

# Metrolinx PRESTO Farecard Peer Review

Value for Money

December 22, 2011

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# Overview

## Context

Grant Thornton LLP (GT) was engaged by Metrolinx to provide consulting services, including a value for money assessment of the investment decisions relating to the PRESTO expansion.

A primary objective of the services is to provide independent advice to Metrolinx Management and the Board, supported by detailed analysis and assessment, as they evaluate additional investment in PRESTO, especially as it relates to the PRESTO Next Generation (PNG) Change Orders under the Accenture contract.

This engagement was of a consulting nature only and it is important to note it does not represent an audit or other form of assurance.

The PRESTO change order process is summarized in Appendix A.

Our scope of review is summarized in Appendix B.

## The PRESTO Program<sup>1</sup>

The Ontario Government has a long standing objective to implement a regional fare card in the Greater Toronto and Hamilton Area (GTHA), with a regional integrated fare card being a critical component of the Metrolinx Regional Transportation Plan, “The Big Move”.

The fare card system, known as PRESTO, endeavours to have a transformational impact on the GTHA’s regional transportation system, allowing integrated inter-regional travel with one common payment card that can be utilized across Ontario. PRESTO has stated that it achieves the following key objectives:

- Provides the foundation for integration of transit across the region.
- Enhances and leverages benefits of all provincial transit investments in the region.
- Brings GTHA into line with current practice for fare cards in other jurisdictions, many of whom have had fare cards in place for years.

In August 2006, the Ministry of Transportation (MTO) entered into a ten year contract with the selected systems integration vendor (Accenture) to design, build, operate and maintain a GTHA fare card system on behalf of the Ontario Government and participating transit agencies. Metrolinx has informed us that the systems integrator, Accenture, was selected after a public,

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<sup>1</sup> Background sourced from various Metrolinx board updates and PRESTO presentations.

competitive procurement process with Accenture leading the successful consortium which included the following members:

Company	Role
Accenture, Inc.	Prime Contractor: System integrator
Thales Group	Sub-contractor: Systems and device design, development, deployment and operation.
Plan Group	Sub-contractor (to Thales): On-site deployment and maintenance.
Scheidt & Bachmann	Sub-contractor: Systems and devices design, development, deployment and operation (maintenance).
Telus	Sub-contractor: Network design, development, hosting and maintenance.
Bell Canada	Sub-contractor (to Telus): On-site deployment and support activities.
Giesecke & Devrient	Sub-contractor: Development and deployment/ provision of fare cards.
Eagle Resources	Sub-contractor. Client site preparation, device software installation support.
Hewlett Packard	Sub-contractor. Provision of certain systems hardware for the Central System.
AUBPOS	Accenture Internal Sub-contractor: Call centre services.
ATIS	Accenture Internal Sub-contractor: Technical help desk services.
Avanade-Canada	Accenture Internal Sub-contractor: Project implementation resources for certain Central System build activities.
Accenture France Delivery Centre	Accenture Internal Sub-contractor: Project implementation resources for Central System build, including website development and ongoing change support.
Avanade France	Accenture Internal Sub-contractor: Deliver certain Project Implementation resources.

Additionally, the consortium use Bank of Montreal as their banking services provider.

The 2006 approval to proceed with the PRESTO project included:

- Authorization to enter into a \$250M, ten year contract with Accenture to design, build, implement and operate the system.
- Approval of the systems design, development and deployment project to create the ongoing intellectual property for the delivery of a Provincial Automated Fare Collection system (a capital investment subset of the \$250M approval).
- The initial project was originally intended to be completed by the end of 2009-10, and this target was subsequently extended to 2010-2011.
- Authorization to enter into a 10 year operating agreement between the province and participating municipalities for the provision of the Automated Fare Collection system.
- Recognition that TTC was not one of the original participating municipalities and that its future joining PRESTO would require a request for additional funding to add it to the system.

In March, 2007, the project's administration and contract management responsibilities were transferred to GO Transit and assumed by Metrolinx in May, 2009 with the merger of Metrolinx and GO Transit. The Ministry retained overall responsibility for project direction, leadership and

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funding. On June 30, 2011, ongoing responsibility for PRESTO was transferred in full to Metrolinx with proclamation of applicable sections of the Metrolinx Act.

The PRESTO fare card provides fare collection and information management systems to GO Transit and municipal transit providers in the GTHA. Currently, PRESTO is in-service for transit systems in Hamilton, Burlington, Oakville, Brampton, three Mississauga routes, twelve TTC subway stations, and almost all GO rail stations across the network. We understand that there have been no material cost overruns in the current PRESTO expenditures.

Change requests to the original contract have been subject to a due diligence process which is outlined in more detail later in this document.

### PRESTO Next Generation

Through the existing contract with Accenture, the PRESTO system has been built to provide an integrated fare medium across the GTHA and other participating transit providers. PRESTO provides GO Transit and participating municipal transit systems access to a provincially owned central system that delivers back office support and fare reconciliation. The municipal service providers also purchase and own PRESTO compatible fare collection infrastructure and devices across their systems. To date, the province has funded 100% of the central system costs and one-third of municipal costs.

The PRESTO system uses a closed proprietary technology model which limits Metrolinx' ability to introduce alternative technologies or source components from other vendors. Additionally, changes and innovations to the PRESTO product can only be made through change orders and direct negotiation with the partner. This closed model was the standard approach for fare card technology at the time PRESTO was initiated.

In late 2009, Metrolinx initiated the PNG program with the intent to enhance the system by undertaking a major redesign of the core system to create an open, flexible and scalable architecture which will provide a platform for future expansion into other channels and products. At the time that PNG was launched PRESTO was not under the authority of Metrolinx. However, we are assured by PRESTO management that the procurement options were thoroughly explored with an Executive Committee (including the Managing Director of GO Transit) in determining the approach, although the analysis was not comprehensively documented.

The 2006 approvals did not make financial provision for OC Transpo or full participation of the Toronto Transit Commission (TTC). The City of Toronto/TTC and City of Ottawa/OC Transpo are the two largest transit systems in the province and both have subsequently sought to become full participants in PRESTO, subject to negotiations ensuring the card meets their business needs. In the opinion of PRESTO management, the addition of these two transit service providers would increase the costs of PRESTO significantly from the original estimates.

Additionally, fare card technology has evolved to allow for “open architecture” that provides the flexibility that positions PRESTO for new services, capabilities and commercial opportunities as well as meet the more complex business requirements of the TTC, OC Transpo and all of the municipal transit partners.

An open architecture framework means the fare card will be based on a standardized technology on which multiple IT service providers could provide value added products. This should allow for more independence from a single device provider. Additionally, since more of the code

currently contained in distributed devices is being consolidated within the core application suite, future deployments should be simplified and more cost effective.

The investment in PNG also is designed to allow PRESTO to deliver specific business requirements for OC Transpo and the TTC at a more competitive price through the use of commercial, off the shelf (COTS) tools to enable multi-vendor sourcing. These business requirements include capability to provide unique pass products available in these larger jurisdictions and greater inter-operability with their existing transit infrastructure. For the user, PNG is designed to facilitate increased payment and feature choices, such as for payment credit cards and mobile devices. For all transit partners, enhanced information management and data analytics capability are being planned to promote more tailored services, improve planning and analysis of transit services to optimize transit services for customers across the entire network.

The TTC's participation is a critical component of PRESTO implementation as it will significantly increase the number of card holders, more than double the target market penetration in terms of fare collections and establish a seamless, integrated fare payment system across the entire GTHA. It creates an opportunity to connect millions of transit customers across the region, to promote increased transit use through better services and to take advantage of valuable commercialization opportunities. PRESTO will be positioned to partner with other public and private organizations to expand the reach of the system across multiple modes of transportation (e.g., cycling, ridesharing, parking, inter-city travel). Commercialization will also create opportunities to increase revenue from non-transportation partnerships (public/private services and retail); potentially leading to monetization of the PRESTO asset after it has been fully deployed across the GTHA.

### Open architecture

The PRESTO fare card system was developed with proprietary central system technology. As part of the PNG program, improvements to the PRESTO central system include moving proprietary elements of the system towards a higher degree of encapsulation, reducing number of n-tiers, delivering a more open architecture. Open architecture is a technology design principle based upon developing systems which are non-proprietary, using off-the-shelf software instead of "closed" or proprietary vendor solutions. The development of open architecture provides modularized system design which accord with industry standards. By developing a system that can more readily accept future changes and expansion, PRESTO can be more open, flexible, scalable and have greater interoperability. Open architecture based systems can take advantage of competition among suppliers as there are fewer proprietary inter-dependencies and more substitutions available, therefore costing less to develop, change and operate.

Other expected benefits of open architecture for PRESTO include reduced complexity in development and deployment to meet the business requirements of OC Transpo and the TTC.

# Approach

## Definition of value for money

As a first step, it is important to distinguish the assessment of the “value for money” of the change orders which will enable the implementation of PRESTO Next Generation (PNG) from a valuation of the PRESTO intellectual property. This differs from an intellectual property valuation which would seek to determine a market value on the rights to intellectual property, as the value for money assessment considers the relative effectiveness and efficiency of the delivery route proposed for PNG in comparison to other alternatives for achieving the business objectives.

This value for money assessment focuses solely on decisions made regarding the PNG phase of the program, at the point in time when the phase commenced in late 2009. It does not assess the entire PRESTO program to date since the original phase of PRESTO was procured through a competitive process.

Value for money is an assessment of whether the proposed delivery approach will allow Metrolinx to realize maximum benefit with the resources available. Value for money is not only a comparative measure of financial and quantifiable factors, such as cost and risk of different delivery alternatives, it also takes account of a combination of qualitative factors including timeliness, fitness for purpose and convenience. Some elements of the value for money assessment are therefore subjective, difficult to measure or intangible. We have sought to supplement our independent analysis with continual dialogue with the PRESTO and Accenture teams to confirm our understanding and judgment has been exercised appropriately.

