4.0 TRANSPORTATION MASTER PLAN

The MASTER PLAN is a comprehensive set of transportation improvement recommendations for future travel demand management (TDM), pedestrian mobility, bikeway development, transit service and the major roadway network. It also includes strategies to improve the City's truck route system, as well as approaches to traffic calming and community transportation. Final recommendations are provided to implement this Master Plan in terms of Official Plan amendments, and monitoring and updating the Plan

4.1 TRANSPORTATION PLANNING STRATEGY

The overall planning strategy of the WALTS study is to manage the growing mobility needs of the City and adjacent municipalities, at both the local and regional levels, by:

1. **Controlling Land Use** - to reduce the growth in home-based trip making. Official Plan policies already support mixed use development and more intensive residential densities at appropriate locations.

2. **Applying Selective Transportation Demand Management (TDM) Measures** - where appropriate to either shift travel modes or reduce trip-making.

3. **Adjusting Level-Of-Service (LOS) -** to optimize existing transportation infrastructure capacity. In this WALTS study, identification of capacity deficiencies uses a peak hour LOS of "E" (down from "D") on Class II arterial and collector roadways, and LOS "D" on Expressways and Class I arterials (down from "C");

4. **Improving and Increasing Supply -** to increase the transportation systems carrying capacity, such as strategically widening roads, extending roads, building additional transit and cycling capacity, building sidewalks and improving key operational features.

In the Windsor area, the success of the Transportation Plan is primarily dependent on adjusting the Level-Of-Service, and on improving and increasing the roadway system capacity. Successful TDM measures and land use changes over the next 20 years represent additional ways of managing future transportation needs.

4.2 TRANSPORTATION DEMAND MANAGEMENT RECOMMENDATIONS

In Section 3.2.2 of this Study, various Transportation Demand Management (TDM) measures available to the Windsor area were evaluated to determine their potential effectiveness in this context. The purpose of such measures is twofold; 1) to augment the benefits of structural improvements with measures that reduce travel needs, and 2) to provide alternatives to the private automobile. The TDM measures recommended for support and further implementation planning in the Windsor area are:

1. support the direct and indirect transit-supportive measures considered in this Study (see Sections 3.2.3 and 4.5), with the goal of doubling transit ridership, and the transit mode share from 3% to 6%, by the year 2016;
2. support policies and programs that encourage telecommuting, shorter work trips, working at home and other methods of home-work related trip reductions with the goal of achieving a 10% reduction in Home Based trips by the year 2016;
3. continue to provide Official Plan policies and Zoning Bylaw provisions that offer opportunities for more mixed-use development forms and higher residential densities, infilling and redevelopment in appropriate areas;
4. support subdivision and urban design guidelines that are pedestrian, cycling and transit-supportive;
5. consider increasing the cost of long-term parking at municipally-owned parking lots;
6. support employers in setting more flexible work hours in order to shift peak travel hours, and establishing effective, well-managed ride-sharing programs, and;

It is also recognized that most of these TDM measures will not generate immediate benefits on the transportation system, nor will they eliminate the need for the structural improvements being recommended in this Study. A high degree of political will and public support is also required to make any of these measures successful. However, they do represent ways of achieving the recommended system performance targets of this Study.

If these targets of better balanced auto and non-auto travel in the Windsor area are not achieved over the next 20 years, additional structural improvements and related expenditures may be needed to maintain the targeted Levels-Of-Service made in this Study.

4.3 PEDESTRIAN MOBILITY

Access, safety and health are all issues associated with walking, which has a role to play in the design and functioning of communities. Although few individuals consciously identify themselves as "pedestrian", there is considerable interest in increasing the quality of life in communities. A component of this is promoting programs and facilities that enhance the "walkability" of communities.

Every person starts a trip as a pedestrian. Improving pedestrian corridors and facilities is recognized as an important aspect of improving the total transportation system. The shift toward neo-traditional design of new neighbourhoods, revitalization of regional and urban centres, and active tourism also reflects a growing desire to reduce the interference that the automobile has on the pedestrian.

4.3.1 LOCAL MOBILITY

Pedestrians and their needs are considered to fall into three distinct groups, as described below. Understanding their characteristics and needs will assist in planning for and encouraging more walking.

- **Leisure walkers** walk 3 km or less, preferring walks through parks, on paths and trails. They are usually willing to pay for facilities and can be vocal for these needs.

- **Utilitarian walkers** are more likely to be the young, the elderly and the disabled. Access and convenience afforded to motorists, around which our communities have been planned, are lacking for these people. They walk during all hours of the day and at night. They need facilities where they live, shop and work, including sidewalks, crossings, roads that are pedestrian friendly and police protected.

- **People with disabilities** may move around for leisure or utilitarian purposes. This group includes seniors and people with physical impairments to walking. It is projected that 85% of today's population will one day have a permanent disability. They need walking freedom, mobility and access, and can often exercise their rights through community-based organizations.

For the purpose of planning and designing for transportation, a disability can be classified as a mobility impairment, sensory deficit or cognitive impairment. Mobility impairments include people who use wheelchairs, scooters, braces, crutches, canes and walkers as aids. Sensory deficits are associated with vision and hearing

loss, loss of the sense of balance and colour-blindness. Cognitive impairments are related to the diminished ability to process information and make decision, including those who are unable to read or understanding a language.

Pedestrians are likely to walk 1.5 km for a commute trip (20 mins.) but less than 0.5 km for regular trips (5 mins.). All distances are greatly reduced when safety, security and comfort are overlooked. Land use planning directly affects the length of a walking trip. Design of pedestrian facilities and design of the corridors in which they exist affects the desire to make the walking trip.

In the Windsor area, walking can take on a more significant role in mobility around the City if pedestrian environments are well-designed and have an invitational quality. Land use planning of growth areas and "infill" areas can reflect an organization and mix of uses to encourage more walking.

4.3.2 PEDESTRIAN-SUPPORTIVE DESIGN GUIDELINES

Basic facilities can be used to encourage walking. There is a need to consider not only movement and flow, but to look at attractiveness, comfort, convenience, safety, security, system coherence and system continuity from the pedestrian viewpoint. The following are elements of the pedestrian environment that should be designed carefully with respect to safety, security and comfort in order to encourage their use.

Sidewalks

Sidewalks are the one physical factor in the roadway system that has the most effect on pedestrian safety. They are recommended for both sides of arterial and collector streets, on at least one side of local residential streets and on other streets where pedestrian activity is expected and invited. A study in the U.S.[1] reported that streets with no sidewalks have 2.6 times more pedestrian collisions than expected on the basis of exposure, while streets with sidewalks on one side have 1.2 times more pedestrian collisions. Streets with sidewalks on both sides have 1.2 times fewer pedestrian collisions.

Crossing conflicts are increased if a sidewalk is only provided on one side of the

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1 *ITE Technical Council Committee 5A-5, Design and Safety of Pedestrian Facilities - A Proposed Recommended Practice of the Institute of Transportation Engineers, Washington, D.C.: Institute of Transportation Engineers, December 1994, p.16.*

street. A pedestrian wanting to reach a destination on the opposite side of the street from the sidewalk must cross the street to reach it and then cross the street again to return to the sidewalk to continue the walking trip. With a sidewalk on both sides of the street, they would only have to cross the street once or perhaps not at all, depending on where they began their walking trip.

Boulevards between sidewalks and roadway curbs are an important element of well-designed streets. They provide a buffer between the pedestrian on the sidewalk and the vehicular traffic in the street, provide a splash area for water from the road and snow storage, and allow space for landscape treatments and utilities.

The walkway environment includes landscaping and streetscaping features such as shade trees and plantings, trash receptacles, lighting and utility poles, benches, transit shelters, signs, vending machines and kiosks. Careful placement of these features is necessary to allow for unimpeded and easy pedestrian movement.

Pedestrian Crossings

For pedestrian comfort and safety in crossing streets, the maximum crossing width should be 15 m and not more than four lanes of traffic. Pedestrian signalization should be provided based on a 0.90 to 1.2 metre/second walking speed, with the lower limit used in school zones and road crossings near seniors facilities. These are already the pedestrian crossing speed standards in Windsor area. Appropriately designed, channelized right-turn lanes, medians, and curb extensions or bulb-outs should be used effectively to reduce the crossing width of a street, especially at complex and busy intersections. Roadway geometry should dictate turning speeds of motorized vehicles to acceptable levels, below 30 km/h for left turns and below 15 km/h for right turns.

Raised medians - on two-way, multi-lane roadways benefit pedestrians by allowing the pedestrian to cross one direction of traffic at a time, reducing the amount of time it takes to cross the road. Cuts in the median are required to accommodate people with mobility aids. Centre, left-turn lanes do not provide safe refuge for pedestrians crossing the street and should be retrofitted with a median where crossings are to be encouraged.

Curb extensions or bulb-outs - can be used effectively to reduce the crossing width of a street. On streets with curb-side parking, a bulb-out will protect the parking lane, stop illegal parking close to the intersection, and place the pedestrian more within the field of view of the driver in the adjacent lane at an intersection. The bulb-out can also provide space for landscaping and street furniture. They can be used to ramp sidewalks down to the street level for improved accessibility for people with mobility aids without affecting the existing sidewalk, utilities and other property at the street corner.

Intersection and driveway corner radii - have a marked effect on the crossing distance, the distance between the crossing pedestrian and the turning vehicle, and the speed of the turning vehicle. A 15 m radius on an 8 m wide roadway with a sidewalk adjacent to the curb will increase the crossing distance by 150% to 27 m compared to a 4.5 m radius with a crossing distance of 11 m. The design of the corner radii depends on the vehicle travel path as it approaches and departs from the intersection or driveway. For example, where parking is allowed, a vehicle typically makes the turn at an appreciable distance from the curb line. In other situations, the vehicle may hug the curb line.

