



Corporate Report

NO: R235

COUNCIL DATE: November 17,

2003

REGULAR COUNCIL

TO: Mayor & Council DATE: **November
4, 2003**

FROM: Fire Chief & General Manager,
Engineering FILE: 5460-80 (Fire Pre-emption)

SUBJECT: Intersection Traffic Pre-emption System
Expansion Proposal

RECOMMENDATION

That Council authorize the expenditure of collected Fire specific NCP (Neighbourhood Concept Plan) funds in the amount of \$ 420,000 to purchase and install 92 additional traffic signal pre-emption systems in the City of Surrey.

BACKGROUND

The pre-emption system works by installing optical sensors on the traffic poles at each intersection, and a signal emitter on each emergency vehicle. Controlled by a switch in the vehicle, a signal is broadcast by the emitter to the sensor. The sensor in turn sends a signal to the traffic signal control computer initiating a "signal pre-emption timing plan". This timing plan is designed by the traffic engineer to ensure safe operations. The signal pre-emption timing plan will immediately change the signal for opposing traffic to amber and then red – as per accepted standards – and then change the signal to green for the direction in which the emergency vehicle is traveling.

The pre-emption timing plan is designed to hold the signal in this state until the emergency vehicle(s) clear the intersection, after which the signal returns to normal operation. Using a complete system of signal pre-emption technology at successive signalised intersections enables emergency vehicles to travel through the intersections using green signals, rather than having to slow down, stop then enter the intersections on a red light. By giving the emergency vehicle the right-of-way, time-critical travel to fire incidents is improved with all other traffic responding to the right-of-way transition safely, without confusion, in a predictable manner. Refer to Appendix A for a diagram of the pre-emption system.

Surrey Fire Service has been using a limited level of emergency vehicle signal pre-emption to expedite emergency response for the past 15 years. Currently installed in 86 intersections throughout the City, the present level of pre-emption technology has helped to improve fire service efficiency, improve public safety, and reduce operational costs. As emergency response is increasingly affected by growing population density, traffic patterns, and congestion within the City, these factors have been considered in an analysis supporting the Intersection Traffic Preemption System Expansion.

DISCUSSION

Analysis through simulation modeling has forecasted that an increased level of pre-emption systems at key, strategic locations will reduce current response time by an estimated average of fourteen seconds. In emergency situations where first responder delay can be improved using pre-emption technology, every second saved can be critical to public safety. Increasing the number of pre-emption systems installed throughout Surrey will:

- reduce Fire Service response time;
- assist the Fire Service to comply with NFPA international standards for fire safety;
- reduce the long-term operational cost for expanding fire services;
- reduce the fleet maintenance cost resulting from the reduction of stop-and-go travel; and
- improve firefighter and public safety.

Analysis has forecasted that in order to gain the equivalent timesavings using the traditional methods would require 5 more fire stations to respond from, in addition to the existing seventeen, plus a considerable investment in staff, infrastructure, vehicles, and equipment. In addition, operational wear on fire department vehicles will be reduced, increasing fleet fuel efficiency. The difference between a one-time capital investment of \$420,000 to expand the preemption system compares to an ongoing annual cost of \$7.62 million to add five additional locations and equipment.

The installation of the pre-emption equipment is a joint project of the Fire Service and the Engineering Department. The Fire Service has been working closely with Traffic Operations to ascertain the optimal locations for the installation and the most cost effective means to install the equipment. The Engineering Department will assume responsibility for on-going operation and maintenance (O&M) of the pre-emption equipment after installation. Specifications for all future new installations of signalised traffic intersections within the City have been modified to require traffic pre-emption devices.

CONCLUSION

Installation of the proposed pre-emption presents a relatively low capital investment with minimal ongoing costs contained in the maintenance budget for traffic intersections. The benefit of this investment is ongoing and will actually increase over time as the City of Surrey continues to grow. The General Manager of Finance, Technology & HR has confirmed the availability of the funds and that this expenditure is an appropriate use of the NCP funds.

Len Garis
Fire Chief

Paul Ham, P.Eng
General Manager, Engineering

"Appendix A"

Diagram of the Pre-emption System

