



## CITY OF VANCOUVER

### ADMINISTRATIVE REPORT

Report Date: April 04, 2006  
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Meeting Date: April 18, 2006

TO: Standing Committee on Transportation and Traffic  
FROM: General Manager of Engineering Services  
SUBJECT: 2006 Traffic Signal Program

#### RECOMMENDATION

- A. THAT Council approve the 2006 Traffic Signal Program, with city funding of \$1,692,500, and that the General Manager of Engineering Services be authorized to install and modify pedestrian and traffic signals, as described in this report;
- B. THAT Council approve funding of \$1,266,500, in advance of the 2006 Streets Basic Capital Budget for the Traffic Signal Program, and the balance of \$426,000 from the 2005 Capital approved for Traffic Signals; and
- C. THAT additional annual costs of \$33,500 related to ongoing maintenance be reflected in future Operating Budgets, subject to the 2007 budget review process.

#### COUNCIL POLICY

Council approved funding which provides for traffic signal installations as part of the 2006-2008 Streets Capital Plan.

On May 27, 1997, Council approved the Vancouver Transportation Plan which emphasizes the need for improved pedestrian facilities.

**SUMMARY**

Council has approved funding as part of the 2006 - 2008 Streets Capital Plan for the Annual Traffic Signal Program. Funding requests included in A) and B) and D) account for one-third of the money approved in the three-year Capital Plan. Funding for C) is provided from the 2005 Streets Capital for Traffic Signal. The 2006 Traffic Signal Program is recommended as follows:

A) Pedestrian-Controlled Signals	City	ICBC	Other	TOTAL
A1) Powell at Princess	\$ 79,000	\$ 29,000	-----	\$108,000
A2) 49 <sup>th</sup> Avenue at Arlington	\$ 88,000	\$ 32,000	-----	\$120,000
A3) Renfrew at Turner	\$ 75,500	\$ 17,500	-----	\$ 93,000
A4) Dunbar at 26 <sup>th</sup> Avenue	\$ 76,000	\$ 10,000	-----	\$ 86,000
A5) 12 <sup>th</sup> at Sophia	\$ 66,000	\$ 18,000	\$22,000	\$106,000
A6) Nanaimo at 6 <sup>th</sup> Avenue	\$ 67,000	\$ 42,000	-----	\$109,000
A7) King Edward at Valley	\$ 87,000	\$ 25,000	-----	\$112,000
A8) 4 <sup>th</sup> Avenue at Dunbar	\$ 77,000	\$ 24,000	-----	\$101,000
A9) Broadway at Trutch	\$ 61,000	\$ 35,000	-----	\$ 96,000
<b>TOTAL</b>	<b>\$676,500</b>	<b>\$232,500</b>	<b>\$22,000</b>	<b>\$931,000</b>

**B) Full Signals**

B1) Point Grey Road and Alma	\$175,000	\$25,000	-----	\$200,000
B2) 49 <sup>TH</sup> Avenue and Alberta	\$ 50,000	-----	\$50,000	\$100,000
<b>TOTAL</b>	<b>\$225,000</b>	<b>\$25,000</b>	<b>\$50,000</b>	<b>\$300,000</b>

**C) Special Retrofit to Pedestrian - Controlled**

C1) Hemlock at 13 <sup>th</sup> Avenue	\$68,000	\$8,000	-----	\$ 76,000
C2) Nanaimo at Brock	\$67,000	\$8,000	-----	\$ 75,000
C3) 12 <sup>th</sup> Avenue at Alder	\$68,000	\$8,000	-----	\$ 76,000
C4) 41 <sup>st</sup> at Columbia	\$65,000	\$8,000	-----	\$ 73,000
C5) 4 <sup>th</sup> Avenue at Wallace	\$79,000	\$8,000	-----	\$ 87,000
C6) 4 <sup>th</sup> Avenue at Trutch	\$79,000	\$8,000	-----	\$ 87,000
<b>TOTAL</b>	<b>\$426,000</b>	<b>\$48,000</b>	<b>-----</b>	<b>\$474,000</b>

D) Signal Modifications	\$365,000	-----	-----	\$365,000
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**FUNDING SUMMARY**

Total City Funding	<u>\$1,692,500</u>			
Total ICBC Funding		<u>\$305,500</u>		
Total Other Funding			<u>\$ 72,000</u>	
<b>TOTAL 2005 PROGRAM</b>				<b><u>\$2,070,000</u></b>

## PURPOSE

This report lists the locations recommended for signal installations or modifications and the reasons for these recommendations.

## BACKGROUND

The City of Vancouver relies on a surface street network to handle its transportation needs. Therefore, pedestrian, cyclist, transit and traffic signals are significant traffic management elements in the safe movement of people and goods. Each year we receive 100 to 150 requests for signals in the City. Detailed studies are undertaken by staff to determine locations that require new or modified traffic signal controls.

The study includes a review of pedestrian and traffic volumes; pedestrian movements and driver courtesy; visibility conditions; adjacent street use; and safety history. Other factors that are included are pedestrian age and mobility, delay in crossing the street, nearest pedestrian crossings and input from Police, ICBC and Translink. This information is then used to help us prioritize locations throughout the City for new pedestrian-controlled signals and other major capital improvements.