Channelized right-turn lanes - should only be used in the Windsor area only after careful consideration of site-specific traffic conditions. While they can be designed for automobile traffic at low speeds of 20 to 30 km/h, and at an angle that can allow the driver to view the merging traffic flow and pedestrians that may cross the lane, experience in other cities shows that automobiles may not yield the right-of-way to pedestrians in these turn lanes. For this reason, careful consideration of their use is recommended.

Raised crosswalks - especially if textured and coloured, are more visible and act as speed humps to reduce vehicular speeds. **Raised intersections** are treated by motorists as areas not designed for rapid through movement, but as areas where pedestrians are to be expected. Raised crosswalks and intersections are extensions of the sidewalk and, with no change in grade, do not require ramps to accommodate people with mobility aids. They can also simplify drainage inlet placements because all surface water will drain away from the crosswalk or intersection.

Illumination - is required at approaches to and at all major street corners to provide clear visibility of pedestrians approaching intersection crosswalks. At night,

pedestrians are poor at assessing closure speed and a safe gap in traffic when wanting to cross a street. A pedestrian wearing dark clothing may not be seen by nearly half of all drivers at distances above 30 m. Lighting should illuminate the crossing and waiting areas and/or create backlighting to make the pedestrian silhouette clearly visible on approach. This is of particular importance near schools, in downtowns, commercial areas and entertainment centres, and other areas where pedestrian activity occurs or is encouraged.

Walking to and from School

The trip a child walks to and from school, in general, is a safer one in relation to other pedestrian activities of children. However, the youngest students, ages 5 to 8, are particularly over-involved in pedestrian crashes (approximately 30% of all injuries and fatalities). In many areas, those motorists most commonly traveling too fast, illegally parking, or otherwise creating unsafe conditions for children are the teachers and parents of other children being brought to school.

A program ensuring the safety of walking school children consists of two parts:

- the physical facilities, particularly sidewalks and walkways that separate school children from vehicular flow, and
- an operational plan consisting of traffic control devices and supervisory/control elements that help children to cross streets.

School crossing control should only be considered where warranted. Some form of traffic control is needed if current standards are not met in terms of the duration and number of gaps in vehicular traffic. When the delay between the occurrence of adequate gaps becomes excessive, children may become impatient and endanger themselves by attempting to cross the street during an inadequate gap. The traffic control should create in the traffic stream the gaps necessary to reduce the hazard.

It is recommended that where major problems associated with school site access are identified, the physical facilities and operational plan for walking school children should be examined. These case-by-case investigations should be conducted at the local level through the involvement of all partners, such as the school, Police Department, parent/teacher associations, City Traffic Engineering Department and other affected transportation and children's safety groups. This group would develop a "Safe Routes to School" program which could consist of the following steps:

1. develop a process for investigating the school trip safety;
2. identify safe routes to school, including access to the school property and the building;
3. identify deficiencies in routes to school;
4. select route improvements and control measures;
5. implement improvements, and;
6. periodically evaluate the routes.

Pedestrian-Supported Land Use Planning

Efficiency of urban designs for walking is reflected in the nearness of services, the pattern of developments, the density of development and the mix and design of land uses. Building design and street design must be considered together in their influence over the use of public spaces.

New and infill land use development should accommodate walking. Successful downtowns, waterfronts and entertainment districts often find a 50:50 ratio of walking space to vehicular space ideal for maximum economic development.

Land use patterns conducive to walking include:

- greater housing densities allow more residents to live closer to neighbourhood destinations such as stores and schools;
- mixed-use zoning allows services such as stores and professional buildings to be closer to residential areas, making it easier to access these facilities on foot;
- multiple-use zoning allows residences and businesses to share the same structure, reducing travel demands;
- locating buildings close to the street allows easy access by pedestrians, and parking areas planned to minimize walking in vehicle space and the backing up of vehicles reduces the potential for vehicle/pedestrian conflicts;
- resolving conflicts with neighbourhood street management, including traffic calming techniques, makes streets more inviting to walkers.

4.3.3 PEDESTRIANS WITH SPECIAL NEEDS

Like able-bodied pedestrians, a person with a disability traveling independently is usually a shopper, student or employee going about normal business. For the purpose of transportation planning and design, a disability can be classified as a mobility impairment, sensory deficit or cognitive impairment. The objective should be to

refrain from erecting special needs barriers, and to strive to eliminate any existing ones over which the municipality has jurisdiction or influence.

The level of energy required by a wheelchair user to push a given distance is about 30% higher than needed by a walker. A person on crutches or with artificial legs requires 70% more energy to go the same distance. If a person in a wheelchair travels a full city block to find no curb cut, doubles back and travels that same distance in the street, it is the equivalent of an ambulatory person going 4 extra blocks, not to mention the extra time and inconvenience. This illustrates the importance of creating barrier-free environments. Design guidelines are outlined below.

Sidewalks should have a minimum clear width of at least 90 cm and should be provided on both sides of a street in areas where the public are invited. Joints in concrete sidewalks or other breaks in the surface should not result in a lip more than 6 mm high. Maximum crossfall should be 2%, and maximum grade 8% for not more than 9 m. Handrails should be installed along long ramps. Alternatives to steep grades should be clearly signed.

Street furniture has needlessly caused more problems for disabled pedestrians than any other obstacles. For the safety of the visually impaired, furnishings and other objects should be placed, wherever possible, out of the normal pedestrian travel path. Reference should be made to established City policies and practices for installation of street furniture.

Street furniture should not block access from the sidewalk to any on-street parking provided for those with special needs, particularly people in wheelchairs. Quadriplegics and people with poor coordination or with prosthetic hands may not be able to operate standard street furniture such as parking meters or pedestrian-actuated signals.

Curb cuts and ramps are the single most common features employed to improve the mobility of pedestrians with special needs but are often inadequately designed and placed. Curb cuts should be at least 90 cm wide with flared sides that do not exceed a 10% slope and have a tactile warning texture extending the full width and depth of the ramp. The single most important feature is that the ramp be flared into the street or sidewalk surface. A sudden drop-off of more than 6 mm can tip a wheelchair.

Ramps located in the centre of a corner should be avoided. Such locations force the visually impaired and the wheelchair user into the intersection where they must turn to reach the crosswalk. Each corner should have 2 curb cuts or a broad cut serving both corners. Ramps or cut-through islands, along with push-button walk actuators where pedestrian actuated signals are used, should be provided on pedestrian median refuges.

Boulevards improve the continuity of sidewalks for people using mobility aids at driveways and are recommended for all new arterial and collector street construction. The driveway can be ramped from the outer edge of the sidewalk to the street, without requiring a change in crossfall of the sidewalk. In existing areas, if a boulevard is not present, the sidewalk should be widened or offset from the edge of the roadway so that a minimum 1 m wide area is provided with no change in the sidewalk's crossfall beyond the driveway ramp.

Drainage on sidewalks, walkways and crosswalks is important. A poorly drained area that creates a puddle or ice build-up will hide debris that can cause an accident for wheelchair users and others.

The City should continue to work with community groups to maintain a mobility map of pedestrian areas such as the downtown. The map would show characteristics of the street such as ramps, curb cuts, grades, pedestrian crossings and audible signals that would influence the travel route selected by people with special access needs. The map would highlight deficiencies that could be prioritized for future improvements.

4.4 BIKEWAY AND RECREATIONWAY DEVELOPMENT

Access to the City's planned Bikeways and Recreationways from all parts of the City and neighbouring areas, as described in the Windsor Bicycle Use Development Study, will encourage more residents to walk and cycle. This encouragement can continue by strategic staging of further Bikeway and Recreationway development over the next 20 year, plus the development of associated policies to support engineering design, education programs, and enforcement and encouragement initiatives.

4.4.1 The Bicycle Use Development Study

A potential network of bikeways on roads and streets, and multi-use recreationway trails in open space, utility corridors, abandoned rail lines and parks, was developed for Windsor in 1990. Since then most of the planned off-road recreationways have been developed, such as:

- the College Avenue and West Recreationway in west and south Windsor;
- the Ambassador/Assumption/Centennial Recreationway;
- the Roseville Garden Park trail;
- the Little River Corridor trail, and parts of the Ganatchio Trail Recreationway;
- Walker Homesite/Devonwood Trail, and;
- Southwood Lakes Trail

Emphasis should now be on continuing to implement on-road primary Bikeways that integrate with established Recreationways. This further Bikeway and Recreationway development should be planned in conjunction with an update of the Windsor Bicycle Use Development Study, as well as polices found in the County and involved Town Official Plans. . This will allow for the integration of the system.

Regardless of the type of bikeway, the designer must consider that a bicycle is a vehicle and is governed by the rules of the road set out in the *Highway Traffic Act*. Design and maintenance practices should not require cyclists or motorists to question

the right-of-way or violate rules of the road. As a result, updating the Bicycle Use Development Study will provide an opportunity to integrate new engineering standards into the Windsor and area system. This update should also revisit the education, enforcement and encouragement initiatives recommended in the Bicycle Use Development Study.

4.5 THE TRANSIT SYSTEM

An increased role for transit in the Windsor area transportation system is recommended over the next 20 year. The target is to achieve a 6% mode share of peak hour trips, similar to conditions in the late 1980's. Annual ridership must reach the 12 million passenger level, similar to that experienced in Windsor in 1989/1990. This role and associated performance targets will require increased operating funding together with supportive municipal policies and aggressive marketing and promotion activities.

4.5.1 FUTURE STRATEGIC DIRECTION

Public transit in the Windsor area consists of conventional and specialized transit services. There are also a number of other transportation services provided by other agencies within the Health, Community and Social Services and Education sectors. Transit Windsor's conventional service carries approximately 6,500,000 passengers annually. Although future strategies focus on conventional transit service and some alternative service delivery methods (ASDM), changing demographics, travel patterns, lifestyles and health care practices in the future will have "conventional" transit service encompassing a broader range of services and service delivery methods compared to today's approach of large buses operating on fixed routes according to set schedules. As such, conventional public transit will likely come to include aspects of today's "specialized" transit service as well as elements of the transportation services now provided by the other government sectors (also see Section 4.10 on Community Transportation) through the Province's Community Transportation Action Program (CTAP).

