City of Burnaby

Item	
Meeting	2011 Jul 11

COUNCIL REPORT

TO: CITY MANAGER **DATE:** 2011 July 06

FROM: DIRECTOR PLANNING AND BUILDING **FILE:** 90300 20
Reference: *Smart Card & Faregate Project*

SUBJECT: TRANSLINK'S BUSINESS CASE FOR SMART CARDS AND FAREGATES

PURPOSE: To review TransLink's business case for smart cards and faregates.

RECOMMENDATIONS:

1. **THAT** Council advise the TransLink Board of this report's findings, that the 2009 *Business Case* does not provide a sound justification for the implementation of smart cards and, in particular, faregates.

2. **THAT** Council request the. TransLink Board to provide a response to justify its approval of the smart card and fare gate project with a low benefit-cost ratio, particularly given the uncertainties in the quantification of benefits.

3. **THAT** Council request that the TransLink Board initiate a further business analysis of smart cards and faregates, with that analysis to include:

   a. the context provided by previous analyses of faregates;

   b. separate financial analyses of smart cards and faregates as stand-alone systems;

   c. explanation or rationale for the estimated benefits; and

   d. consideration of project costs before narrowing the field of options to a single choice.

4. **THAT** Council request that the TransLink Board suspend implementation of smart cards and faregates, pending consideration of the outcome of the above-mentioned business analysis.

5. **THAT** copies of this report be sent to: Councils of Metro Vancouver municipalities, Burnaby Members of the Legislative Assembly, Burnaby Members of Parliament, the provincial Minister of Transportation and Infrastructure, and the Federal Minister of Transport, Infrastructure and Communities.

6. **THAT** copies of this report be sent to the Auditor General of British Columbia, Mr. John Doyle and the Information and Privacy Commissioner for British Columbia, Ms. Elizabeth Denham.

REPORT

1.0 INTRODUCTION

On 2010 December 13, Council requested that staff obtain the 2009 *Business Case* used by the TransLink Board as a basis for implementing "smart cards" and "faregates". TransLink did not release the *Business Case* in response to staff's request. However, an edited version of the *Business Case* was made public in 2011 March. Based on that document, this report responds to Council's request.

2.0 BACKGROUND

2.1 Project Description

TransLink is in the process of implementing a smart card system for paying transit fares. A smart card is physically similar to a credit card, with a computer "chip" inside. The chip contains fare information that can be updated. The card can be "loaded" with cash for paying individual fares, or with specific fare products such as a monthly pass. Passengers will tap their cards against card readers when entering or exiting transit (including buses) as a means of making or confirming payment. Based on a public consultation process, the smart card will go by the name of "Compass".

In conjunction with smart cards, TransLink is installing faregates at all SkyTrain stations. These are gates, activated by the smart cards, that people must pass through when entering or exiting a SkyTrain station. The confirmation of a SkyTrain passenger's fare would thus be made at the point of entry rather than, as at present, via periodic on-board inspections.

2.2 History

Select events leading up to the current project are:

- **2002 June:** TransLink rejected the use of faregates on the SkyTrain system. A report to the TransLink Board estimated SkyTrain fare evasion at 8.7%, amounting to $3.3 million per annum loss to the system. The capital cost for faregates (then on only two SkyTrain lines) was estimated at $83 million, with incremental operating costs of $22 million per year. The combined capital and operating cost of faregates, taken over the life of the project and discounted back to the present, was thus estimated to have a present value of $300 million. This cost for the project was clearly far greater than anything that could be recouped even if the $3.3 million fare evasion was completely eliminated, and the report noted that even transit systems which are fully gated still experience some fare evasion (up to 4%).