Many locations are reviewed in this program to provide a comprehensive coverage. Based on this review, a recommended Traffic Signal Program has been prepared.

Signal installation and modifications may also be generated through other programs or agencies such as Developers, Bikeways and Greenways. Rationale for these installations is consistent with the requirements above. On average, the signal program annually recommends 10 signals to be installed. Other programs have accounted for up to 16 additional locations in a year and on average account for seven additional signals. Trends of signal installations over the last 20 years are shown in Appendix A.

## DISCUSSION

Council's top transportation priority is pedestrians, and 15 of the 17 recommended signals are pedestrian-controlled signals, eight of which will assist school students. Transit customers and transit vehicles are being aided at several of the recommended signals and signal improvements. The proposed vehicle signals will address pedestrian and traffic safety. Furthermore, a retrofit of several special crosswalks is recommended as part of this year's program. This retrofit consists of changing these locations to pedestrian signals thereby providing a greater level of control at these pedestrian crossings.

### A) Pedestrian Signals - Recommended Locations

- |  |   |
|--|---|
| A1) Powell Street at Princess          | A2) 49 <sup>th</sup> Avenue at Arlington  |
| A3) Renfrew Street at Turner           | A4) Dunbar at 26 <sup>th</sup> Avenue     |
| A5) 12 <sup>th</sup> Avenue at Sophia  | A6) Nanaimo Street at 6 <sup>th</sup> Ave |
| A7) King Edward Avenue at Valley Drive | A8) 4 <sup>th</sup> Avenue at Dunbar      |
| A9) Broadway at Trutch                 |   |

## B) Full Traffic Signals - Recommended Locations

- B1) Point Grey and Alma
- B2) 49<sup>th</sup> Avenue and Alberta

Rationales for recommended locations are included in Appendix B. A number of other locations were also reviewed for installation of pedestrian signals. Included in Appendix B is a list of locations that are not recommended at this time due to the above priorities, but are to be monitored for future programs.

## C) Special Crosswalks Retrofit

Special crosswalks can help to enhance intersections by increasing driver visibility and awareness of pedestrians. This pedestrian crossing device, as shown in Appendix C, consists of the following features: zebra pavement markings, overhead internally-illuminated signs with pedestrian-activated flashing amber beacons, ground mounted signs, advance warning signs and special lighting of the crosswalk area. We now have 20 locations in the City where these pedestrian crossing control devices are in use.

However, special crosswalks, installed in the City since 2000, have been met with mixed reaction in the community. In 2005, after 5 years of installing this device, staff initiated a detailed review of all special crosswalks in the City. These 20 locations were reviewed for potential upgrades and other improvements. Conclusions from the review indicate that a pedestrian signal would be a more suitable device at several locations for reasons including, increased traffic and pedestrian volumes, traffic speeds, resident complaints and geometry. The pedestrian signal provides a higher level of control and would further improve the pedestrian environment for the road user. Generally, retrofits are recommended to be completed at locations that have seen increased pedestrian or traffic volumes or have 4 to 6-lane cross sections.

The following locations are recommended to be retrofit to pedestrian signals:

- |  |                                       |
|--|---------------------------------------|
| C1) 4 <sup>th</sup> and Trutch         | C2) 12 <sup>th</sup> Avenue at Alder  |
| C3) Hemlock at 13 <sup>th</sup> Avenue | C4) 41 <sup>st</sup> at Columbia      |
| C5) Nanaimo at Brock                   | C6) 4 <sup>th</sup> Avenue at Wallace |

## D) Signal Modifications

This program allows staff to address concerns related to traffic signal modifications and upgrades. Many of these ongoing projects help address concerns forwarded by residents and staff. The program is summarized below:

- |  |                          |
|--|--------------------------|
| D1) Pedestrian Indicators              | D2) Left-Turn Phasing    |
| D3) Audible signals                    | D4) Signal Modifications |
| D5) Intelligent Transportation Systems | D6) Tertiary Heads       |

This program complements the Transportation Plan by allowing safety improvements to be made to existing signalized intersections. Appendix D includes details of each item listed above.

## OTHER SIGNAL INSTALLATIONS

Signal installation and modifications may also be initiated through other programs or agencies. Appendix E lists signals which are being reviewed due to private developments and through other projects such as Greenways, Bikeways, Community Visions, and Neighbourhood Centres. Additional reports will be forwarded to Council as these public processes are completed.

