

REGION OF OTTAWA-CARLETON
RÉGION D'OTTAWA-CARLETON

REPORT
RAPPORT

Our File/N/Réf. **50 12-00-46**
 Your File/V/Réf.

DATE 27 January 2000

TO/DEST. Co-ordinator
 Transportation Committee

FROM/EXP. Director Engineering Division
 Environment and Transportation Department

SUBJECT/OBJET **WOODROFFE AVENUE BUS-ONLY LANES**
 BASELINE STATION TO THE NEPEAN SPORTSPLEX
 PRELIMINARY DESIGN

DEPARTMENTAL RECOMMENDATION

That the Transportation Committee recommend Council approve the preliminary design for the Woodroffe Avenue Bus-Only lanes between Baseline Station and the Nepean Sportsplex.

EXECUTIVE SUMMARY

In 1993, the Region of Ottawa-Carleton initiated the Environmental Assessment (EA) Study for the extension of the Southwest Transitway. Regional Council approved the study in March 1996, which was subsequently approved by the Province of Ontario on 06 October 1999.

The study found that the Woodroffe corridor was the most appropriate location to implement improved transit measures and also recognized that a staged implementation of transit improvements may be necessary. The study recommended that bus-only lanes be constructed as an interim staging option between Norice Street and the Fallowfield Park and Ride (Transit Station).

The existing roadway is a major 4 lane urban arterial from the north limit of the project at Baseline Station to the Nepean Sportsplex and is divided by a median over most of this section. The posted speed limit is 60 km/h. This report addresses the urban section from Baseline Station to the Nepean Sportsplex. The rural section from the Sportsplex to the Fallowfield Transit Station entrance is still under study and will be presented at a later date.

This project proposes the construction of southbound bus-only lanes (BOLs) from Baseline Station to the Nepean Sportsplex (2.7 km.) and northbound BOLs from the Nepean Sportsplex to the Ottawa Central Railway (OCR) structure north of Medhurst Drive (1.6 km.). (See Fig. 1) The provision of BOLs along Woodroffe Avenue will be accomplished by a widening of the existing asphalt pavement to new curbs and sidewalks. The traffic signal plant and the existing streetlighting will need to be reconfigured. The project will also provide an opportunity to include on-road cycling facilities as identified in the Region's Cycling Transportation Network

The widening will be 5.3 m., a 3.5 m. BOL and a 1.8 m. bicycle lane. When the level of service on Woodroffe becomes unacceptable due to the increased traffic volumes, then the BOLs will be converted to mixed use traffic. The level of service on Woodroffe will need to be monitored such that timely planning can begin for the implementation of the Transitway construction. The bicycle lanes will be delineated from the BOL by a solid painted line with the exception of a dashed line at intersections and bus stops. This will provide a consistent facility to the cyclist, both in terms of appearance and dimension, with the bicycle lanes on Hunt Club Road.

The piers of the Ottawa Central Railway structure north of Knoxdale Road will be protected by continuous concrete Jersey barriers, and the alignment will be slightly narrowed at the bridge location in order to provide standard clearances for the through lanes.

The existing pole mounted 44,000V primary line owned by Nepean Hydro along the east side of Woodroffe Avenue has insufficient setback and will need to be relocated behind the future sidewalk between Medhurst and the Nepean Sportsplex prior to construction.

The Woodroffe and Meadowlands intersection was analyzed to compare alternative intersection designs both 'with' and 'without' pedestrian (traffic) islands. It was found that the design alternative with the islands is preferred. Accordingly, the staff recommendation is that each intersection currently configured with pedestrian islands will retain pedestrian islands in the proposed design.

At the 26 May 1999 meeting of Council, a motion was moved by Councillor Hunter which stated: "... High Occupancy Vehicle (HOV) usage be considered in the design assignment for the bus only lanes and a report go to Transportation Committee". A detailed report addressing this motion is attached as Appendix 'A'. The staff recommendation is that the bus-only lanes should be for the exclusive use of buses and not shared with HOVs.

