

REGION OF OTTAWA-CARLETON
RÉGION D'OTTAWA-CARLETON

REPORT
RAPPORT

Our File/N/Réf. **50 20-00-0081**
Your File/V/Réf.

DATE 02 June 2000

TO/DEST. Co-ordinator Transportation Committee

FROM/EXP. Director Mobility Services and Corporate Fleet Services
Environment and Transportation Department

SUBJECT/OBJET **WOODROFFE AVENUE TRANSPORTATION STUDY**
FINAL REPORT

DEPARTMENTAL RECOMMENDATION

That Transportation Committee recommend Council:

- 1. Receive the Woodroffe Avenue Transportation Study Final Report, as produced by Stantec Consulting;**
- 2. Approve staff's recommendations (Annex B) on the recommendations contained in the final report and summarized in its Executive Summary (Annex C);**
- 3. Approve that staff encourage local school boards to participate in the Ottawa-Carleton Safety Village programme, to educate children about traffic safety and rules of the road.**

BACKGROUND

In April 1998, Environment and Transportation Department staff produced a report on traffic calming which responded to increasing requests for Regional road traffic calming studies. The report, in addition to requesting direction from Transportation Committee which would help define traffic calming on Regional roads, identified needs and requirements to undertake such studies. In response to the report, Transportation Committee on 20 May 1998 and Council on 10 June 1998 approved traffic calming studies for three Regional road corridors, one of which included the Woodroffe Avenue corridor between the Queensway and the Ottawa River Parkway.

On 18 November 1998, Transportation Committee recommended Council approve terms of reference for the Woodroffe Avenue Transportation Study, where the terms of reference were developed collectively by the study area community and City of Ottawa and Regional staff (the study's Advisory Committee) as directed by Transportation Committee. Council approved the terms of reference and consultant funding at its 09 December 1998 meeting with an amendment to ensure that no Woodroffe corridor traffic be diverted to other roadways, in particular local roadways.

The project's terms of reference and specific study terms of reference were developed based on a study process that is put forth by the Transportation Association of Canada (TAC), Guide to Traffic Calming Studies, November 1997. This process relies on significant community involvement in the early stages of the study and for the Woodroffe transportation study, involvement with the Advisory Committee's development of the study terms of reference. This allowed buy-in and ownership by the community at the outset of and throughout the study.

Terms of reference were drawn to address the issues of traffic volume, speed and driver behaviour within the study area which affected pedestrian safety and mobility, the cycling environment and the safety and efficiency of the Woodroffe Avenue corridor as an arterial roadway. The study area as reflected in the terms of reference consisted of Woodroffe Avenue between the Queensway and the Ottawa River Parkway, including the Regional sections of Lenester and Fairlawn Avenues, as well as the signalized intersections on Carling between Edgeworth and Iroquois and on Richmond between New Orchard and Cleary Avenue (refer to Annex A).

Based on the requirements defined in the terms of reference, the consultant firm of Stantec Consulting Ltd. was retained in February 1999 through a selection process conducted by the Advisory Committee. From the terms of reference, the consultant produced in consultation with the Advisory Committee a work plan to guide the study. Throughout the past year the consultant has undertaken the study and as a result has put forward the recommendations as summarized in the final report's Executive Summary (refer to Annex C). Staff's response to these recommendations is attached in Annex B. Comments and discussion on the study process, findings and staff's recommendations are included in the following sections.

DISCUSSION

In undertaking any traffic/transportation/traffic calming study, there is a huge challenge for the study members (community members, municipal staff and the consultant) to complete the study with a list of recommendations that satisfy all those with issues. Unfortunately, as we all know this cannot and does not happen as there are many competing and conflicting issues. As a result it is up to the study consultant with input from the community, staff, and direction from the study's terms of reference to make recommendations that provide a balanced solution that the majority of stakeholders can buy into, that can be implemented, and that most importantly provides for a safer environment.