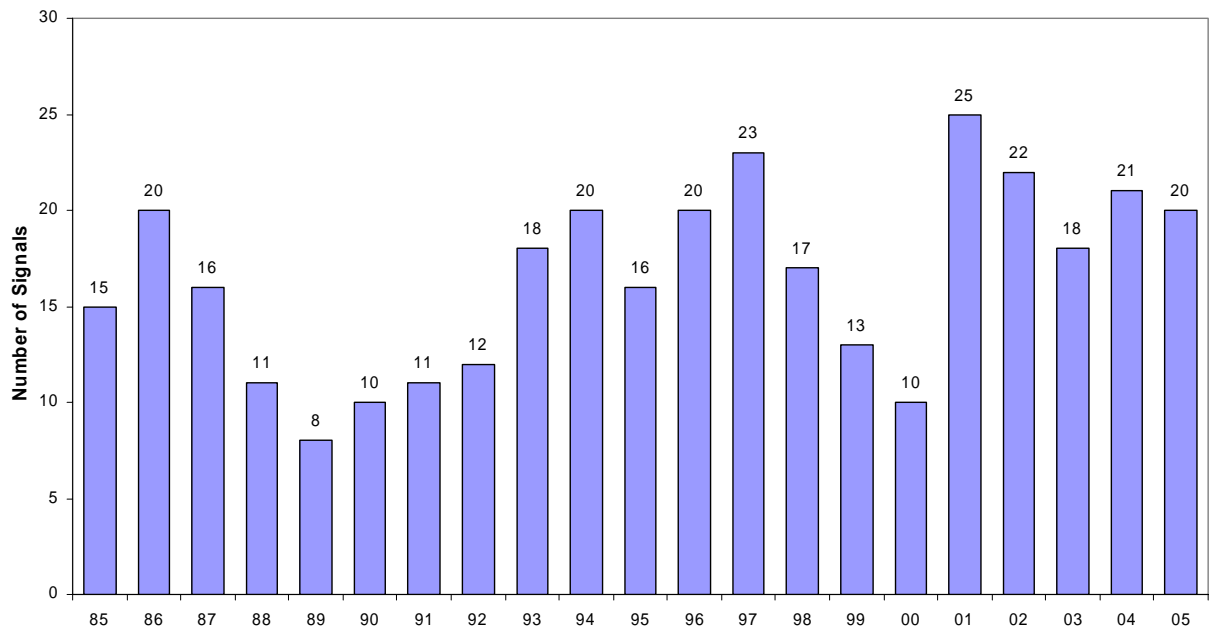
## FINANCIAL IMPLICATIONS

The total cost of the 2006 Traffic Signal Program is \$2,070,000, of which \$1,266,500 will be funded from 2006 Street Basic Capital for the Traffic Signal program; \$426,000 from the 2005 Traffic Signal Program, order group CB3EA3A, \$305,500 from ICBC, \$22,000 from the developer of 350 Kingsway; and \$50,000 from Intransit BC. It is recommended that Council approve this funding in advance of the 2006 Engineering Basic Capital Budget, which will be submitted shortly. It is important to gain early approval of this program so that materials can be ordered, and work completed in time for upcoming deadlines, such as the opening of school in September.

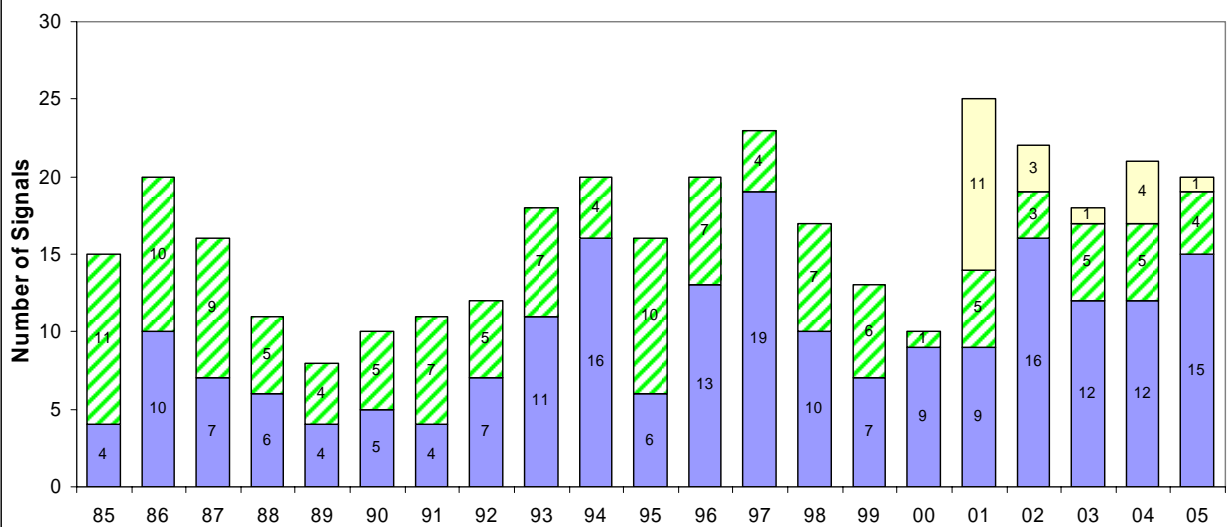
Future Operating Budgets will be affected by increases in maintenance costs associated with the addition of new signals, signage, road marking, intersection traffic counts, and increased energy consumption. This year's Signal Program represents roughly a one and one-half percent increase in the plant of the Traffic Signal System. The annual operating cost will be increased by \$33,500, which will be subject to the 2007 Budget Review.

