efficiency.

An increasing number of "emissions free" vehicles are being developed and marketed around the world, including vehicles powered by hydrogen fuel cells. While emission-free vehicles offer interesting opportunities, their price is still prohibitive for the marketplace, and therefore far from a universal solution for the foreseeable future. When full life cycle costs are considered, the environmental benefit of these vehicles is not currently significant enough to alter market-based transportation decisions.

Also, alternative fuel vehicles must still be produced, and the power sources on which they operate must also be charged. Plants where electricity and hydrogen fuel cells are produced seldom use renewable resources. This means that GHG emissions are just displaced to another location rather than eliminated. The result also carries ethical issues as this displacement creates cleaner air in wealthier areas at the cost of air quality in disadvantaged areas where these new "emission-free" technologies are too costly to be used.

On the other hand, electricity can be produced using non-GHG emitting processes, such as wind and solar energy (i.e. Calgary's LRT system is powered by a wind farm). Use of private vehicles reliant upon electrical power (or batteries) rather than fossil fuels offers the future possibility of a logistically simpler conversion to cleaner sources of energy, as privately owned individual vehicles will not have to be replaced.

Implications for EWRTMP: The subject of alternative fuels cannot be clearly influenced or administered at the municipal government level. The EWRTMP plan supports the role of fuel efficiency and alternative fuels in the regional transportation system, in some cases by setting good examples by using such vehicles, but the implications on EWRTMP will be largely dictated by the public marketplace, private sector and provincial regulation on vehicle maintenance.

Non-Motorized Modes - Ultimately, the creation of communities and lifestyles that encourage non-motorized, active modes of transportation are expected to lead to the greatest reduction in GHG production. Active modes produce an infinitesimal quantity of GHG in comparison to motorized transportation, and carry added health benefits. These modes can be encouraged through measures such as appropriate design of buildings and landscapes, inclusion of facilities such as showers and secure storage spaces for equipment, and the encouragement of inter-modal transfer from regional systems to walking and cycling friendly areas.

> **Implications for EWRTMP:** The regional transportation master plan supports alternative modes of travel based on all associated plans and policy statements on this subject from the local Official Plans, and by incorporating existing plans such as the ERCA Greenway Plan, the Windsor Bicycle Use Master Plan and the LaSalle Greenway System Plan. EWRTMP also recommends that direct further investigations be carried out at the local municipality level on extensions of these non-motorized routing plans in settlement and rural areas.

Public Awareness and Understanding - Increasing the understanding of climate change, GHG emissions and the impacts of personal and group decisions on mobility may help in making wiser transportation choices. However, within the context of a regional transportation master plan, all measures and options must be contextualized and considered at a wide regional level. For example, the preservation of "carbon sinks" such as forests and parks to generate 02 must be evaluated in relation to added travel distances that may be created by avoiding these sinks. While trees and green space contribute tremendously to the reduction of VOCs and GHGs, their advantages do not compensate for increased VKT in less compact development.

Lifestyle changes by individuals are also facilitated by community support. Involving community groups and organizations, schools and workplaces in the promotion of GHG reduction makes these changes much easier and more effective.

> **Implications for EWRTMP:** The master plan implementation policies included in EWRTMP include the role of public education and awareness in meeting the plan's objectives, starting with support programs provided at the municipal government level.

5.3.3 HOW TO MAKE CHOICES FOR SUSTAINABLE DEVELOPMENT

Many of the transportation and related policies found in the County of Essex Official Plan, and reflected in the EWRTMP Terms of Reference, generally fall under the theme of Sustainable Development, for example represented by the following Terms of Reference statement:

"There is a political commitment, through the preparation of this transportation policy and implementation strategy, to have this region develop in a coordinated manner that will be effective in minimizing traffic congestion, poor air quality and smog alert days while allowing the goals of improved public transit and less dependence on the automobile to be achieved".

The term "sustainable development" was initiated in 1987 when the Brundtland Commission defined it as ***"development that meets the needs of current generations without compromising the ability of future generations to meet their own needs".*** Based in an ethic of resource conservation, sustainable development seeks to minimize the use of resources, particularly those that are non-renewable.

The impacts of transportation on the environment are well documented. Transportation requires the use of limited resources, including land for roads and vehicle storage and disposal, fossil fuels for vehicle and road operation and production, and minerals used in the production of vehicles. Vehicle emissions and accidents have a direct impact on air quality and personal health and safety. As the availability of resources and the planet's ability to absorb impacts declines, our ability to maintain current levels of quality of life, let alone increase them, has become limited. For reductions in consumption and other mitigating measures to be implemented, there needs to be a socio-political shift that favours sustainable development.

The Government of Canada's Sustainable Development information center confirms that this change is a behavioral change, defining sustainable development as a process where decisions are made with integrated consideration of the economy, society and the environment. (www.sdinfo.gc.ca). Transport Canada more specifically isolated a number of key considerations in their Sustainable Development Strategy, including:

- Encourage Canadians to make more sustainable transportation choices;
- Enhance innovation and skills development;
- Increase system efficiency and optimize modal choices;
- Enhance efficiency of vehicles, fuels and fuelling infrastructure;
- Improve performance of carriers and operators;
- Improve decision-making by governments and the transportation sector; and
- Improve management of Transport Canada operations and lands (source: www.tc.gc.ca)

These issues are also key considerations at a local level, as municipal governments have a role to play in how the following choices affect our transportation system sustainability:

Aware and Educated Life-Style Choices – Personal lifestyle is perhaps the most difficult transportation element to change because its impact on individuals is the greatest. In North American society, a transportation master plan has very little influence over lifestyle choices unless associated with tangible, effective incentives (carrots) and restrictions (sticks). However, changing personal behaviors toward sustainable choices is also expected to yield the greatest results. While we make certain choices every day, such as whether to drive or ride a bike to the grocery store, the options available to those making choices are predetermined by other more fundamental choices, such as auto ownership, place of residence, time availability and feeling of personal safety. Awareness is motivated by perception of transportation modes. By making the true costs of transportation more visible, including infrastructure, administration and disposal, we can increase understanding of the efficiencies gained by using more sustainable alternatives, or the reduced infrastructure needs of more central and compact development.