It will be necessary to acquire property fronting onto Woodroffe Avenue at several locations between Knoxdale and Hunt Club. It is expected that expropriation proceedings will be necessary in some cases. Discussions have also been initiated with the National Capital Commission to acquire property south of Hunt Club to the Sportsplex.

The staging of the construction is planned as follows:

- Baseline Station to Knoxdale Road - 2000
- Knoxdale Road to Nepean Sportsplex - 2001 (or 2002 if the property acquisition is delayed)

In the event that the minor property acquisition requirements are met prior to tender, it is intended to include the northbound lanes between Majestic Drive and Medhurst Drive for construction in 2000.

WOODROFFE AVENUE BUS-ONLY LANES			
BASELINE STATION TO THE NEPEAN SPORTSPLEX			
SUMMARY OF ESTIMATED COSTS			
	Baseline Stn.	Knoxdale Rd.	
	To	To	TOTAL
	Knoxdale Rd.	Sportsplex	
	\$	\$	\$
Construction	1,878,000	2,255,000	4,133,000
Utility relocations	545,000	1,301,000	1,846,000
Construction contingency (10%)	242,000	355,000	597,000
Engineering	180,000	295,000	475,000
Project Management	535,000	785,000	1,320,000
Project Contingency (5%)	170,000	257,000	427,000
GST	249,000	367,000	616,000
TOTAL	3,799,000	* 5,616,000	* 9,415,000

Construction costs are in 2000 dollars and do not take into account the inflationary trends in the construction industry. Utility relocation costs are estimates only and are subject to variation dependent upon actual billings from the utility companies. Engineering and project management costs are percentages of construction costs based upon accumulated historical data.

* Excluding property – firm property costs are not available prior to concluding transactions.

Extensive public and agency consultation was carried out as an integral part of the Environmental Assessment process. In addition, notice of the Public Hearing for the proposed bus-only lanes project on Woodroffe Avenue between Baseline Station and the Nepean Sportsplex has been placed in Le Droit, the Ottawa Citizen and the Ottawa Sun for four consecutive weeks commencing 14 January 2000.

An Open House was held at the Nepean Sportsplex on 01 December 1999. A subsequent meeting was held on 17 January 2000 at the Tanglewood Community Centre

The Regional Cycling Advisory Group (RCAG) was consulted on the proposed cross-section for the project (3.5 m. BOL and a 1.8 m. bicycle lane). Due to the constrained right-of-way, RCAG concurred with a narrower section for the bike lane (1.8 m.) in the urban section of the project.

BACKGROUND

In 1993, the Region of Ottawa-Carleton initiated the Environmental Assessment (EA) Study for the extension of the Southwest Transitway. The purpose of the study was to determine if there was a need to provide upgraded transit facilities and improved transit service to accommodate the substantial growth in the South Urban Community.

On 27 March 1996, Regional Council approved the recommendations of the EA study, which was subsequently approved by the Province of Ontario on 06 October 1999.

The approved study concluded that improved facilities are required to satisfy the transit objectives of the Region's Official Plan. A series of alternatives were developed, evaluated and documented in accordance with the EA procedure. Based on effectiveness, cost and environmental impacts, the Woodroffe corridor was found to be the most appropriate location to implement improved transit measures.

The study also recognized that a staged implementation of transit improvements may be necessary in this corridor and recommended that bus-only lanes be constructed as an interim option between Norice Street and the Fallowfield Park and Ride (Transit Station). This project will extend the northerly limit of the study recommendation from Norice Street to Baseline Station under the 'Significant Modification' process - a mechanism for change specifically provided for in the EA document. As a result, it is proposed that bus-only lanes will be constructed between Baseline Station and the proposed Fallowfield Transit Station as an interim staging option.