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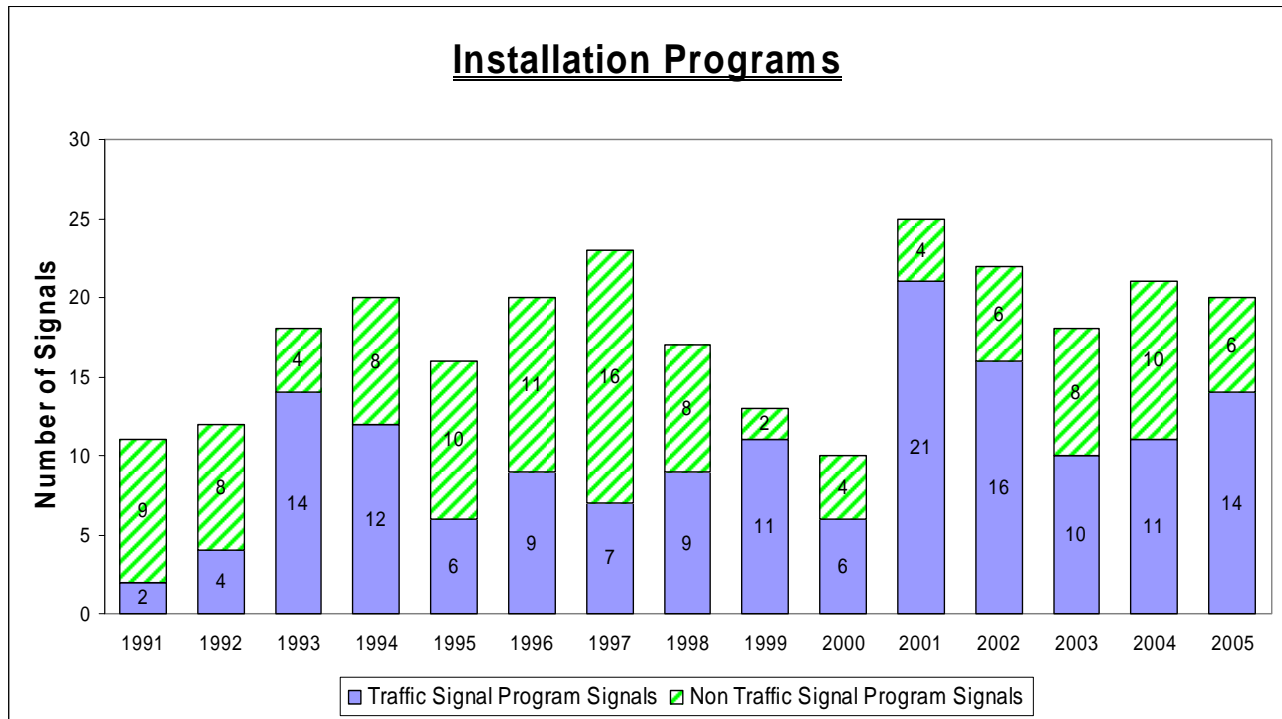
### City of Vancouver Annual Traffic Signal Installations



### Type of Signal Installed



■ Pedestrian Signals     
 ■ Other types of Traffic Signals installed     
 ■ Special Crosswalks



## A) Pedestrian Signals - Recommended Locations

### A1) Powell Street at Princess \$79,000

Residents and people frequenting the area have requested that a pedestrian signal be installed. A petition with 457 signatures gathered by the Downtown Community Health Centre, located at the northwest corner of the intersection was also received by staff. In the petition concerns were raised about high volumes of traffic causing difficulty for many infirm pedestrians to get to the Community Health Centre. Field studies have confirmed that traffic was steady during the rush periods and that drivers ignore pedestrians at this intersection. There were also many instances where pedestrians were uncertain about right-of-way, causing confusion for both motorists and other pedestrians. Within the past five years there has been one vehicle-pedestrian collision at this intersection. For these reasons staff recommend a pedestrian signal at this intersection. ICBC is willing to contribute \$29,000 towards this signal for a total cost of \$108,000.

### A2) 49<sup>th</sup> Avenue at Arlington \$88,000

This intersection is located in the Champlain Heights area of Vancouver. The neighbourhood, generally made up of townhomes and other multi-family residences, is populated with many young families and seniors. There is a residence for the disabled located just west of the intersection on 49<sup>th</sup>. Field studies show that two bus stops at this intersection account for over 50% of observed crossings, and that many of these bus passengers were destined for Park Place, a housing complex located on the north side of 49<sup>th</sup>. The curvature of 49<sup>th</sup> Ave also created some visibility concerns for pedestrians. In the westbound direction motorists are required to merge into 1 lane from a two lane roadway. This merging movement introduces confusion for a pedestrian since passing on the right occurs often. Within the past five years there has been one vehicle-pedestrian collision at this intersection. A pedestrian controlled signal is recommended for this intersection to increase pedestrian safety. ICBC is willing to contribute \$32,000 towards this signal for a total cost of \$120,000.

