

REGION OF OTTAWA-CARLETON
RÉGION D'OTTAWA-CARLETON

MEMORANDUM
NOTE DE SERVICE

Our File/N/Réf. **50-12-99-0003; 02-99-0026**
Your File/V/Réf.

DATE 02 November 1999

TO/DEST. The Chair and Members of
 Council

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

SUBJECT/OBJET **1999 TRANSIT PRIORITY STATUS REPORT**

<u>Information Previously Distributed</u>	
To be listed on the Transportation Committee Agenda 17 Nov 99	

BACKGROUND

In the Region's Official Plan and the Transportation Master Plan, transit priority measures were identified as one of the key elements to increase the transit modal share from the current 15% to 20% by the year 2021.

Transit Priority measures are traffic engineering techniques designed to minimize delays to buses in a mixed traffic flow. These measures often require that transit be given preference in allocating road space and traffic signal timing. Preferential treatment of buses compared to automobiles is justified because buses carry more passengers than cars.

This report outlines some of the recent achievements of the Transit Priority Task Force (TPTF) to date and outlines future plans.

IMPLEMENTED TRANSIT PRIORITY MEASURES

The Selection of Locations for Implementing Priority Measures

Locations with high bus volumes, such as entrances and exits to Transitway stations and at-grade Transitway intersections are selected first for implementing priority measures (LeBreton, Lincoln Fields, Billings Bridge, Baseline Station) . The TPTF also investigates complaints from the public and bus drivers, and acts on recommendations from OC Transpo's scheduling workshops. In some cases, other unrelated road or signal works are used as an opportunity to implement transit priority measures.

Work is ongoing on the development of a transit performance monitoring program which will be based on OC Transpo's Automatic Passenger Counting system. The first part of the project, the modification of the Automatic Passenger Counting system outputs, has been completed. The second part, developing a program to organize and interpret the data is on-going.

A list of implemented transit priority measures and a map is provided in Annex A and Annex B. Annex C contains a list of studies and reviews conducted by the TPTF.

Bus Lanes

The TPTF initiated the construction of bus-only lanes along Woodroffe Avenue between Baseline Station and the future park & ride lot at Fallowfield Road as a relatively low-cost medium-term measure to provide relief for transit from congestion. Following Regional Council's approval on 26 May 1999, consultants were appointed for the design work and recommendations will be presented to Transportation Committee for discussion in the next few months.

Signal Priority Measures

The Traffic Operations Branch of the Region has a full time signals engineer working on signal timing to provide preference to buses. The TPTF is planning to implement more complex signal priority measures. However, sophisticated signal priority measures require equipment which is not readily available on the market. Work is underway to develop the needed hardware and software.

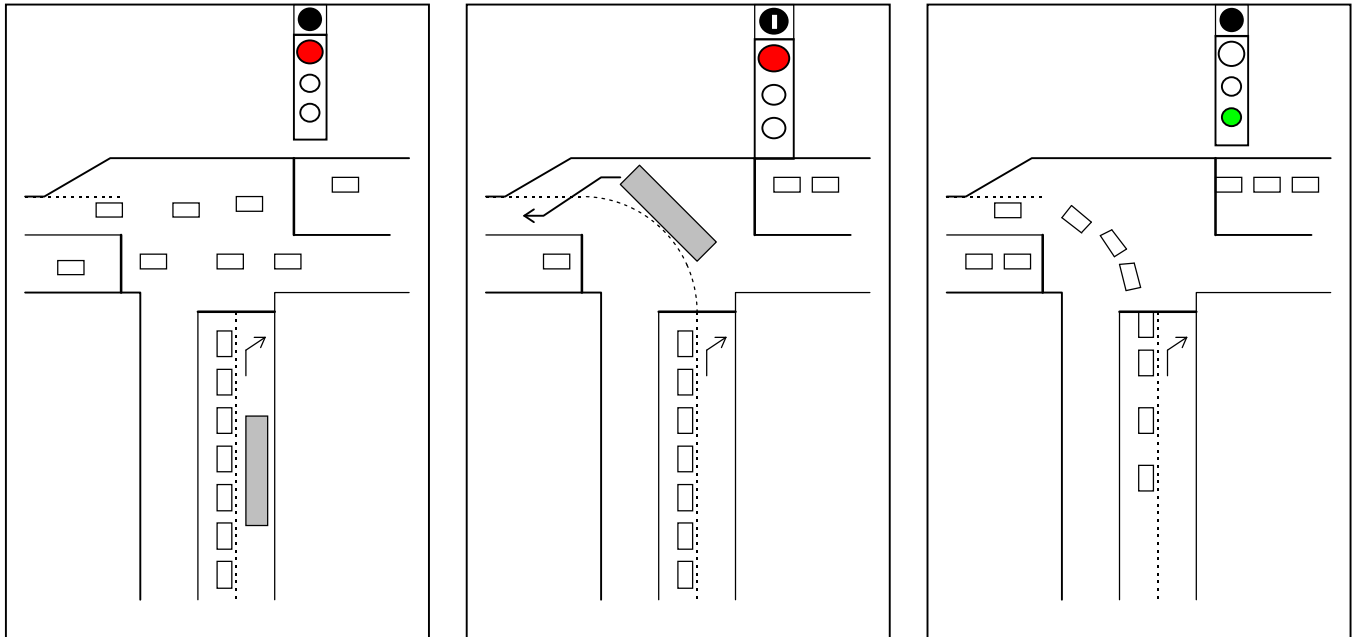
Sophisticated signal priority measures require reliable selective bus detection. The current bus detecting equipment's advantage is that it requires no hardware on the bus, however, it has a number of limitations. A new detection technology is being investigated which requires the installation of both road-side and on-vehicle equipment.