It is also important to note that the value for money assessment as developed for the assessment of PRESTO is distinct from the value for money assessment methodology for Alternative Financing and Procurement (AFP) of infrastructure projects, as developed by Infrastructure Ontario. While the methodology developed for this engagement employs many common concepts and principles with Infrastructure Ontario’s AFP assessment methodology, the PRESTO analysis uses a bespoke approach reflecting the unique nature of the PNG program as an overall capital investment decision as opposed to solely a procurement decision.

## Approach and methodology for value for money analysis

Our assessment of value for money recognizes that the PNG program is being developed within the confines of an existing operational system (PRESTO “Base System” or P1) and contractual commitments where there are a number of practical constraints as to how the program may be procured and implemented. As such, our approach to value for money has been developed in a phased manner to firstly apply a qualitative filter to determine the extent to which the identified

options are deliverable in practical terms, comparing the merits of each option. Subsequently, to the extent possible with available data, we have sought to quantitatively assess the relative value for money of each option.

The approach taken to assessing value for money followed the steps below:

1. Definition of PNG program objectives and parameters
2. Scoping and definition of delivery options available to meet for the PNG objectives
3. Qualitative Value for Money assessment
4. Quantitative Value for Money assessment (to the extent possible)
5. Value for Money conclusion.

### PRESTO strategic objectives

We understand that the PRESTO program supports the Province's general public and social policy goals, but also has specific strategic objectives, being:<sup>2</sup>

- To be a Provincial integrated e-fare system provider for GTHA and Ontario;
- To enable customer choice and convenience for transit e-fare payment and use (e.g. PRESTO card, university cards, mobile payments, financial cards);
- To be integrated to meet the business requirements of Transit Authorities, including OC Transpo and the TTC;
- To exploit new technology to create improved and integrated approaches across Transit Authorities;
- To achieve complete deployment across GTHA prior to the Pan-Am Games in July 2015;
- To create opportunity for commercial partnerships and investments; and
- To support public and social policy issues (e.g. congestion reduction, green agenda, tax policy, consumer debt).

### PRESTO next generation objectives and principles

More specifically, PRESTO Next Generation represents the evolution of the PRESTO program to support Metrolinx strategic needs; being:<sup>3</sup>

- To deliver a lower cost of total ownership by delivering product enhancements through regular releases to keep pace with industry changes;
- Addressing immediate or short term requirements for system expansion, in particular satisfying OC Transpo's business requirements and known TTC business requirements; and

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<sup>2</sup> "PRESTO Next Generation - OC Transpo Solution Blueprint", Accenture, October 2010.

<sup>3</sup> "PRESTO Next Generation - OC Transpo Solution Blueprint", Accenture, October 2010.

- To improve upon the existing PRESTO system by introducing an open, flexible and scalable architecture which will provide a platform for future expansion into other channels (such as NFC) and products (such as parking).

Metrolinx have sought to develop the PRESTO Next Generation program from the current system based upon the following development principles;<sup>4</sup>

- Open architecture (open, flexible, non-proprietary);
- Standard tools –Commercial off the shelf (COTS) tools rather than proprietary or closed software;
- Multi-vendor sourcing – choice of multiple device vendors and device types;
- Abstraction layers providing open and flexible design supporting multiple payment types and future requirements;
- Progressive technology roadmap utilizing a Service Oriented Architecture (SOA);
- Operational efficiency, flexibility, services; and
- Build from existing Central System components which are compatible (e.g. interfaces, settlement, clearing, back office), replacing those which are not.

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<sup>4</sup> “PRESTO Next Generation – Executive Summary”, December 2010.

# Delivery options

The value for money process is inherently comparative, and as such it is essential to establish and define the possible options for comparison.

The options considered in assessing value for money are:

1. “PNG Base Case” option: the proposed PNG program, as defined in the series of change orders proposed or executed to date. The PNG Base Case is primarily predicated upon the replacement of the existing proprietary Thales Integrated Fare System (IFS) by implementing an open architecture system through the current Accenture system integrator. Under this approach, logic would also be moved from the front end devices to the core system.
2. “Enhanced P1” option: a comparator option which assumes that the existing Phase 1 PRESTO system is retained, but enhanced by a series of “patches” within the framework of the existing core technology and existing architecture which includes the proprietary Thales IFS, using the existing Accenture integrator contract arrangement and vendors.
3. “Re-procurement option”: a further comparator option which assumes that Metrolinx terminates the existing Accenture integrator contract and undertakes a new procurement process to identify vendors and technical solutions meet the PNG requirements.

We have considered and ultimately rejected the potential for a “do-nothing” option on the basis it would fundamentally fail to address the strategic objectives and existing commitments of the program.

Under all options, telecommunications and data center management services would be provided by Telus, devices and physical infrastructure would be provided by the service provider and cards are owned by the end users.

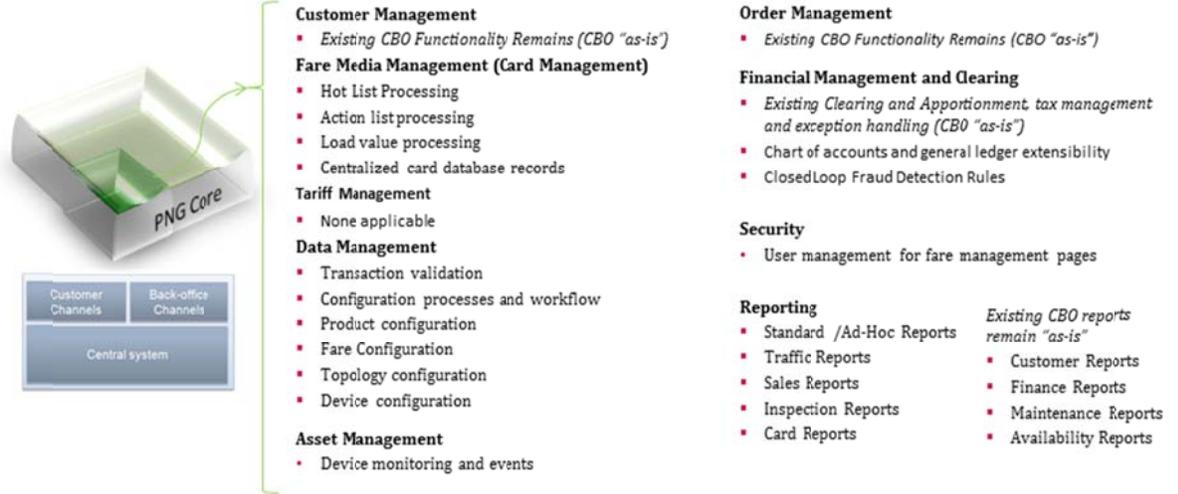
These options were identified, developed and assessed based upon our interviews with PRESTO management, Accenture, independent research and review by our technology experts.

## 1. PNG base case option

The PNG Base Case option represents the solution that was selected by PRESTO management. It builds upon the existing PRESTO system using industry standard tools and products to create a more open and non-proprietary system to help meet current needs and support future growth.

Specifically, the PNG Base Case includes the following developments:<sup>5</sup>

**Renewal of core capabilities in the following areas:**

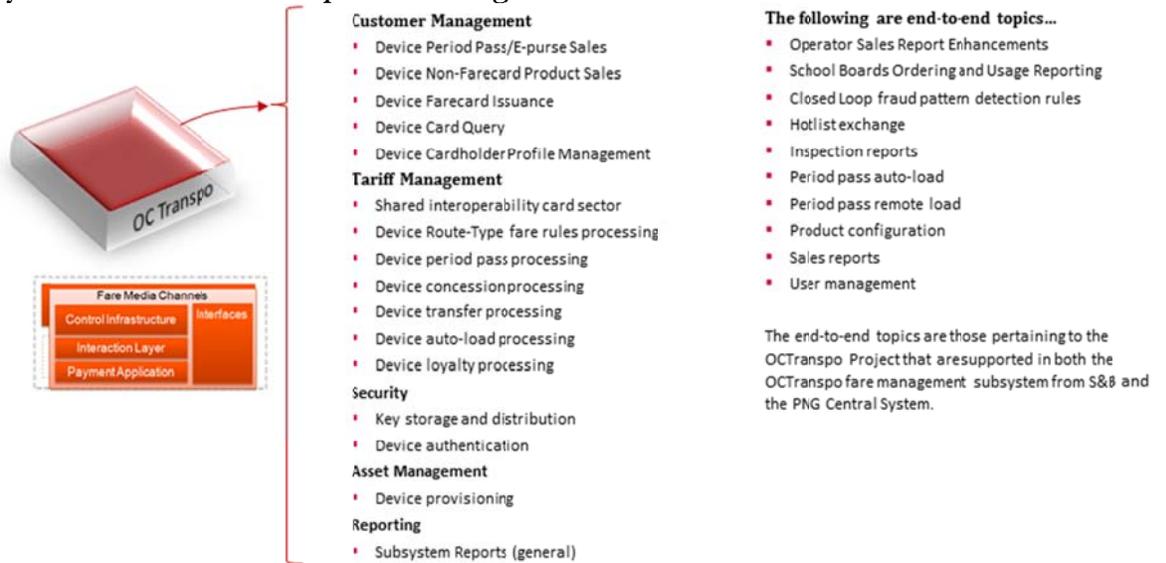


**Features to meet new requirements or enhancements/ extensions to existing features in the following areas:**



<sup>5</sup> "PRESTO PNG PL150 Solution Blueprint", Accenture, January 28, 2011.

**Specific features and functions within the Scheidt and Bachmann fare management subsystems which are device specific or integrated end to end:**



**2. Enhanced P1 option**

The “Enhanced P1” option is a comparator based upon the assumption that the existing Phase 1 PRESTO system would be retained, but enhanced by a series of “patches” within the framework of the existing core technology and existing architecture which includes the proprietary Thales IFS, using the existing Accenture integrator contract arrangement and vendors.

The Enhanced P1 option is, by definition, an incremental approach to expanding the system building upon the existing PRESTO system. It is recognized that this comparator would not achieve the intent of being non-proprietary due to the continued use of the Thales IFS; however it is presented as a theoretical alternative against which to consider the PNG Base Case option. While robust quotes for cost of an Enhanced P1 option could not be obtained by Metrolinx despite attempts to do so, it is understood that the cost attached to such an option would be significant; relying on proprietary technology, with associated technology constraints and significant delivery risk. Accenture have noted in meetings that they consider the delivery and technology risk under such an option to be high enough that they would not be able to provide a fixed price for such a model, while we understand that Thales declined to provide a written quote for such an option.