Ridership Growth

According to City Planning Department forecasts, Windsor's population is expected to grow by 7.8% over the period 1996 - 2016 from 197,694 to 213,217. Based on today's transit ridership rate of about 35 rides per capita (6.5 million annual rides/197,694 population), and assuming a constant rides/capita rate, annual transit ridership within the same Transit Windsor service area would only will be 7,500,000 by 2016.

The target of increasing the transit modal split to 6% represents a doubling of transit ridership, increasing this annual ridership level to approximately 12 million. Most of the WALTS area population growth forecasted for the neighbouring municipalities (15,523 in Windsor compared to 35,000 in the County portion of the WALTS area). Therefore, with the City expected to generate about 7.5 million rides by 2016, the remaining ridership increase must come from a combination of increased City ridership, and a carefully expanded market base beyond Transit Windsor's urban transit service area.

If the resulting potential transit ridership by year 2016 included all of the forecasted WALTS area population of 303,000 persons, then 12 million rides would equate to rides/capita of about 39. This would be somewhat higher than recent (1995) rates experienced in other cities such as Peterborough (32.1) and Guelph (34.9), but would be very similar say to London (39.8). It would also be similar to the per capita ridership experienced by Transit Windsor as recently as 1992/93.

An increase in ridership, as a result of whatever strategies are adopted, cannot reasonably be expected to commence before 2000, and can be expected to take at least 15 years to achieve the 6% modal split target.

Strategic Needs

Given the downward trend in transit ridership in Windsor over the past six years, achieving the targeted level of ridership increase will require a determined and dedicated commitment to increase transit use through a combination of supportive municipal policies in all areas of municipal governance and influence, gradually improved transit service levels and aggressive and innovative marketing and promotion activities.

Higher levels of transit ridership can occur as a result of several influences:

- higher density development at strategic locations (i.e transit route nodes);
- major trip generators suited to transit use, such as schools, community colleges and universities;
- large employers that increase the concentration of potential transit users;
- strong downtown core with good mix of residential and commercial/retail space;
- shopping malls;

- transit-supportive parking pricing and supply, especially in the downtown;
- transit-priority measures on selected streets and at intersections to speed-up service;
- attractive transit service levels with a convenient and direct route network, and;
- effective marketing programs.

From a broad policy standpoint, the City, County and the transit operator would need to become full partners in the support and delivery of transit services through:

- the adoption by the City and County of transit goals, objectives, service standards and a long-term funding commitment to transit;
- the adoption of transit-supportive measures which encourage transit use at every opportunity, and;
- continue to include and consider transit requirements in subdivision designs and approvals.

Specific strategies which could encourage increased transit usage and likely contribute towards the achievement of the 6% modal split target are described below. These are grouped into Direct (transit-specific) and Indirect (non transit-specific) categories. The transit-specific examples are representative, and would be subject to detailed operational planning prior to implementation.

4.5.2 DIRECT TRANSIT-SUPPORTIVE RECOMMENDATIONS

Transit Services: First 5 Year Period (1998 – 2002)

- Improve transit service levels in weekday peak hours initially from the existing 30 minute to 15 minute frequency on key routes such as Tecumseh Road, Wyandotte Street and Dougall/Ouellette Avenues, followed by increased headways on secondary routes.
- Improve Saturday service by increasing headways to 20 minutes on secondary routes and 15 minute service on key routes.
- Continue to maintain Sunday and statutory holiday service to meet the growing needs of residents and workers.
- Introduce supplementary or specialized services, such as community bus routes and community transportation services (see Section 4.9), for specific market segments such as industrial area employees, seniors, and students.
- Expand service to adjacent municipalities.

Transit Services: Second 5 Year Period (2003 – 2007)

- Increase weekday peak hour headways on key routes to 10 minutes.
- Expand express/limited stop services to reduce travel times between key destinations.
- Expand to other County communities such as Amherstburg, Essex, Kingsville, Belle River and Leamington.

Other Ongoing Initiatives

Fares

Develop incentive programs to encourage transit use, especially by post-secondary students. Such programs could be led by the post-secondary institutions, municipal governments with its employees, and expanded to include private sector businesses such as malls, major employers, hospitals, etc.

Marketing and Promotion

Develop and implement an on-going marketing and promotion program targeting ridership development, improvement of transit system image and acceptance and benefit of transit in the community. This program should include an outreach component to form partnerships with the private sector to encourage transit use. Marketing should include regular assessment of transit system performance and acceptance in the community, and frequent communication with stakeholders regarding services offered, changes, improvements, benefits of transit, etc.

4.5.3 INDIRECT TRANSIT-SUPPORTIVE RECOMMENDATIONS

Short-Term (1998 – 2002)

Financial Commitments

The City of Windsor, along with the County of Essex when service is expanded, should provide long-term commitment to funding of the transit system based on development of a multi-year Business Plan to achieve modal split targets and implementation of transit service improvements. This Business Plan would build on Transit Windsor's Route Planning Policies and Service Standards (1998) to further describe specific actions, plans and financial requirements needed to phase in and

achieve the strategic transit target (6% mode share/12 million rides by 2016).

Marketing and Operations

- The City's Official Plan and Zoning Bylaw provides ample opportunities for land use intensification in residential and industrial areas. More proactive actions could be taken in marketing these areas, including the consideration of financial incentives.

- Official Plans and Zoning Bylaws for LaSalle, Tecumseh, St. Clair Beach, Sandwich South and Maidstone should be reviewed to determine intensified development and associated transit node opportunities in fringe suburban areas surrounding the City.

- Transit stops and transfer terminals, within or at shopping mall developments, should be considered to facilitate transit access to sites and to minimize walking distances for transit users.

- Park-And-Ride facilities should be provided, particularly in outlying communities at designated transit stops and transfer terminals (i.e. shopping malls) at no cost to encourage transit use. Local mobility and access to these facilities can also be enhanced through the inclusion of bicycle shortage equipment, and by connecting transit stops and transfer terminals to pedestrian trails and routes.

Planning Policies

- Municipal Zoning Bylaws within the WALTS area should ensure that higher density development areas are located close to existing and potential transit routes and/or arterial roads intended to be used for transit purposes. As part of the plans approval process, the City and area municipalities should ensure that development proposals will be transit-friendly in the design and layout of internal road network, location of sidewalks and walkways, and housing orientations to facilitate bus stop and shelter location.

Parking Policies

- Consideration should be given to increasing the morning peak hour rates for day-long parking at municipally-owned lots to create an incentive to use public transit by people who basically store their car all day. This would not affect the cost on non-peak hour parking for the business and entertainment users of the downtown and other employment nodes.

- Off-street parking provisions in Zoning Bylaws should specify a maximum amount of parking required for development projects, not a minimum amount, and cash-in-lieu of parking provisions that can be directed to other transportation system needs (i.e. transit).

Transit Priority Measures

- Plan transit routes to introduce traffic signal priorities at key locations, thereby facilitating the movement of buses during times of high congestion. Candidate locations at the transit route intersections on Ouellette Avenue, Walker/Lincoln Road, Tecumseh Road, Wyandotte Street and Lauzon Road. and at other locations identified by transit management. This should be scheduled for implementation in future capital budgets.

- Promote new federal legislation that will allow employees to receive transit passes from employers as a tax-exempt benefit.

- Promote provincial legislation that would allow a portion of fuel tax revenue to be directed to structural improvements and other transit supportive measures at the local level.

4.6 THE ROADWAY SYSTEM

4.6.1 NETWORK PLANNING PRINCIPLES

This Transportation Study has concluded that selected improvements to the Windsor area's major roadway network are required over the next 20 years in order to:

- address existing roadway capacity and operational deficiencies;
- accommodate increased traffic volumes due to City and surrounding area growth;
- accommodate increased public transit and non-motorized transportation within the roadway network;
- retain an effective Level-Of-Service for regional and local mobility, and;
- address the public's need for the safe and efficient movement of people and goods within the Windsor area.

To answer these basic mobility needs, the roadway network component of this Master Plan has been prepared based on three important planning principles:

1. **Maximize Use of the Existing Infrastructure -** The roadway network plan makes the maximum use of existing roadways through selected widenings and operational improvements. These improvements are also capable of accommodating increased transit and on-road cycling volumes.

2. **Maintain Level-Of-Service With Performance Targets** - The structural roadway improvements recommended in this master plan are needed to maintain the Planning Level-Of-Service established for the WALTS study, and will assist in achieving the following performance targets considered in this Study, namely:

Table 4.1 - WALTS Performance Targets (PM Peak Period)

FACTOR	CURRENT LEVEL	2016 LEVEL
Transit Share of Trips	3%	6%
Cycling Share of Trips	2%	3%
Walking Share of Trips	10%	15%
Auto/Other Share of Trips	85%	76%

Auto Occupancy	1.3 p/veh.	1.4p/veh.

These performance targets offer a means of ensuring that the overall transportation Level-Of-Service "D - E" set for the Windsor area can be maintained over the next 20 years without any further major structural improvements to the roadway network beyond those recommended on Figure 4.1. If these targets cannot be met, future transportation studies may have to reassess the need for further structural improvements.

3. **Implement A Package Of Improvements -** Each of the capacity and operational improvements found in the recommended roadway network plan are there to address a link or site-specific deficiency. Therefore, if any single recommended improvement is not implemented, other components of the network will likely be negatively affected. For example, if adequate operational capacity is not provided along Wyandotte Street, continued traffic growth and congestion can be expected along Riverside Drive East. Therefore, any decision to not implement a component of this Plan's "package" of improvements should be carefully studied in terms of resulting impacts on the entire network.

