CITY OF RICHMOND

REPORT TO COMMITTEE

TO:	Public Works and Transportation Committee	**DATE:**	December 16, 1999
FROM:	Gordon Chan, P. Eng. Manager, Transportation	**FILE:**	6450-06-03
RE:	**PROPOSED STOP SIGN IMPROVEMENT PROGRAM**		

STAFF RECOMMENDATION

1. That the use of highly reflective sign material, as described in the attached report from the Manager of Transportation, be adopted as the new standard for stop sign upgrading and installation in the City.

2. That the proposed *Stop Sign Improvement Program*, a program to replace existing stop signs in the City with the new highly reflective sign material, be submitted to the Insurance Corporation of British Columbia (ICBC) Road Safety Program for funding contribution.

3. That staff report back on the outcome of the above ICBC funding application for this project.

Gordon Chan, P. Eng.
Manager, Transportation

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STAFF REPORT

ORIGIN

In January, 1996 Hamilton Associates Consulting Limited, under contract by the Insurance Corporation of British Columbia (ICBC), evaluated the effectiveness of the use of highly reflective material for traffic signs. The finding of the report suggested that upgraded traffic signs with highly reflective material standard would increase the visibility of the signs and reduce traffic accident potential.

As a result of these findings, ICBC has offered to reimburse municipalities for the cost incurred in upgrading standard traffic signs with highly reflective materials. This is part of an on-going joint initiative between road authorities and ICBC to enhance traffic safety through the application of road and traffic engineering measures.

ANALYSIS

1. **Retro-Reflectivity of Road Signs**

The night-time visibility of traffic signs and road markings depends on "*retro-reflectivity*", defined as the redirection of light back toward the light source. Retro-reflective materials for traffic signs were introduced in North America in the 1950's. There are currently several grades of retro-reflective materials commonly used in the traffic engineering industry.

(a) Engineering Grade - Retro-reflectivity is achieved in engineering grade sheeting by using glass beads to reflect incident light back to the driver's eyes. Sheeting refers to the material adhered to a metal frame which indicates a particular traffic regulation such as a stop sign, yield sign, etc. Most of the traffic signs in Richmond are manufactured using engineering grade sheeting.

(b) High Intensity Grade - High intensity grade sheeting is approximately three times brighter than engineering grade sheeting and was introduced in the 1970's. High intensity grade sheeting is brighter as it uses larger, more closely spaced encapsulated glass beads with a metallic reflector coat. Richmond currently uses high intensity grade sheeting at some stop sign installations and overhead street name signs.

(c) Highly Reflective Grade - Recently, new methodologies have been applied to enhance retro-reflectivity. Prismatic lens sheeting such as diamond grade and Series 6200HP were introduced in 1989 and are approximately ten times brighter than engineering grade sheeting. Both are considered to be "highly reflective" material. Richmond has used diamond grade sheeting for school zone advanced warning signs and some warning signs at high accident locations.

2. **Traffic Safety Enhancement**

Highly reflective traffic signs have been proven to be effective in reducing the potential of traffic accidents. "Before and after" studies conducted in the UK and United States have indicated a reduction in the total number of traffic collisions in areas where highly reflective traffic signs have been installed. Highly reflective traffic signs could reduce vehicular collisions by increasing the visibility of traffic signs, sign legibility, and consequently driver perception-reaction time. The improved legibility of highly reflective traffic signs specifically helps older drivers anticipate road conditions ahead in complex visual environments.

3. **Practices of Other Jurisdictions in the Lower Mainland**

The use of diamond grade highly reflective signs is becoming more popular in the Lower Mainland. The increasing awareness of the importance of enhancing traffic safety and the funding contribution from agencies such as ICBC have resulted in much interest among road authorities in the Lower Mainland to adopt the use of highly reflective materials for traffic signs. For example, ICBC will fund traffic sign upgrading programs when it is determined that the more visible signs will result in a significant reduction in traffic incidents.

Several communities including Burnaby, Surrey, and Coquitlam have taken advantage of funding provided by ICBC and are replacing exiting signs with highly reflective signs. Common signs replaced under this ICBC program include stop signs, yield signs, and "do not enter" signs, critical warning signs, and overhead lane use signs.

FINANCIAL IMPACT

ICBC's funding programs pays the difference between engineering grade and diamond grade sheets when an existing sign is replaced or a new sign is installed. ICBC's requirement to qualify for funding is that a set program be established and accomplished within a reasonable time frame.

The cost to the City could be minimized if the program were phased in over a five-year period. The cost of replacing stop signs with diamond grade signs will be minimal as the majority of our existing stop signs will need replacing due to wear and damage. The City's cost of replacing all 420 stop signs in the City is estimated at $3,500 in materials and labour over and above regular maintenance expected for these signs. The estimated incremental cost ($700 annually over a five-year period) can be absorbed in the annual minor capital program. Alternatively, the City could choose to accelerate the replacement program. The exact schedule for this sign upgrade program will be determined as part of the operating budget review process.

CONCLUSION

The use of highly reflective materials for traffic signs has been proven to be very effective in reducing the potential of traffic accidents. ICBC has undertaken the initiative of offering municipalities the incentive to upgrade their signage to diamond grade signs (highly reflective material) by providing funding to cover the difference in price between engineering grade and diamond grade sheeting. Diamond grade sheeting is approximately four times the price of engineering grade sheeting. It is noted that the reflective sheeting represents a significant portion of the overall sign cost.

Staff recommend that the City take advantage of the ICBC program to upgrade all stop signs in the City. The proposed sign upgrading program is intended to be completed within a five-year period. The exact timetable for this program will be established as part of the annual Operating Budget review process. Staff also intend to monitor the effectiveness of the new signs and will advise Council in a future report on whether the program should be expanded to include additional sign classifications.

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