### A3) Renfrew Street at Turner \$75,500

A school crossing with zebra paint markings and overhead signs is located at the south crossing of the intersection. People cross Renfrew to access Dr.A.R. Lord Elementary School, Hastings Community Center, Hastings Preschool and Templeton Secondary school. Crossings are also generated from bus stops located at the intersection. Field studies show that over 50% of the crossings were generated by teens or children reflecting the fact that this is a school route. Pedestrians must cross four travel lanes and two parking lanes and even with a marked and signed crosswalk, motorists tend to ignore pedestrians at the crosswalk. The intersection is also located in a five block stretch on Renfrew where no pedestrian signals are installed to assist pedestrians. Within the past five years there has been one vehicle-pedestrian collision at this intersection. A pedestrian controlled signal is recommended to improve pedestrian



safety. ICBC is willing to contribute \$17,500 towards this signal for a total cost of \$93,000

**A4) Dunbar at 26<sup>th</sup> Avenue \$76,000**

The intersection of Dunbar and 26<sup>th</sup> is located in a commercial/retail block that includes banks, pharmacies, medical facilities, and several new apartment buildings. Staff observed that with these new developments, many pedestrians had a desire to cross here. Motorists generally ignored pedestrians and parking decreased visibility for pedestrians waiting to cross. Other generators that attract pedestrians to the intersection include a bus stop on the northeast corner and Chaldecott Park and Queen Elizabeth Annex located two blocks west of the intersection. A pedestrian controlled signal is recommended to address the additional pedestrian volumes observed and to create a safer crossing for pedestrians. ICBC is willing to contribute \$10,000 towards this signal for a total cost of \$86,000.

**A5) 12<sup>th</sup> Avenue at Sophia \$66,000**

This intersection is located on a curve between Main Street and Kingsway on 12<sup>th</sup> Ave. Residents have expressed concerns with crossing and have requested a pedestrian signal to assist seniors and others in crossing here. Seniors in particular have said that they avoid the intersection due to the four lane width and curvature of the road. Field studies show that volumes are high during peak periods resulting in very few gaps for pedestrians to cross. A new development at 350 Kingsway (northeast corner of the intersection) has offered a parcel of land which would extend the current boundary of the wellness walkway on Sophia. This would extend the boundary of the wellness walkway across 12<sup>th</sup> Avenue, thus creating a higher demand for seniors to cross here. The developer of 350 Kingsway is required to provide 25% funding towards the pedestrian signal, subject to approval in this program. Within the past five years there has been one vehicle-pedestrian collision at this intersection. The total cost of the signal is \$106,000, the developer is willing to contribute \$22,000 and ICBC \$18,000.

**A6) Nanaimo Street at 6<sup>th</sup> Ave \$67,000**

A marked and signed crosswalk is currently in place to assist in crossing. Complaints from residents have been received outlining their concerns for safety at this intersection. Field studies have shown that drivers do not commonly stop for pedestrians waiting to cross at the intersection. Pedestrians must cross a wide road cross section of two lanes of heavy volumes of traffic and 1 parking lane in each direction on Nanaimo Street. With these high volumes and aggressive motorist behavior, few opportunities are created for pedestrians to cross safely at this intersection. The crossing is located in a long eight block stretch on Nanaimo Street that does not have any pedestrian signal to assist in crossing. Within the past five years there have been two vehicle-pedestrian collisions at the intersection. For these reasons staff recommend a pedestrian controlled signal for this intersection to improve pedestrian safety. ICBC is willing to contribute \$42,000 towards this signal for a total cost of \$109,000.

**A7) King Edward Avenue at Valley Drive \$87,000**

The intersection of King Edward and Valley is located in a residential area close to Trafalgar Park and Arbutus Village Park. Other pedestrian generators include the Prince of Wales High School, the Arbutus Village Shopping Mall and bus stops on the southeast and northwest corners. Field studies have shown that although there is a large median, motorists tended to ignore pedestrians waiting to cross at this intersection. Studies also show that this intersection is heavily used by students. In fact, 75% of the crossings generated during our study were made by either teens or children. The intersection is located in a long six block stretch on King Edward that does not have any pedestrian signal to assist in crossing. The signal will also help cyclists using the Valley bikeway which was approved by Council last year. A pedestrian controlled signal is recommended for this intersection to improve pedestrian safety. ICBC is willing to contribute \$25,000 towards this signal for a total cost of \$112,000

**A8) 4<sup>th</sup> Avenue at Dunbar \$77,000**

The intersection of 4<sup>th</sup> Avenue at Dunbar is located between two signalized intersections. However, there is still a demand for pedestrians to cross at Dunbar as there are a number of commercial and residential buildings on both sides of 4<sup>th</sup> Avenue. The bookstore on the south side has requested a pedestrian signal. During field studies, staff observed that visibility for pedestrians is often blocked by cars parking too close to the intersection. Motorists did not generally yield and pedestrians must cross four lanes of heavy volumes of traffic along with two parking lanes. In addition, staff observed eastbound motorists driving at considerable speed after getting the green at Alma, one block west of the intersection. Within the past five years there has been one vehicle-pedestrian collision at the intersection. ICBC is willing to contribute \$24,000 towards the signal for a total cost of \$101,000.