- **2005 December:** The TransLink Board again rejected faregates. SkyTrain fare evasion was estimated at this time at 6.3% of passengers, or $4 million per annum (though public perception was that fare evasion exceeded 25%). It was anticipated that a faregate system would require a staff presence at every SkyTrain entrance. This is the common practice in other cities, to deal with special access for wheelchairs, luggage, or other

reasons that required bypass of the gate system. The annualized cost[1] (capital and operating) for faregates was estimated at $25 million[2]. Again, this was far in excess of the $4 million that could be saved annually if all SkyTrain fare evasion was eliminated. In fact, since some evasion would still occur, potential benefits were estimated at only $2.9 million.

- **2007 November:** In a surprise announcement, the then-Minister of Transportation, the Honourable Kevin Falcon, announced that the Province would pay the capital cost of installing faregates on the SkyTrain system.

- **2008 July:** TransLink's financial *2009 Base Plan*[3] did not provide funding for smart cards or faregates.

- **2009 April:** Senior governments committed $70 million ($40 million provincial and $30 million federal) for faregates, about 41% of the estimated capital costs of faregates.

- **2009 July:** TransLink's financial *2010 Base Plan*[4] included $179 million in capital funding over six years to implement smart cards and fare gates.

- **2009 December:** The TransLink Board decided to implement smart cards and faregates, based on a *Business Case*[5] that they received. That document was not made public at that time. Shortly thereafter, TransLink retained architectural and civil engineering consultants to design station alterations to accommodate the smart card and faregate equipment. This typically involved a modest expansion of the station house, primarily for the older Expo Line stations. Fewer alterations were needed to Millennium Line stations, which had originally been designed for this type of installation.

- **2010 November 1:** Council adopted a motion calling on TransLink to implement smart cards but not faregates.

- **2010 November 22:** The TransLink Board Chair Dale Parker responded to Council's motion. He indicated the benefits of faregates as they would provide data on SkyTrain boardings/alightings, enhance safety and security, and reduce fare evasion. For smart cards and faregates taken together, he stated the benefits to be: bus operating efficiencies, reduced fare evasion, improved asset utilization, and new ridership revenue. In describing the proposed implementation, he indicated that:

    - SeaBus will also have faregates;
    - Buses and West Coast Express will have smart card readers but not faregates;
    - Buses will continue to accept cash fares;
    - Implementation is scheduled for 2013;

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[1] The annualized cost is the cost per year of the capital and operating costs of the faregates over the lifespan of the asset.
[2] TransLink, "Canada Line – Controlled Access"; 2005 December 1.
[3] TransLink; "2009 10-Year Transportation & Financial Plan"; 2008 July.
[4] TransLink; "2010 10-Year Transportation and Financial Base Plan"; 2009 July 31.
[5] TransLink; "The Smart Card and Faregate Project – Business Case"; 2009 December.

- The system was approved by the TransLink Board based on the 2009 *Business Case*;
- Over the lifetime of the project, there is a net financial benefit to TransLink.

- **2010 December 8:** The TransLink Board awarded a ten-year contract to Cubic Transportation Systems (with IBM Canada) to design, build, and operate the smart card and faregate system.

- **2010 December 13:** Council requested that staff obtain the 2009 *Business Case.*

- **2011 March:** An edited version of the 2009 *Business Case* was made public, with some of the financial information deleted. This is the primary document that is reviewed in the current report.

The above summary has focused on faregates. In contrast, TransLink has had a favourable view of smart cards for over a decade. This is reflected in a broad range of policy documents over the years, though the only formal analysis[6] (which staff have not yet been able to obtain from TransLink) appears to have been in 2005.

3.0 BUSINESS CASE

The edited version of TransLink's *The Smart Card and Faregate Project – Business Case* is dated 2009 December and has been provided to Council under separate cover. Though TransLink is listed as the sole author, the Ministry of Transportation and Infrastructure is identified as a co-sponsor of the project. This is the document that was released in 2011 March, after the award of the contract to design, build and operate the system.