Implementation of this project will improve transit services to the residents of the neighbourhoods adjacent to Woodroffe Avenue and the South Urban Community, meet the objectives of the Transportation Master Plan and the Region Official Plan and promote increased transit ridership. OC Transpo has indicated that not only will the bus-only lanes improve bus travel times and service reliability for transit users, but will reduce operating costs.

EXISTING CONDITIONS

The existing roadway is a major north-south 4 lane urban arterial from the northerly limit of the project at Baseline Station to the Nepean Sportsplex and is divided by a median over most of this section. The posted speed limit is 60 km/h.

Immediately south of the Sportsplex, the roadway transitions from a 4 lane urban to a 4 lane rural section to Slack Road and thence into a 2 lane rural cross-section to the southerly terminus of the project at the Woodroffe entrance to the Fallowfield Transit Station. The posted speed limit changes to 80 km/h. at Slack Road.

This report only addresses the urban section of the Southwest Transitway from Baseline Station to the Nepean Sportsplex. Design and funding issues for the rural section from the Sportsplex to the Fallowfield Transit Station entrance are still under study and therefore this section will be presented at a later date.

There are three major intersections on Woodroffe Avenue within the project limits located at Meadowlands Drive/Tallwood Drive, Knoxdale Road/Medhurst Drive and Hunt Club Road. There are two minor intersections at Norice Street and Majestic Drive. Turn lanes are provided at each signalized intersection. On the southbound approach to Hunt Club Road, double turn lanes are provided. Woodroffe Avenue passes under the Beachburg Subdivision of the Ottawa Central Railway (formerly Canadian National) line between Norice Street and Knoxdale Road.

There are 12 off-peak bus routes which serve the Woodroffe Avenue corridor. Three northbound buses originate in Barrhaven and the number gradually increases as buses from adjacent arterial roads join Woodroffe enroute to Baseline Station. Eight additional buses are added during the peak period of which five originate in Barrhaven. There are 31 northbound buses leaving Barrhaven in the morning peak period, a number which increases to 61 at the Baseline Station. There are 59 southbound buses leaving Baseline Station in the afternoon peak period, a number which decreases to 25 crossing the Greenbelt to Barrhaven.

PROPOSED DESIGN

This project proposes the construction of southbound bus-only lanes (BOLs) from Baseline Station to the Nepean Sportsplex (2.7 km.) and northbound BOLs from the Nepean Sportsplex to the Ottawa Central Railway (OCR) structure north of Medhurst Drive (1.6 km.). (See Figure 1) The northbound lane will tie into the existing BOL from the OCR structure to David Drive, which is one block north of Meadowlands Drive. The northbound lane is not required north of David Drive since bus traffic is shifting into the through lanes in order to make the northbound left into Baseline Station.

The provision of BOLs along Woodroffe Avenue will be accomplished by a widening of the existing asphalt pavement to new curbs and sidewalks. The widening will necessitate reconfiguration of the geometry at each intersection, which will require alterations to the traffic signal plant. The existing streetlighting will also need to be reconfigured to maintain appropriate illumination levels for the widened pavement. The project will also provide an opportunity to include on-road cycling facilities as identified in the Region's Cycling Transportation Network

The recommendation of the design team was that a widening of 5.3 m. should be specified, a 3.5 m. BOL and a 1.8 m. on-road bicycle lane. The analysis considered that ultimately the BOL would be converted to mixed use traffic. The bicycle lanes will be delineated from the BOL by a solid painted line with the exception of a dashed line at intersections and bus stops. This will provide a consistent facility to the cyclist, both in terms of appearance and dimension, with the bicycle lanes on Hunt Club Road.

The piers of the Ottawa Central Railway structure north of Knoxdale Road will be protected by continuous concrete Jersey barriers, and the alignment will be slightly narrowed at the bridge location in order to provide standard clearances for the through lanes. The design proposal has been modified to address all concerns raised by the Ottawa Central Railway, the new owners of the old CN Beachburg subdivision track.