4.6.2 RECOMMENDED ROADWAY SYSTEM IMPROVEMENT PLAN

Previously in Section 3.4.5, Alternative Roadway Network 4 - Balanced TDM/Structural Improvements was selected as the recommended alternative resulting from the extensive network evaluation process. It forms the basis of the Recommended Roadway System Improvement Plan, providing improved roadway continuity along major north-south and east-west corridors. As shown on Figure 4.1 and on Table 4.2, four types of roadway system improvements are recommended for the WALTS area:

1. **Short-term (Remaining 5 Year) Capital Improvements** associated with approved ESR's, and involving selective roadway widenings from 2 to 3 or 4 lanes, from 4 to 6 lanes, or for a fifth centre turning lane;

2. **Operational and Capacity Improvements** that, pending further study and Class Environmental Assessment, involve roadway upgrading and widening for additional lanes and/or bicycle lanes, introduction of exclusive turn lanes and associated signal improvements at key intersections, and use of one-way couplets or reverse lanes to enhance the capacity of existing roadways or corridors.

Included here are a number of projects recommended to enhance system continuity by improving capacity along the Cabana Road/Division Road corridor, the Ouellette Avenue corridor, the Howard Avenue corridor and on sections of Grand Marais Road East, Central Avenue and Malden Road. On these routes, alternative network evaluations in Section 4.6 showed additional capacity improvement would be required to avoid forecasted deficiency problems by 2016.

3. **Roadway Extensions** to provide improved corridor continuity and accessibility, and to divert traffic from associated congested routes. The recommended extension of Jefferson Boulevard from the E.C. Row Expressway to Division Road is intended primarily to provide improved access for abutting airport property development. It will also act as a north-south alternative route to Walker Road in south-central Windsor, thereby alleviating growing traffic congestion on Walker Road. Extending a short section of Edinborough Street from Ouellette Avenue to Dougall Avenue improves the functional linkages between these two important downtown access routes.

4. **New Interchange** - Need for new interchange development or improvement will be determined either by the City regarding the E.C. Row Expressway, or the Ministry of Transportation on Highway 401. The City has identified the need for additional access to highway 401 at the 6th Concession Road in south Windsor relating to continued subdivision development in the surrounding area, and associated need for peripheral access to the City's arterial roadway system.

Traffic assessments conducted in the WALTS study show that these roadway system improvements shown on Figure 4.1 at key intersections and roadway corridors will accommodate forecasted traffic volumes in the Windsor area at least to the 20 year planning horizon of this Master Plan (2016).

A fifth type of capacity enhancement measure is already applied by the City to selected arterial and collector roadway sections where additional traffic capacity is required, but where physical widening is not possible. This involves the full or partial removal of on-street parking (ie. Tecumseh Road) so that one or two additional travel lanes are made available either for peak AM and/or PM hours, or for the entire day. This approach to capacity enhancement should continue to be applied where physical widening is not available.

The resulting Recommended Roadway System Improvements Plan is shown on Figure 4.1. It includes component improvements that are costed and phased on Table

4.2 over the three planning horizons of this Study. It is important to note that these costs are only for the specific network improvement projects recommended in this Master Plan for the next 20 years. They do not include associated or more detailed projects which may be required in designing and constructing these improvements.

The anticipated Class EA schedule for each project is included on Table 4.2 based on the Class EA as follows, **with this Master Plan satisfying Phases 1 and 2 of the Class EA Process in each Schedule**(see Section 1.1.3):

Schedule A - Approved Activities where the proponent may proceed without further reference to the Class EA and includes most general maintenance activities, operational improvements valued at less than $6.0 M, roadway reconstruction for the same use, and construction or reconstruction of roads shown on an approved development plan.

Schedule B - Activities Subject to the Screening Process where Phases 1 and 2 of the Class EA process are completed, and the project approved subject to screening.

Schedule C - Activities Subject to the Full Planning Process of the Class EA where the project is usually large with significant potential environmental impacts.

Table 4.2 - Recommended Roadway System Improvements

IMPROVEMENT DESCRIPTION	NET CAPITAL COST($M) see Note #1			LENGTH (metres)	EA Schedule
	0 - 5	6 - 10	11 - 20		
Short-Term 5-Year Capital Improvements:					
1. Widen Walker Road to 5-Lanes from Division Road south to Highway 3	20.00			as per March 1995 ESR	C
2. Construct New Subway Structure and Realign 4-Lane Tecumseh Road West from Crawford Avenue to York Street	5.00			as per ESR estimate	C
3. Widen Lauzon Road to 5-Lanes from Wyandotte Street East to Tranby Avenue, with 4-lane Extension from Tranby to Tecumseh Road East.	12.00			as perESR estimate	C
4. Widen Tecumseh Road East to 6-Lanes divided from Jefferson Boulevard to Banwell Road	14.20			as per October 1996 ESR	C
Sub-Total	**51.20**				
Operational & Capacity Improvements: **SEE NOTE #2**					
5. McDougall Capacity Improvements from	6.50			4000	C

Wyandotte Street to Howard Avenue					
6. Wyandotte Street East from Ouellette Avenue to Lauzon Road		4.25		8500	A
7. Traffic Calming Program on Riverside Drive East	as per final plan				A
8. Tecumseh Road East from Banwell Road to Lesperance Road **		4.40			C
9. Walker Road from Riverside Drive East to Division Street		4.15		8300	C
10. Howard Avenue from Tecumseh Road East to Memorial Drive		0.50		900	A *
11. Ouellette Avenue from Giles Blvd. to Dougall Street.		1.25		2500	A *
12. Matchette Road from Tecumseh Road West to Reaume Road **			9.00	5300	C
13. Malden Road from Todd Lane to Reaume Road **			2.40	2000	C
14. Todd Lane from Malden Road to Huron Church Road **			2.76	2300	C
15. Lauzon Parkway (County Road 17) from EC Row Expressway to Division Road			2.40	2000	C
16. Dougall Avenue from Eugenie Avenue to EC Row Expressway	6.00			2200	C
17. Cabana Road/Division Road from Huron Church Road to Lauzon Parkway (County Road 17)		6.30	6.30	10,500	C
18. County Road 22 from E.C. Row Expressway at Banwell Road to Manning Road **			3.30	2750	C
19. Grand Marais Road East from Walker Road to Pillette Road		4.00		2250	C
20. Central Avenue from Grand Marais Road to E.C. Row Expressway	0.50			1000	C
21. Howard Avenue from Division Road south to Highway 3 (Talbot Road)		8.00		4250	C
Sub-Total	**13.00**	**32.85**	**26.16**		
Road Extensions:					
22. Edinborough Street from Ouellette Avenue to Dougall Avenue		2.00		300	C
23. Jefferson Blvd. Extension from E.C. Row Expressway to Division Road		3.75		2500	C
Sub-Total	**-**	**5.75**	**-**		
New Interchange:					
24. Partial Interchange at Hwy 401/Sixth Concession	2.00			As per 1996 ESR	C
TOTAL IMPROVEMENTS	**66.20**	**38.60**	**26.16**		

*** Schedule C projects if physical roadway widening is required.**

**** All or part of project is outside of the City of Windsor.**

NOTE #1 - Conceptual Range-Of-Magnitude cost estimates only, based on the following generalized per unit construction cost factors (including earthworks, pavement, curb and gutter, storm and sanitary sewers, sidewalks and standard vegetation):

New Construction:

2-Lane Urban:	$1,500/m
4-Lane Urban Arterial	$2,000/m

Widening:

2-Lane Urban Arterial to 4-Lane Urban Arterial	$1,000/m
2-Lane Rural Arterial to 4-Lane Urban Arterial	$1,200/m
4-Lane Rural Arterial to 5-Lane Urban Arterial	$ 800/m
4-Lane Urban Arterial to 5-Lane Urban Arterial	$ 500/m
4-Lane Urban Arterial to 6-Lane Urban Arterial	$ 900/m

General Capacity Improvements:

Based on Improvement Corridor Length	$ 500/m

NOTE #2 - Recommended Operational & Capacity Improvements, Enhancements and Roadway Extensions include projects added to the City's 5-Year roadway improvement plans.

4.6.3 LONG TERM CORRIDOR PROTECTION

There is a need to protect additional roadway corridors for future transportation planning flexibility in the Windsor area. This is mainly a result of growing cross-border transportation needs, longer term planning uncertainty associated with continued suburban growth and the need for related roadway network continuity.

It is not possible at this time to graphically describe in any detail these longer term transportation corridor options. Specific alignments will be the subject of more detailed corridor planning, taking into consideration environmental impacts, roadway network operations, land use patterns and implementation costs. However, the general function of these corridors is described as follows. Figure 4.2 also shows the general areas where longer term planning flexibility to accommodate a corridor or corridors should be protected.

This protection should be provided through Official Plan policy, land use and transportation system planning in the Windsor area. This will help ensure that these longer term transportation planning solutions remain available to the WALTS area. Furthermore, local, provincial and federal planning initiatives should begin as soon as possible, in response to proposed border crossing expansions (i.e. expanded bridge

capacity), to plan new cross-border "connecting links" in the Windsor area. This route planning would be conducted within the framework of the Class EA Process.

Southwest Corridor - An east-west transportation corridor has been identified for protection extending from the Ojibway Parkway/Hwy 18 to Highway 401 using existing arterial roads. Based on available Secondary Plans in this area, candidate arterial routes for upgrading and extension to provide this longer term link include Reaume Road, Bouffard Road, 6th Concession Road or Laurier Road planned in the Historic LaSalle and the Reaume Secondary Plans, or a new east-west collector road alignment planned in the Historic LaSalle Secondary Plan. Other candidate alignments could follow the new east-west Normandy Avenue collector road extension planned from Malden Road to Huron Church Road in the Todd Lane/Todd Centre Secondary Plan. Once again, the selection of a preferred corridor from these and other candidate alignments will be dependent on comprehensive land use, transportation and environmental planning.