**3. Re-procurement option**

A further comparator option has also been considered, being a “Re-procurement” option. While both the P2 Base Case and Enhanced P1 options above are centred upon the continued use of Accenture as a systems integrator under amendments to their existing contract, this comparator is based upon the premise that Metrolinx terminates the Accenture integrator contract and commences a full new procurement of the entire system.

The procurement would seek new vendors and technical solutions to fully meet the PNG specification, therefore the composition and technical solution of the preferred vendor would be unknown, but may result in scrapping the existing PRESTO system or may result in an incremental solution. There would be substantial cost in writing off the current investment in PRESTO to date. Eight transit authorities have PRESTO in production and severing the Accenture relationship would place substantial risk on PRESTO's customers.

Re-procurement would allow the exercise of competition for all components, which may drive pricing benefits. However, it is recognized that there may be significant reputational risk for Metrolinx from undertaking a new procurement, and also the possibility that market interest may be reduced given the re-compete nature of the procurement. Ability to meet timetable requirements would also be a challenge if a new procurement was undertaken; it is estimated that the re-procurement would take in excess of 24 months.

# Qualitative analysis

## Approach

To enable analysis of the qualitative merits and constraints of the three options, Grant Thornton developed a number of assessment criteria which reflect the strategic aims for PRESTO and the specific objectives and principles of the PNG program.

Each of the criteria has been assessed against two different considerations;

1. Alignment with objectives, and
2. Risk to Metrolinx.

For alignment to objectives, each option has been assessed and scored on a scale of 1 to 5, representing weakest alignment to objectives to strongest alignment.

Each option has also been scored and assessed on a three point scale to consider the risk presented against the criteria, denoted as low risk (L), medium risk (M) or high risk (H).

These factors have been considered initially in isolation. For example, an option may score 5 as being highly compatible with the objective; however, it may be that there is a high degree of risk attached to achieving the objective, in which case the option would be scored accordingly as high risk against the criteria.

The two criteria were then combined to produce a risk weighted, multiplicative score. Weightings for risk have been applied as follows:

- High risk (H) = 0.5
- Medium (M) = 1.0
- Low risk (L) = 1.5

## Summary of qualitative analysis

In developing qualitative assessment scoring, an initial workshop was held with the PRESTO project leadership as well as our own technology experts to discuss criteria and relative qualitative merits of options. Based upon our understanding of the program objectives, constraints and the experience of our team, we then developed a comparatively scored matrix assessing each option.

Results of the qualitative assessment are summarized in the matrix and commentary below, with the score for each option's alignment to objectives noted in the upper left hand corner of each cell, and the risk assessment in the lower right hand corner.

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Assessment Element	PNG Base Case	Enhanced P1	Re-Procurement
<b>1. Business Drivers</b>			
Ability to meet the integrated business requirements of Transit Authorities, including Ottawa and expected TTC business requirements	4 M	2 H	4 H
<b>2. Technical</b>			
Technical capability, ability to support progressive technology	4 M	2 H	4 M
Sustainability and maintainability of option	4 M	2 H	5 L
Innovation and extensibility of option	4 M	2 H	5 H
Level of interface with existing legacy systems	4 L	2 H	5 M
Operational flexibility to exploit future new technology	5 M	2 H	5 M
<b>3. Operations</b>			
Impact to on-going operations – cost, time and attention needed to implement change	4 L	2 H	2 H
Ability to meet timetable requirements (i.e. complete deployment in advance of Pan American Games in 2015)	4 M	1 H	1 H
Clarity of ownership of Intellectual Property	2 H	2 H	4 M
Alignment with Metrolinx in-house capability and resources	4 L	4 H	4 H

Assessment Element	PNG Base Case	Enhanced P1	Re-Procurement
Reputational impact to Metrolinx of implementing the option	3 M	1 H	1 H
<b>4. Cost</b>			
Extent to which total cost of ownership is minimized	3 M	1 H	3 H
Ability to maximize competition in future procurements; extent to which option uses standard, non proprietary solutions	4 M	2 H	5 H
<b>Weighed score</b>	<b>54.0</b>	<b>12.5</b>	<b>38.0</b>

### Commentary on qualitative scores

**1. Business drivers:** *the ability of each option to meet the fundamental business drivers for PNG, notably the OC Transpo and TTC requirements*

Both the PNG Base Case and Re-Procurement options were considered to be a close fit to the business requirements of the transit authorities, but were scored a 4 rather than maximum 5 since the business drivers for TTC were/are not fully known at this point in time, so there remains a possibility that the ultimate solution may not fully meet final TTC business requirements. All options carry delivery risk in respect of the uncertainty around TTC requirements; however the ability to meet delivery timetable is also considered a key business requirement resulting in a high risk weighting for both Re-Procurement and Enhanced P1 options.

The Enhanced P1 option was considered to have a weak alignment with the business objectives for the project, being doubtful that the option could deliver the open architecture approach which is central to the business requirements. Risk was considered high, primarily based upon consideration of vendor, technology and timetable risk.

**2. Technical**

**Ability to support progressive technology roadmap:** *how well each option supports future development in technology*

Both PNG Base Case and Re-Procurement produce modular solutions that would have sufficient technical capability to meet PRESTO’s objectives. The Enhanced P1 option was not considered to have the ability to support progressive technology, being limited to the pace and scope of the development of Thales technology. The risk attached to this option was also therefore scored as high.

**Sustainability/ maintainability:** *the extent to which each option offers a sustainable solution, minimizing maintenance cost and effort*

The Re-procurement option scored 5 as a high alignment to objectives, as given the ability to specify the project drawing on the lessons learned to date, it is expected that PRESTO and the Audit • Tax • Advisory

vendor would generate a sustainable solution. The “clean slate” of Re-procurement should also result in low risk, although note that time and cost are considered under other criteria. PNG Base Case is considered to align relatively well with sustainability objectives, given its modular format and use of COTS products. Enhanced P1 was considered to be a poor alignment and high risk option due to experience to date. Unlike newer open architecture solutions the closed architecture systems utilized during the period when PRESTO was originally procured are much more difficult to sustain / maintain. For example, hard coding of data has been identified which results in even logo changes being a challenge to maintain.

**Innovation and extensibility:** *the extent to which each option supports innovation and evolution to ensure improved value for money*

Re-procuring the system clearly offered the highest opportunity for innovation in approach to accommodate future demands, and scored highest for alignment to objectives. However, re-procurement carried significant risk around the nature of the solution proposed and composition of consortium, which was reflected in the high risk weighting.

PNG Base Case was again considered to be a strong fit with objectives with the ability to support modular and (mainly) non proprietary future changes, while the reliance upon a limited vendor pool and the nature of proprietary systems resulted in a high risk weighting and poor alignment with objectives for the Enhanced P1 option.

**Interface with legacy systems:** *the extent to which each option is compatible with the existing PRESTO system as developed to date*

The objective that PRESTO drive integrated approaches across transit agencies resulted in the more incremental options scoring best against this criteria; alignment was considered strong under Re-procurement, where there was the ability to start afresh and apply lessons learned, and strong for the PNG Base Case. The incremental approach of PNG Base Case is very much a known and understood quantity compared to the uncertainty regarding the preferred proponent under a re-procured solution led to the differential in risk weightings between options. Therefore, the Re-procurement option carries a higher risk weighting than PNG Base Case, reflecting the need to clearly define inter-operability under the preferred solution and proponent.

The P1 Enhanced option would also build upon the legacy systems, however based on the experience of our team and understanding of current vendors’ attitudes, it is understood that such an alignment would be highly challenging to achieve. It would also carry significant risk, reflected in the weak alignment and high risk scored attributed to this option.

**Operational flexibility to exploit future technology:** *the extent to which each option provides flexibility to accommodate future technology advances*

PNG Base Case and Re-procurement were both considered to offer very strong alignment with program objectives, albeit for different reasons: PNG Base Case because of the known modular design, open architecture and COTS approach, Re-procurement because such requirements could be specified and used as an evaluation factor. Again, the Enhanced P1 option scored poorly in terms of alignment to PRESTO objectives with limited flexibility to exploit technology developments (not only general technology development but those specific to the transit and payment industries) due to the proprietary IFS and limited sourcing opportunities.

### 3. Operations

**Impact to ongoing-operations:** *the extent to which implementation of each option would impact upon the current operations of Metrolinx*

Both the Enhanced P1 and Re-procurement options would require significant management time and attention if they were to be pursued, more so than the PNG Base Case, which is reflected in the low scores for alignment, and also the higher risk weighting attached to each.

**Timetable:** *how well each option aligns with the project's timetable parameters*

Both Re-procurement and Enhanced P1 options are considered highly unlikely to allow Metrolinx timetable requirements to be met. PNG Base Case should align with this objective, although medium level risk is considered to still exist which must be managed to ensure full deployment is achieved.

**Intellectual Property:** *the extent to which ownership of IP is both clear and rests with the most appropriate parties under each option*

The PNG Base Case and Enhanced P1 options both build upon the existing intellectual property developed for PRESTO, which has been subject to a dispute around its ownership and use. Accordingly, this represents a high risk to Metrolinx, albeit one which is currently being addressed. The Re-procurement option would allow IP ownership to be specified at the outset and effected, resulting in a better risk profile for Metrolinx and alignment with objectives; again, it is noted that there may be an adverse cost impact to this, which are considered as a distinct factor.

**Alignment with Metrolinx resources:** *the extent to which each option can be delivered using existing or additional Metrolinx staff and skillsets*

It was considered that all of the options presented a good fit with Metrolinx available resources, held within the PRESTO project team. However, the risk attached to the potentially increased vendor management under the Enhanced P1 option and the uncertainty about the potential requirement under Re-procurement is represented in the high risk weighting for these two options, compared to the medium risk for PNG Base Case where there is single integrator to be managed.