Due to the proposed widening, the existing pole mounted 44,000V primary line which is owned by Nepean Hydro along the east side of Woodroffe Avenue has insufficient setback. The line will need to be relocated behind the future sidewalk between the Esso gas station at Medhurst to the south limit of this project at the Nepean Sportsplex prior to construction. Also, due to the location of the existing streetlight poles, new streetlighting will be required to maintain the required illumination levels across the widened pavement and will be achieved by double davit poles in the median.

As an integral part of the design process, the intersection of Woodroffe and Meadowlands was analyzed to compare the efficiency of alternative intersection designs both 'with' and 'without' pedestrian (traffic) islands.

It is recommended that the design alternative with the islands be adopted since:

- An intersection without pedestrian islands:
 - requires longer cycle lengths;
 - results in increased pedestrian waiting time;
 - provides less pedestrian crossing time, and
- An intersection without pedestrian islands requires placing pedestrian signals beyond the maximum distance from curb to curb thus creating visibility problems.
- Due to the longer crossing distances, additional signal heads will be needed on the median. This will encourage pedestrians to stop and wait for the green signal on the median – this is an unsafe practice.
- Due to the longer distances to be spanned, an intersection without pedestrian islands will incur additional costs for signal plant hardware of approximately \$3,000 per intersection.
- Since an intersection without pedestrian islands will need a longer pedestrian clearance interval, this will lead to less flexibility in providing signal priority to buses.

The staff recommendation is that each intersection currently configured with pedestrian islands will retain pedestrian islands in the proposed design.

HIGH OCCUPANCY VEHICLES (HOV)

At its meeting of 26 May 1999, Regional Council approved the contract awards for Consultant assignments for this project. The following motion moved by Councillor Hunter was added to the report recommendations:

“Whereas the current volume of traffic on Woodroffe is reaching a critical level; and whereas there is no provincial support to deal with the road needs in South Nepean; be it resolved that High Occupancy Vehicle (HOV) usage be considered in the design assignment for the bus-only lanes and a report go to Transportation Committee”.

A detailed report has been prepared to address the issue of allowing high occupancy vehicles (HOVs) to share the bus-only lanes and is attached as Appendix ‘A’.

The staff recommendation is that the bus-only lanes should be for the exclusive use of buses and not shared with HOVs. The short term benefit of bus lanes is their ability to provide reliable and fast transit service to the south urban community. The long term benefit of bus lanes is their ability to attract future travel growth.

A high quality transit service can be provided by:

- providing dedicated bus lanes to eliminate delays caused by congestion;
- providing signal priority measures to minimize traffic signal delay.

Allowing HOV use of the bus lanes would reduce the short term, and especially the long term, benefits of the bus lanes for marginal short term benefits of the HOV lanes.

a) HOVs would adversely affect bus operation both in the short and long term because HOVs would:

- Contribute to additional transit delay by limiting the application of signal priority measures;
- Contribute to additional transit delay at intersections due to vehicular queues;
- Contribute to additional transit delay to causing more collisions in the HOV lane, especially in peak hours;
- Invite violation and thus more congestion, (violation of HOV lanes is much more likely than violation of BOLs);
- Make enforcement difficult and inefficient, (darkness, tinted windows)

b) The long term benefits of allowing HOVs to use the newly constructed lanes are very limited because:

- HOV lanes would not encourage the formation of new carpools - the time required to form the carpool by picking up the riders within the neighbourhood is longer than the

time saved by using the HOV lane;

- HOV lanes would end at congested intersections and would create operational and safety problems;
- HOV lanes would contribute very little to solve capacity and delay problems - they would merely move queues and delays from one intersection to another.

c) The short term benefit of allowing HOVs into the newly built lanes are mostly perceptual such as:

- HOVs will alleviate the “empty lane syndrome”;
- HOVs will “increase the vehicle and person carrying capacity of the facility”;
- HOVs will “improve conditions” for motorists.