Transportation System Efficiency - Improvements can be made to transportation systems within which people travel as a whole, by contributing to the directness of routes, efficiency of traffic controls, reductions in vehicle kilometers traveled, delays and waiting times, redistribution of traffic to off-peak times, regular maintenance, and increased network safety. Equal consideration of all modes also ensures that more sustainable modes such as walking or cycling can be integrated into existing facilities. This is done by considering the people-moving capacity of transportation system, rather than just the vehicle-moving capacity (i.e. a transit bus moving through an intersection can have the people-moving capacity equivalent to 40 single occupancy vehicles). Furthermore, maintaining and enhancing the convenience of these modes when improvements to other modes are made (i.e. roads) can optimize transfer between modes.

Increased Fuel Efficiency – Technological gains are starting to be made in fuel efficiency, refinement and quality, and improved motors can reduce dependence on petroleum-based fuels that are not renewable. A number of alternative fuels derived from renewable sources such as "bio-diesels" offer locally produced alternatives that can be developed to meet the same air quality and efficiency standards as regular diesel. Use of these fuels is not yet widespread, but is already common practice for some municipal fleets for example using compressed natural gas transit systems and propane taxis. Once again, except for setting an example with its own equipment choices, the municipality and its transportation plan has little impact on the advancement of alternative fuel use.

Participation Processes - Sustainable development requires increased consultation with residents and stakeholders in order to ensure that systems are as responsive as possible to the needs of users, and that long-term investments such as infrastructure development furthers a common vision for the future. Directly involving all members of society in the elaboration and application of solutions can also help increase awareness of their personal impact, even if some members of the public choice to ignore these impacts.

Transportation as a Means of Empowerment - Transportation is essential for the movement of people and goods. The links that transportation creates support the socio-economic health and vitality of communities, regions and countries. Transportation must therefore be guaranteed for all members of society, enabling them to partake in a region's prosperity rather than simply depend on its social services. This social empowerment of transportation is provided through two key choices:

- the choice to provide certain transportation service, i.e. public transit, as both a "business" and as a form of social service for those dependent on this form of transportation; and

- the choice to provide transportation modes that are free of obstacles for persons with physical or other disabilities in order to serve all residents.

Equity and Transportation - In the planning, development, and promotion of transportation choices, the availability of modes to all segments of the population must be taken into consideration. Provision of cycling systems is a good example, where the cost, physical requirements, distance to be traveled, or physical capability of the user all limit the use of this transportation mode. In these cases, public investment must strive to provide services and infrastructure equitably. Furthermore, costs associated with the construction of infrastructure, and operation of certain modes such as cycling, are not necessarily born by their users. Also, residents of areas adjacent to major roadways may suffer traffic-related impacts whether or not they operate a vehicle. For these and other reasons, it is all the more crucial to consider social and environmental impacts in the planning of new transportation infrastructure. The widespread use of a "triple bottom-line" (social, economic and natural environment) seeks to address these issues.

Think Globally - Act Locally - Neighborhood or area-specific transportation initiatives can contribute greatly to an integration of sustainable development principles, and can be encouraged as part of transportation planning policy. For example, many TDM initiatives such as ridesharing and safe-routes-to-schools rely on a smaller scale grassroots approach that can be more directly and personally appealing to the target audience. These types of cooperative transportation measures can increases awareness of community interaction, and the potential for any individual to contribute to sustainable development.

Consider Life-Cycle Costs - Much of the true impact of transportation is hidden, and seldom considers processes and costs involved for example in the production and disposal of tires and auto parts, or infrastructure maintenance such as parking lots. Transportation planning should consider all "measurable" operation, maintenance, administration (i.e. insurance) and obsolescence costs. Conversely, other transportation-related costs are extremely difficult, if not impossible to measure because investments have no market price, or are inherently incapable of being reduced to a surrogate market value, for example dealing with air quality impacts (i.e. asthma), removal of natural areas or and the social impacts of accidents. This is why the use of cost-benefit analysis is not suited to large scale transportation master planning.

5.4 Regional Road System

The Terms of Reference requires that the Transportation Master Plan include:

"*a consistent classification system and set of standards across the County and City based on an agreed upon functional hierarchy of transportation corridors for all controlled access highways, expressways and arterial and collector roads that form part of the regional transportation network, and are under the jurisdiction and ownership of the province, County, City and the 7 local Essex County municipalities".*

This Classification System was previously presented in Section 2.4.2 of this Master Plan and shown on Exhibit 2.6. However, the Terms of Reference also call for a regional transportation planning framework to be established that can be used to:

"*properly regulate and control vehicular access, building locations and land use adjacent to "regionally" important transportation corridors".*

In response, a Regional Road System was developed for **"transportation and related planning purposes only"** based on existing policies, examples from other urban/rural jurisdictions, roadway design standards and recommended classification criteria, and includes a recommended definition of a "regional road" within the context of the Essex/Windsor region. Background information on how the classification system was developed, and the different classification systems currently used in the County and local municipality Official Plans are presented in the **Technical Appendix**, and summarized as follows for this Master Plan.