In undertaking the Woodroffe transportation study, the main issues were those of traffic volume, speed and driver behaviour (primarily related to motor vehicles) which in turn affect pedestrian safety and mobility, cycling comfort and the overall safety and efficiency of the arterial road corridor. In terms of competing issues, common conflicts such as pedestrians versus cars at intersections and road crossings (from both signal timing and lane capacity perspectives), cycling facility requirements versus desired road narrowings for speed control, cut through traffic on local streets versus traffic calming measures and access control, etc. were found. In attempting to address all issues, competing or not, the study solutions were generated as a package that took the entire study area into consideration, and in doing so, a balance of safety and service levels throughout the corridor was achieved. As a final product, recommendations supported an efficient arterial road network, with all its links remaining in the system. This approach allows the road network to keep through traffic on the main arterials and not as cut through traffic on the local side streets. It also allows for a traffic management concept that enables the various forms of mobility to be in the safest environment available given the surrounding circumstances.

The following is a review of items recommended which require further information and/or discussion. In addition to the review, additional staff recommendations to enhance the study's end product are discussed. For details on the consultant's recommendations and analysis leading up to them, the final study report should be referred to. Staff's recommendations which result from the review of the consultant's recommendations are reflected in Annex B.

Consultant Recommendations

In general, staff support the overall recommendation package as put forth by the consultant (refer to Annex B). However, for those recommendations (i) that require geometric changes, staff recommend they be subject to detailed design and cycling facility standards assessment; (ii) that require signal timing and phasing modification, staff will review the consultant's setting and determine final settings which reflect the consultant's intent and ensure that pedestrian timings and overall signal progression are not compromised and are appropriate for current traffic conditions at the time of implementation; and (iii) that require involvement from other agencies due to jurisdiction responsibilities, staff recommend that the items be forwarded to those agencies for their consideration and implementation with a staff statement on its importance and role in the overall recommendation package.

It is important to note that the focus of the study was on the operation of the arterial road and not traffic issues within the adjacent communities and their associated streets. Local community traffic issues in general which relate to the study area are appropriately addressed in this study by maximizing the efficiency to the arterial road to encourage through traffic to use it opposed to the local street network. Cut through traffic recommendations that were deemed necessary for completion of this study and deal with local streets are to be forwarded to the City of Ottawa for their consideration (Items 4 in part and 6, Annex B). It should also be noted that the issue of Lenester and Fairlawn's appropriateness within the Regional road system was also raised. In dealing with this issue it was confirmed that these links were necessary for the corridor's operation. However, the overall recommendation package brings items forward to better manage the traffic flow on these links and better address the role they play. The

underlying plan used in addressing the issue was basically to increase the efficiency and attractiveness of the Woodroffe/Carling/Woodroffe route while at the same time lessening the attractiveness of the Lenester and Fairlawn route. This underlying plan supports a number of the recommendations, including most of the recommendations along Lenester and Fairlawn (Item 4, Annex B) and at both the intersections of Woodroffe and Carling (Items 8 and 9, Annex B).

The following items refer directly to the recommendations as identified in Annex B. Only items requiring discussion, explanation and/or further information have been addressed.

Items 1.1 and 1.2/Community Safety Zones and Highway 417 Interchange Modifications

The Community Safety Zone Programme is currently being assessed by the Region in conjunction with the local municipalities and Regional Police. If the programme is deemed to be effective, the Woodroffe corridor should be identified as a high priority candidate for implementation. As the Ministry of Transportation Ontario (MTO) will be reviewing the operation of Highway 417 and associated ramps over the next two years, Regional staff will be required to bring the study issues and recommendations regarding the ramps to MTO's attention for input and recommended implementation.

Items 2.1 and 2.2/Woodroffe to Georgina Left-turn Phase Trial and Monitoring

In light of the many needs and conflicting interests at the Woodroffe/Georgina/Lenester intersection, staff concur with the implementation of a left-turn phase in the peak hours from Woodroffe to Georgina on a trial basis. Monitoring will also be required to assess the resulting impacts, especially on crossing pedestrians, traffic impacts in the Whitehaven community, the delay on other users of the intersection, the speeds along Woodroffe in the northbound direction, and the number of collisions at this intersection. It is noted that without the existence of a left-turn lane to support this phase, benefits may be minor.

Items 3.1 and 3.2/D. Roy Kennedy School Traffic Operations

A consultant review of the school pick-up and drop-off area along with D. Roy Kennedy School representatives identified the current operation as unsafe and a source of traffic concern along Lenester. It is estimated that the consultant recommendation to move staff parking operations to the front of the school would cost approximately \$70,000. To ensure safety of the children exposed to the area of concern, it will be necessary for the School Board to address this problem. Staff will work with the School Board to identify the importance of the recommendations to enhance student safety.