In summary, in the Woodroffe corridor, the short and long term benefits of bus-only lanes outweighs the short term benefits of HOV lanes. The Region’s Transportation Master Plan foresees a limited role of HOVs in the Region and does not suggest HOV application in corridors with high level of transit service. Downgrading of busways to HOV facilities has virtually eliminated exclusive busways as a viable, high quality transit system. (See Appendix ‘A’)

PROPERTY REQUIREMENTS

As identified in the Environmental Study Report, the implementation of the BOLs between Baseline Station and the Nepean Sportsplex is to a large degree dependent upon the acquisition of both private and public property.

Several private properties are affected in the section between Knoxdale Road and Hunt Club Road. In each case, it will be necessary to acquire property fronting onto Woodroffe Avenue where, based upon earlier contact with the parties concerned, it is expected that expropriation proceedings will be necessary.

- CCC #298 - acquisition of a part approximately 1.5 m. wide.
- Triole Investments - acquisition of a part varying from 1.0 to 1.5 m. wide
- Manor Village - acquisition of a part varying from 1.2 to 4.8 m. wide.

There are other minor requirements for property from Ontario Hydro in this section. Other property is currently owned by the Region.

There are property requirements between Hunt Club Road and the Nepean Sportsplex where the property is either owned by the National Capital Commission or Agriculture Canada whose real estate transactions are managed by the National Capital Commission. Discussions have been initiated with NCC in this regard.

STAGING/CONSTRUCTION SCHEDULE

Based upon the constraints imposed by the acquisition of property and the possible delay resulting from the conclusion of acquisition negotiations, the staging of the construction is planned as follows:

- Baseline Station to Knoxdale Road 2000
- Knoxdale Road to Nepean Sportsplex 2001 (or 2002 if the property acquisition is delayed)

In the event that the minor property acquisition requirements are concluded prior to tender, it is intended to include the northbound lanes between Majestic Drive and Medhurst Drive for construction in 2000. This will allow timely replacement of the existing 200 mm watermain which has suffered several recent breaks.

COST ESTIMATE

WOODROFFE AVENUE BUS-ONLY LANES			
BASELINE STATION TO THE NEPEAN SPORTSPLEX			
SUMMARY OF COSTS			
	Baseline Stn.	Knoxdale Rd.	
	To	To	TOTAL
	Knoxdale Rd.	Sportsplex	
	\$	\$	\$
Construction	1,878,000	2,255,000	4,133,000
Utility relocations	545,000	1,301,000	1,846,000
Construction contingency (10%)	242,000	355,000	597,000
Engineering	180,000	295,000	475,000
Project Management	535,000	785,000	1,320,000
Project Contingency (5%)	170,000	257,000	427,000
GST	249,000	367,000	616,000
TOTAL	3,799,000	* 5,616,000	* 9,415,000

* Estimate excluding property – firm property costs are not available prior to concluding transactions.

CONSULTATION

Notice of the proposed bus-only lanes project on Woodroffe Avenue between Baseline Station and the Nepean Sportsplex has been placed in Le Droit, the Ottawa Citizen and the Ottawa Sun for four consecutive weeks commencing 14 January 2000.

Extensive public and agency consultation was carried out as an integral part of the environmental assessment process.

In order to implement the BOL option north of Norice Street, the procedure for a significant modification to the project, as specifically provided for in the approved EA document, requires that the affected residents be consulted. Accordingly, an Open House was held on 01 December 1999 at the Nepean Sportsplex which provided an opportunity for residents affected by the modification to comment on the proposal.

Sixteen people attended the Open House, three of whom left comment sheets expressing positive remarks on the proposed work. Subsequent to the meeting, staff received electronic mail from one resident on Birchview Road in Ryan Farm who was concerned about:

- 1) Noise;
- 2) Vibration;
- 3) Action by the Region regarding the placement of additional regulatory signs;
- 4) Removal of the existing bus shelter at Parkglen Crescent.