**A9) Broadway at Trutch \$61,000**

This area of Broadway consists of busy commercial uses which contribute to high pedestrian volumes at this intersection. The intersection is located between two signalized intersections; however demand is high to cross here. Field studies show that a pedestrian must cross two lanes of heavy traffic and 1 parking lane in each direction. Motorists were not courteous resulting in pedestrians acting in a very cautious way when crossing. This signal is one element that will contribute to transit and pedestrian improvements planned for West Broadway early next year. Within the past five years there have been four vehicle-pedestrian collisions at the intersection. ICBC is willing to contribute \$35,000 towards the signal for a total cost of \$96,000.

## B) Full Traffic Signals - Recommended Locations

### B1) Point Grey Road and Alma \$175,000

The intersection of Point Grey Road and Alma is a unique intersection that is controlled by stop signs on the west leg of Point Grey Road and the north leg of Alma. The dominant vehicle movements are westbound to southbound left-turns and northbound to eastbound right turns in the opposite direction. These movements are able to free flow at this intersection. Staff proposes that the signal still give a majority of the green time to these movements, while allowing pedestrians and vehicles on the west and north legs to actuate the signal. These movements make it very difficult, especially during peak periods to cross as a pedestrian. Vehicles also experience significant delays and difficulties entering and exiting the west and north legs during these periods. In March of this year, staff distributed a letter to area residents requesting their feedback regarding the proposed traffic signal. Of the 1000 letters that were distributed, 116 responses were received, 83 responses were in favour and 33 were not (72% in favour). Many residents agreed that in order to facilitate pedestrian movements and vehicle movements a traffic signal would be required. Other residents felt that the addition of the traffic signal would slow traffic too much and introduce shortcutting in the neighbourhood. Engineering had studied this, and determined that it would be appropriate to install speed humps in the lane way between Point Grey and 1<sup>ST</sup> Ave to discourage shortcutting. Staff will also continue to monitor other local roads to determine if other traffic calming measures are necessary. It is recommended that a traffic signal and associated geometric modifications including bulging and normalization be installed at this location. ICBC is willing to contribute \$25,000 for a total cost of 200,000.

### B2) 49<sup>TH</sup> Ave and Alberta \$50,000

The intersection of 49<sup>th</sup> and Alberta is located one block east of Cambie Street, where construction for the Canada Line is underway. InTransitBC is constructing the line on the east side of Cambie, affecting local residents who enter and exit the neighbourhood on the southeast. The construction closes two main Cambie Street entrances into the neighbourhood, forcing residents from the south to enter and exit at the 49<sup>th</sup> and Alberta intersection. The increase in traffic at an already busy intersection would require a full traffic signal to be installed. InTransitBC has agreed to pay 50% of the cost of the signal for this reason. The signal also improves accessibility to the YMCA and the Langara Golf Course located south of the intersection. Staff has received requests from residents and users of this facility for a traffic signal. It is recommended that a traffic signal be installed at this location. InTransitBC is to contribute \$50,000, for a total cost of \$100,000.

### LOCATIONS FOR FURTHER REVIEW

A number of other locations were also reviewed for installation of pedestrian signals. This is a list of locations that are not recommended at this time due to the above priorities, but are to be monitored for future programs.

#### **Kerr and 55<sup>th</sup> and 56<sup>th</sup> - (approximately 70<sup>th</sup> on the priority list)**

Residents sent staff a 1710 signature petition following two vehicle-pedestrian collisions in the last year at Kerr and 55<sup>th</sup> and Kerr and 56<sup>th</sup>. A zebra marked and bulged pedestrian crossing exists on Kerr St at 55<sup>th</sup> Ave and at 56<sup>th</sup> Ave. These measures were installed in 2004 to increase driver awareness, provide pedestrians with a shorter crossing distance, and improve visibility.

Observations of these intersection conducted by staff show that driver behavior at these intersections was not good. Drivers were seemingly unaware or indifferent to pedestrians crossing and traveled at high speeds through the corridor. The Vancouver Police Department conducted an 8-day enforcement campaign at this location ticketing speeders, j-walking and motorist non-compliance. Their observations reinforced staff conclusions that driver behavior is the major issue here.

In addition to enforcement, Engineering Services has reviewed this corridor to determine if any modifications are necessary. The intersections were reviewed for both pedestrian signals and full traffic signals. Neither of these options was found to meet the threshold to be recommended in this year's program. However, we are recommending increasing street lighting levels at the crosswalks above standard. Other recommendations include the installation of bike lanes on Kerr. The bike lanes are to provide a facility for cyclists and narrow the current lane width on the street. This may result in decreased vehicle speeds on Kerr since the marked bike lanes narrow the current lane width. Our Neighbourhood Transportation Branch will provide details on this bike lane in a subsequent report to Council. Staff will continue to monitor these locations for future programs.