**Reputational impact:** *the likely impact on Metrolinx's reputation of pursuing each option*

The potential reputational impact to Metrolinx of aborting the current procurement and Re-procuring was felt to be significant and also high risk, while Enhanced P1 presented a high risk that PRESTO's objectives would not be met, also resulting in a significant negative impact. The PNG Base Case is considered to offer medium risk to reputation, particularly given the customer facing nature of the project; however it represents a closer alignment in terms of objectives and risk profile than the alternatives.

#### 4. Cost

**Total cost of ownership:** *relative estimated capital, operating and maintenance cost of each option*

The expected costs attached to each option were the subject of some uncertainty. While the current change orders represent the expected cost of the PNG Base Case option, no formal pricing quote has ever been obtained from alternative vendors for an Enhanced P1 option. Based on discussions with the existing PRESTO vendors, it is understood that they would not be willing or able to provide a fixed cost for an Enhanced P1 option due to the perceived risks attached to such a model. For the Re-procurement option, there is clearly also a high degree of uncertainty as to the level of cost which may be quoted by the market.

In relative terms, the total cost of ownership (capital, operating and lifecycle) for PNG Base Case and Re-procurement are considered to be of similar magnitude, with additional competitive pressure being partly offset by shorter timetable for Re-procurement, while existing knowledge

developed by the vendor team and no mobilization costs limiting the reduced level of competition present in the PNG Base Case. However the risk attached to Re-procurement was considered to be greater given the uncertainty regarding the approach which may be proposed. While Re-procurement may potentially allow for application of increased competition, the reduced timetable appears likely to attract a pricing premium so the ultimate cost is uncertain.

**Ability to maximize future competition:** *the extent to which competitive pressure can be applied for future expansion or upgrade of PRESTO*

Re-procurement would allow competition of all components, including the current Accenture role, so has scored highest for alignment with objectives. However, it is recognized that market appetite may be reduced in a re-procurement based on bidder's perception of their ability to compete with Accenture's knowledge developed to date, or confidence in Metrolinx to deliver a second procurement process. If Accenture had their contract cancelled, other potential vendors may be concerned that Metrolinx would do a similar thing again, therefore a number of potential vendors may elect not to bid for that reason.

PNG Base Case has less risk, but scores slightly lower in terms of objectives as retention of Accenture as systems integrator and use of some products such as Microsoft limits future competition in some ways, albeit with lower risk. Enhanced P1 offers little ability to swap out technologies, multi-source future products or solutions to drive value and reduce operating costs.

### Qualitative analysis conclusion

The key conclusion to the qualitative assessment is that the PNG Base Case is the only option that can deliver the program requirements within the time and technical requirements. Applying the weighted scoring mechanism to take account of alignment to objectives and risk, the PNG Base Case is the preferred option by a clear margin over Re-procurement. The low score for the Enhanced P1 option reflects its inability to meet the fundamental objectives of PNG.

The qualitative assessment demonstrates that the PNG Base Case represents the lowest risk, most deliverable of the options available to Metrolinx. Re-procurement carries a high risk to Metrolinx in terms of cost, impact to on-going operations and reputation. Undertaking a re-procurement would also cause Metrolinx to diverge from the timetable for full deployment in time for the Pan American games. It was considered highly unlikely that this is a viable alternative based on these factors.

Similarly, it appears unlikely that the Enhanced P1 option would be able to meet the technical requirements specified for the PNG program, and even if it could, would carry a material price premium and unacceptable risk.

In capital investment decision-making, a qualitative screening process is utilized to determine which options should be subject to a quantitative analysis. Based on the above, the quantitative analysis of value for money will focus solely on the deliverable option that is PNG Base Case. The Re-procurement and P1 Enhanced have fundamental challenges regarding reputation and timing considerations, as well as technical viability in the P1 Enhanced option that would be sufficient to eliminate these alternatives for capital investment decision-making.

This approach is not only based on the significant qualitative shortcomings of the other options, but challenges in establishing meaningful quantitative information which is discussed in greater detail in the quantitative analysis section.

# Quantitative analysis

## Quantitative analysis – approach and challenges

Quantitative assessment of value for money of different delivery options typically involves comparative assessment of the net financial cost and risk attached to each option, or a robust quantified cost / benefit analysis. However, it is recognized that in this instance such a comparative approach is not practical for the PRESTO system for a number of reasons:

- 1) The PNG Base Case option is the only delivery option which fundamentally meets the objectives for the program in terms of technical capability and timetable as demonstrated in the quantitative analysis;
- 2) Accenture have confirmed that they would not have been able to provide a fixed cost for an Enhanced P1 option due to the commercial risks attached, nor is third party data available to develop comparative, risk adjusted costs for such an option;
- 3) A robust cost estimate of the Re-procurement option is also not possible, given that the cost and risk transfer positions would be driven by the technical solution proposed by the successful bidder, their appetite for risk and competitive pressures; and
- 4) The guiding project documents also do not provide quantified analysis of benefits, so no cost / benefit quantification has been undertaken to date and “cost” has largely been used as a proxy for “value”.

In light of these factors, the quantitative assessment therefore does not seek to quantify the program’s benefits and considers the reasonableness of the cost attached to the PNG Base Case option, which is the only deliverable solution in qualitative terms. As such, we have therefore sought to use three different approaches to consider the quantitative value for money of the PNG Base Case option:

- High level benchmarking of program costs;
- Review of Accenture’s approach to pricing the changes; and
- Review of individual change order tasks and costs.

## **Benchmarking**

An alternative approach to developing whole life comparative costing is to benchmark cost data for PRESTO against comparable systems, to consider reasonableness of costs at a high level. However, it is recognized in this instance that cost benchmarking is at best an indicative measure to provide context. The PNG program is moving towards an open architecture from an existing operational smartcard system and there are few “like for like” comparator systems. Additionally,

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there is a limited volume of publicly available cost data for smartcard ticketing generally and again, the level of comparability of financial information is questionable.

### **Review of Accenture’s approach to pricing**

Further, we have met with Accenture’s PRESTO project team and been provided with information regarding their approach to pricing PNG, their level of effort for the program and general approach to estimating. While we are not privy to Accenture’s confidential pricing methodology, we have reviewed additional details on level of effort and allocation of effort across tasks in respect of the fixed price as a further indicator of reasonableness of pricing.

### **Review of individual change order tasks and costs**

Additionally, it is possible to review the scope and cost of individual tasks in the change orders to consider whether the level of effort appears appropriate. Such a review can consider whether there is overlap between the scopes of defined tasks for PNG or, for example, whether tasks should have been delivered within the scope of the original PRESTO project.

### Cost of original PRESTO system

The original approval to proceed with the PRESTO project was granted by the Ministry of Transportation in 2006, which provided authority to enter into a \$250m, ten year contract to build, implement and operate the system. The original contract value comprised<sup>6</sup>:

- Capital \$141m,
- Operating \$98m, and
- Taxes \$11m.

The \$250m cost represents the Accenture consortium contract value only over the 10 year contract term, and is exclusive of Metrolinx’ own internal operating costs and the transit agencies’ project management costs and specific infrastructure costs. It should be noted that Accenture managed all vendors and they have been paid out of the same above budget.

### Cost of PNG base case option change orders

In addition to the original PRESTO approval, the PNG program incorporates a series of change orders which enable the upgrade and expansion of the system as described earlier in this document.

The change orders which comprise the PNG Base Case option are currently expected to cost \$143.3m in capital cost across a number of change orders, in addition to a further \$17.1m of operating costs which arise directly from the change orders. Many of these change orders represent delivery of the OC Transpo and early stages of the TTC programs.

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<sup>6</sup> “PRESTO Update – Metrolinx Board”, PRESTO, September 15, 2011.

The most material of the individual change orders, sorted from largest to smallest, are noted in the table below:

Date	Nature of change order <sup>7</sup>	Capital cost	Operating cost
Jun-11	PRESTO 2.0 Build Iteration #2 (Jul 1 - Sep 30, 2011)	17,281,691	-
May-11	PNG R1.0 Build Phase (Apr 1 - Jun 30, 2011)	16,551,793	-
Feb-11	PNG R1.0-Design Phase (Feb 1 - Mar 31, 2011)	9,272,870	-
Dec-10	PRESTO Next Generation (PNG) R1.0 Design Phase	8,287,533	-
Dec-10	OC Transpo Device Hdw & Sfw Subsystem Design Phase	5,900,000	-
Jul-11	Purchase Order 140 , Pricing, Delivery Dates and Perf Inc.	4,518,966	-
Aug-09	OC Transpo Design (COA Amend #1)	3,877,400	-
Apr-11	Activities associated with R1.2 CN	3,672,049	-
Aug-09	GO Bus Communication Solution (Wireless LAN) - Go WiFi	2,908,159	2,321,350
Mar-11	Thales R1.2 Bundle re CN 195.1 -A4, 209, 217, 227 and 246	2,851,803	-
Aug-09	TTC Solution Arch Development	2,600,000	-
Jun-11	GO Transit revised roll-out schedule	1,900,000	-
Aug-09	GO GPS for Bus Fleet	1,800,000	302,600
Jun-10	Pre Production Environment Build and Maintenance	1,726,528	9,505,619
Mar-10	Architecture Enhancements for Transaction Reporting/SP Report and PRESTO Webpages for Loyalty Info	1,718,798	-
Nov-09	Stage 3 - Release 1.1 Bundle	1,506,000	-
Jun-11	Ottawa Deployment Phase 1 (July 1-September 30, 2011)	1,445,875	-
Sep-11	TTC Solution Planning	1,400,000	-
Aug-11	GTHA-PRESTO R2.0 Consolidation and Upgrade	1,320,000	-
Mar-10	Amendment #6 OC Transpo Blueprint	983,000	-
	PRESTO 2.0 Test Phase 1 (Oct 1, 2011 - Jan 31, 2012)	25,248,700	-
	Ottawa Deployment Phase 2 (Oct 1, 2011 - Jan 31, 2012)	1,421,896	-
	Miscellaneous Signed Change Requests (all below \$855,000)	23,748,181	4,991,731
	Miscellaneous Detailed Feasibility Notices Underway	360,073	-
	<b>TOTAL</b>	<b>143,281,315</b>	<b>17,121,300</b>

