Reviewed by the GVTA Finance & Audit Committee – June 28, 2006

To: GVTA Board of Directors

From: Sheri Plewes, Vice-President, Capital Management and Engineering

Date: June 15, 2006

Subject: 2006 Capital Program Projects - Specific Project Approval

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Staff Recommendation:
That the GVTA Board provides Specific Project Approval for the following capital projects:

- Public Address System Replacement – Expo Line: Budget: $1,110,000
- SkyTrain Card Access Control System: Budget: $1,065,000
- Lighting Upgrades in Expo Line Stations – Phase 2: $1,950,000
- Marine Drive Trolley Overhead Extension: $8,795,000
- West Coast Express Ticket Vending Machine Replacement: $6,900,000

PURPOSE

To obtain Step 2 Specific Project Approval for five capital projects.

BACKGROUND

The 2006 Capital Program and the 2006 Transportation Plan and Budget were approved by the Board of Directors at its regular meeting of December 7th, 2005. These approvals established the envelope for the 2006 Capital Program and authorized Step 1 Approval in Principle for the projects proposed as part of the 2006 Capital Program.

To release project funds, individual projects must receive Step 2 Specific Project Approval from the Board. Prior to requesting Specific Project Approval, detailed project justifications and work plans for each project are completed, and reviewed and approved by the Capital Management Committee. Separate project justifications are not required for revenue vehicle procurements, or for capital programs comprised of multiple projects that are presented and approved as part of the annual Transportation Plan and Budget.

DISCUSSION

Specific Project Approval is requested for the following capital projects. A comparison of the proposed expenditures versus Approval in Principle estimates is provided below.

1. Public Address System Replacement – Expo Line: Budget: $1,110,000

This project is to replace the public address and audio alarm system at the SkyTrain Expo Line stations. The existing system was initially installed in 1986 using analog technology and is now obsolete. The system is no longer supported by the manufacturer and is increasingly difficult to maintain. In addition to reaching the end of its useful life, a replacement system will address objectives to improve audio quality and to reduce noise impacts on nearby neighbourhoods. The original equipment was primarily designed to broadcast fire alarm evacuation tones and emergency voice announcements, with common speakers shared between the fire alarm annunciator and the public address system. The intelligibility of voice announcements has deteriorated over the years as a result of poor station acoustics coupled with increases in ambient noise around the stations, as well as ongoing fire alarm code requirements.

The proposed project will replace the existing public address system with a new digital Emergency Voice Alarm Communication (EVAC) system. Industry research has shown that there are digital EVAC systems available that can integrate with the existing fire control panels while providing a significantly higher level of audio and alarm quality. Replacement is not expected to be required for the fire control panels for at least ten years, and the system is highly reliable with few failures.

The following scope of work is proposed:

- Supply and install a new EVAC system to replace the existing PA/audio alarm equipment at the Expo Line stations;
- Code review related to potential impacts of equipment changeout on local codes/variances;
- Review alarm audio alternatives (tone vs. bells);
- Supply and install supplemental voice processing equipment at SkyTrain stations and the OMC to further improve audio quality and allow automatic volume adjustments based on ambient noise levels; and
- Replacement and/or addition of PA system speakers as required.

The budget estimate for the *Public Address System Replacement – Expo Line* project is less than the Approval in Principle budget:

Approval Stage	Total
Approval in Principle	$ 1,215,000
Specific Project Approval	$ 1,110,000
Increase/(Decrease)	$ (105,000)

The project budget has been reduced to reflect refinements in project scope since Approval in Principle.

2. SkyTrain Card Access Control System: Budget: $1,065,000

This project is to replace the existing electronic and manual key systems at the SkyTrain Operations and Maintenance Centre (OMC) and associated facilities, and at the Expo and Millennium Line stations, with a new, electronic card access control system.

There are three independent electronic card access control systems used to control access to the OMC and related facilities. These systems are at the end of their useful life and are no longer fully functional. The existing independent systems cannot be integrated due to technical limitations, meaning that staff must carry multiple access cards. Each system must be updated independently, and the systems cannot accommodate new stations. The existing systems are obsolete and system components, access cards and coded keys are not supported or are no longer available.

Access to critical areas of the SkyTrain stations is currently controlled through a manual key system which is less secure than an electronic system. The use of mechanical keys is not recorded electronically so there is no record of the User ID accessing the room, and no way to notify OMC that a room is being accessed. Furthermore, mechanical keys can be lost, stolen or duplicated.

An independent review of the access control systems was completed and it was recommended that a fully integrated card access control system be installed to increase security and to better control facility access, particularly for high security/mission-critical areas of SkyTrain.