Items 3.3, 6 in part and 7/Police Enforcement of Turn Restrictions and Non-Truck Routes

Staff will be required to notify Regional Police of the study recommendations and in particular the areas that require enforcement to increase awareness and compliance of existing turn and recommended heavy vehicle movement restrictions.

Item 4/Southbound Restrictions on Ancaster

The traffic diverter on Ancaster addresses two issues: - a safety issue related to a traffic movement onto the Regional road and a cut through traffic issue on the local roads. As the location recommended for implementation of the diverter falls outside the Region's jurisdiction, this item is to be forwarded to the City of Ottawa for their consideration, assessment and possible implementation.

Item 7/Lenester/Fairlawn Removal of Truck Traffic

It will be necessary for staff to ensure heavy vehicles have appropriate access to the Fairlawn Plaza prior to the locating of heavy truck prohibition signs on the north end of Fairlawn. Installation of signs restricting trucks in the remainder of Fairlawn and Lenester is recommended.

Items 8 and 9/Woodroffe and Carling Intersection Modifications

Recommended improvements primarily support the vehicle efficiency concept desired along the Woodroffe/Carling/Woodroffe route versus Lenester/Fairlawn as addressed previously, and in association with this desire, pedestrian movement recommendations are included. Staff are in support of these recommendations with one exception. The closure of the pedestrian crossing at the east side of the west Woodroffe and Carling intersection will not be recommended. Although staff support the overall concept to improve the safety of these intersections, it is not clear that the crossing closure will support safer conditions. It has been in the past Council and Committee's practice to maximize the opportunities for pedestrians, a position supported by the Transportation Master Plan. With mixed support from the public on this item and little supporting data, there is not a strong argument for the closure.

Item 10/Road Narrowings on Woodroffe between Saville and Knightsbridge

Although this item had mixed public and/or cycling group support, it does address a speed issue in a school zone along Woodroffe between Saville and Knightsbridge. In proceeding with the recommendation, further consultation with the community will be required during the design stage to ensure appropriate and effective measures are put in place.

Item 11/Pedestrian Signal Woodroffe at Anthony

Having recently completed a pedestrian crossing survey along Woodroffe in the vicinity of Anthony, it was found that a pedestrian signal is only 76% warranted. Staff as directed by Council only recommend the installation of signals when warrants as adopted by Council are 100% satisfied.

Items 12 and 13/Woodroffe and Richmond Intersection Modifications

Intersection modifications at this intersection support an increased efficiency and order of operation. Staff concur with the recommendations subject to a detailed design and compliance to cycling facility standards assessment. Setting of associated timing and phasing will be subject to Regional staff review and implementation.

Item 15/ NCC Related Issues Woodroffe at the Ottawa River Parkway

Items addressing issues related to the NCC, specifically to the recreational path crossing and the community entrance feature will be forwarded to the NCC for their consideration and assessment. Rumble strips proposed to enhance the awareness of the NCC recreation path are supported in principle; however they should be subject to further technical review for their suitability in winter weather and impact on cyclists.

Education of Children regarding Traffic Safety and Rules of the Road

During this study, a publication put out through a Go for Green (a national non-profit organization promoting health, physical activity, and environment) programme initiative was brought to the attention of staff by the Transportation Committee Chair. The programme's study report entitled Active/Safe Routes to School, 1998 was produced by the Canadian Institute of Child Health and the Go for Green organization and was funded by Health Canada. The report as the title suggests addresses active and safe routes to schools, through the assessment of the issues and causes that surround child travel to and from school. As a result the report recommends actions (to be carried out by various groups) to provide the safest routes to school.

With five schools within a block of the Woodroffe corridor and a high school within the immediate area, the recommendations as put forth by the Active/Safe Routes to School Report relate directly to the Woodroffe study. Of the four recommendations on health promotion strategies to promote active and safe routes to school, two are addressed by the Region and City through basic policies and procedures and the recommendations of the Woodroffe study. The third is outside the scope of work undertaken by the Region. The fourth is an area the Region is trying to increase its presence in, that being education regarding traffic safety and rules of the road. The Ottawa-Carleton Safety Village programme is an ongoing programme which, through the Ottawa-Carleton Safety Council (funded in part by the Region), educates school children through a fun interactive hands-on environment about traffic safety and rules of the road. As the programme receives children on an ad hoc basis through schools or concerned

parents, a working committee made up of the Region's Emergency Services, Health and Environment and Transportation Departments is currently attempting to have the Safety Village programme become a regular part of school curriculum. In doing so, staff ask for direction and support from Transportation Committee and Council to encourage the School Boards to participate in such an important and relative programme.