#### **Fir Street at 14<sup>th</sup> Ave - (approximately 50<sup>th</sup> on the priority list)**

A 1204 signature petition was received from area residents following a vehicle-pedestrian collision December 2005. This accident has been the one reported accident in the past five years. A review of this location noted that most pedestrians were able to cross Fir Street during gaps in the existing traffic flow. The nearest signals are at 12th Avenue and at 16th Avenue. There is a marked and signed crosswalk at the south crossing to assist pedestrians in crossing Fir Street. There is a long term care facility and senior's complex nearby. Although some drivers were not courteous, pedestrians would not have to wait long for a gap to be created. The recent development of Crystal Court on the NW corner has increased density in the neighbourhood, but pedestrian volumes have not yet reached the threshold for this intersection to become a signal based on city wide priorities. Staff will continue to monitor this location for future programs.

Additional Locations to be monitored for future Signal Programs:

57<sup>th</sup> Avenue at Fleming St  
57<sup>th</sup> Avenue at Prince Edward St  
Homer at Helmcken  
King Edward at Brakenridge  
Nootka at 27<sup>th</sup>  
Pender at Nicola  
Rupert at 27<sup>th</sup>  
SW Marine at 49th  
Thurlow Street at Barclay St  
King Edward and Alexandra  
Robson and Jervis  
Cordova and Princess  
Venables and Raymur

**APPENDIX**

The "Special Crosswalk" pedestrian crossing device consists of the following features: pavement markings, overhead internally-illuminated signs with pedestrian-activated flashing amber beacons, ground mounted signs, advance warning signs and special lighting of the crosswalk area.

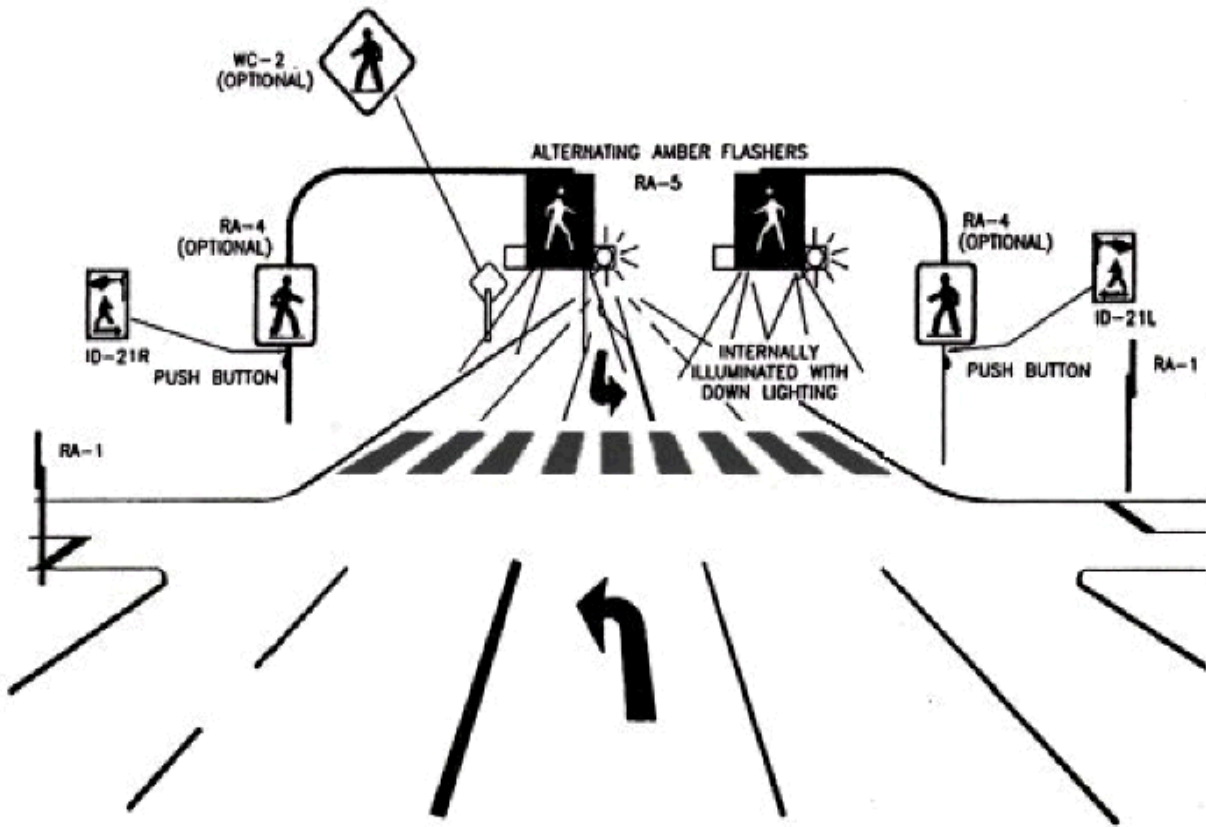


Figure 1 - Typical "Special Crosswalk" installation

**D) Signal Modifications \$365,000**

**D1) Pedestrian Indicators \$35,000**

Pedestrian indicators provide "walk" and "don't walk" indications for pedestrians at signalized intersections. Existing signals that do not have pedestrian indicators are reviewed and retrofitted each year. It is recommended that funding for up to five suitable locations at an average cost of \$7,000 be appropriated for 2006.