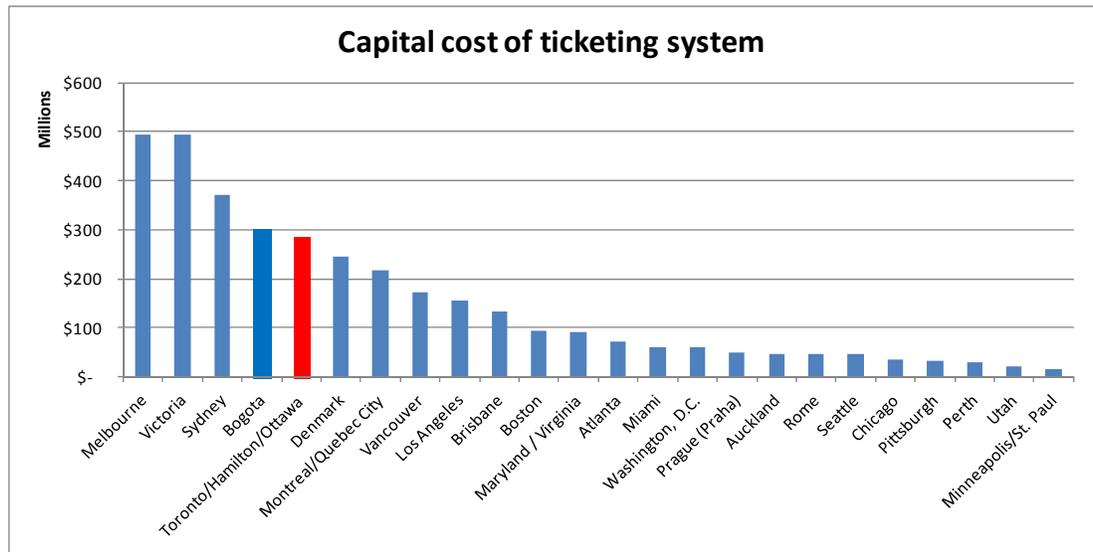
### Benchmarking of capital cost

The comparative high level capital costs of a range of ticketing systems for a number of international ticketing systems are graphed below. Note that the comparability of projects is limited as the generation and type of technology used by each system is different, as is the level of prior system development and scope of the ticketing project for which costs were obtained. Additionally, it is recognized that the distinction between capital and operating cost can be treated differently across jurisdictions, with cost sometimes back loaded into operating budgets. The data graphed below is therefore indicative in nature and is intended to provide context.

The chart below highlights the capital cost of a number of a range of different ticketing systems undertaken by the largest vendors for transit authorities worldwide. All costs have been translated into common currency (\$).

<sup>7</sup> We understand that naming conventions for change orders has subsequently changed from release phases (i.e. R1.0, R1.1, etc) however, these labels have been retained in this table as being the labels used at the time.

Chart 3: Capital costs of international smartcard ticketing systems

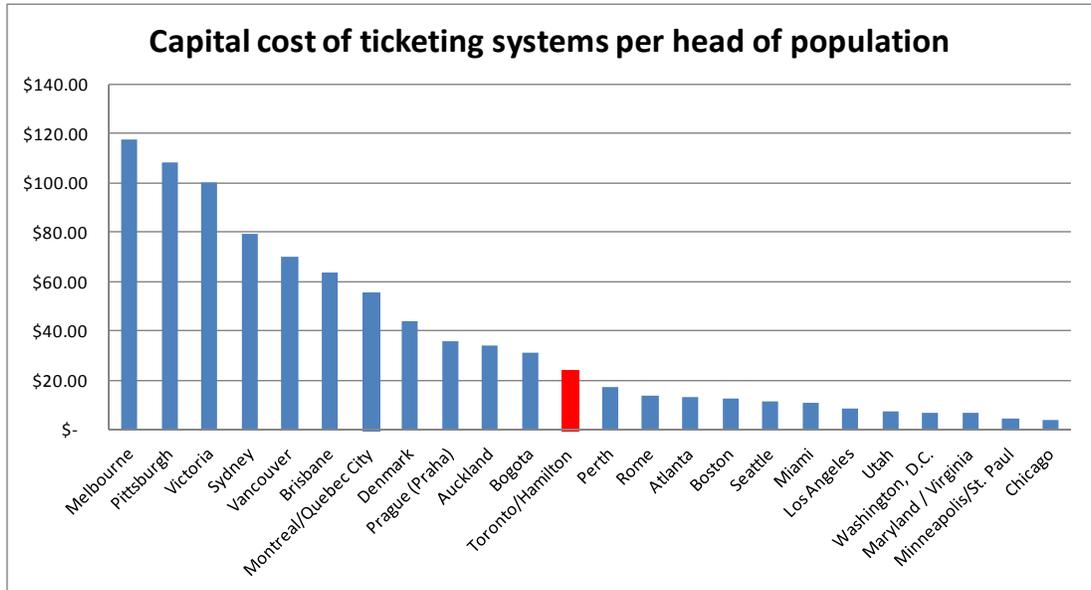


The capital cost of the PRESTO program of approximately \$284m (being the original capital approval of \$141m, plus PNG change orders of \$143m) compares favourably with other contemporary procurements being undertaken with Vix, Cubic and LG CNS respectively for Melbourne/ Victoria, Sydney and Bogota.

It is also worth noting that for some of the lower capital cost systems noted on the graph, including Washington DC Metrocard and Chicago’s Chicago card, the capital costs available represent a previous generation of smartcard ticketing technology from that being developed by PRESTO, generally closed or proprietary technologies. We understand that both of these cities are currently undertaking procurements to move towards more open technology; in the instance of Chicago, it is understood from informal market discussion that the on-going open payment procurement is budgeted to cost in excess of \$450m.

In order to consider relative cost of systems that cover different geographical areas and population bases, we have also sought to compare the capital cost of transit ticketing systems on a population basis. Considering initially the original PRESTO system with capital cost approval of \$141m and served the GTHA area, the capital cost per head of population measure produces the below comparison:

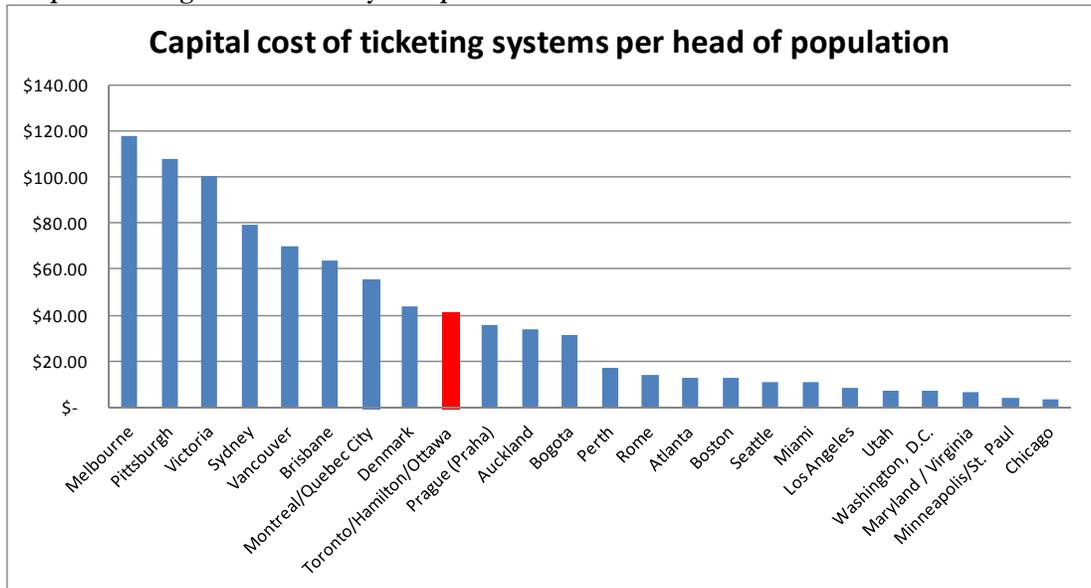
**Chart 4: Capital costs of international smartcard ticketing systems per head of population, compared to original PRESTO system**



Taking account of the original capital cost of PRESTO and population area it served, the system appears to compare favourably with other ticketing systems, including those which used a previous generation of ticketing technology.

Expanding and updating through the PRESTO Next Generation program to include an additional \$143m of capital cost represented by the PNG change orders and incorporate OC Transpo and the TTC alters the capital cost per head of population for PRESTO as follows:

**Chart 5: Capital costs of international smartcard ticketing systems per head of population, compared to original PRESTO system plus PNG**



While the per head capital cost increases to reflect the additional cost and relatively smaller growth in population served, the PNG program appears to still compare favourably with a many of the comparator systems. This is particularly notable once the multi-municipality nature of the PRESTO system is fully considered.

It is noted that while the population served by the expansion may not markedly increase as a result of PNG, the actual ridership use of PRESTO is expected to significantly increase mainly as a result of inclusion of the TTC and as legacy fare mediums are retired at the various transit service providers.

Benchmarking on the basis of trips provided was not possible due to a lack of trip data for benchmark systems.

### Accenture approach to pricing

Accenture's pricing to implement PRESTO Next Generation was provided on a firm fixed price basis, based upon the scope and requirements defined by Metrolinx. The pricing includes labor and non-labor costs, including hardware, software and expenses such as core product development and client specific localizations. Accenture notes<sup>8</sup> that the pricing reflects their responsibility for managing their own costs and risks within the fixed price and therefore includes expenses, financing costs and contingencies both within the Accenture estimates and the estimates of the sub-contractors.

For hardware and software procurement for the PNG program, Accenture makes use of two internal groups to obtain market competitive rates; Accenture's "Alliance Utilization organization" and Accenture's Procurement organization.

Accenture's Alliance Utilization organization is charged with identifying, procuring and establishing leveraged alliances with third party hardware and software vendors in order to deliver the most cost complete and cost effective solutions for Accenture's clients, bringing to bear Accenture's global network and buying power. The group has alliance relationships with over 400 leading hardware and software providers including Oracle (Sun), Hewlett Packard, Cisco, Dell, EMC, Unisys, Telus and IBM.