CONSULTATION

In addition to the involvement of the community (residential, institutional and commercial) in the Advisory Committee, consultation was also carried out through public open houses, focus groups and on-site visits. Details on the consultation process, involvement and results can be found in the consultant's final study report.

Recommendations were reviewed by emergency services (fire and ambulance). Both services identified that recommendations as put forth would not be a cause of concern for their operations.

A copy of this report has been circulated to the Regional Cycling Advisory Group (RCAG) for comments. Any RCAG comments received will be made available at the Public Hearing.

FINANCIAL IMPLICATION

As part of the final study report, the consultant has identified a conceptual estimate for funding the recommended improvement programme. The amount identified is \$200,000 which includes capital costs and engineering costs for those measures on Regional roads. Not all items recommended require capital account funding as some items can be conducted through current operational programmes and budgets. Those recommendations involving areas outside the Region's jurisdiction will be forwarded to the appropriate agency for their consideration, implementation and funding.

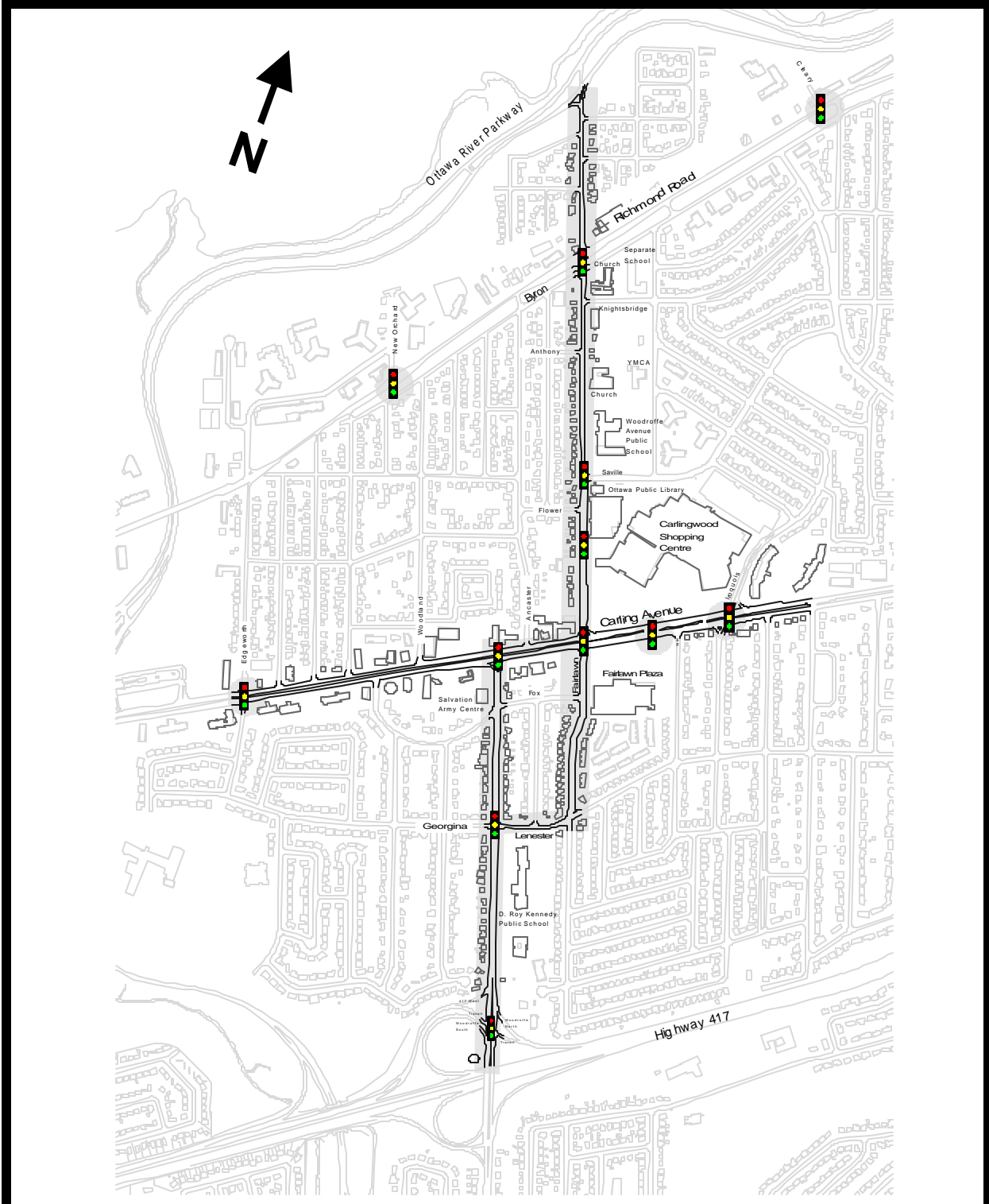
Of the \$800,000 approved by Council for Traffic Calming Measures (Order No. 900065) in the 2000 Capital Budget, staff has expected to allocate approximately \$150,000 for design, construction and staff time associated with implementation of the Woodroffe Transportation Study recommendations.