Key findings of the *Business Case* are presented below, focusing on those parts of the document which supported the decision to proceed with implementation. The *Business Case* also included an evaluation of possible procurement methods, which is not presented or evaluated here[7]. However, that analysis of how to procure the system seems to be the actual focus of the *Business Case*, consuming two-thirds of the body of the report.

3.1 Preamble

The *Business Case* generally takes the view that the need for smart cards and faregates is self-evident. For example, it is stated that, "The purpose and need for the Project has long been established."

The project objectives are stated as:

1. "Improve operating efficiency and increase ridership through improved customer and ridership information and data;
2. Create new opportunities to generate or increase revenue;
3. Provide convenient new options for transit riders to increase customer satisfaction;

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[6] Cited in "2006 Transportation Plan"; 2005 December.
[7] The *Business Case* recommended a Design-Build-Operate-Maintain procurement model.

4. Improve the quality and efficiency of transit service delivery; and
5. Improve safety and security."

> ***Staff comment:*** *The* Business Case *tries to portray the smart card / faregate project as long-contemplated and well-established. This is incorrect. Faregates had been repeatedly rejected in the past.*
>
> *The project objectives aim only to enhance benefits. There is no objective to do so cost-effectively.*

3.2 Preliminary Screening

The *Business Case* initially considers four possible scenarios:

- **Status quo:** no smart cards or faregates.
- **Option 1:** smart card used to access the system, but not needed for egress. No faregates.
- **Option 2:** smart card used for both access and egress (i.e., card also scanned upon departure). No faregates.
- **Option 3:** smart card used for both access and egress, with faregates.

Note that Options 2 and 3 would introduce the need to "tag-off" when alighting from a bus, which could affect alighting times and thus bus travel times.

In the *Business Case*, the above options are evaluated qualitatively rather than quantitatively. That is, there are no financial or other numeric analyses at this stage. The five objectives defined previously are each evaluated with general statements such as, "Excellent opportunity to improve operations to meet customer needs". This evaluation is presented in a summary table with no discussion. In broad terms, the *Business Case* sees the benefits of smart cards as:

- Provide more and better ridership data;
- New marketing opportunities;
- Increased customer convenience leading to increased ridership; and
- Service efficiencies arising from improved ridership data.

If smart cards are used for *both* access and egress, then the additional benefits are seen by the *Business Case* as:

- Even better data; and
- Option to implement distance-based fares (i.e., more sophisticated than the existing three-zone system) which could be more efficient and equitable.

The benefits of faregates are seen as:

- Improved data quality due to more consistent use of the smart cards;
- Reduced fare evasion;
- Improved customer perception of safety on SkyTrain; and
- Reallocation of SkyTrain fare-checker staff to "other safety and security issues".

However, it is acknowledged that faregates "may be less convenient for some customers".

Based on the evaluation table, Option 3 is declared to be superior. The remainder of the *Business Case* deals only with that scenario.

> ***Staff comment:*** *The preliminary screening is only qualitative, and only considers benefits. The five criteria that were used give no consideration to capital or operating costs. It is concluded in the* Business Case *that the combination of smart cards and faregates will produce higher benefits than either system alone.*

3.3 Financial Analysis

The project capital cost for smart cards with faregates is estimated at $171 million, with annual incremental operating costs of $7.7 million. Estimated benefits are shown in ***Table 1***. The savings from reduced fare evasion are higher than in previous estimates, and several new categories of savings have been identified. More specifically:

1. **Fare evasion.** SkyTrain fare evasion is expected to drop from the existing value of around 6% to 1.6%, which is the rate for buses.
2. **Ridership.** This is projected to rise by 1.5%. A rationale or explanation for this is not provided.
3. **Resource utilization.** This paragraph was deleted from the public version of the report. It is thus not known what is meant by "resource utilization".
4. **Bus operating efficiencies.** Improved data will allow for better customization of service to match demand, resulting in an estimated 2% to 5% reduction in annual operating costs.