Response:

- 1) A supplementary noise analysis carried out at the Birchview Road location following the meeting found that in accordance with current Regional policy that mitigation measures are not warranted;
- 2) A seismic analysis carried out at this property on the 17th and 18th January 2000, concluded that traffic-induced vibration at the Birchview Road location is slightly perceptible to the average person for vibration levels recorded during the monitoring period, but is below levels capable of causing architectural or structural damage. Based on all observations, maintenance measures on Woodroffe Avenue will not mitigate the vibrations that were measured;
- 3) Safety and Traffic Studies Branch have advised that a regulatory sign will not be placed prohibiting 'stopping to drop off' in the northbound right turn lane into Algonquin campus.
- 4) OC Transpo have indicated that the bus shelter is scheduled to be removed following a notice to the affected community.

A subsequent meeting was held on 17 January 2000 at the Tanglewood Community Centre where the project details and requirements for future property acquisition were presented to approximately 25 residents of Carleton Condominium Corporation #298. The Region can expect that expropriation proceedings will be necessary at this location.

REGIONAL CYCLING ADVISORY GROUP (RCAG)

The RCAG was consulted to solicit an opinion on the proposed cross-section for the project (3.5 m. BOL and a 1.8 m. bicycle lane). RCAG indicated that since the right-of-way is severely constrained, they would concur with a narrower section for the bike lane (1.8 m.) in the urban section of the project. However, where there were no constraints in the future rural section south of the Sportsplex, they would pursue a wider (2.5 m.) section.

*Approved by
J. Miller, P.Eng.*

HOV IN THE WOODROFFE CORRIDOR

Introduction

To accommodate the increasing travel demand between the rapidly expanding south urban community and the urban area within the Greenbelt, there is a need to increase the person carrying capacity of Woodroffe Avenue.

This report will analyze two alternatives. The first alternative is to allow High Occupancy Vehicles (HOV) to use the new lanes. In this case, any vehicle carrying a specified minimum number of occupants could use the lanes. The second alternative is to design and operate the new lanes as Bus-Only Lanes (BOL).

The HOV Option

HOV Experience Elsewhere

Most HOV applications in the US are on freeways and in urban areas which are substantially different from the Region of Ottawa Carleton. The most extensive *arterial* HOV network is probably in Toronto. One important difference between Toronto and the Woodroffe corridor is that in Toronto, most HOV lanes were created by conversion and *not* by new construction.

Building new lanes for HOVs in the Woodroffe corridor would not be a typical HOV application because:

- The HOV lanes would be along an arterial road and not on a freeway;
- The new lanes would not connect to other HOV lanes;
- HOV lanes would be used in a corridor with high transit modal share;
- The new facility would be shorter than what is required to encourage carpooling.

The Transit Perspective

From the transit perspective, facilities restricted to buses-only are always preferable. Bus-only facilities, if properly designed and enforced, provide reliable and fast transit service. It has been observed in many cases that buses in separate lanes attract choice riders, while most bus services in mixed flow lanes have mostly captive riders.

It is recognized, however, that there are corridors where justifying a separate bus-only facility is not possible. In corridors where transit has a relatively small modal share and where there are no aspirations to increase it, transit only facilities are difficult to justify. Clearly, this is not the case for the Woodroffe corridor.

Time Saving for HOVs - The Incentive to Carpool

HOV lanes can contribute to a more efficient transportation system only if they encourage more people to carpool. If HOV lanes are used mainly by existing carpools, they only encourage the redistribution of vehicles into different lanes depending on the number of occupants.

One of the main incentives to carpool is travel time saving. The potential time saving by travelling in HOV lanes must be more than the time needed to form carpools. A number of studies suggest that, in order to generate new carpool, a five minute time saving is considered a minimum, and a saving of at least eight to ten minutes considered desirable (McCormick, 1999, MTO 1993; Fuhs, 1990).