Highway 401 West Connector - With the proposed twinning of the Ambassador Bridge, or construct a new bridge in the southwest WALTS area, a new connecting alignment to Highway 401 would be required. The two generic options here involve further upgrading the Huron Church Road/Highway 3 connecting link, or developing a new connecting link through west Windsor and LaSalle to Highway 401. Any further consideration of this question will require the undertaking of a full feasibility and route planning study.

Highway 401 East Connector – A new easterly connector to Highway 401 can be provided by upgrading County Road 17 (10th Concession Road) between County Road 42 (Division Road) and Highway 401. This new 401 connection would be a future phase of the Lauzon Parkway extension recommended as Roadway System Improvement No. 15 on Figure 4.1 and on table 4.2. This involves the recommended upgrading of County Road 17 along the east Airport boundary, ultimately providing a continuous arterial connection between the EC Row Expressway and Highway 401. The result would be an additional connecting link for cross-border traffic to bypass the entire south Windsor roadway system. Other candidate connection alternatives which may be capable of providing this east connection are suggested on Figure 4.2 in the Township of Sandwich South. These include Banwell Road/11th Concession Road, and Manning Road (County Road 19). The 10th and 11th Concession Road options would also require interchange construction at Highway 401. Comprehensive

feasibility, route planning and environmental assessment is required to determine the best approach from these options.

4.6.4 FUTURE BORDER CROSSING ACCESS

The WALTS study has analyzed future traffic growth and related transportation system needs in the entire WALTS planning area. This has included consideration of existing and future cross border traffic as a major component of Windsor area traffic. In fact, the traffic forecasting model used SEMCOG traffic data as input into the Windsor forecasting model (see Section 2.3).

Cross border traffic between Windsor and Detroit is a major component of the overall area transportation system. Much of the current information about US/Canada cross-border traffic shows that the Detroit/Windsor Tunnel is the busiest auto crossing point between both countries. Furthermore, The Ambassador Bridge is the busiest commercial vehicle crossing facility.[2] The Tunnel accommodated 4.2 million autos entering the US in 1995, followed by the Ambassador Bridge with 3.6 million autos. About 17 million total vehicles crossed at Windsor in 1995.

These cross-border traffic volumes directly involve the Windsor area roadway system. As a result, the WALTS Terms of Reference asked that consideration be given to whether and when additional border crossing capacity would be required at Windsor, either through expanded or new facilities.

In addressing this question, the provision of border crossing facilities and services must first be put into context. The provision of international transportation infrastructure is firstly a federal responsibility, and therefore requires a federal solution. Whether additional crossing capacity is provided at Windsor will largely be dependent on federal and province/state government recognition of this need. This decision will also be partly influenced by current provincial initiatives such as MTO's SW Ontario Transportation Perspective and the SW Ontario International Gateway Study. Also influencing the provision of cross-border facilities at Windsor will be the NAFTA Superhighway Coalition.

NAFTA Superhighway

[2] *Trade and Traffic Across the Eastern US-Canada Border*, prepared by Parsons Brinckerhoff Quade & Douglas, Inc. in March 1997 for the Eastern Border Transportation Coalition (EBTC).

If a NAFTA-sponsored or induced international highway improvement program is put into place between Canada and the US, it could have a significant impact on Windsor. This would depend on what international highway corridor or corridors are selected for improvement funding. If Windsor/Detroit are included in such a program, the border crossing facilities and area roadway systems could experience significant growth, well beyond any "normal" growth rate extrapolated from recent historical trends.

To reflect this possibility, the WALTS study considered a cross-border traffic growth option that assumed a tripling of international through-commercial traffic crossing at Windsor (see Section 3.3.2, Network Alternative 5c). This option assumed "normal" commercial traffic growth of 5% per year over the next 20 years at the border, plus an additional 5% per year attributed to the potential North American highway trade corridor attraction. This option was used to test the resulting impact of these cross border traffic volumes on the Windsor roadway system.

The City's calibrated System II traffic forecasting model tested this 200% commercial traffic increase from 1996 to 2016, coupled with a normal 20% growth in local traffic. The result had the Ambassador Bridge deficient at Level-Of Service (LOS) F at least by the end of that 20 year period. As previously shown on Figure 3.8, the Bridge and streets surrounding the plaza area would also be deficient, operating at LOS F. Most of Huron Church Road would operate at LOS D, with LOS E conditions at the EC Row Expressway interchange. These conditions assume a capacity of 2,700 vehicles/direction/hour on Huron Church, or 900 vehicle/lane/hour at LOS E (LOS E was chosen as the "Planning Capacity" to identify capacity deficiencies in the WALTS study).

The model also shows serious deficiencies on Cabana Road, Division Road and the Dougall Avenue/Howard Avenue corridor at LOS E and F. It is concluded that these volumes occurred specifically as a result of the tripling of cross-border traffic, and are attributed to this traffic attempting to access Highway 401 via alternative routes rather than Huron Church/Highway 3. In summary, a 200% increase in through commercial traffic by 2016 would severely impact on traffic operations at the Ambassador Bridge, Plaza area, sections of Huron Church Road and other arterial routes in the western and southwestern Windsor area.

SW Ontario Transportation Perspective

This study, conducted by MTO in 1996/97, has annual vehicle traffic at the Ambassador Bridge and Detroit-Windsor Tunnel growing by 81% between 1994 and 2026, or 2.5% per year. This includes a 92% growth in truck traffic over the same period. The study concludes that additional crossing capacity will be required between Windsor and Detroit to accommodate anticipated demand.[3] In addition to this capacity, the Study also notes the need for innovative crossing management, customs and inspection, and toll collection technologies.

The Study also recognizes, in addition to this border crossing capacity, that the roadway corridors serving them must also be considered. Owing to the provincial scope of the Perspective, this attention to connecting corridors focuses on Highway 401, and not the connecting links within the Windsor area.

SW Ontario Frontier International Gateway Study

Results from this 1998 MTO study again confirm that the Ambassador Bridge accommodates most of the cross border imports and exports within the SW Ontario Gateway (Sarnia to Windsor). The Study, using economic indicators and an associated growth in commercial traffic of 5% per year, has the Ambassador Bridge reaching capacity by the year 2014. Furthermore, these same forecasts also have most of Huron Church Road, from the Bridge to Cabana, becoming deficient at LOS D and E by the year 2011.

These findings compare closely with WALTS forecasts in Network Alternative 5b (see Section 3.3.2). Here, WALTS calculated a 100% increase in through commercial traffic, which is also 5% per year over 20 years. The resulting traffic forecasts showed the Bridge deficient at LOS E by year 2016, and the Plaza area at LOS F. Also, high levels of congestion off Huron Church onto Cabana, Dougall, Howard and Division (LOS D, E and F) were also forecast as cross-border traffic seeks alternative connections to and from Highway 401.

The MTO study has Huron Church Road operating at a LOS D capacity of 2,200

[3] *Draft SW Ontario Transportation Perspective,* Provincial Planning Office, Transportation Systems Planning Branch, Ministry of Transportation, page 7-26.

vehicle/hour, compared to the WALTS planning capacity of 2,700 vehicles/hour. The result has the MTO deficiency forecasts being more accelerated compared to WALTS forecasts which assume more roadway capacity optimization.

Cross Border Needs and Options

The MTO studies and WALTS reach the same basic conclusion, namely that border crossing facilities at Windsor will reach capacity within the 20 year timeframe of this Master Plan, as early as the year 2014. Furthermore, sections of associated connecting corridors in the WALTS area, most notably Huron Church Road and Highway 3, will also reach capacity by 2016.

The MTO studies to date, in conjunction with the WALTS study findings, represent the preliminary "Need & Justification" to investigate future border crossing options at Windsor. Five basic options are available for the WALTS area in addressing these forecasted needs:

Option 1: Status Quo

This option would involve no capacity improvements at or associated with the Windsor border crossings. Status quo conditions, operations and capacities would be maintained to accommodate existing commercial crossing activity plus local traffic crossings, expected to grow at 1% per year in response to expected WALTS area population and employment growth. The existing WALTS roadway system would be able to accommodate this amount of cross border traffic growth without any major capacity or operational problems.

Based on available international trade and cross-border traffic data, this option would be a very conservative response to future border crossing needs, and damaging to the Windsor area roadway system. Without capacity and operational improvements, commercial traffic would eventually be expected to divert to another SW Ontario crossing, most likely at Sarnia-Port Huron.

Option 2: Expand Existing Bridge Capacity

In this option, widening or twinning the four lane Ambassador Bridge to 6 or 8 lanes would be associated with operational enhancements at or associated with the Bridge Plaza (customs, inspection, tolls, etc.). The Canadian Transit Company has proposed

that this twinning would link with the Plaza via Indian Road, where the Company has acquired almost all property along the east side.

WALTS forecasting data and analysis shows that this option would also require further, concurrent improvements on the connecting link to Highway 401. This could be accomplished in at least two ways. The first would be to improve Huron Church Road capacity at least from the Bridge to EC Row Expressway. At this point, improved access could be provided to Highway 401 either via the existing Huron Church Road/Highway 3 connecting link, or via a new easterly link from the EC Row Expressway south to Highway 401 via an improved route such as Lauzon Parkway/County Road 17 and the 10th Concession Road (see Long Term Corridor Protection on Figure 4.2 and Section 4.6.3).

A second connecting link option would be from the Bridge Plaza to Ojibway Parkway or EC Row Expressway via a route parallel to College Avenue and the ETR Railway line. Both of these, and other connecting link options warrant further study. Whichever solution is followed, significant roadway capacity and operational improvements would be required along the chosen route, depending on further route selection and functional planning.

Finally, in considering the Bridge twinning proposal, traffic forecasting and analyses conducted by WALTS and MTO both show a significant need for capacity improvements on Huron Church Road between the Bridge and Expressway (see Section 3.4.6) to accommodate a doubling or tripling of bridge traffic. In this case, providing up to 8 lanes on portions of the Road may be required, with associated major land acquisition needs along one or both sides of Huron Church Road to accommodate the widened right-of-way. A final traffic operations concern along the Road involves the need to accommodate growing intersecting traffic from the suburban southwestern LaSalle growth areas across Huron Church Road. This crossing need would be most critical at Tecumseh Road West and Todd Lane/Cabana Road.