So far, various signal priority measures have been implemented for buses at more than 30 intersections. Signal priority measures include advanced left turns, additional green phases, signal pre-emption, phase and cycle length modifications and bus actuated pedestrian signals (half signals).

The first bus-actuated pedestrian signal was implemented at the intersection of Richmond Road and Dumaurier Avenue where a selective bus detector has been added to the existing signal installation. A red signal indication is displayed on Richmond Road immediately when a bus is detected on the Dumaurier Avenue approach.

One of the new developments is the equipment needed to display the Transit Priority Signal Indicator. This is a new traffic signal which can be used to allow buses to proceed while other traffic is stopped. The first installation is planned to occur before the end of the year. This signal will allow the time separation of bus and car movements on the same approach and this priority measure will be highly visible, compared to most other signal priority measures which are "hidden" to the casual observer.

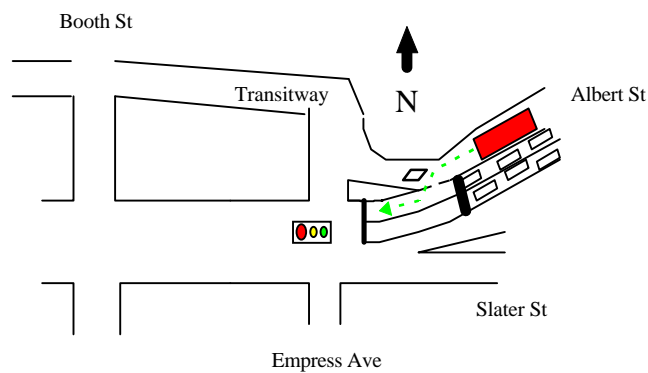
Figure 1: Application of the Transit Priority Signal Indicator



Other Transit Priority Measures

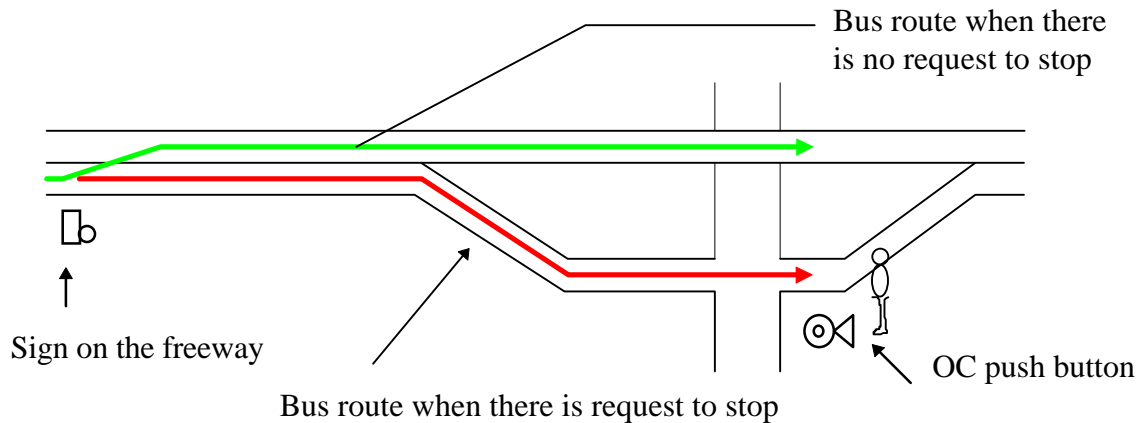
An advanced stop line at the intersection of Albert Street and Empress Avenue has been implemented to reduce delay to westbound buses. When cars queue behind the new stop line during red light, buses are able to pull-in ahead of the queue.