In regional transportation planning, it is often advantageous to overlay a designated network of "regional roads" over the roadway system hierarchy. The regional road designation can then be used to apply and maintain consistent operational and maintenance standards between all municipalities within a region. When designating regional roads within a regional planning area, provincial freeways and highways are typically not included as they are not under the jurisdiction of the "regional" municipality or municipalities. For the purposes of the Essex-Windsor Regional Transportation Master Plan, "regional roads" are defined as:

REGIONAL ROADS - Roads, both urban and rural, that by themselves or in combination with other regional roads, provide inter-regional connectivity within the regional planning area and to adjacent municipalities. This inter-regional connectivity within the Essex-Windsor area is recommended as the prime service function criteria in designated regional roads. Roads or road sections that may serve high traffic volume but do not provide inter-regional connections would not be designated as a regional road.

All County Arterial Roads on Schedule "D" of the County Official Plan meet this definition, especially when the following added Regional Road criteria are considered:

1. Provide continuous roadway service as part of an overall Regional Road system. Non-continuous "stub" roads should not be designated as Regional Roads;

2. Regional Roads should be capable of being upgraded to a reasonable standard consistent with the service being provided. Road with rights-of-way that are restricted from upgrading by geometry or terrain should not be designated Regional Roads;

3. In urban areas, Regional Roads should be limited to routes that provide a continuous transportation corridor service and can be upgraded, including widening. Urban arterial roads which have rights-of-way that cannot be upgraded without severe property and/or socio/environmental damage should not be considered as Regional Roads; and

4. Roads that provide parallel service to Provincial Highways should not be considered Regional Roads.

As stated earlier, traffic volume should not influence the inter-region function criteria in designating regional roads since there are roads, such as Lesperance Road in Tecumseh and Matchette Road in LaSalle, that currently experience relatively high traffic volumes owing to their location in high growth areas, but do not provide the inter-regional connection required of regional roads.

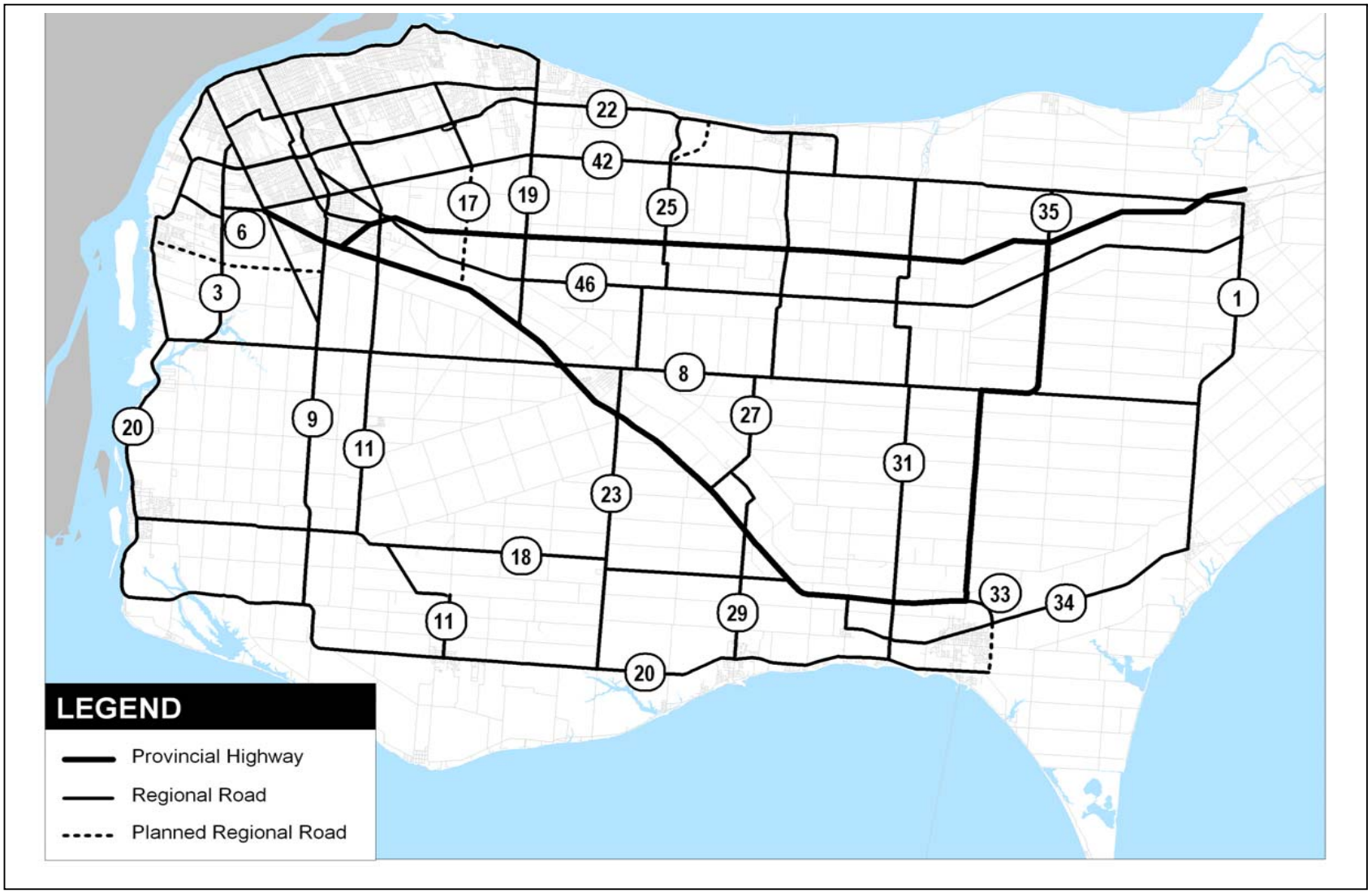
In the City of Windsor, the inter-regional criteria for regional road designation also applies to urban arterials. For example, Cabana Road/Division Road through Windsor is clearly part of a major east-west inter-regional connection extending from CR 7 in LaSalle east to Tilbury in the Municipality of recommended as part of the regional road system, unlike Howard Avenue which links with CR 46 as a major inter-regional route. With consideration to the inter-regional connectivity criteria, plus these additional criteria and comments provided by some of the Essex-Windsor municipalities, the recommended Regional Road System is listed on Exhibit 5.6 and shown on Exhibit 5.7:

Exhibit 5.6 – Recommended Regional Road System Links

Road	From	To
CR 1	CR 34 at Wheatley	Through Tilbury via Queen St to CR 2
CR 3/Malden Road	CR 8	Huron Church Road
Planned Laurier E-W Arterial	CR 9	CR 20
CR 31	CR 20	CR 42
CR 29/27	CR 20 at Kingsville	CR 22 via CR 34 and Hwy 3
CR 23/25	CR 20	CR 22 at Puce (existing & realigned)

CR 17/Lauzon Parkway	Highway 3	Tecumseh Road
CR 19	CR 8	Riverside Drive
CR 11/Walker Rd.	CR 20	Tecumseh Rd.
CR 9/Howard Ave.	CR 20	Tecumseh Rd.
CR 20/Ojibway Pkwy/E.C. Row Expressway	CR 33 at Leamington	CR 19
Sandwich Street/Riverside Drive	Ojibway Pkwy	CR 19
Huron Church Rd./CR 7	Ambassador Bridge	CR 9
Tecumseh Rd.	Huron Church Rd.	CR 19
CR 22	CR 19	CR 42
Dougall Ave/Ouellette Ave	Riverside Drive	Highway 401
Sprucewood/CR 6/Cabana Rd/Division Rd/CR 42	CR 20	CR 1 at Tilbury
Provincial Rd/CR 46	Howard Ave.	CR 1
CR 8	CR 20	CR 1
CR 18	CR 20	Hwy 3
CR 33	Highway 77	CR 34
CR 50	CR 20 at Malden Centre	CR 20 at Kingsville
CR 34	Hwy 3	CR 1 at Wheatley
CR 35	Highway 401/Highway 77	CR 42

Exhibit 5.7 – Recommended Regional Road System



5.5 Funding Mechanisms

The project Terms of Reference required that alternative mechanisms for fair and equitable funding of transportation system improvements in the Essex-Windsor region be identified. In response, an overview was prepared of potential funding mechanisms to be considered by the County in potentially cost sharing road improvements with the lower tier municipalities within the County. This over view did not include the following provincial and federal funding programs already in affect, as the County and local municipalities are already aware of and eligible for these funding sources:

- Ontario Small Town and Rural (OSTAR) Development Infrastructure;
- Ontario Municipal Economic Infrastructure Financing Authority (OMEIFA);
- Municipal Rural Infrastructure Fund (MRIF – Federal);
- Canada Strategic Infrastructure Fund (CSIF);
- Infrastructure Canada Program (ICP); and
- The Strategic Highway Infrastructure Program (SHIP – Federal).

The central issue in determining a fair and equitable funding mechanism in Essex County is the extent to which the transportation services are to the benefit of the existing community (non-growth related) or growth-related. Provincial legislation (The Development Charges Act, 1997) allows for the imposition of a development charge to offset the cost of growth-related services in regard to roads and other hard services, as well as soft services provided by both lower tier and county/regional municipalities.

The County of Essex does not currently have a development charge with respect to growth-related road infrastructure, but consideration may be given to establishing a development charge by-law. As such, the distinctions between growth and non-growth-related capital expenditures is important in considering options for funding overall road-related capital works.

5.5.1 EXISTING APPROACH TO FUNDING COUNTY ROAD EXPENDITURES IN ESSEX COUNTY

The County categorizes its road-related operating and capital program as follows:

- Standard maintenance (operating cost);
- Rehabilitation and major maintenance (Capital program); and
- Capacity projects (primarily projects necessitated by the increased use of the road network owing in large part to population and employment growth).

With respect to the rehabilitation and maintenance of existing roads, the County funds these expenditures from the annual County levy (the County's portion of the property tax). The distribution of the amount of the levy between the lower tier municipalities of the County is based on weighted assessment. With respect to the County's current capacity-related construction project in 2004, County Road 11 (Walker Road) widening from Highway 401 to Highway 3, the County has funded this development through debentures. The annual repayment costs associated with this debt are funded from the County levy. As such, these capacity projects are also cost-shared on the basis of weighted assessment.