*Approved by
Doug Brousseau*

GK

Attach. (3)

ANNEX A



Woodroffe Avenue Transportation Study Study Area

Staff Recommendations on the Woodroffe Avenue Transportation Study - Recommended Improvement Plan

In general, staff support in principle the recommendations put forward by the consultant. Specifically, staff's recommendation on each separate item is as follows (for details on the staff recommendations refer to the DISCUSSION section of this report):

Consultant Recommendation	Staff Recommendation
<p>1. <u>Woodroffe South from Queensway to Lenester/Georgina</u></p> <p>1.1 Designate Woodroffe from Queensway to Parkway, including Fairlawn/Lenester, as a Community Safety Zone.</p> <p>1.2 Realign existing ramps on the north side of the Queensway to move the free-flow westbound exit and southbound entrance ramps to a new signalized intersection. All traffic onto and off Woodroffe would be restricted to right turns only, except for transit (similar to current condition). Detailed design options for this change must be reviewed and approved by the Ministry of Transportation (MTO jurisdiction).</p>	<p>Concur, subject to results of and evaluation of Community Safety Zones programme.</p> <p>Concur in principle, forward to Ministry of Transportation for assessment and implementation.</p>
<p>2. <u>Lenester/Georgina at Woodroffe South</u></p> <p>2.1 Add a northbound advanced green from Woodroffe onto Georgina.</p> <p>2.2 Any increased traffic on Georgina after installation of this advanced green will have to be monitored and addressed if required.</p>	<p>Concur, on a trial basis, subject to the Region setting the appropriate signal timings.</p> <p>Concur, follow-up monitoring will be required to assess impacts.</p>

<p>3. <u>Lenester Between Woodroffe and Fairlawn</u></p> <p>3.1 Request that the School Board encourage more student bussing and walking to the school.</p> <p>3.1 Request the School Board construct new staff and visitor parking at the front of the school off Woodroffe, and construct an enlarged off-street student drop-off and pick-up zone at the north end off Lenester (OCDSB jurisdiction).</p> <p>3.2 Increase enforcement of right-turn restrictions onto Lenester.</p>	<p>Concur in principle to both items, forward to Ottawa-Carleton District School Board for approval and implementation as a child safety requirement.</p> <p>Request increased enforcement by Ottawa-Carleton Police.</p>
<p>4. <u>Ancaster at Carling</u></p> <p>4.1 Install a right-turn diverter on Ancaster north of Carling in order to restrict Ancaster southbound right turn, but retain Ancaster access for commercial operations on Carling (City of Ottawa jurisdiction).</p>	<p>Concur in principle, forward to City of Ottawa for further review and implementation.</p>
<p>5. <u>Lenester between Woodroffe and Fairlawn, and Fairlawn between Lenester and Carling</u></p> <p>5.1 Reduce speeds by narrowing Fairlawn travel lanes with a mountable, colour- pressed asphalt median, along with the possible introduction of other median streetscaping treatments (i.e. plantings) to narrow the field of vision.</p>	<p>Concur in principle, subject to detailed design and compliance with Regional standards for cycling facilities.</p>
<p>6. <u>Fox between Woodroffe and Fairlawn</u></p> <p>6.1 Consider installation of speed humps on Fox to deter through traffic, OR close Fox at Woodroffe (City initiative).</p> <p>6.2 Also consider installation of a pedestrian advisory warning sign at Fox and Woodroffe.</p>	<p>Forward to City of Ottawa for their consideration and assessment.</p> <p>Staff to review.</p>