During the morning peak period the average travel times from Fallowfield Road to Hunt Club Road is 3-4 minutes and from Fallowfield Road to Meadowlands Drive is from 6 to 8 minutes. Saving 8-10 minutes on a trip of 8 minutes is impossible. Therefore, the time saving is insufficient to generate new carpools.

Occupancy Violation and Enforcement

Occupancy violation has been an issue on most HOV facilities, especially on arterial roadways. A number of studies show that the violation rate is high and regular and even continuous enforcement is essential for successful operation (The Municipality of Metropolitan of Toronto, 1995; McCormick Rankin Pty., Ltd., 1999, ICARO, 1999).

Violation of HOV lanes is much more likely than the violation of bus-only lanes. Enforcing occupancy restrictions on HOV lanes has the following additional problems (compared to enforcing bus-only lanes):

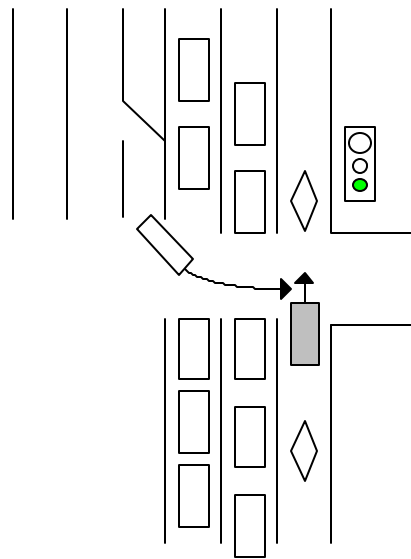
- monitoring vehicle occupancy in darkness,
- observation of vehicles travelling at higher speeds,
- use of tinted windows,
- difficulty detecting small passengers/children,
- use of “dummies”,
- motorists’ confusion used as an excuse in the courts,
- lack of space to stop vehicles for enforcement.

Past experience has shown that HOV lanes in arterial corridors do not get sufficient enforcement. If the lanes are used only by buses, certain design elements and signage could be used to discourage violation.

Safety Issues

In Toronto, an increased collision experience had been reported along the HOV lanes. The collision frequency increased along most HOV 3+ lanes (Bahar, 1998). Most of the collisions (74 %) were connected to left turns. This type of collision occurs when a left turning vehicle - into a street, plaza or driveway- gets “waived through” by the two lanes of opposing vehicles which are stopped due to congestion (Figure 1). Left turning vehicles collide with approaching vehicles in the free-flowing HOV lane. This type of collision is much less frequent if only buses are allowed to use the HOV lane. Approaching buses, due to their size, are easily noticed by drivers making the left turn.

Figure 1: Collisions involving left turning cars and cars in the HOV lane



BOL Option

Justification

Route 95, a high frequency Transitway route (4-8 min. headways), is planned to be extended from Baseline Terminal to the Fallowfield Terminal.

Currently, the congestion along Woodroffe Avenue causes bus delays and large travel time variability (6-12 min. from Fallowfield to Baseline Station). These two factors limit transit's potential to attract more passengers. Furthermore, high travel time variability prevents extending

Route 95 to the Fallowfield Transit Terminal. The new lanes must provide Transitway-like service if Route 95 is to be extended.

Bus only lanes are essential components of the future Park & Ride facility. Other major Park&Ride facilities in the Region (Kanata and Orleans) also have dedicated bus lane connection to the Transitway.

Current peak period transit modal share in the Woodroffe corridor is high (35-45%). Bus and transit passenger volumes are sufficient to justify dedicated bus-only lanes along Woodroffe Avenue. During the morning and afternoon peak hours, bus volumes are between 25-60 buses/hour depending on the location within the corridor. The number of transit passenger volumes varies between 800-1,500 per hour. Car volumes are approximately 900-1,100 per lane which is equivalent to 1,100-1,320 passengers/lane. During the critical period, therefore, buses already carry almost as many or more passengers than cars in one lane.