Accenture's Procurement organization are mandated to ensure that best value is realized when purchasing goods and services, and acts as an agent for Accenture's internal operations as well as supporting client projects in three areas:

- Preparation (finding goods and services, identifying preferred suppliers to take advantage of favourable pricing, benchmarking supplier pricing, etc),
- Purchasing, and:
- Payment.

Accenture have cited these functions as a key step in how they ensure their pricing to Metrolinx represents value for money.

Accenture have also provided a breakdown of the "price to complete PRESTO 2.0" of \$119.6M, which we understand is a firm price within the \$143M change order total and excludes the TTC

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<sup>8</sup> "Accenture Input to Questions from Grant Thornton", Accenture, November 18, 2011.  
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portion of approximately \$20M. No breakdown was available from Accenture for the remaining costs within the change order total.

Price breakdown	Price (C\$000)
<b>Labour Portion</b>	
Resource cost, fully loaded including contingency	99,800
<b>Non Labor Portion</b>	
Non reimbursable expenses	8,700
Hardware and software	7,200
Subcontractor cost including contingency	2,300
Facilities and technology cost	1,100
Financing/ carrying cost	500
<b>Total Price</b>	<b>119,600</b>

The fully loaded resource cost including contingency and the implied average hourly cost was reviewed, but has not been disclosed as it is commercially sensitive information.<sup>9</sup> While this blended rate simplifies the diverse skills and rate costs required for the plan/ analyse/ design, build, test and deployment phases, it appears to represent an hourly rate which is relatively high in the context of our understanding of the market. This is expected as a risk premium is built in by Accenture due to the firm fixed price nature of the contract. Given the risk transfer required, Accenture would be expected to price the change orders at a rate which allows them to fulfil the end point quality and timeliness of the deliverable.

The phasing of effort (actual historic and budgeted future) was reviewed and discussed with Accenture.<sup>10</sup>

The chart above illustrates the level of effort incurred and forecast by Accenture, and the maximum FTE levels during the maximum during the build and test phases were reviewed.

The allocation of effort by phase indicates that Accenture view the testing and deployment as being the highest risk area of the project with 40% of effort being anticipated in these phases, which in our experience is slightly higher than normal. This is offset by a slightly lower than anticipated design phase, which is likely reflective of Accenture’s understanding of the client requirements developed during the previous phase of the PRESTO project.

Overall, the span time and level of effort estimated for the project appear reasonable and comparable to projects of similar scale complexity and size, based upon the experience of our technology experts.

### Consideration of individual change orders

As outlined earlier in this document, PRESTO follows a process to determine and manage the scope of change orders as outlined in the “PRESTO Change Request/ Scope Management” document,<sup>11</sup> which includes negotiation of price. Price negotiation can sometimes include a collective price for a grouped program of change orders, in which instance the fixed price is allocated across a series of deliverables or work product outputs.

<sup>9</sup> Assuming an 8 hour day. Including the non labor portion of costs (which includes subcontractor costs).

<sup>10</sup> Source: Accenture

<sup>11</sup> “PRESTO Change Request/ Scope Management: Version 2.4”, prepared by Quality Assurance, 21 September 2011.

Based upon discussion with PRESTO management, we understand that the PRESTO team and Accenture typically commence a change order request by collectively developing an early stage “order of magnitude” price estimate for a change order outcome that PRESTO may wish to request. PRESTO may then request this be developed into a firm fixed price by Accenture, after which the negotiation process typically commences with Accenture and their vendors (as appropriate) explaining and justifying to the PRESTO team how they have reached their price.

Evaluation as to whether the price and justification is reasonable is largely based upon the estimate provided which is carefully reviewed by the PRESTO senior team. If there is concern raised over the proposed estimate in the change request, Accenture can be asked to either review their pricing or make amendments to the change request accordingly. For items of hardware or licenses, it is possible for the PRESTO staff to benchmark the costs of these relatively standard products to market rates, although we have not obtained any documented examples of benchmarking being undertaken as part of the negotiation process. PRESTO management have noted that they believe there are challenges inherent in attempting to benchmark a fixed price inclusive of a risk premium for bespoke code, and that they are not staffed to undertake this type of benchmarking. PRESTO management have informed us that they have predominantly relied upon Accenture’s procurement expertise and their long term vendor relationships as a central means of seeking best value pricing for commercial off the shelf hardware and software.

Payment for change orders is based upon completion of phased deliverables. While the overall price for the changes was negotiated at a global level, the total change was then allocated against individual deliverables and sub-deliverables that represented payment milestones.

We recognize that retrospective consideration of individual change orders lacks the context of the time and environment in which they were agreed. However based upon our review of the individual change orders, we make the following observations:

- There appears to be some overlap between the tasks and deliverables for some of the individual change orders for items including;
  - design documents,
  - requirements documents,
  - test approaches, plans and scripts.
- There is also a lack of disclosure as to what is included in each change order and minimal detail as to the relationship between the change order deliverable or milestone and the cost allocated to it. As a result, the cost attached to individual work products in some change orders appears disproportionately high. PRESTO management have noted that these work products can be interim output milestones and do not reflect the level of effort or tasks required to produce them, however we note that these underlying tasks are not highlighted in the change orders in a transparent manner. These concerns could be resolved through more detailed documentation of the scope of work proposed in the Change Order.
- There have also been a number of follow up amendments to deliverables from Phase 1 which required alterations. We have reviewed the follow up “fixes” to Phase 1 deliverables and have not identified any matters where Accenture have failed to resolve the issue at no cost. Further, we have not identified any areas where the issues for resolution under Phase 1 of PRESTO have subsequently been incorporated into PNG.

### Quantitative analysis conclusion

As established in the qualitative analysis, the delivery route for PNG based upon a series of change requests to the existing Accenture systems integrator agreement appears to be the only model which can fundamentally meet the program requirements within time and risk parameters.

It is a consequence of this procurement route that there is an inability for PRESTO to exert competitive pressure in the pricing of change orders to visibly demonstrate the achievement of optimal pricing and value. Accordingly, there is a high degree of judgment exercised by PRESTO in determining the extent to which change order pricing represents value for money.

It is recognized that the PRESTO team has significant experience in both projects of this nature and PRESTO specifically and understanding of the outputs they wish to procure, and as such, are well placed to make judgments regarding risk, price and effort. However, the subjective nature of judgments required and the lack of documented price expectation, quantified benefits statement or budgeting prior to commencement of negotiation means that we are unable to quantify the extent to which value for money has been achieved.

For their part, Accenture apply internal mechanisms and resources to leverage supplier relationships and seek to improve value for money of component pricing. While these mechanisms are likely to be generally beneficial to the PNG program, they are not transparent and cannot be the main method for Metrolinx to achieve value for money in change order pricing.

Based upon the limited information provided by Accenture for the overall PNG program, the level of effort estimated and incurred for the project does not appear unreasonable in our experience. The average blended rate charged by Accenture for the project appears to be high, but is reflective of the risk transfer achieved by Metrolinx in its firm fixed price approach to pricing. We have noted some individual instances of tasks for which the level of effort and cost appears high for the tasks specified; however the value of these are immaterial in the context of the overall PNG program.

At a macro level, the capital cost of the PRESTO program does not appear to be disproportionate to the cost of other transit ticketing programs. However, we have not been able to obtain any comparison of change order pricing to prepared budget estimates, any documented basis or target for price negotiation or other benchmark documents that allow us to independently quantify the value for money represented by the individual change orders.

## Conclusions and observations

### Conclusion on value for money of change order process for PNG

The review of the value for money represented by the PNG change orders has evaluated both qualitative factors and quantitative considerations. Based upon the analysis of the information available, we note the following conclusions and observations:

- The delivery approach being pursued for the program, defined as the PNG Base Case option is appropriate. It represents the only deliverable option available to Metrolinx within the program parameters, building upon the existing PRESTO system and within the time constraints available. The alternative approaches, Re-procurement and Phase 1 Enhanced do not meet fundamental requirements of the program and are not considered to be viable options.
- Based on our analysis, the PNG Base Case also represents the lowest risk approach to Metrolinx for delivery of the program.
- While the delivery route applied for PNG is appropriate based on our analysis, a consequence of the use of the existing Accenture systems integration contract is that Metrolinx lacks the ability to exert competitive pressure in the pricing of change orders to transparently demonstrate value for money of pricing.
- In the context of the lack of prior pricing targets, the difficulty in effectively benchmarking costs and the level of judgment inherent in price negotiations, the quantitative assessment of the value for money of the PNG change orders is considered inconclusive.
- However, at a high level the overall capital cost of the PNG program is consistent with its peer group in the context of a number of other international smartcard ticketing projects using a range of technology solutions and vendors, particularly given the area and population which PRESTO covers.
- Additionally, Accenture's overall level of effort and delivery timeline for PNG appears to be reasonable based on our experience. Their blended hourly rates for the program appear to be full, although given the risk which they require to manage under the fixed price contract, this may be expected.

## Appendix A – Change Order Process

### The PRESTO change order process

The PRESTO Next Generation program is being implemented by executing a series of change orders to the existing Accenture contract. These are driven by the OC Transpo and TTC projects that were never contemplated in the original scope.

The PRESTO team follow a defined process for management of change orders. Changes to the PRESTO system are managed at three levels: Program Change, Contract Amendment Authority and Change Requests / Change Orders. PRESTO management has noted that most of the system changes are in response to requests from the service providers. The service providers are responsible for identifying and assessing the business needs while PRESTO is responsible for developing and implementing a delivery strategy (technical solution and procurement approach) to deliver the required changes. The overall change order process is owned by the Change Review Board, chaired by the Lead PRESTO Executive. Subject Matter Leads are responsible for developing requirements and approach documentation for changes in their areas of expertise. Essentially, input is provided by a range of parties in a range of forms as summarized in the table below:

	Responsible	Approves	Supports	Consulted	Informed
<b>Change Review Board</b>	✓	✓			
<b>Subject Matter Leads</b>	✓	✓			
<b>Accenture Solution Team</b>	✓	✓			
<b>PRESTO Program Management</b>			✓	✓	✓
<b>Accenture Program Management Office</b>			✓	✓	✓
<b>Service Providers</b>		✓	✓	✓	✓
<b>Finance and Contract Management</b>			✓	✓	✓
<b>Proper Authority (individual with sufficient signing authority with respect to price)</b>		✓			

PRESTO’s general guidelines for managing change orders are contained in the “PRESTO Change Request/ Scope Management” guidance documents, including key guidelines as follows<sup>12</sup>:

- Change order can be requested by service providers, PRESTO management and any project team members and are routed through the appropriate PRESTO subject matter lead.