Table 1: Projected Annual Benefits

Category	$M
Reduced fare evasion	$6.8
New ridership revenue	$2.7
Resource utilization	$2.4
Bus operating efficiencies	$8.4 - $21.0
Total	**$20.3 - $32.9**

In summary, the analysis indicates the present value of costs as $181 million, as compared with $199 million for benefits, both measured from 2010 through 2027. This leads to a benefit-cost ratio of 1.10. That is, the estimated benefits barely exceed the estimated costs, based on bus operating efficiencies of 2%. A higher benefit-cost ratio of 1.73 is noted if bus operating efficiencies are assumed at 5%.

The TransLink Board had access to additional background information when considering the above. A one-page appendix entitled "Cost Benefit Analysis" and a 50-page appendix entitled "Cost Estimate Report" have both been deleted in their entirety from the public version of the *Business Case.*

Staff comment: *Having selected the combined system on the basis of qualitative benefits, it is only this combined system that is analyzed financially. There is no attempt to financially separate smart cards from faregates. Either system has its own costs and benefits, but these are not documented. A proper financial analysis would first consider the two systems separately, and then determine the* incremental *costs and benefits of adding faregates on top of the smart card system.*

The calculation of benefits is vague and simplistic. No rationale is given for why the project would increase ridership at all, let alone by 1.5%. Due to deletions, there is no explanation of what is meant by "resource utilization" which is estimated to generate $2.4 million in benefits. While it is reasonable to suggest that improved ridership data will allow for some bus operating efficiencies, there is no justification for the stated range of 2% to 5%.

The final result (a benefit-cost ratio of 1.1) is not sufficient, on a business case, to justify advancing the project. The estimated benefits barely exceed costs. In addition, there are risks and uncertainties associated with the estimates of benefits. Such a project would be marginal if an agency had unlimited funds at its disposal (i.e., financial ability to pursue all projects with a benefit-cost ratio above 1.0). Given TransLink's severely constrained capital and operating budgets, where even existing operations are being cut back, such a project should only proceed if it out-performed other possible uses for the same funds.

The edited Business Case *does not provide enough information to separate the costs of smart cards from those of faregates. However, it is possible to separate the benefits. Fare evasion benefits (33% of all benefits) are attributable to faregates. Other benefits (67%) are attributable to smart cards, which in staffs view indicates that smart cards alone could be the wiser investment, and that the smaller benefits of faregates are not sufficient to justify the additional costs.*

4.0 CONCLUSION

This report has presented a review of TransLink's 2009 *Business Case* for smart cards and faregates. While TransLink has the ability to produce sound business case analyses, this ability has not been applied to this *Business Case*. From the information that staff has been able to obtain, the subject business case seems to be designed to retroactively justify the Minister's 2007 announcement of faregates than to present a critical financial assessment that would allow for a sound business decision to be made. It is therefore recommended that:

1. Council advise the TransLink Board of this report's findings, that the 2009 *Business Case* does not provide a sound justification for the implementation of smart cards and (in particular) faregates.

2. Council request the TransLink Board to provide a response to justify its approval of the smart card and fare gate project with a low benefit-cost ratio, particularly given the uncertainties in the quantification of benefits.

3. Council request that the TransLink Board initiate a further business analysis of smart cards and faregates, with that analysis to include:

    a. the context provided by previous analyses of faregates;

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    d. consideration of project costs before narrowing the field of options to a single choice.

4. Council request that the TransLink Board suspend implementation of smart cards and faregates, pending the outcome of the above-mentioned business analysis.

5. Copies of this report be sent to: Councils of Metro Vancouver municipalities, Burnaby Members of the Legislative Assembly, Burnaby Members of Parliament, the provincial Minister of Transportation and Infrastructure, and the Federal Minister of Transport, Infrastructure and Communities.

B. Luksun, Director
PLANNING AND BUILDING

SR:ll:jc

cc: Director Finance
Director Engineering