<p>7. <u>Fairlawn/Lenester Loop</u></p> <p>7.1 Sign the loop as a "No Trucks Route".</p>	<p>Concur in principle, north section subject to commercial vehicles having appropriate access to the Fairlawn Shopping Plaza loading docks.</p>
<p>8. <u>Carling at Fairlawn and Woodroffe North</u></p> <p>8.1 Existing westbound left-turn phase timing remains unchanged to discourage use of Fairlawn/Lenester loop.</p> <p>8.2 Reduce the four Fairlawn lanes at Carling to one northbound through/right, one northbound left turn and one southbound lane.</p> <p>8.3 Change the existing southbound shared through/left-turn lane on Woodroffe to an exclusive left-turn lane and modify timing.</p>	<p>Concur.</p> <p>Concur in principle, geometric changes subject to detailed design and compliance with Regional standards for cycling facilities; timings subject to staff evaluation and appropriate settings.</p>

<p>9. <u>Carling at Woodroffe South</u></p> <p>9.1 Minor signal timing adjustment shifting time from eastbound green through to westbound advanced green.</p> <p>9.2 Prohibit pedestrian crossing of Carling across east leg of intersection.</p> <p>9.3 Install existing stop sign in the eastbound channelized right-turn lane from Carling onto Woodroffe South.</p> <p>9.4 Provide a short advanced pedestrian crossing phase from the northwest corner of the intersection prior to the Woodroffe green phase.</p> <p>9.5 Consider including west side crossing in Adult Crossing Programme.</p>	<p>Concur in principle, subject to staff evaluation and appropriate settings.</p> <p>Not recommended.</p> <p>Concur in principle, subject to staff post-impact assessment.</p> <p>Concur in principle, subject to staff evaluation and appropriate settings.</p> <p>Staff to assess under Adult Crossing Programme warrants, subject to available funding.</p>
<p>10. <u>Woodroffe between Saville and Richmond</u></p> <p>10.1 Narrow travel lanes by installing curb extensions with widened boulevards and optional parking bays along this section of Woodroffe, including an extended and landscaped boulevard in front of Woodroffe Avenue Public School.</p>	<p>Concur in principle, subject to detailed design and compliance with Regional standards for cycling facilities.</p>
<p>11. <u>Woodroffe North at Anthony</u></p> <p>11.1 Install a pedestrian activated intersection pedestrian signal.</p>	<p>Not recommended, as signal is only 76% warranted</p>

<p><u>12. Woodroffe North at Richmond</u></p> <p>12.1 Remove the eastbound channelized right-turn lane and deceleration lane, and replace with a through/right-turn lane. Widen Woodroffe northbound lanes.</p> <p>12.2 Mark the Richmond westbound curb lane as "THIS LANE ENDS".</p>	<p>Concur in principle, subject to detailed design and compliance with Regional standards for cycling facilities.</p> <p>Concur in principle, staff to install appropriate signage.</p>
<p><u>13. Woodroffe North at Richmond</u></p> <p>13.1 Add a southbound left-turn lane and northbound advanced green. Line up Woodroffe centrelines and opposing left-turn lanes. Increase eastbound left-turn advance time.</p>	<p>Concur in principle, geometric changes subject to detailed design and compliance with Regional standards for cycling facilities. Signal timings subject to staff evaluation and appropriate settings.</p>
<p><u>14. Woodroffe North at Byron</u></p> <p>14.1 Extend the median at Byron 10 to 15 metres farther south, without impacting adjacent property access.</p>	<p>Concur in principle, subject to detailed design.</p>
<p><u>15. Woodroffe North from Richmond to Parkway</u></p> <p>15.1 Install coloured pressed asphalt crossing at NCC trail and clear surrounding vegetation.</p> <p>15.2 Install rumble strips on Woodroffe at approaches to the NCC trail crossing.</p>	<p>Concur in principle, subject to NCC approval.</p> <p>Concur in principle, subject to further technical evaluation and detailed design.</p>