Several of the municipalities within the County have also proposed road construction projects which may ultimately be assumed by the County, with the expectation that the County may also contribute to the initial capital costs of development. The County is also seeking funding from Phase 2 of the Border Infrastructure Grant Program to help defer the costs of road improvements on those highways serving the border crossing itself.

5.5.2 BASIC APPROACH TO MUNICIPAL COST SHARING

Where services are provided across municipal boundaries, cost-sharing between municipalities for shared municipal services is often considered in terms of three alternatives:

1. The purchased service approach (the actual or average cost of the service paid for by the user);
2. Share of population; and
3. The weighted assessment approach.

Roads, both local and regional, are often described as services which exhibit "*Public Good*" characteristics, whereby the service provides collective benefits to the community as a whole. The provision of road services, and hence any improvement to the road network, has a spillover effect when users of the system who reside elsewhere and who do not directly contribute to the cost of the system through property tax or tolls (the *"free-rider"* effect). Under these conditions, specific beneficiaries are not easily identified since local and county roads, as well as other services ranging from street lighting, fire and police protection, and neighbourhood parks etc., are used by a wide variety of individuals and may include not only residents of the local municipalities, but also non-resident employees and visitors. In the particular case of the Windsor-Detroit border, there is additional potential for use of the road network by non-local/non-regional traffic crossing the border and connecting with the County road network. As a result, user fees and specific charges are, by comparison to other services, less appropriate as a means to cover costs associated with providing the service. While road tolls provide an opportunity to recoup costs directly from the consumer, such tolls are more practical on controlled access highways such as the 400-series highways.

The preferred approach to funding general expenditures on county or regional roads is through the county levy, which is based on weighted assessment. The county road network, as opposed to the local road network, is seen as a regional service of benefit to all residents of the county irrespective of whether lower tier municipalities are more or less connected to the regional system. It is also true that while non-county residents use the county system, county residents also travel to other jurisdictions. Accordingly, each municipality is deemed to benefit from the services and are therefore required to contribute to the county levy. The basis for doing this has traditionally been weighted assessment.

The use of weighted assessment essentially relates to the concept of the relative ability to pay. Municipalities with a more significant assessment base contribute more to the cost of a service relative to municipalities with a smaller assessment base.

The "Share of Population" approach is used elsewhere in Ontario for allocating costs between jurisdictions for such services as land ambulance, Provincial Offences Act (POA) services, and in some instances, social housing provision. The "Purchased Service" approach (using measures of cost such as actual cost of service or caseload in each municipality for which the particular service is provided) is used for a number of municipal services, including social services, social housing, and childcare. In addition, certain other services, such as recreation programs, are supported in part by direct user fees paid by facility users and program participants.

The following discusses the particular approaches which can be developed toward cost-sharing for growth-related services in Essex County.

5.5.3 APPROACHES TO COST-SHARING GROWTH-RELATED SERVICES (AREA-SPECIFIC CHARGES)

Development charges enable municipalities to recoup a portion of their capital expenditures on growth-related infrastructure and services, based on an established level of service (the 10-year average). Depending on the scale of development planned, development charges may not cover the entire costs of planned infrastructure development. Municipalities are able to establish municipal-wide development charges as well as area-specific charges (including a distinction between urban and non-urban service standards) applicable only to identified portions of the municipality. Typically, development charges related to the county/regional road network are municipal-wide owing to the regional benefits of the road system. By comparison, infrastructure works related to specific municipal facilities and services (e.g., local roads, sanitary and water services) potentially have benefits limited to specific areas. Hence, area specific charges are more common for these other (more localized) services.

Based on a brief review of recent development charge studies, the following examples are noted:

- York Region DC addresses certain local road improvements which are deemed to have a regional benefit (e.g. overpasses on local roads over Highway 400), through funding one third of the capital cost of three roads. The DC recoverable portion is spread Region-wide;
- The Region of Durham DC has a uniform region-wide charge with the exception of two area specific charges;
- Halton Region's DC has no area-specific road charge; and
- Peel Region DC has a region-wide charge.

In assessing the appropriate scale of any area-specific charge in different areas based on the level of need in each area, two alternative approaches have been used increasingly in calculating the development charge for roads:

- Trip generation data would provide an indication of the likely load on the road system as well as the extent to which the need for infrastructure is related to growth vs. non-growth traffic; and
- Another approach that is used increasingly in development charge calculations is assigning growth-related costs to each area based on the projected relative change in population and employment over a specified period. This is a less direct method by which to establish the use of, for example, the road network, but provides a useful proxy for the full range services which may be used by residents and employees and which are eligible under development charge by-laws. Population and employment growth projections are also commonly used to split growth costs between residential and non-residential.

5.5.4 SUMMARY AND IMPLICATIONS FOR THE COUNTY OF ESSEX

The existing means of sharing costs for operation and maintenance of the existing County road network is generally considered to be satisfactory. The principal focus of this review is addressing the most appropriate means of cost apportionment for growth-related road expenditures.

There are four options for growth-related cost allocation in Essex County:

1. Weighted assessment as the basis of the tax levy used to support for major road expenditures (through debentures or own funds given revenues);

2. A DC (county-wide) wherein development pays a portion of the costs in the County. Any unmet costs are shared on the basis of weighted assessment, along with existing, non-growth-related costs through the tax levy;

3. A DC (county-wide plus area-specific) – any unmet costs are based on weighted assessment county-wide through the tax levy; and

4. Actual cost allocated to each municipality based on benefits-received. This requires determining the level of benefits to each municipality from road development. Each benefiting lower tier municipality would pay on the basis of its level of benefit. This is difficult to achieve and is open to considerable debate as to level of benefit.