<sup>12</sup> “PRESTO Change Request/ Scope Management: Version 2.4”, prepared by Quality Assurance, 21 September 2011.

- Originators and the Subject Matter leads are responsible for clearly articulating the business need for the requested change. Both Originators and the Subject Matter leads identify the risk attached to both the status-quo and proceeding with the change, while PRESTO management also note that they consider the priority of each in regards to other changes in the queue.
- Regular and ongoing communication between originators and all stakeholders is maintained.
- Service providers are consulted with respect to requested changes that would be a material change to the existing operating model.<sup>13</sup>
- Prior to submission of the change order, the PRESTO and Accenture leads must agree on the complexity of the analysis either as a simple or complex to develop a Preliminary Feasibility Notice and/or Detail Feasibility Notice.

The “PRESTO Change Request/ Scope Management” guidance documents the required process as far as the approval stage. Although the formal guidance does not extend to acceptance testing in support of payment, we understand that sophisticated technical and functional testing processes are undertaken prior to the sign-off on the system production. Further, the change requests, individually and collectively do not include quantification of benefits expected from the requested changes.

There are two types of PRESTO projects related to either the Current Base System or PRESTO Next Generation. If the change order request is only for one type of the project, then a single Change Notice is created. If the request is for both types of projects, a separate Change Notice requires to be created for each type of project.

The change request process starts with an informal consultation process between PRESTO and key stakeholders (for example, the service providers) to confirm the nature of the change requirement, what is to be achieved and to determine the order of magnitude budget to ensure that all parties agree it is appropriate to advance the matter. The formal change order process follows, and uses a structured process of:

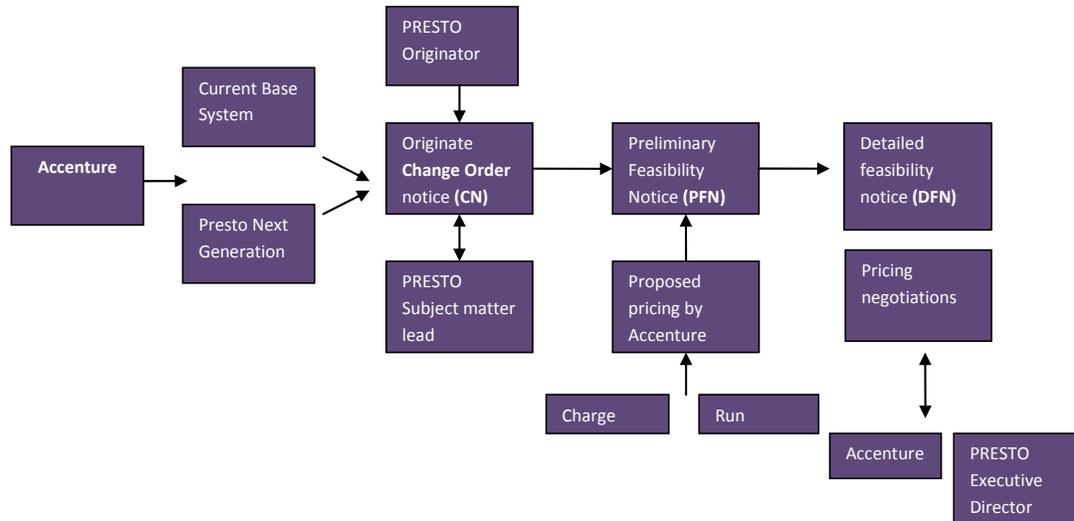
1. Developing a Preliminary Feasibility Notice,
2. A Detailed Feasibility Notice, and
3. The final approval process.

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<sup>13</sup> PRESTO management has noted that they utilize a governance model when seeking approval from its stakeholders on any material change contemplated to the PRESTO card system. We have not reviewed documentation relating to stakeholder approvals of material changes.

The change order process is shown diagrammatically in the chart below:

**Chart 1: Change order process**



The proposed pricing for the change order is initially provided by Accenture and is included in preliminary feasibility notice (PFN). Two types of prices are included in the change notice:

1. The one-time cost to develop and implement the change, and
2. The “run” representing the incremental impact to the ongoing monthly billings by Accenture to PRESTO once the change is implemented.

Note that Change Order pricing estimates address only the cost changes to the Accenture contract. They do not appear to capture any of the cost implications for Metrolinx in terms of project management or other costs such as future operating expenditures, other than those incurred by Accenture.

The initial pricing as proposed in the Detailed Feasibility Notice (DFN) and is subject to negotiation between the PRESTO Lead Executive and Accenture. Once the price is agreed, it becomes fixed price for the acceptance of deliverables by PRESTO. PRESTO management have informed us that historically, they have negotiated a collective fixed price for a grouped series of Change Orders. When this happens, the fixed price is allocated across a series of deliverables of work products as milestones.

We understand that for non-Accenture costs (e.g. licenses or standard hardware being procured directly at a Provincial level); the Accenture team assists Metrolinx in sourcing pricing and market information to support third party negotiations.

Preparation costs for the preliminary and detail feasibility plans, design and corresponding pricing are not paid to Accenture, although such costs are reflected in the final pricing of the change order. If the PRESTO team cancels the change notice unilaterally (as it is entitled to),

Accenture will be compensated for cost incurred in the developing the feasibility notice as per table provided below:

	Cancellation Fee After PFN	Cancellation Fee After DFN
<b>Simple</b>	\$2,000	\$5,000
<b>Complex</b>	\$5,000	\$10,000

PRESTO noted that controls exercised over change orders include establishing clearly defined deliverables for a fixed price thus transferring risk to the vendor.

**Final approval process**

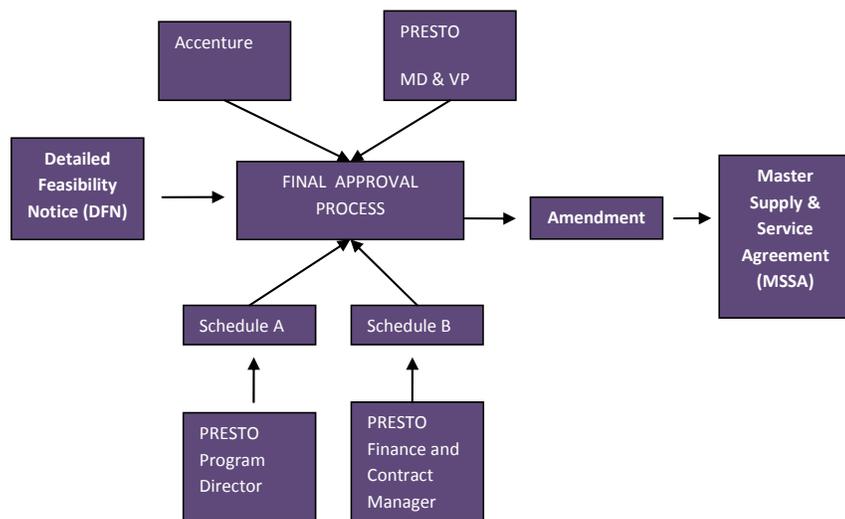
Once PRESTO and Accenture have agreed on pricing to develop and implement the Change Notice, as detailed in the Detailed Feasibility Notice – Financial document (DFN-F), the PRESTO Program Director will sign Schedule A of the DFN-F. This represents agreement on pricing between PRESTO and Accenture.

Also, PRESTO Finance and Contract Management will fill out Schedule B and obtain signed approvals on Schedule B from appropriate authority from each of the Service Providers providing funding as originally agreed in the Change Notice.

The Change Notice may not proceed to a Change Order Agreement until Schedules A and B of the DFN-F are fully approved. Once a Change Order Agreement has been signed by Accenture and the PRESTO Managing Director and Executive Vice President (and additional senior Metrolinx executives, if required based on the total cost), the Change Order Agreement becomes an amendment to the Main Supply & Service Agreement (MSSA) Contract and a legally binding commitment between Accenture and PRESTO.

The parties and documents which input into the Final Approval Process are noted in the chart below.

**Chart 2: Final approval process**



### Change notice cancellation and splitting

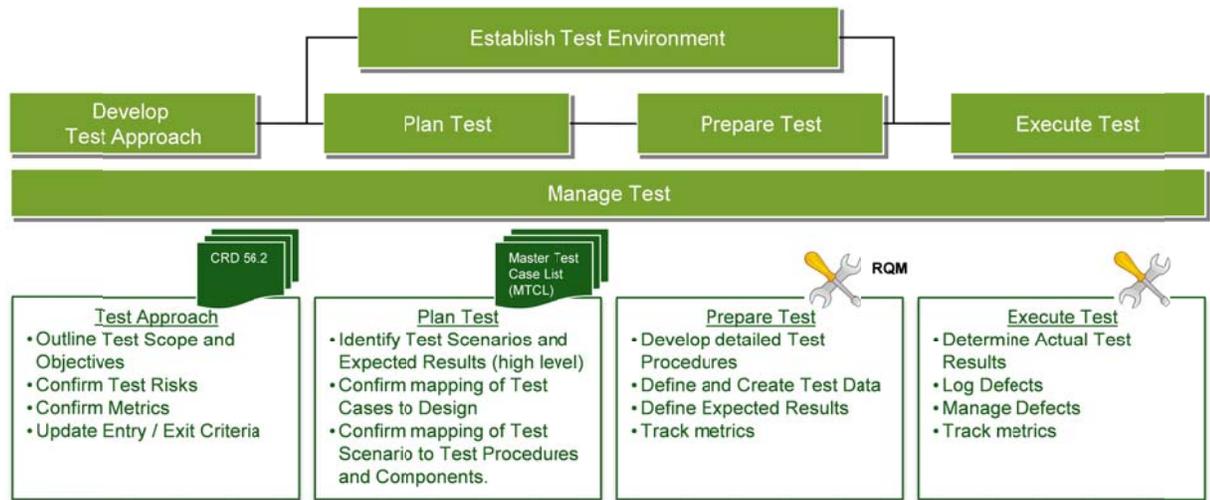
PRESTO may unilaterally cancel a Change Notice at any time prior to a Change Order Agreement being signed, subject to any cancellation fees as described above.