Figure 2: Queue Jump with Advanced Stop Bar



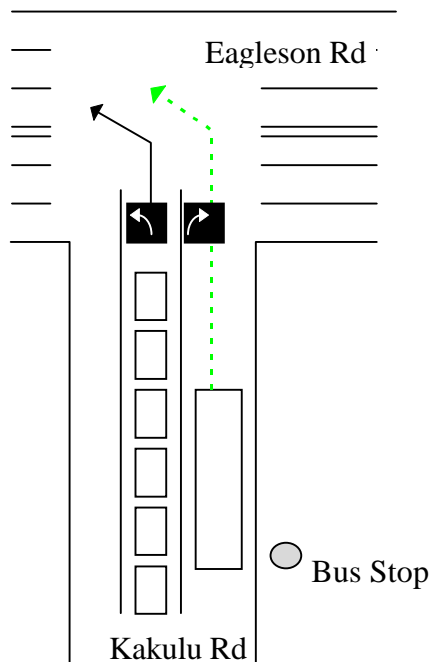
A new push-button signal system at the intersection of Regional Road 174 and Montreal Road allows customers at the stop to alert approaching buses to exit the highway and make the pick-up. When there is no request to stop, the bus continues along the freeway without delay. This innovation was designed by Regional and OC Transpo staff and has met with considerable success. A similar system is in the final stage of design on the Queensway eastbound ramp at Moodie Drive.

Figure 3: Demand for Service Indicating System (DSIS)



Eastbound buses on Kakulu Road found it nearly impossible to move from their last stop into the left turning lane at the Eagleson Road intersection due to long queues. By re-designating the right turn lane into a "right turn lane - buses excepted", buses can now jump the queue and make the left turn from the curb lane.

Figure 4: Left turn from curb lane for buses only



Monitoring bus and general traffic operations plays an important role in identifying unexpected congestion in the downtown core. Closed circuit cameras installed at key locations allow the Region's Traffic Operations Centre to monitor critical sections of roadway, identify and react to problems that can result traffic jams and bus delays.

Work is underway to provide this feed to OC Transpo's Central Control room, giving Transpo staff additional information needed to help solve short-term operational problems.

Promotion of Transit Priority

So far, the TPTF has focused its resources on research, implementation and evaluation of transit priority measures. Some promotional activity has been carried out in the form of three seminars on transit priority to Regional and OC Transpo staff, an educational video to OC Transpo bus drivers and a few short articles in different publications.

As transit priority measures are becoming more widespread and visible, public information and education is becoming more important. The TPTF has prepared a document which explains some of the reasons why transit priority is implemented and describes some of the measures. (The document is attached.) Currently staff is working on a public education strategy to introduce and promote the application of the Transit Priority Signal.

PLAN FOR 2000

The TPTF will focus on the implementation of the Woodroffe bus lanes and the implementation of signal priorities at various isolated locations. A list of locations where work has already begun is attached in Annex D.

Work will continue on the selection of at least one corridor where signal priority measures will be applied along a number of intersections. The potential corridors are Woodroffe Avenue, Richmond Road/Montreal Road, Carling Avenue and Baseline Road.

The development of traffic signal software and hardware will continue. A new selective bus detection system will be tested.

Region of Ottawa-Carleton's research of transit priority measures in other jurisdictions (i.e. other Canadian cities, United States, Europe) will continue, however, at a less intensive pace than previous years.