Outside of the use of area-based DCs for growth-related costs, the only other area-specific approach is case-specific cost sharing based on agreements reached between municipalities who likely have a local component to the road. In this case, the County would contribute only where there is a regional benefit.

The project Terms of Reference noted that one purpose of the new Regional Transportation Master Plan is to *"establish fair and equitable funding mechanisms required to finance growth and non-growth related region-wide transportation improvements".* In Ontario, this is typically done through development charges. However, within the scope of this project, allocation of potential development charges, or any other equitable funding mechanism, to roadway improvements cannot be described without a project-specific assessment of traffic origins and destinations in order to determine benefiting areas. Within the scope of this project, there is insufficient traffic O-D data to identify background, growth and non-growth related roadway improvements.

If the County wishes to further pursue alternatives to the existing cost-sharing approach, the County should undertake a review to determine the pros and cons of establishing a development charge and the extent to which the planned improvements to the County road system can be covered by the development charge. The development charge represents an added cost to the developer and ultimately the consumer. There are a number of issues to consider when assessing the appropriations and scale of any charge, including its impact on residential and particularly industrial and commercial growth. The benefits of a charge compared to its potential impacts on economic growth should be assessed.

To determine the merits of the approaches described above, in the context of the County of Essex, will require available information as to the nature of usage of the County road system either through an assessment of trip origin-destinations or through proxies such as population and employment growth projections. In terms of expenditures related to existing development, as well as that portion of growth-related expenditures which cannot be met by a development charge, this roadway use data would help establish whether the use of weighted assessment remains a fair and equitable approach, or whether a more area-specific cost allocation formula should be developed.

If local municipalities expect that their road construction projects should be partly funded by the County, it is recommended that the County clearly establish the County-wide benefits of these localized projects. If benefits are mainly localized, cost-sharing agreements with the specific lower tier municipality in question may not be appropriate. The apportionment of cost should be based on a clear understanding of local versus County benefits.

5.6 Plan Implementation

5.6.1 OFFICIAL PLAN INTEGRATION

The recommendations of this Transportation Master Plan should be incorporated into the County of Essex Official Plan as the statutory basis on which to implement the Plan's recommendations. The City should also use the Plan to review the 1999 WALTS plan to determine if and where technical and policy updates are required. The WALTS plan recommends that it be reviewed and updated as required every five years.

There are also a number of guidelines and policy recommendations made in this Plan regarding transportation demand management through land use planning, urban form and transportation/land use integration. All municipalities, including the local municipalities within the County, should determine where and how to incorporate this information into their Official Plans, where required to improve the transportation/land use relationship in the region over the next 20 years.

Specific policies recommended for inclusion in amended Official Plans are:

Regional Transportation Goal - The goal of regional transportation planning in the Essex-Windsor region is to direct and implement multi-jurisdictional policies and solutions that will serve the needs of the region for a twenty year planning horizon.

Regional Transportation Objectives - The objectives of regional transportation planning in the Essex-Windsor region are to:

1. Fairly and equitably manage, coordinate and finance growth and non-growth related region-wide transportation improvements, with a balance of capacity enhancements and demand management that best benefits the region;

2. Have the region develop in a coordinated manner that will be effective in minimizing traffic congestion and associated environmental impacts, protecting and managing required transportation corridors and achieving the region's transportation management goals;

3. Increase the availability of "viable" transportation options by making public transit, cycling and walking more attractive for Essex-Windsor residents;

4. Identify and implement achievable strategies, in the context of the County of Essex and the City of Windsor, to reduce the number of kilometres traveled by the private automobile per household by creating more compact built forms, mixed-use neighbourhoods and developments, and by adopting transit, cycling and pedestrian-supportive land use planning and urban design policies and plans throughout the region;

5. Ensure that regional transportation planning is conducted in an integrated, inclusive and comprehensive manner; and

6. Use the Transportation Master Plan to satisfy Phases 1 and 2 of the Municipal Class EA process dealing with transportation system needs and alternative planning strategies respectively.

Transportation Planning Principles - Incorporate the Transportation Planning Principles established for the Regional Transportation Master Plan into municipal Official Plans as follows:

Principle #1: Optimize Arterial Roadway Network Capacity – Based on experience elsewhere, regional residents are expected to want a safe, convenient and effective transportation system. The County of Essex, its local municipalities and the City of Windsor have a responsibility to provide a functional transportation system with an appropriate Level-of-Service (LOS) for the safe and efficient movement of people and goods.

In response, and where appropriate in the region, priority should be placed on optimizing the carrying capacity of the existing arterial roadway network within the urban and rural areas before investing in new major capital improvements such as road widenings, extensions and new roads. Arterial optimization will focus on access management and corridor protection along "regionally" important major routes through regulation and control of vehicular access, building locations, land use types, turning movements, side road access and driveway access.

Principle #2: Select Appropriate Levels of Service and Standards – Before making major roadway network improvements, the road or roads in question should be analyzed to determine the appropriate Level-Of-Service and design standards that match the need and character of the area being served. This principle is required in a mixed urban/rural region such as Essex-Windsor because the urban and rural character is extremely different. In predominantly rural areas, County roads typically have low traffic volumes. This trend is expected to continue into the future, and so most of the County road system is not expected to experience Level-of-Service problems. Conversely, there are several County roads near Windsor within urban communities that are already experiencing congestion. When roadway improvements are considered in these areas, they should be examined from the perspective of community need, traffic volumes and Level of Service measurements.