Option 3: Expand Existing Tunnel Capacity

The concept of expanding the Tunnel would require associated expansion of the Plaza, and the ability of the downtown street system to accommodate resulting traffic volumes. Such an expansion could be designed primarily for passenger and smaller

commercial vehicles, thereby enhancing the Tunnel's role in accommodating local traffic and commuting. This traffic would be diverted from the Ambassador Bridge, helping to optimize the Bridge's capacity. A detailed impact analysis of this increased local traffic on the core area's roadway system would be required.

Conversely, major Tunnel expansion or redevelopment may be designed to also accommodate increased through commercial traffic. However, this approach does not appear suited to existing downtown conditions, cross-border traffic patterns and major highway connections on both sides of the border. Any changes in Tunnel capacity and service should only be considered in the context of joint facility planning, management and rationalization.

Option 4: Additional Crossing Within WALTS Area

A new crossing facility, most likely a bridge, could be built within the WALTS area to augment the Ambassador Bridge capacity. This concept would have both bridges operating to accommodate the doubling or tripling of cross border traffic possible in the Windsor-Detroit area.

The location of a new bridge would be limited by crossing distance and cost, associated land use, availability of roadway connections and directness to the external highway system (Highway 401 and US Interstate I-75). On this latter criteria, an extended connection could be made from the Ojibway Parkway or Sandwich Street directly to the EC Row Expressway and Highway 401 One optional route would be via Huron Church Road/Highway 3, with another being via a new easterly connection. If new connecting routes were required based on a new bridge location, associated land acquisition and environmental impacts would be considered. In either case, a full corridor feasibility planning study would be required to determine bridge location and connecting link options.

Option 5: Additional Crossing Outside WALTS Area

Rather than locate a new crossing facility within the WALTS area, this option would seek a location beyond the study area, most likely to the southwest along the Detroit River. Instead of providing connecting access to Highway 401 using existing or new WALTS area routes, this option would require consideration of rural connections that bypass the Windsor area. The same concerns about highway directness, crossing distance and cost and land use impacts would still apply. Therefore, consideration of

this option should also be contained within a full corridor feasibility planning study.

4.7 TRUCK ROUTE PLANNING & MANAGEMENT

4.7.1 ROUTE PLANNING

The location of truck routes is dictated by the land use patterns that generate truck traffic. Industrial areas are generally high generators of goods movement activity. Downtown offices, government employment, institutions and residential areas usually generate low volumes of truck movements. In terms of truck size, heavy trucks (exceeding 4,500 kilograms in weight, or 12.5 metres in length) generally serve terminal/warehouse types of industrial and "power centre" retail areas. They are used mostly for loading and unloading of cargo at trip ends. Lighter trucks tend to serve larger institutions and more conventional retail areas such as shopping malls for service deliveries and personal business.

The selection of actual truck routes is dictated largely by engineering and socio-environmental considerations, including:

- impacts on abutting lands;
- availability of driver and vehicle facilities along the route (i.e. fuel, parking, rest stops);
- access to major truck traffic generators (i.e Bridge, Tunnel, industrial plants);
- provide for network continuity via inter-connecting links;
- provide adequate structural strength and geometric design to accommodate truck weights and dimensions, for example limited sharp turns with radii determined by permitted truck types as per Transportation Association of Canada (TAC) turning templates;
- clearance of overhead structures and obstructions;
- provide traffic lanes at least 3.5 metres wide;
- avoid steep grades where practical, to a preferable maximum of 4 percent, and;
- provide adequate roadway capacity so that travel time along a truck route should be comparable to, or less than, motor vehicles travel time on alternatives routes.

In Windsor, the existing truck route network has been largely influenced by these factors. It is strongly oriented to the arterial roadway grid and industrial districts. Major retailing areas are served by truck routes along arterials and a number of inter-

connecting links.

Truck route extensions into fringe areas will have to be considered based on the previously noted factors as commercial traffic generators and attractors continue to grow out from the existing City of Windsor boundary. This extended route planning will help ensure continuity of truck routes between the City and County, and the proper management of truck traffic near growing residential communities. As such, it should focus on the southerly route extensions on:

- Ojibway Parkway
- Malden Road
- Huron Church Road/County Road 7
- Howard Avenue/County Road 9
- County Road 11 (Walker Road)
- Lauzon Parkway, and
- Manning Road/County Road 19

4.7.2 TRUCK ROUTE MANAGEMENT

Based on experiences in a wide variety of cities, truck route management falls into two basic types, restrictive and operational. A summary description of various management techniques in each type is provided as follows:

Restrictive

Vehicle Restrictions – as used in Windsor are most commonly based on vehicle weight, with other limitations being height, length, width as well as specific types of vehicles or loads, and often occur by default because of roadway obstructions or geometric limitations.

Time Restrictions - can reduce impacts associated with truck routes and are usually associated with night hours. When these restrictions are used, it must be ensured that the impacts on the remaining or alternative truck routes are not accentuated.

Seasonal Restrictions - are usually used in rural setting where seasonal conditions (i.e. frost, thaw, flooding) create structural limitations on what types of vehicles can

used a road.

"No-Entry" Access Restrictions - may or may not provide for local access through an area, especially where alternative bypass routes exist, but require diligent enforcement and traffic management.

Zonal Truck Restrictions - are meant to cover reasonably small areas usually bounded by arterial road truck routes, with the intent to keep through traffic out of designated areas.

Local Truck Restrictions - are similar to zonal restrictions, but only apply to one street or part of a street, and may be temporary or permanent to protect the roadway surface, narrow widths or steep slopes from truck intrusion.

Operational

Traffic Management - measures include the coordination of traffic signals to produce less stop-start conditions, lane continuity to reduce the number of lane changes required, and clearly marked signals to assist in identifying the intended operation. Traffic management devises such as speed humps, lane restrictions and through-traffic diverters can also be used in more critical situations where local streets are improperly used by trucks as a link to a designated truck route. Although local traffic is also affected, residents may weight off any personal traffic inconvenience against the elimination of the local truck access problem. In these more sensitive cases, a campaign involving posted "No-Entry" truck bans combined with passive neighbourhood surveillance and a complaint line can be effective in convincing truck operators to avoid local streets.

One-Way Truck Routes - can be used to reduce the magnitude of truck use on parts of the truck route network by designating certain routes for one-way truck access, while diverting the counterflow traffic onto other one-way truck routes. Enforcing these roadway couplets can be difficult, and they can introduce more truck turning movements.

Two-Tier Truck Routes - where all trucks are classified into two categories for the purpose of assigning truck to appropriate routes. For example, all two and three axle vehicles may be allowed to use the arterial street system. Truck with more than three axles would use a designated second tier route system with less impact potential.

While this approach is effective in serving lighter trucks and protecting residential areas from heavier trucks, it can also be seen as discriminatory against larger truck operators.

Open System With Time Restrictions - permits truck movements on all arterials during designated hours, but with residential impact concerns during unrestricted hours.

Recommended Approach

Continued use of the full City-wide truck restriction approach, in association with time restriction on selected routes, is recommended in the Windsor area to facilitate and manage truck movements. Where chronic problems arise with undesirable truck movements on non-truck routes, a phased two-step action approach is also recommended:

1. Initiate an active and visible enforcement of fines during an extended period of time, as provided by the City's Truck Route Bylaw, and the use of a public complaint reporting system to the Police Department.

2. If the chronic problem cannot be solved by the first action, the use of more intrusive, restrictive traffic calming techniques along the affected non-truck route may be recommended. These would involve the strategic installation of street narrowings, forced turns and/or surface changes (see next Section - Traffic Calming), all designed to create barriers or deterrents to large truck use on the affected street(s). Since these physical changes will also affect the flow of local and through vehicles on the affected street(s), they must be planned in association with the affected residents as part of a neighbourhood traffic impact assessment.

4.8 TRAFFIC CALMING

4.8.1 NEED AND OBJECTIVES

Controlling traffic speeds and volumes on local and collector streets has become a common goal of concerned residents who feel that their streets have slowly changed for the worse over time. Streets used to be multi-purpose places that provided physical access and encouraged social links with a community. Now, in some cases the balance has changed so that the main function of many streets has become solely the accommodation of traffic, much of which is often unrelated to the abutting residents. A need has now been promoted in many cities, including the Windsor area, to better manage traffic on local residential streets. Specifically, it can be argued that vehicles should travel at no more than 30 to 40 kilometers per hour on local residential streets. This can be achieved most effectively through the redesign of roadways from the typically wide, straight corridors to narrower, shorter sections of street broken up by an array of different techniques. Traffic calming is the name given to this process and its techniques

The definition of Traffic Calming from the Canadian Guide To Neighbourhood Traffic Calming, prepared by the Transportation Association of Canada (TAC) is;

"Traffic calming is the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behaviour and improve conditions for non-motorized street users."

Its application must extend along a street, several streets or throughout a neighbourhood. Traffic calming should only be considered principally where local support exists, where existing traffic impacts are significant and within the context of a neighbourhood traffic management plan.

4.8.2 Traffic Calming Techniques

Traffic calming techniques rely on a number of set principles:

- the street design allows drivers to drive at, but no more than the desired speed;
- the street design allows local access, while discouraging through traffic, and;
- traffic calming works best when the roads are properly designed in the first place.

Traffic calming involves physical changes to the layout of the street. To be effective, it must be considered on a neighbourhood or district level so as not to off-load or transfer one street's traffic problems simply onto the adjacent area or connecting street. Measures are most effective at lowering average speeds if they are used in combination, and throughout an area, but are placed judicially. For example, speed tables or humps can slow traffic to 30 mph or less at a spacing of 300 feet. Traffic circles are effective in slowing traffic within 150 ft. of the circle. Designs must be site-specific, that is, a measure that works at one location may not work in the context of another location.