The proposed project will replace the existing access control systems with a centrally managed system with medium intelligence controllers at each facility. This solution will improve the overall level of access control, and can be expanded in the future to additional sites and cardholders, and can be integrated with other security and personnel management systems.

The following scope of work is proposed:

- Supply and install a centralized electronic card/coded key systems at the OMC, OMC front access gate, OMC Administration Building, mainline Expo and Millennium Line SkyTrain stations;
- Identify infrastructure improvements to support installation of a new card access control system;
- Supply and install card access system management and reporting workstations at Wayside Maintenance, Human Resources and OMC;
- Supply access cards; and
- Supply and install electronic card access door readers at stations and OMC equipment rooms that contain operationally sensitive electronic equipment.

The Specific Project Approval budget requested for the *SkyTrain Card Access Control System* project is higher than the Approval in Principle budget:

Approval Stage	**Total**
Approval in Principle	$ 855,000
Specific Project Approval	$ 1,065,000
Increase/(Decrease)	$ 210,000

The budget increase is primarily due to changes in estimated wiring and installation costs, and inclusion of an engineering study to assess and design facility improvements, following further development of the project design.

3. Lighting Upgrades in Expo Line Stations – Phase 2: $1,950,000

The objective of the lighting upgrade program is to replace the existing lighting systems to improve the illumination levels in the Expo Line SkyTrain stations. The work will address problems associated with the age and wear of the lighting systems, including high energy consumption, diminished lamp performance, faded reflectors and lenses, poor lighting quality and low illumination levels. The lighting upgrades will also improve public safety perceptions by increasing illumination levels to the equivalent of the Millennium Line stations.

This is the second of a three-phase program proposed to improve the lighting in all 20 Expo Line Stations. The first phase included the following seven stations determined to be of highest priority – Waterfront, Burrard, Granville, Stadium, Broadway, Edmonds and Columbia. The lighting upgrades are currently underway in Burrard and Granville Stations. The design of lighting upgrades at the remaining Phase 1 stations is complete and the implementation of upgrades will commence in summer 2006. This second phase includes the stations determined to be of medium priority – Main Street, 29th Avenue, Joyce, Patterson,

Metrotown, Royal Oak and New Westminster. The third phase for the final six Expo Line stations will be proposed in a future capital program.

The scope of the project includes:

- Upgrading existing lighting systems to improve the technology of the existing fixtures, improve illumination output, reduce energy consumption and extend the life of the existing system;
- Augmenting existing lighting systems by adding light fixtures of a similar type in specific station areas to increase illumination levels; and
- Replacing existing lighting systems with more advanced systems in specific station areas to improve illumination output, and to make fixtures more accessible for maintenance purposes (e.g., over escalators and stairwells where ceilings are high).

Work in areas, such as concourse, ticket vending and corridors, can be performed during non-peak revenue service hours. Work in platform areas will occur during non-revenue service hours, and some station areas such as over escalators and stairways may require temporary closures.

These lighting upgrades will result in significant improvements in the illumination levels at these stations, and will constitute a major step toward a consistent illumination standard throughout the SkyTrain system.

The budget estimate for the *Lighting Upgrades in Expo Line Stations – Phase 2* project has decreased by $925,000 from the Approval in Principle budget, as shown below:

Approval Stage	**Total**
Approval in Principle	$2,875,000
Specific Project Approval	$1,950,000
Increase / (Decrease)	$ (925,000)

Prior to Phase 1, a study was initiated under the Minor Capital Account to review the current illumination levels and assess the condition of the lighting systems, and to provide recommendations and capital cost estimates on lighting system upgrades. The Approval in Principle budget reflected the cost estimates provided from the study. Based on experience with the lighting upgrade work in Phase 1, the project cost estimates have been reduced accordingly.

In 2003, TransLink confirmed its commitment to BC Hydro's PowerSmart Program, to adopt the principles of energy efficiency in business practices, and to improve energy efficiency by at least five percent as part of a long-term PowerSmart strategy. Through the PowerSmart Program, BC Hydro will reimburse TransLink with a portion of the cost of the lighting upgrades, as well as

the lighting study. The level of compensation is dependent upon the energy efficiency of the new systems, and will be estimated following the completion of design. The actual compensation is based on verified efficiency improvements, and will be paid approximately one year following implementation. As a result, compensation has not been included as a cost recovery in the project budget.

There are no net operating savings assumed as a result of this project. Although the new lighting systems will achieve more efficient energy consumption, the cost savings are expected to be offset by a net increase in illumination output due to the addition of lighting fixtures and the higher illumination levels.