Principle #3: Ensure Transportation Improvement Affordability – The ability of the City, County and local municipalities to fund major transportation projects over the next 20 years may be limited by funding limitations and competing needs. This being the case, transportation planning may have to consider the implications of reduced investment scenarios on the level of transportation service, as measured by criteria such as travel time and LOS changes. The Transportation Master Plan must prioritize recommended system improvements, including structural, operational and TDM measures, in order to respond to funding limitations or targets.

Principle #4: Ensure Transportation System Sustainability **–** To sustain the existing transportation system in the Essex-Windsor region, decisions should be made using integrated transportation/land use planning. This approach responds to the Smart Growth approach to land use and density distribution, using re-urbanization and intensification in appropriate areas to reduce the impacts of urban growth on the roadway network. In both the City of Windsor and County of Essex, this principle could extend so far as to allow urban development only where and when adequate transportation services and capacities are made available. The common measurement of the regional transportation system's sustainability will be the vehicle kilometres of travel being conducted.

Under the sustainability principle, this measurement should not increase over the next 20 years, and preferably decrease in appropriate areas such as the urban communities. This principle can be accomplished through a balance of roadway capacity optimization and enhancement that provide for high connectivity and travel efficiency throughout the region, coupled with demand management measures that encourage more sustainable travel characteristics by regional residents (i.e. alternative modes, travel times and home-work proximity) and a closer home-work relationship (i.e. through moiré mixed use and intensified development forms).

Principle #5: Ensure Roadway Network Enhancement Achievability – In order to satisfy Phase 2 of the Class Environmental Assessment process, the Transportation Master Plan study must objectively identify all possible alternatives to address transportation system needs over the next 20 years. However, alternatives that are not considered to be feasible and reasonable based on current Official Plan policies, Provincial Policy Statements, community character, expected system and community impacts and public costs should be screened out early from further consideration. This principle applies equally to capacity-based projects such as road improvements, and demand-based projects such as transit service extensions and TDM programs.

Regional Roadway Classification System and Regional Road Plan – The Transportation Schedule in each of the Essex-Windsor region's Official Plan should be amended to reflect the expanded roadway classification system recommended on Exhibit 2.6 of the Regional Transportation Master Plan, as well as the designated Regional Road System on Exhibit 5.4. Incorporating these new systems will help ensure that all County and municipal roads that form the Regional Road System are maintained with coordinated standards and practices amongst all municipalities. These amendments should also include the recommended regional road extensions as shown on Exhibit 5.3 and 5.4.

Regional Roadway Level of Service (LOS) - Any reference to LOS standards in the Official Plans, other statutory policies or transportation-related plans and Municipal Class Environmental Assessment studies should state that the County of Essex and City of Windsor are endeavouring to maintain at least LOS D conditions on all regional roads in the PM Peak Hour. Once this LOS is measured or forecast to exceed LOS D on a road section in the County and LOS E on a City road section, plans and actions will be taken to regain the minimum LOS D or E planning standard.

Transportation Corridor Protection - The City of Windsor and County of Essex should review their respective Official Plans to ensure they include sufficient policy directions to protect the long term operational effectiveness of the Regional Road System, plus the provincial highways. These corridors must be protected from land use forms, access and encroachment that would restrict or constrain Regional Road operations, as well as provincial highway operations. Such encroachments can range from parcel severances, property rezoning applications and Official Plan amendment applications, through to Drafts Plans of Subdivision and development permit applications.

It is also recognized that there must be appropriate consultation through legislated implementation measures, most notably the Environmental Assessment process and the Official Plan amendment process, to ensure protection of some of the specific components of the Regional Road System, such as recommended extensions, widening and other capacity enhancement measures.

It is further recognized that since some Regional Roads traverse the City of Windsor/County of Essex boundary, and in a few cases involve sections of municipal roads, cooperative support for any related Official Plan amendment will be required between the City, County and other involved local municipalities in the Regional Road System. In some cases, joint planning and funding of Regional Road improvements traversing municipal boundaries may be appropriate to consider.

Public Transit - Although it is not advised to include a specific transit ridership target in an Official Plan, as the ability of achieving this target will evolve and vary over time, any reference to transit ridership should recognize that the Regional Transportation Master Plan is based, in part, on a Transportation Demand Management strategy that includes the extension of conventional scheduled transit service from the City of Windsor into adjacent suburban communities in LaSalle, Tecumseh and Lakeshore. The Official Plans should also include policies supporting the provision of Alternative Service Delivery Methods (i.e. Dial-A-Bus, TransCab) and "Community

Transportation" services beyond the designated Urban area into the Urban Areas in Rural Settings. Implementation of the expanded role set for transit in this Plan will be the responsibility of Transit Windsor, as well as other private sector operators who may provide the Alternative Service Delivery Methods and Community Transportation Services outside the Urban area. The most important next steps for Transit Windsor are to:

1. Recommend where, when and how extensions to Transit Windsor service can be made into adjacent communities in LaSalle, Tecumseh and Lakeshore in order to move towards achieving the future transit target set in this Transportation Master Plan. This relates directly to the Transit Windsor Chair's 2004-2006 Goal and Objectives recommendation for *"careful expansion of public transit service into our adjacent municipalities"*; [6]

2. Work in cooperation with the City, County and adjacent local municipalities to identify potential transit priority measures in the roadway network, including exact intersection locations for installation of these measures; and

3. Develop the cost estimates and business case for extension of Transit Windsor services, and include the results in the next three-year Chair's Report of Transit Windsor.