Traffic calming measures generally fall into two basic categories:

Passive Controls

These controls do not restrict traffic flow, but attempt to influence or encourage motorists to either use alternative routes or reduce their travel speeds. Examples here include:

Visual Effects - including signs, pavement markings and in some cases planting, usually with the objective of slowing vehicular speeds and providing notification of pedestrian and/or cycling routes and crossings. They are usually the least cost measures and readily accepted by the public, but constant traffic enforcement is needed for maximum effect. If plantings are included, this results in an added maintenance cost.

Surface Treatments - Vehicles can be passively encouraged to slow at key stops, such as intersections or mid-block pedestrian crossings, through the use of special surface treatments that create both a visual and physical warning. Examples here include interlocking concrete pavers, stamped concrete, rough pavement surfaces and minor vertical deflections such as rumble strips (10-20 mm humps) on the vehicle travelway to create a minor "rumble" on crossing.

Active Controls

These measures create more of a physical impact on vehicles, thereby affecting how they use the controlled streets. They are usually more effective than passive controls in preventing motorists from using certain streets and/or slowing their speed. Active

controls include:

Chicanes - These are a form of "horizontal deflection" or impediment on the street by building out the curbline or locating fixed objects within the travel portion of the street. When located on alternative sides of the street to break up long stretches, they force drivers to divert around the objects, thereby slowing down along the strip. Instead of alternating the objects or build-outs, they can also be located across from each other, producing a **Pinch Point**. Both Chicanes and Pinch Points can usually be included within an existing road right-of-way since they involve "squeezing" the travel lanes. The advantage of either type is that they force vehicles to slow because of the objects and related side friction. Temporary measures, using concrete planters and barrier curbs for example, can be relatively inexpensive. However, they are also generally unattractive and can lack public support. Permanent features add to costs, and the traffic calming restrictions affect all motorists, including area residents. Straight routes through Chicanes can be provided pedestrians, but cyclists should follow the flow of traffic.

Speed Humps- These "vertical deflections" place obstacles on a roadway to slow or redirect traffic. They also limit emergency vehicle and transit speed. They involve gradual vertical deflections in the order of 50 to 100 mm maximum with tapered edges, and must be spaced approximately 150 metres apart in a progression along a street to induce constant speed. They are effective in providing visual and physical notification to reduce vehicular speed. Flat top humps, also known as **Raised Crosswalks** and **Raised Intersections**, are used for special pedestrian crossings of roadways at mid-block or key intersection locations. They have different geometry than speed humps.

Central Medians- These are another type of vertical deflection to indicate to the driver that the character of a roadway has changed. This can be at the start of a comprehensive traffic calming scheme, a school zone, a commercial area or community entrance. The visual and physical intrusion they represent within the street tends to slow traffic. This can be enhanced by adding other elements such as special surface treatments, pinch points and/or signage and markings. The median width is usually 1-2 metres, with minimum 3.0 metres driving lanes on either side. Medians are usually affective, and publicly acceptable, when used to announce special community areas or features. Another form of median involves **Islands** or **Refuges.** These are wider medians , at least 2 metres in width, that can include

pedestrian-oriented features such as lighting and signage. While Medians and Islands are effective in controlling travel speed, they may require a widening of the street right-of-way to accommodate the geometrics, and assuming sidewalks and boulevard space is also involved. Alternatively, they may require the removal of on-street parking in the narrowed area.

Parking - On-street parking is an effective traffic calming feature because of its visual obstruction and street friction. However, such parking may have to be removed to accommodate the needs of any horizontal deflection measures noted above. A decision whether or not to include on-street parking in a traffic calming scheme depends on a number of related land use, property access and pedestrian considerations.

Bicycle Lanes - As with on-street parking, bicycle lanes can reduce vehicular lane widths and introduce side friction to the street, thereby slowing vehicular speeds. Such lanes may require removal of off-street parking depending on the available lane width. They are not always necessary along low volume residential streets in a neighbourhood. Therefore, their use in traffic calming is usually oriented mainly to collector streets where exclusive cycling lanes are appropriate.

Traffic Circles - Also known as "mini-roundabouts", these raised circles located in the middle of intersections are very effective in slowing travel speeds around the circle. They require specific right-of-way width to reduce speeds, and can create obstacles for large vehicle through the circles.

Traffic Calming Signage - Most traffic calming techniques must be signed for warning and liability reasons. More general "Neighbourhood Traffic Calming" signs can also be prominently displayed at neighbourhood entrances to notify motorists that calming measures have been installed.

Street Closures - Full or partial street closures, usually at intersections, prevent through traffic movements and require access to be provided from other streets. They can also result in diversion of traffic to parallel street, thereby moving the problems rather than solving it. The closed street section will require maintenance with associated costs (i.e. grass mowing, litter cleanup). As an alternative, **Partial Street Closures** and **Diverters** can be used to control traffic patterns through an area. While extremely effective in this control, closures and diverters affect all area

residents, not just the offending traffic, and so may be difficult to implement. They also limit emergency vehicle access within the affected area, and come with maintenance needs and costs . It is important to maintain pedestrian and cycling access through any closed street.

4.8.3 CONSULTATION AND LIABILITY

Neighbourhood traffic management plans considering the traffic calming process and techniques **must** be planned, implemented and monitored as a partnership between residents, the street users (motorists, cyclists, pedestrians, transit users), City staff and politicians, local business, schools, police and other agencies in the neighbourhood, and maintenance and emergency service providers.

Concern can be raised about potential public liability from the introduction of traffic calming. However, it is important to note that in the research leading to production of the new ***Canadian Guidelines To Neighbourhood Traffic Calming***, no successful Canadian claims were found as a result of traffic calming measures. Three successful lawsuits were found in the USA dealing with a speed hump and a curb extension. In the former case, the issue was the lack of proper signage.

Considering the value of traffic calming and the legal record on a lack of successful claims, public liability is not considered an issue as long as traffic calming is treated the same as other aspects of road design and traffic operations.

4.8.4 RECOMMENDED TRAFFIC CALMING APPLICATION: RIVERSIDE DRIVE EAST

Objective

Riverside Drive East is a special roadway within the Windsor area, and can be considered as an example of a traffic calming application (along with other potential applications). Traffic calming must be considered, planned and applied with the knowledge and involvement of the affected community. Therefore, while the WALTS study recommends the following traffic calming considerations on Riverside Drive East, detailed plans must be discussed with the surrounding neighbourhood, preferably as part of a more comprehensive neighbourhood traffic management plan.

As with most Great Lakes cities, for example Duluth, Sault Ste. Marie, Sarnia,

Burlington or Kingston, the Windsor area has historically grown from its original roadway system running parallel to and up from the waterfront. The result in Windsor has been to recognize this historical importance by classifying Riverside Drive East as part of a "Scenic Drive" in the Official Plan.

In addition to this overall community value, Riverside Drive East provides two other important functions. Firstly, it is one of a limited number of continuous east-west roadway corridors in the area. This provides direct access between downtown Windsor and suburban points to the east, extending as far as Tecumseh and St. Clair Beach. Second, Riverside Drive East is not a purely residential street since it provides local access not only to adjacent residences, but also to businesses and public spaces located along the waterfront.

When considering these important roles for Riverside Drive East, the overall objective of traffic calming along this route should be to:

- introduce appropriate traffic calming measures along Riverside Drive East that balance the through traffic needs of this important traffic route for the overall community, while enhancing the residential and waterfront character of and access to adjacent land uses.

Recommended Mechanisms

Any traffic calming or control mechanism which prevents through traffic movement on Riverside Drive East cannot be recommended, owing mainly to the east-west continuity function provided by this road. However, it is possible, using appropriate traffic calming techniques, to encourage through trips to use alternative east-west routes. This can be done by introducing three types of calming mechanisms described as follows:

1. Introduce **raised intersections** and **passive surface treatments** at key pedestrian crossings along Riverside Drive East. At the minor crossings, stamped, coloured pavement with a rough surface and minor vertical deflection that operate as a rumble strip, and visually identify pedestrian crossings. At major crossing, the 80mm vertical deflection of raised intersections would further discourage speeding and running stops. This combination of textured surface, vertical deflection and resulting physical/auditory signals will tend to slow approach and crossing traffic speeds. Key points for installation of these treatments along

Riverside Drive East will be subject to more detailed review and approval.

2. Install active control mechanisms in the form of **curb extensions** on one side of the street at strategic points, to be determined in association with adjacent landowners. Extensions are very effective on straight stretches of roadway in slowing travel speeds. These horizontal "bump-outs" should also be designed as attractive streetscape features, rather than as temporary concrete edges or planters. The result will be to reduce the travel lanes to minimum widths, resulting in the side friction needed to slow traffic. Sidewalks may traverse across the extensions depending on the final cross-section design.

3. Introducing additional visual obstructions into the travelway can reduce the roadway width, thereby creating **"street friction"** that reduces speeds and possibly discourages through traffic. On-street parking is proven to be an effective friction elements on streets.

Operational improvements at key intersections can also be accommodated along with these passive calming treatments. The Environmental Study Report (ESR) for proposed Riverside Drive East improvements includes the introduction of dedicated right turn lanes (eastbound) at George Avenue, Pillette Road, Jefferson Boulevard and St. Rose Avenue intersections. The ESR also proposes new dedicated left turn lanes at Jefferson Boulevard (westbound) and Strabane Avenue (westbound).[4] Introduction of passive surface treatments, together with pedestrian signals at these intersections will not impact on the exclusive turn lane operations. These intersection improvements, plus other major capacity improvements planned for Walker Road and Lauzon Parkway, will all contribute to improved north-south traffic flow from Riverside Drive East to alternative routes along Wyandotte Street, Tecumseh Road and E.C. Row Expressway.