<p>15.3 Trim existing street trees along Woodroffe to improve visibility.</p> <p>15.4 Reconstruct Woodroffe roadway surface with narrow lanes and widened decorative boulevards, OR provide widened shared vehicle/bike lanes.</p> <p>15.5 Construct a community entrance feature near the Woodroffe/Parkway exit ramp.</p>	<p>Concur.</p> <p>Concur in principle, subject to further public consultation and detailed design.</p> <p>Staff to assess preferred location, if on NCC property - forward to NCC for consideration and approval, if on Regional right of way include as item for review in the Region's upcoming sign assessment study.</p>
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WOODROFFE AVENUE TRANSPORTATION STUDY FINAL STUDY REPORT - RECOMMENDED IMPROVEMENT PROGRAMME

EXECUTIVE SUMMARY

1. INTRODUCTION - This Study was commissioned to recommend transportation system improvements for pedestrians, cyclists and vehicular traffic within the primary study area, namely Woodroffe Avenue from the Queensway north to the Parkway, including the Lenester/Fairlawn loop portion of this Regional arterial route. Section 1 introduces the primary conditions under which the study was conducted, the Study Advisory Committee members, involved stakeholders and the public consultation process. It concludes with a summary description of the Study Work Plan.

2. WOODROFFE CORRIDOR TRAFFIC CONDITIONS - Existing traffic conditions and Level of Service at critical study area intersections are presented in the section, with emphasis on the most problematic Lenester/Woodroffe and Richmond/Woodroffe intersections. These conditions are then forecasted to year 2004, based on area development proposals and overall traffic growth, to show how these conditions are forecasted to worsen at these and other intersections in the short term if no improvement actions are taken.

3. WOODROFFE CORRIDOR TRAFFIC ISSUES - This section lists and briefly describes the types of traffic issues in the study area brought forward by the Study Advisory Committee, area stakeholders and the public. They deal with the Regional arterial network, corridor traffic operations, and some local traffic conditions brought forward in this and other studies, but outside this study's scope to address in any detail.

4. EVALUATION OF ALTERNATIVE SOLUTIONS - In this section, strategic objectives are first recommended on which to base alternative solutions, namely to: 1) reduce traffic impacts on sensitive land uses and enhance public safety; 2) optimize through traffic on Regional roads; 3) maximize use of local streets by local traffic only; and, 4) balance the need of local streets and Regional roads to meet these strategies.

The remainder of this section presents a number of alternative solutions to each major study area traffic issue, as well as the more specific results expected from each alternative, and associated trade-offs.

5. RECOMMENDED TRANSPORTATION IMPROVEMENT PROGRAM

LOCATION	ISSUE	RECOMMENDATION
1. Woodroffe South from Queensway to Lenester/ Georgina	Excessive vehicular speeds on Woodroffe South in proximity to schools, churches and homes	<p>General Recommendation - designate Woodroffe from Queensway to Parkway, including Fairlawn/Lenester, as a <i>Community Safety Zone</i>.</p> <p>Realign existing ramps on the north side of the Queensway to move the free-flow westbound exit and south-bound entrance ramps to a new signalized intersection. All traffic onto and off Woodroffe would be restricted to right-turns only, except for transit (similar to current condition). Detailed design options for this change must be reviewed and approved by the Ministry of Transportation.</p>
2. Lenester/Georgina at Woodroffe South	Intersection congestion caused by excessive delays in the westbound and northbound approaches, and lack of left-turn lanes or phases	Add a northbound advanced green from Woodroffe onto Georgina, while recognizing that this will slightly increase southbound queues at the intersection, potentially increase northbound through delays and increase the overall intersection delays by about 5 seconds per vehicle. Any increased traffic on Georgina after installation of this advanced green will have to be monitored and addressed if required.
3. Lenester Between Woodroffe and Fairlawn	Pedestrian conflicts and on-street parking concerns associated with D. Roy Kennedy School	Request the School Board to encourage more student bussing and walking to the school, construct new staff and visitor parking at the front of the school off Woodroffe, and construct an enlarged off-street student drop-off and pick-up zone at the north end off Lenester. Increase enforcement of right-turn restrictions onto Lenester.