4. The most important priority action for Essex County relating to the future role of public transit is to enshrine this role as an Official Plan policy, instead of the existing non-committal Policy 2.9.1 (xi) currently stating that "*while the provision of public transit is encouraged as an alternative means of transportation, this Plan acknowledges that the provision of public transit is a local matter."* This County Official Plan policy should be amended to recognize that the provision of public transit may include County involvement and support as part of the Regional Transportation Master Plan, because regional transportation policies and strategies should be non-jurisdictional, as much as possible.

Capacity Optimization - A new Official Plan policy is recommended with reference to the Regional Transportation Master Plan's emphasis in optimizing arterial capacity. The policy should state that the optimization guidelines are to be followed in the review of all roadway and intersection design projects, signal timing changes, site plan and development permit applications and Environmental Assessments to ensure that the capacity of the arterial and collector roadway network is optimized and preserved to the fullest extent possible before major capacity enhancements are required.

Travel Demand Forecasting and Traffic Impact Studies - It is important to stress that once the Regional Transportation Master Plan is integrated into Official Plans, if any significant changes are made to growth projections and fundamental growth management plans in the County or City, then an associated updating of the Master Plan may be required This would entail re-running the City's expanded City/County TransCad travel demand forecasting model with the new growth data, re-establishing PM Peak Hour trip forecasts and evaluating possible alternative solutions. A policy requiring that a Traffic Impact Study is required at the following stages of planning approval should also be included in the County and local municipally Official Plans:

[6] Transit Windsor Chair's 2004-2006 Goal and Objectives, February 26, 2004

Stage of Approval	General Transportation Impact Study Scope
Area Plan/Secondary Plan	• Identification of major/arterial transportation infrastructure and operational improvements associated with area wide development potential
Plan of Subdivision	• Arterial and collector roadway requirements and operations • Phasing plan • Transportation infrastructure improvements tied to phasing plan • General description of access locations and operations • Allocation of responsibility for funding and implementation of transportation infrastructure improvements
Rezoning	• Phasing plan • Transportation infrastructure improvements tied to phasing plan • General description of access locations and operations • Allocation of responsibility for funding and implementation of transportation infrastructure improvements
Site Plan	• Access location and operations • Site specific impacts on road network including adjacent site operations

5.6.2 PLAN MONITORING AND REVIEW

The Regional Transportation Master Plan is not a static document. It must be regularly reviewed to ensure it meets the transportation needs of the County of Essex and the local municipalities. Changing growth and development patterns may also require a re-investigation of the Plan's Capacity Enhancement Strategy and the TDM Strategy, and both should be reviewed by municipal staff annually to determine changes in travel behaviour and associated travel characteristics in the region. This should be done as follows.

A coordinated report on local transportation conditions, behaviours, needs and trends should be submitted annually to the County of Essex and local municipal Councils or appropriate Committees with input from:

- County Transportation Services;
- County Planning Services;
- County Land Ambulance Service;
- Transportation Demand Management Coordinator (City or County);
- Municipal Planning Departments
- Transit Windsor
- Ministry of Transportation
- Neighbourhood Associations
- Business Improvement Associations

To address transportation issues on an annual and consistent basis, this "State of the Transportation System" report should document:

- results of annual or regular traffic count programs;

- new trends and technologies in traffic operations and management;
- progress in Arterial Capacity Optimization projects and decisions;
- public and private sector initiatives as part of the TDM Strategy (i.e. car pooling, preferential parking, transit incentives, flexible work hours, telecommuting, cycling facilities);
- status of related provincial initiatives, policies and funding programs, and;
- the need to re-assess, amend or update components of the Regional Transportation Master Plan.

The County of Essex and City of Windsor should coordinate their annual transportation system improvement budgets for all modes. The objective here should be to maximize effectiveness, efficiencies and economies of scale in the provision of transportation services. This may require the establishment of "Regional Transportation management Committee" to coordinate this joint municipal planning and budgeting effort.

The Regional Transportation Master Plan was also prepared using household travel survey data collected for Windsor and the immediate area in 1997, augmented with additional rural data in 2002. Updated survey data should be collected every five years on the following key temporal trip-making characteristics in order to gauge changes in regional travel characteristics, and to measure to what degree the strategic directions and targets of the Regional Transportation Master Plan are being met:

- Travel Mode
- Travel Origin and Destination
- Trip Purpose
- Trip Time
- Vehicle Occupancy

The Regional Transportation Master Plan requires regular updating to remain relevant and effective in dealing with Essex-Windsor local transportation needs. It is recommended that the Plan undergo a full review and update every five years, ideally at the same time as the County carries out its statutory assessment of their Official Plans if possible. This review should include the above-noted household travel survey data to update travel characteristics in the region and measure performance against the recommendations of this Regional Transportation Master Plan.

The potential impacts on the Region's road network resulting from deferral of improvements to Highway 3 by MTO are also significant. Therefore, if MTO has not committed to undertake the planned improvements by 2010, or has indicated that they have abandoned plans for the improvements, the County of Essex will be required to investigate alternatives to address network deficiencies and related impacts