*Approved by
Doug Brousseau*

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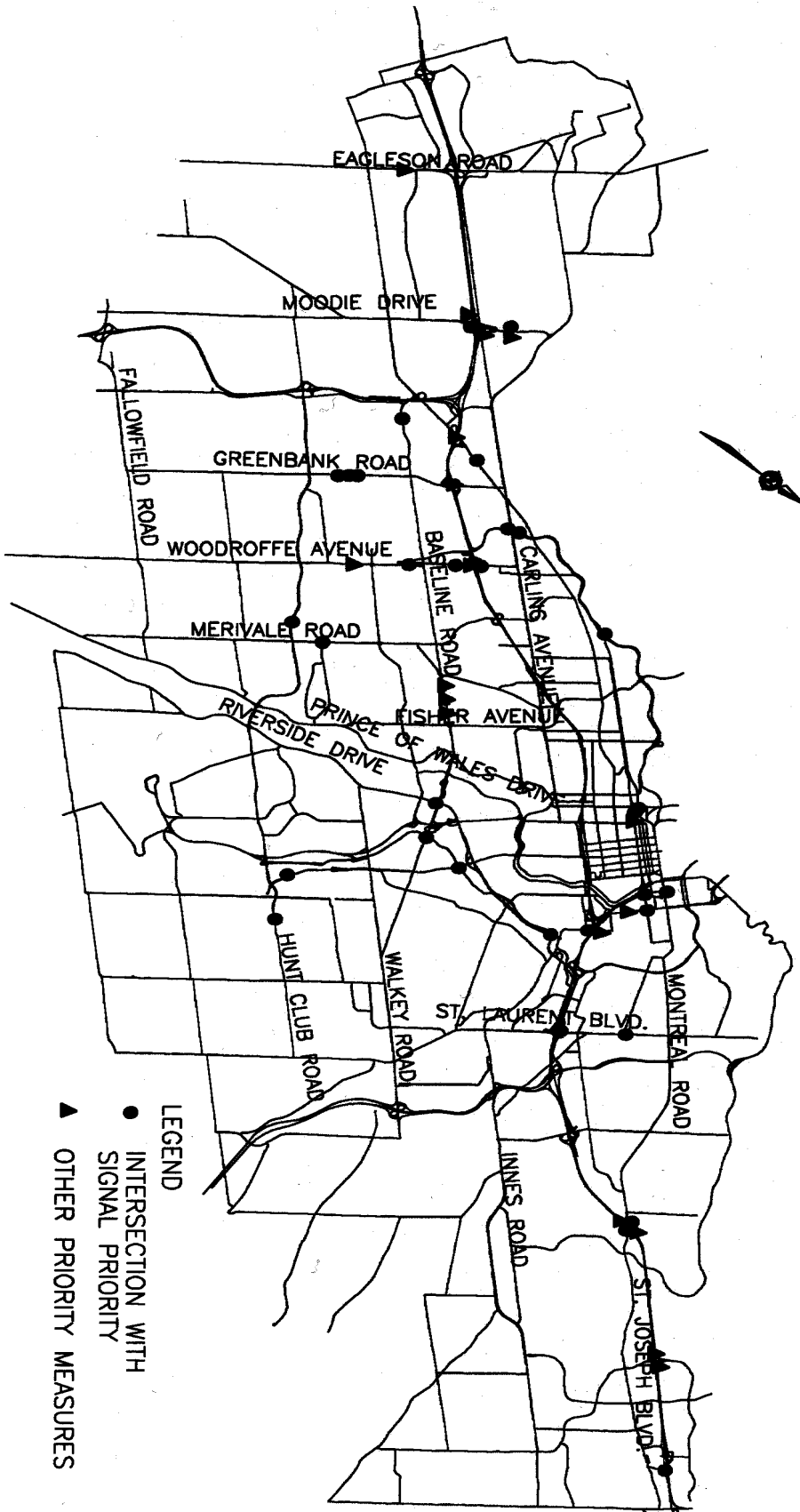
IMPLEMENTED TRANSIT PRIORITY MEASURES

Location	Date	Measure
East Transitway and St. Laurent	1994	Revised Offset
	1994	Revised Timing (minimum recall for off-peak from Monday to Friday 9:00 - 15:00)
Laurier and Transitway	1994	Reduced cycle length to half
Booth and Transitway	1994	Revised timing (minimum recall during off peak)
	Jun-99	Revised timing in PM peak. Cycle length reduced to 55 seconds from 110 seconds.
Albert/Empress and Transitway	1995	Off-peak cycle length reduced to 55 seconds and synchronized with Slater and Bronson
	1995	Revised timing (minimum recall for weekdays from 07:00 - 18:00)
	Dec-98	Queue jump with queue relocation
Lebreton Area	Jan-99	Signal timing update
Transitway and Lees	1995	Transit phase inserted into two phases
	Sep-96	Offset adjusted to minimize bus delay at adjacent intersection (King Edward)
Bank and Billing Bridge Transitway	1995	Added a transit actuated phase (NB Left turn) at certain times of day
	1996	Detector upgraded
West Transitway and Parkway	1994	Revised timing (reduced the minimum green time and increased maximum extension on the Parkway)
Mc Arthur and St. Laurent	1994	Revised timing (NB left turn phase increased)
Greenbank Road and Banner	1995	Signal preemption
Greenbank Road and Bellman	1995	Signal preemption
Greenbank Road and Craig Henry	1995	Signal preemption
Bank and Cahill	1995	Signal preemption
Heron and Riverside	Oct-95	Revised timing (offset modification to decrease ST queue and allow buses to enter into the left turn lane)
Baseline Between Merivale and Fisher	1995	Bus bay fill in pilot project
Woodroffe and Baseline Station	Nov-95	Revised phasing (lagging NB left turn instead of leading)
	Nov-99	Added a second left turn lagging phase for all time periods during the same cycle