4. Marine Drive Trolley Overhead Extension: $8,795,000

This project is to extend the existing trolley overhead (TOH) network along Marine Drive between Oak Street and Victoria Drive and to increase the output of a new booster rectifier station to supply power to the new line.

This project addresses an opportunity to increase operational efficiency through reducing bus deadheading costs and reducing overall congestion of trolley buses in the Marpole area following the relocation of the Vancouver bus depot from the Oakridge Transit Centre (OTC) to the new Vancouver Transit Centre (VTC). In July 2003, the Board provided Specific Project Approval for the construction of the new VTC in South Vancouver. The current site (OTC) was well located within the TOH network for minimizing bus deadheading costs, while the new VTC would incur incremental deadheading costs due to its location and the limitations of the existing TOH network. By extending the TOH network on Marine Drive, this project will also support transit connections to the new Canada Line Rapid Transit Line.

A Minor Capital Account study was completed to assess the savings and costs associated with extending the TOH lines along Marine Drive. Taking into account the capital and operating impacts, it was determined that extending the TOH on Marine Drive from Oak Street to Victoria Drive represented the best value to TransLink.

The scope of the project includes:

- Supply and installation of trolley foundations and poles on both the north and south sides of Marine Drive;
- Supply and installation of running (contact) wires complete with all necessary hardware for eastbound and westbound trolley buses on Marine Drive;
- Supply and installation of feeder wires complete with pole clamp and insulators;
- Restoration and refinishing of sidewalks and roadways affected during installation; and

- Increase output of a new booster rectifier station (being constructed through the Trolley Bus Replacement Project) from 2MVA to 4MVA to supply power to the TOH extension.

The cost of the land for the rectifier station is covered through the Canada Line Rapid Transit project.

The Specific Project Approval budget requested for the *Marine Drive Trolley Overhead Extension* project is less than the Approval in Principle budget:

Approval Stage	**Total**
Approval in Principle	$10,900,000
Specific Project Approval	$ 8,795,000
Increase/(Decrease)	$ (2,105,000)

The budget reduction is primarily due to the further refinement of scope for the additional rectifier station. Following completion of the TOH extension in mid-2009, annual deadhead savings (net of incremental maintenance) of approximately $710,000 will be realized.

5. West Coast Express Ticket Vending Machine Replacement: $6,900,000

This project is to replace the existing West Coast Express (WCE) ticket vending machines (TVMs) and parking pay stations (PPSs) which have reached the end of their serviceable life. The TVMs were originally installed in 1995 and, although only ten years old, the TVMs have had a higher than anticipated duty cycle which has contributed to a shortened life span. The PPSs were last replaced in 2000, and it is TransLink's preference to utilize similar hardware for the TVMs and PPSs in order to minimize maintenance and spare parts requirements. As a result, it is necessary to replace the PPS at the same time in order for them to be compatible with the new TVMs.

There are currently 29 TVMs at the eight WCE stations and 12 PPSs at six of the stations. Three additional TVMs are proposed to increase customer service for a total of 32 replacement TVMs. The PPSs would be replaced on a one-for-one basis. Technical work was completed under a Minor Capital Account study to develop the functional requirements.

The proposed project will replace the obsolete equipment with new TVMs, PPSs and associated computer hardware and software. The new equipment will be designed for a higher level of usage and should achieve the expected 15-year service life. WCE fares and ticket media are different from the rest of the transit system. The study reviewed the cost and benefits of integrating WCE with the rest of the system. It was determined that the significant additional cost provided

little customer and management benefit. Therefore, the new WCE fare media will not be compatible with the magnetic strip fare media used on SkyTrain, SeaBus, bus and Community Shuttle services.

The scope of the project includes:

- Supply and install new fare collection equipment for WCE including TVMs, PPSs and associated computer systems;
- Testing and commissioning of the fare collection system;
- Vendor training on the system use, management and maintenance;
- Prepare modified architectural, communication, electrical, installation and system cut over plan and design drawings for each WCE station;
- Disposal of retiring equipment; and
- Review and implementation of recommended TVM area security features.

The Specific Project Approval budget requested for the *West Coast Express Ticket Vending Machine Replacement* project is less than the Approval in Principle budget:

Approval Stage	**Total**
Approval in Principle	$ 9,600,000
Specific Project Approval	$ 6,900,000
Increase/(Decrease)	$ (2,700,000)

The budget reduction is primarily due to the recommendation to continue with a separate, non-magnetic fare system for WCE, instead of a magnetic system that would be compatible with the rest of the transit system.

CONCLUSION

Staff recommends that the Board approve funds totaling $19,820,000 for the capital projects described in this report. The total Step 2 Specific Project Approval budget for these projects is $5,625,000 less than the total Approval in Principle budget.