Expected Results

The intent of these recommended traffic calming mechanisms along Riverside Drive East is to reduce the level of through travel convenience along the route. This will in turn encouraging through traffic to use alternative routes, specifically Wyandotte East, and to a lesser extent Tecumseh Road East since it is farther removed from the Riverside/Wyandotte corridor area. This can only be achieved if the north/south

[4] *Riverside Drive East Class EA Screening Report, M.M. Dillon, June 1996.*

linkages between Riverside and Wyandotte have adequate capacity. Existing capacity and operational deficiencies have been noted currently on portions of Walker Road and Lauzon Road between Riverside and Wyandotte. Further deficiencies have been forecasted to occur on Jefferson Road and Pillette Road in the Do-Nothing scenario. Capacity improvements to these and other critical north-south connection routes, as well as to the Wyandotte and Tecumseh east-west corridors will be required if through traffic on Riverside is to be effectively relocated and reduced.

Finally, the planned East Riverside community is expected to place growing traffic demands on Riverside Drive East and Tecumseh Road since they are the peripheral east-west arterials to this development area. The City should emphasis the role of Wyandotte Street east in also providing an additional east-west linkage to and from the development area.

4.9 COMMUNITY TRANSPORTATION

Community Transportation is a general terms describing the combination of transportation services provided by public transportation (either publicly or privately owned, and regular and parallel transit), school transportation, non-emergency health transportation and social service transportation including long-term care. In August, 1996, the Province of Ontario announced the start-up of a new Community Transportation Action Program (CTAP) to assist in the planning and funding of community transportation programs in Ontario.

In response to this provincial initiative, a Community Transportation planning process began in the Windsor/Essex area in early 1996. It was made up of diverse representation from health and social service agencies, the City and County, school boards and public and specialized transportation operators.

Early on in the process, a need to examine local transportation planning issues was identified, and to determine ways of addressing gaps and duplication in providing community transportation services. Most issues surrounded policies and practices, funding and geographic boundaries. In response, a number of Community Transportation policy recommendations are recommended, and form part of the WALTS Master Plan:

- community planning with broad-based community participation should incorporate transportation issues, including those pertaining to service planning, as an important component of the planning process;
- feasible alternative strategies for community transportation should be considered by a joint group of area transportation officials, providers and agencies;
- users of community transportation services should also be consulted periodically regarding emerging issues affecting transportation;
- research should be undertaken by designated Community Transportation management into current services to determine the feasibility of future alternative routing mechanisms;
- Furthermore, optional methods to provide services, eliminate barriers, form partnerships, increase ridership, make more effective use of existing resources and coordinate/simplify service requests should be pursued.

4.10 MASTER PLAN IMPLEMENTATION

4.10.1 PLAN MONITORING AND REVIEW

The WALTS Transportation Master Plan is not a static document. It must be regularly reviewed to ensure it is meeting the transportation needs of the City and surrounding municipalities. Changing growth and development patterns may also require a re-investigation of the Study's technical framework (Section 2). This should be done as follows:

- A coordinated report on "The State of the Transportation System" should be submitted annually by City administration to the City's Planning Advisory Committee and City Council, and by the County administration to County Council. This report should include joint input from:
  - Traffic Engineering Department (traffic growth, roadway network and traffic management operations);
  - Public Works Department/County Engineering Department (roads, sidewalks and on-road cycling);
  - Transit Windsor;
  - Parks and Recreation Department (trails & off-road cycling);
  - the City and County Planning Departments (growth and density);
  - Cycling Advisory Committees of Council, Sidewalk Action Team (LaSalle) and other community transportation-related agencies;
  - the Ambassador Bridge and Detroit/Windsor Tunnel management;
  - the Windsor Airport Management;
  - the Windsor Harbour Commission,
  - the Essex Terminal Railway (with input as required from mainline railroad companies);
  - Ministry of Transportation (re: Highway 401 and connecting links) and;
  - the Community Transportation management.
- The City and County should require that annual transportation system improvement budgets for all modes be coordinated and prepared jointly by all involved transportation agencies noted in the preceding list. The objective should be to maximize effectiveness, efficiencies and economies of scale in the provision of transportation services.
- To address transportation issues on an annual and consistent basis, this "State of

the Transportation System" report should document:

- results of an annual traffic count program at selected key intersections and routes;
- new trends and technologies in traffic operations and management;
- private sector initiatives in TDM measures (i.e. car pooling, transit incentives, preferential parking, flexible hours, telecommuting);
- status and progress towards transportation system performance targets recommended in the WALTS Master Plan;
- status of related provincial initiatives, policies and funding programs, and;
- the need to re-assess, amend or update components of the WALTS Transportation Master Plan.

- As part of the monitoring process, at 5 year intervals starting with approval of the new Windsor *Vision In Action* Official Plan Update, a statistically valid household travel survey of 3-4% of the total WALTS area households should be conducted in the Windsor area (similar to the 3.3% household survey in 1997) to update trip making characteristics and collect input on public attitudes about the area's transportation system. The first survey update should occur in association with the next concurrent WALTS Transportation Study update so that results can be fed into this Study update. Survey results should be combined with Transit Windsor ridership statistics to form a comprehensive, current picture of transportation mode patterns in the Windsor area.

- Starting with Windsor's *Vision In Action* Official Plan update, the WALTS Transportation Study should be updated in conjunction with each Official Plan update, based in part on the results of the above-noted travel survey, including full public consultation. The timing and extent of such reviews should remain flexible based on City and County needs at the time of Official Plan updates.

4.10.2 INCORPORATION INTO OFFICIAL PLAN POLICIES

The recommendations of this Transportation Study should be incorporated as background information into Windsor's *Vision In Action* Official Plan, and where required in the County and neighbouring municipality Official Plans. In this way, the Official Plans will provide the statutory basis on which to implement major WALTS Study recommendations. Specific policy sections recommended for amendment or inclusion in these Official Plans are:

Transportation Goals

Update Official Plan transportation and land use goals to incorporate this Plan's land use control strategy recommended in Section 4.1.

Transportation Objectives

The Transportation Objectives established for WALTS can be included as the Transportation Planning Principles for Official Plans.

Functional Roadway Classification

Roadway classifications in WALTS area Official Plans should incorporate "Long-Term Corridor Protection" areas subject to further corridor route planning and environmental assessment.

Roadway Planning, Design and Implementation

Any reference to Level-Of-Service standards in Official Plans, other statutory policies or transportation-related plans and studies must be amended to maintain a minimum peak hour Level-Of-Service "E" on Class II Arterial and Class I and II Collector Roads, and Level-Of-Service "D" on Class I Arterial Roads and Expressways.

Any reference to future roadway system improvement planning and programming must include the recommended priorities of the WALTS Master Plan (see Table 4.2).

Public Transportation

Although it is not advisable to include a specific transit ridership target in Official Plans, any reference to transit ridership should recognize the recommended WALTS target to double the transit mode split from 3 to 6% of all trips in the PM peak period, with an associated increase in transit ridership between 1996 and 2016.

Bicycle Policies

It is recommended that the Bikeway and Recreationway Master Plan be updated in 1999 to reflect changes in routing implementation and planning made since approval of the original Master Plan 1990. Emphasis should be placed on portions of the Master Plan routing that have not been implemented to date, plus priority for overall Plan implementation through education, enforcement and encouragement initiatives.

Pedestrian Policies

Official Plans should include policy statements supporting continued development of walkways and sidewalks in support of safe, convenient pedestrian movement. This includes the provision of sidewalks on both sides of arterial and collector streets, on at least one side of local residential streets and on other streets where pedestrian activity is expected and invited. Policies should also support the inclusion of landscaping and streetscaping features in areas of high pedestrian activity. Transit planning should include consideration of reasonable walking distances to stops through sidewalk, walkway and pathway systems. Pedestrian crossing of major barriers, such as railways and expressways, should be comprehensively planned and integrated with crossings for other modes (streets, bikeways).

Airport Policies

Policy statements should be included in the appropriate Official Plans supporting the provision of convenient roadway capacity and Level-Of-Service to the airport from the surrounding roadway system, including the recommended Lauzon Parkway extension and possible Jefferson Boulevard extension.

Policy statements should also support the preservation of intermodal transportation opportunities at the airport site involving the airport, associated roadway system and the St. Lawrence and Hudson railway mainline.

Marine Policies

The importance of transportation links to marine facilities should be noted in Official Plan policy. This includes roadway routes to the Port of Windsor area to the west, and road, cycling and pedestrian links to waterfront lands along Riverside Drive East and West.

Rail Policies

As the Windsor area rail system continues to be rationalized, planning policy should support alternative uses for abandoned rail lines. Alternative transportation opportunities should be the first priority, depending on the geometrics and potential function of such lands. Furthermore, any policies supporting continued operation or expansion of rail service within the WALTS area should be conditional on

minimizing associated impacts on the area's roadway, cycling and pedestrian systems.

Cross-Border Transportation Policies

Policy statements should be made supporting the provision of cross-border traffic capacity capable of meeting future traffic needs. It is imperative that such policies also reflect the need for associated connecting link capacity within the WALTS roadway system (for example through the options and actions recommended in Section 4.6.4 of the WALTS Master Plan).

Transportation Master Plan Monitoring and Review

The WALTS Transportation Study and Master Plan should be monitored annually on its effectiveness in providing guidance and a technical basis for transportation and related decision-making in the WALTS area. The Master Plan should also be updated in conjunction with the Windsor and surrounding area Official Plans based on transportation system needs.

Travel Demand Forecasting and Traffic Impact Analysis

It is important to stress that when incorporating this WALTS Study into Official Plans, if any significant changes are made to City and/or area growth projections and fundamental land use policies, an associated updating of the Study's technical framework should also be required. This would entail re-running the travel demand forecasting model with the new growth data, re-establishing system deficiencies and evaluating alternative solutions. A policy requiring this type of traffic impact analysis for any change in any of the City and area's fundamental land use policies, or major land use redesignation, should be included in the Official Plans. The policy should further require the preparation of traffic impact studies for development proposals deemed to be significant by the City or County.