Lincoln Fields Station and Carling	May-96	Revised timing (minimum recall during AM and PM peak and stand-by during off peak)
	Aug-99	Revised timing (standby for all time periods)
	Oct-99	Left turn arrow added on Carling Avenue
	Oct-99	Signal preemption
Baseline and Queensway Hospital	1996	New pedestrian signal
Hwy 417 EB off Ramp and Moodie Drive	1996	New signal
Hunt Club and Cleopatra	Nov-96	Second left turn phase for buses only
Riverside and Transitway	Jan-97	Revised timing (stand by during off peak)
Rideau and Dalhousie	Aug-97	Transit priority LT for EB buses
Hwy 417 WB off ramp and Woodroffe	Aug-97	Immediate response for every vehicle, (will be selective, buses only)
Hwy 17 EB off ramp and Place D'Orleans	Aug-97	Permissive left turn for WB LT buses
King Edward and Laurier	Jan-98	Transit priority LT for EB buses
	Sep-99	Detector upgrade
Woodroffe and Norice	Aug-98	Hump removal in bus lane
RR 174 EB exit ramp and RR 34 (Montreal Road)	Aug-98	Advanced detection and extension for buses
	Aug-98	(DSIS) Demand for Service Indicator System
Hunt Club and Cahill	Oct-98	Signal preemption
RR 174 WB exit ramp and RR 34 (Montreal Road)	Jan-99	Signal preemption
Nortel Corkstown	Jan-99	Bus loop
	Jun-99	Standby in off peak
Kakulu and Eagleson	Feb-99	Double left turn phase for buses
Merivale and Colonnade	Mar-99	Reduced green time on main street for evening peak
King Edward and Sommerset	May-99	Stop bar relocated
Richmond and DuMaurier	Sep-99	Double loop installed for 1/2 signal operation

IMPLEMENTED TRANSIT PRIORITY MEASURES

ANNEX B



COMPLETED TRANSIT PRIORITY STUDIES/ REVIEWS

Date	
Nov-95	Woodroffe corridor study, part 1
May-96	Greenbank Rd bus preemption evaluation
Aug-96	TMP Transit Priority module review (St Laurent)
Jun-96	Queensway EB off-ramp and Moodie intersection study
Oct-96, June-97	Hwy 17 EB off-ramp and Montreal Rd intersection design review
Nov-96	Hurdman Bridge delay study
Jan-97	APC System upgrade, Stage 1 - Requirements definition
Feb-97	Hunt Club & Cleopatra - preemption evaluation
Apr-97	Bus gap acceptance analysis at Moodie-QW and Hunt Club-Cahill
Apr-97	Queensway EB off-ramp and Moodie revision
Apr-97	Route 99
Aug-97	Transit Priority corridor monitoring - procedure development
Sep-97	West Transitway & Acres, design review
Sep-97	West Transitway & Pinecrest, design review
Nov-97	APC System upgrade, Stage 2 - definition of subsections
Sep-97	Industrial and Riverside
Sep-98	1998 Bus Bay Guidelines
Jan-99	West Transitway & Pinecrest, design review
Jan-99	West Transitway & March Rd, design review
Apr-99	Bus bay removal study
Nov-98	Booth & Albert, design review
Apr-99	Bus delay study (Dillon Consulting)
Sep-99	Bus Bay Guidelines - Safety review
Sep-99	Woodroffe bus lane - Design reviews

WORK IN PROGRESS

Earl Mulligan - Woodroffe QJ with LT from the RT lane
Hwy 417 - Moodie Drive - DSIS
Hwy 417 - Moodie Drive signal preemption
Woodroffe bus lanes
Selective detection technology evaluation
Signal priority software
Signal priority along a corridor (Route selection)
Jasmine & Ogilvie ½ signal review
Hunt Club & Esson ½ signal review
Carling & Crystal Beach 1/2 signal review
Richmond/Woodroffe Westbound left turn review
Woodroffe and Carling Southbound Left turn review
Woodroffe and Saville delay - preemption
Algonquin and Woodroffe lagging left turn arrow
Richmond and Poulin selay analysis
Bridle Path and Hunt Club delay analysis
Richmond and Churchill Eastbound left turn delay