4. Ancaster at Carling	Unsafe exiting and merging from Ancaster onto Carling and Woodroffe South.	Install a right-turn diverter on Ancaster north of Carling in order to restrict Ancaster southbound right turn, but retain Ancaster access for commercial operations on Carling.
5. Lenester between Woodroffe and Fairlawn, and Fairlawn between Lenester and Carling	High traffic volume and speed abutting residences and school	Reduce speeds by narrowing Fairlawn travel lanes with a mountable, colour-pressed asphalt median, along with the possible introduction of other median streetscaping treatments (i.e. plantings) to narrow the field of vision.
6. Fox between Woodroffe and Fairlawn	Non-compliance of the right turn restriction	Consider installation of speed humps on Fox to deter through traffic, OR close Fox at Woodroffe (City initiative). Also consider installation of a pedestrian crossing warning sign at Fox and Woodroffe.
7. Fairlawn/Lenester Loop	Commercial truck traffic	Sign the loop as a "No Trucks Route".
8. Carling at Fairlawn and Woodroffe North	8.1 Left-turn congestion from Carling onto Fairlawn	Existing westbound left-turn phase timing remains unchanged to discourage use of Fairlawn/Lenester loop.
	8.2 Reduce use of Fairlawn from Carling	Reduce the four Fairlawn lanes at Carling to one northbound through/ right, one northbound left turn and one southbound lane.
	8.3 Left-turn congestion from Woodroffe southbound onto Carling caused by lack of left-turn lanes	Change the existing southbound shared through/left-turn lane on Woodroffe to an exclusive left- turn lane and modify timing.

9. Carling at Woodroffe South	9.1 Left-turn congestion from Carling onto Woodroffe South	Minor signal timing adjustment shifting time from eastbound green through to westbound advanced green.
	9.2 Pedestrian and cycling security	<p>Prohibit pedestrian crossing of Carling across east leg of intersection.</p> <p>Install exiting stop sign in the eastbound channelized right- turn lane from Carling onto Woodroffe South.</p> <p>Provide a short advanced pedestrian crossing phase from the northwest corner of the intersection prior to the Woodroffe green phase.</p> <p>Consider including west side crossing in adult crossing programme.</p>
10. Woodroffe between Saville and Richmond	Excessive speeds	Narrow travel lanes by installing curb extensions with widened boulevards and optional parking bays along this section of Woodroffe, including an extended and landscaped boulevard in front of Woodroffe Avenue Public School.
11. Woodroffe North at Anthony	Lack of pedestrian crossing	Install a pedestrian activated intersection pedestrian signal.
12. Woodroffe North at Richmond	Pedestrian and cycling crossing security	Remove the eastbound channelized right-turn lane and deceleration lane, and replace with a through/right-turn lane. Widen Woodroffe northbound lanes. Mark the Richmond westbound curb lane as "THIS LANE ENDS".
13. Woodroffe North at Richmond	Need for improved left-turn capability	Add a southbound left turn lane and northbound advanced green. Line up Woodroffe centrelines and opposing left turn lanes. Increase eastbound left turn advance time.

14. Woodroffe North at Byron	Byron traffic diverting around the centre median	Extend the median at Byron 10-15 metres farther south, without impacting adjacent property access.
15. Woodroffe North from Richmond to Parkway	Excessive speed and line of sight limitations	<p>Install colour pressed asphalt crossing at NCC trail and clear surrounding vegetation.</p> <p>Install rumble strips on Woodroffe at approaches to the NCC trail crossing.</p> <p>Trim existing street trees along Woodroffe to improve visibility.</p> <p>Reconstruct Woodroffe roadway surface with narrow lanes and widened decorative boulevards, OR provided widened shared vehicle/bike lanes.</p> <p>Construct a community entrance feature near the Woodroffe/Parkway exit ramp.</p>

6. COST ESTIMATE - Based on the conceptual description of capital improvements recommended in this study, and standard unit costs for various types of improvements, it is estimated that Regional costs to complete their areas of responsibility in this programme would total approximately \$200,000. In addition, School Board costs would be incurred in the recommended redesign and addition of off-street parking and the drop-off/pick-up zone at D. Roy Kennedy, and MTO costs in the reconstruction of the Queensway northside ramps at Woodroffe.

7. WALKING SECURITY INDEX (WSI) - The final section of this report summarizes the application of the Region's WSI on the five major intersections within the study corridor, and how these comparative rankings would be changed with the recommended improvement programme