An approved Change Order Agreement represents a legally binding commitment between PRESTO and Accenture, and an amendment to the MSSA. A signed Change Order Agreement may only be cancelled by mutual agreement between PRESTO (Lead Executive approval required) and Accenture.

In some cases, the large single change notices is split into smaller multiple change notices. Each new Change Notice then progresses normally through the Change Request process. This can be done at any time prior to a Change Order Agreement being signed. A cancellation fee for cancellation of the original Change Notice is not charged by Accenture in this situation.

### Testing

PRESTO requires a formal approach to testing of each phase. The testing approach is structured to be a repeatable process. The key steps are as outlined below:<sup>14</sup>



- 1) Developing the test approach – identifies the objectives, schedule, environment requirements, entry and exit requirements for the test stage;
- 2) Plan test – identifies the test scenarios for the test stage,
- 3) Prepare test – defines the test procedures, input data and expected results,
- 4) Establish test environment – ensures that the test environment is tested before the test execution, and
- 5) Execute test – performs the scripts contained in the test model, compares the actual results to the expected results, identifies and resolves discrepancies.

It appears that the current process requiring successful acceptance testing before approval of payment is undertaken. Further, the testing of deliverables does not include formal verification that the quantified benefits have been delivered. However, PRESTO management has indicated that post implementation assessments are conducted at the system level.

<sup>14</sup> “PRESTO R1.2 I&IT Test Approach”, PRESTO, May 13, 2011.

## Appendix B – Scope of Review

The following listing includes all of the documents that were reviewed by Grant Thornton for this engagement. Our approach to gathering and reviewing the information was as follows:

- Initial planning discussions were held with management to discuss the engagement and its information requirements.
- Based on this discussion, an information request was provided to management, who provided the information requested to us.
- Management also made available access to the library of documents related to the PRESTO project for our review.
- Our technical experts reviewed the information provided, including a review of the library, and summarized all relevant documents reviewed. Our technical experts then briefed our project team on the information and key findings from their review. All summaries were provided to the entire project team.

Specifically, we would note that several interviews were held with the following people:

### **Metrolinx**

Ernie Wallace

Steve Zucker

David Smith

Peter Macaig

Jeff Young

Darryl Browne

Gary Galowski

Victoria Durie

Brian Peters

Scott Gillespie

### **Accenture**

Alden Cuddihey

Garret Wu

Scott Butler

Scott Graham

Serial No	Document	Date
001	Master Supply & Service Agreement with Accenture	N.A.
001	Reconcile version of Appendix K-Milestone, Payment v4A – Final 6-09, Sept 30, 2011	N.A
001	Appendix C – Proposal v5A format for Contract	N.A
001	Final Service Agreement	Dec 03 2010
001	Appendix G – Technical Specs TOC	
001	Appendix G – Part 1 Scope of Work	Oct 6 2005
001	Appendix G - Part 2 – Central System Specs	Dec 5 2005
001	Appendix G - Part 3 – GOSPS Specification – TOC	Nov 14 2005
001	Appendix G - Part 4 – Municipal Service Provider Specs	Nov 30 2005
001	Appendix G - Part 5 – General Design Req'd and Device Specs	Nov 7, 2005
001	Appendix G - Part 6 - Service Specs	Dec 7, 2005
001	Appendix G - Part 7 - System Assurance	Nov 30, 2005
001	Appendix G - Part 8 - Performance Standard	Dec 08, 2005
001	Appendix G - Part 9 - Business Rules	Nov 14, 2005
001	Appendix G – Part 10 – Launch 1 System	Oct 6, 2005
001	Appendix G – Part 11 – OIS Volume 1	Oct 6, 2005
001	Appendix G – Part 11 – OIS Volume 2	Dec 8 2009
001	Appendix G – Part 11 – OIS Volume 3	Sept 23 2008
001	Appendix G – Part 11 – OIS Volume 4	Sept 24 2008
001	Appendix G – Part 11 – OIS Volume 5	July 29 2010
001	Appendix G – Part 12 – Security Architecture – TOC	Oct 6, 2005
002	Presto Update to Metrolinx Board	Sept 15, 2011
003	Roadmap Deployment Scope	N.A.
004	The future of Smart Transit and Mobility	Nov 15, 2010
005	Presto's 2020 Vision – A future of True Mobility	Mar 2011
006	Presto PNG PL150 Solution Blueprint by Accenture	Jan 28 2011
007	Presto R2.0 Architecture & Design Review by PwC	June 27 2011
008	Strategic Risk Assessment and Mitigation	N.A.
009	Presto Change Request – Scope management	Sept 21 2011
010	Changes to Scope	N.A
011	Change Request Tracking Excel sheet for Signed Change order and DFN Underway	N.A
012	Monthly Operation Update	Sept 2010 to Aug 2011
013	COA Presto 2.0 Test Phase I	Sept 26 2011
013	COA PNG Rapid App Design workshops	Oct 15, 2010
013	COA R10 Design Phase	Dec 20, 2010
013	COA PNG R10 Design Phase Part 2 – Amend Final	Mar 14 2011

Serial No	Document	Date
013	COA PNG I&IT Server Storage and Network Purchase Final	July 29, 2011
013	COA R10 Build Phase Part 1 – Amend2	Aug 06 2011
013	COA Presto 2.0 Build Iteration 2	June 28 2011
013	DFN-F PNG R10 Design Phase V3	Dec 20, 2010
013	DFN-F PNG Rapid App Design Workshop	Oct 12, 2010
013	DFN-F PNG Design Phase Part 2, Amend1 Final	March 14, 2011
013	DFN-F PNG I&IT Server Storage and Network Purchase Final	July 29, 2011
013	DFN-F PNG R10 Build Phase Part 1 – Amend2	June 08, 2011
013	DFN-F Presto 20 Build Iteration Final	June 24, 2011
013	Presto Change order Agreement CN 173 PNG	Mar 18, 2010
013	Presto DFN-F CN 173 PNG-CD Final	Mar 17, 2010
013	Presto DFN CR 319 Presto 2.0 Test	Sept 23 2011
014	Presto Next Generation Discussion	Aug 13 2009
015	Presto Security Review – Phase 3C Threat & Risk – Assessment ITRA	Mar 31 2011
016	Greater Toronto Area Fare System – Operating Agreement	N.A
017	Presto Next Generation – CN 173 – PNG Migration Strategy	Apr 9 2010
018	Presto Briefing	Dec 8 2010
019	Presto PNG – OC Transpo Solution Blueprint by Accenture	Oct 2010
020	Presto Proposed Presto Organization Model	June 22 2011
021	Presto Metrolinx Finance and Audit Committee	Nov 15, 2011
022	Presto System Update: Presentation to Board	Nov 16 2010
023	Presto System Contract Amendment: Board Members	Jan 26 2011
024	Presto System Contract Amendment: Board Members	June 23 2011
025	Presto System Contract Amendment: Board Members	Sept 15 2011
026	Presto Update: Metrolinx Board of Directors	June 23 2011
027	Presto System Contract Amendment: Board Members	July 20 2010
028	Presto System Contract Amendment: Board Members	Nov 16 2009
029	Presto/TTC eFare view – MTO Briefing	July 2010
030	Presto Project Office – Capital Forecast – Summary	Feb 18 2011
031	PNG Business Case to Treasury Board	Oct 20 2011
032	Accenture Information on the Fare management industry	Oct 28 2011
033	Metrolinx Presto Office Presto System – Pre-implementation and Post-implementation IT Audit	March 10, 2011
034	Presto Quality Management System – Quality Review Report on Testing	March 24, 2010
034	4 – Quality Review Report on Training	July 26, 2009
034	Presto Quality Management System – Informal Quality Review System	Jan 19 2011

Serial No	Document	Date
	Presto Farecard System – Next steps and TTC participation	May 26 2011
	Presto Requirement Traceability Matrix	Nov 2008
	Presto Work Order	Dec 8 2010
	Presto System Pre-implementation & Post-implementation I.T. Audit	March 10, 2011
	Presto Consolidated RTM for OC Transpo	N.A.
	DFN Technical vision and Risk Assessment	Aug 27 2009
	DFN-F Technical Architecture Vision	Aug 27 2009
	Information and Information Technology (I & IT) Directive	Aug 24 2006
	Operational Policy on the I&IT Project Gateway Process	Jan 26 2007
	An Update on the I & IT Project Gateway Review Process	June 13, 2007
	Report of Ontario Special Task Force on the management of large scale information and information technology projects	July 2005
	Presto Security Review Pre-production Review Report – PwC Report version 2.0	Dec 30, 2009
	Presto Security Review Pre-production Review Report – PwC Report version 2.2	Dec 30, 2009
	Presto Security Review Phase 2 Integrated Project	Dec 8, 2009
	GO-Live Readiness-York	2010/2011
	York overall Readiness Meter	2010/2011
	GO-Live Readiness – Mississauga	2010/2011
	R 1.1. Readiness Meter - Presto Office Status – Fall 2010	2010
	Hamilton overall Readiness meter	2010/2011
	Durham overall readiness meter	2010/2011
	Brampton overall readiness meter	2010/2011
	Fare Management for High performance – a strategic approach to all stakeholders – Accenture Report	2010
	Public Transit Revenue Growth – Innovations for moving forward – Accenture report	2010
	Strengthening the Public Transit Backbone – Optimization Costs in the Age of Austerity – Accenture report	2011
	Mobile Ticketing for Public transportation: Convenience, Efficiency & Revenue – Accenture report	2011
	PRESTO System Project Disaster Recovery Plan	Feb 20 2009



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