**D2) Left-Turn Phasing \$125,000**

The City receives many requests for left-turn flashing arrows at existing traffic signals. They are best suited at intersections with left-turn bays and high left-turn volumes which cannot clear during gaps in opposing traffic flow. This program also provides funding for the addition of detectors in the left-turn bay so the length of the left-turn phase responds to demand.

**D3) Audible Signals \$50,000**

Audible signals provide visually disabled pedestrians with an indication of when to cross the roadway at signalized intersections. Vancouver has more audible signals than any other Canadian city with over three hundred and ten locations completed as of March. Funding of \$50,000 is recommended to install audible signals at existing and new signal installations. The priority of installation is established by user requests, land use, and transit availability in consultation with local advocacy groups, the CNIB, Vancouver School Board and the Special Advisory Committee on Disability Issues.

**D4) Signal Modifications \$55,000**

There are routine modifications required on the present signal plant from time to time. Some examples of the modifications are:

- adjustment of signal timings in the local controllers;
- visibility improvements of existing signal equipment by the relocation or addition of signal heads;
- the modification of overhead signs;
- modifications to hardware and software for the controllers; and
- purchase of computer hardware and software to allow staff to better manage the existing signal system, utilize database software to inventory pedestrian and vehicle information, and to handle increasing requests from the public for traffic related data.

D5) Intelligent Transportation Systems \$50,000

Intelligent Transportation Systems are the development and application of technology to optimize the effectiveness of the existing street infrastructure. Additionally, Intelligent Transportation Systems (ITS) provide information to road users to help them make smarter travel choices. Examples of ITS funded through this program include:

- Traffic monitoring cameras which provide images to the City's Road Ahead webpage;
- Automated traffic counters and related data transfer equipment; and
- Hardware and software modifications related to the Traffic Signal Management System to help optimize the signal network.

D6) Tertiary Heads \$50,000

Since 1994, the City has been cost-sharing with ICBC the upgrade of existing signalized locations for improved signal visibility. These upgrades include the addition of a third signal head and have achieved significant reduction of traffic collisions at many high-accident intersections. Throughout the coming year, staff will continue to pursue further support from ICBC. This funding partnership will allow the City to continue to install tertiary signal heads at high volume/high collision intersections. ICBC funding has yet to be determined.



## Signal Improvements Funded Through Other Projects

New signal installations and upgrades to existing signals through Greenways, Bikeways, Community Visions, and Neighbourhood Centres are listed below. The following locations have had signal work completed within the past year or are currently underway. The upgrading of signals refers to one or more of the following:

- the addition of cyclist push-buttons
- major reconstruction of an existing signal in which items such as turning movements and/or arrows have been added.

- 1) Beach & Cardero- New Signal completed- Cardero Bikeway
- 2) Kingsway at Dumfries New Signal underway Neighbourhood Centres
- 3) Alberni at Nicola New Signal completed Haro-Nicola Bikeway
- 4) Robson at Nicola New Signal completed Haro-Nicola Bikeway
- 5) King Edward and Quesnel New Signal underway Greenways
- 6) Great Northern Way at Keith new signal completed - Rapid Transit
- 7) Main and 20<sup>th</sup> New Signal underway Main Street Showcase
- 8) Main and 46<sup>th</sup> New Signal underway Main Street Showcase
- 9) Main and 62<sup>nd</sup> New Signal underway Main Street Showcase

The following locations are under review at this time and have yet to go through neighbourhood consultation, the Bicycle Advisory Committee or approved by Council

- 1) Oak and Nanton/28<sup>th</sup> Avenue -under review- Bikeway
- 2) 12th and Trafalgar under- review- Bikeway
- 3) Main and 1<sup>st</sup> - under review - Central Valley Greenway
- 4) Quebec and 1<sup>st</sup> - under review - Central Valley Greenway
- 5) 4<sup>th</sup> Avenue and Balaclava under review Bikeway
- 6) SW Marine and Balaclava- under Review- Bikeway

## Signal Locations to be Funded by Developers

There are locations where, in accordance to the rezoning agreements or as a condition of development approval, signals may be installed at the expense of the developers. These are locations where existing conditions are satisfactory but as a direct result of the developments, future conditions may be affected and signals will be required to accommodate pedestrians and traffic. Future signal locations to be funded by others are as follows:

- 1) Thurlow and Canada Place Way - New Signal recommended - Vancouver Convention Centre
- 2) Burrard and Canada Place Way - New Signal recommended -Vancouver Convention Centre
- 3) Cambie and 64<sup>th</sup> - New Signal Recommended - Translink/InTransit BC

- 4) Broadway and Yew - New Signal underway - London Drugs
- 5) Hamilton and Nelson - New Signal recommended - Wall Financial
- 6) Pacific & Smithe - New Signal recommended - Concord Pacific
- 7) Pacific and Griffiths Way - New Signal Under Review - Plaza of Nations Casino
- 8) 41<sup>st</sup> and Balaclava - New Signal under review - Crofton House
- 9) Yukon & 7<sup>th</sup> Avenue - New Signal recommended - Canadian Tire/Grosvenor
- 10) Expo and Griffiths - New Signal recommended - Costco Development