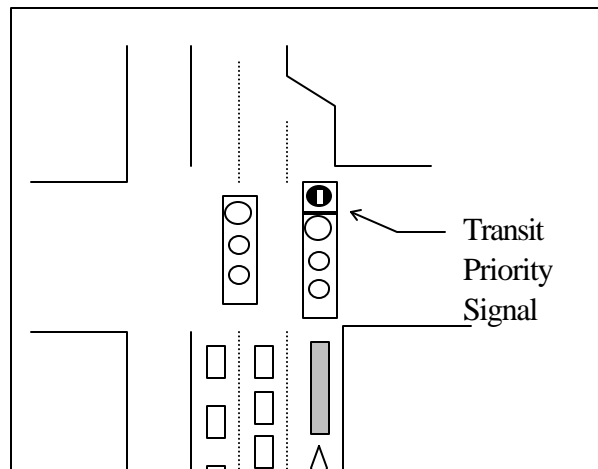
During the peak hours, intersections on and adjacent to the Woodroffe corridor operate close or at capacity. Increasing vehicular capacity on a relatively short section of a roadway by allowing HOVs will move the queue from one intersection to another, but will not significantly change the vehicular or person carrying capacity of the network.

Operation

Successful bus priority treatment includes both dedicated right of way and signal priority measures. Carpools would prevent or limit the application of signal priority measures.

The construction of the new lanes from the Baseline Transitway station to Fallowfield Park & Ride will occur in stages and will take a number of years. The most critical part between Hunt Club and Knoxdale will probably be completed last. Before the entire facility is completed, signal priority at the entrances to the bottleneck would be necessary. This is only possible if the additional lanes leading to the bottleneck are used only by buses (Figure 2).

Figure 2: Implementing the Transit Priority Signal at bottlenecks



Policy Issues

The HOV concept (excluding bus-only facilities) emerged in the USA. There has been a big difference between transportation policies in US cities and the transportation policy in Ottawa-Carleton. As a result, the average transit modal share in Ottawa-Carleton is around 15 %, compared to 1 to 5 % in most US cities. The HOV concept, which may be appropriate in an almost completely car based society (US urban areas) might not be appropriate in an urban area where transit has a significant modal share and big aspirations (Ottawa-Carleton).

The short term disbenefit of slightly lower person carrying characteristic of a BOL facility (since HOVs are denied to utilize the space between buses) will be compensated by the long term ridership gain of a reliable transit system.

In a study analyzing the conversion of bus lanes into HOV lanes, Vuchic (1995) concludes that “the empty lane syndrome based on the fallacious belief that filling the lanes does not have any negative impacts on buses, has resulted in degradation of bus service... The conversion of busways to HOV facilities has had major negative impacts from the transportation system policy point of view for two reasons. First, the common ‘transit incentive/auto disincentive’ package, used successfully in many countries, has been gradually converted into a far more expensive and less efficient ‘transit incentive/auto incentive’ package. And second, **downgrading of busways onto HOV facilities has virtually eliminated exclusive busways as a viable, high quality transit system.**”

The Transportation Master Plan foresees a limited role of HOV lanes and does not recommend it for a corridor with high transit modal share.

Conclusions

In case of the Woodroffe corridor, the bus-only lane alternative is the preferred option because:

- Transitway like service along Woodroffe corridor is essential to make the Fallowfield Park & Ride facility attractive. Transitway like service requires dedicated bus lanes and signal priority measures;
- Some signal priority measures, such as displaying the Transit Priority Signal, cannot be used if HOVs are allowed to use the facility;

- HOV lanes in the Woodroffe corridor have no or very little potential to encourage carpooling;
- Combating the “empty lane syndrome” by allowing HOV’s into a bus lane would be detrimental to the quality of transit service and transit ridership in this corridor;
- The HOV concept in the this corridor would have a negative impact on safety.

References:

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Charles A. Fuhs: **High Occupancy Vehicle Facilities, Current Planning, Operation and Design Practices**, Parsons Brinckerhoff Quade & Douglas, Inc, October 1990

Figure 1

