



YUS LINE SERVICE IMPROVEMENT STRATEGY

Platform Edge Doors Business Case

September 30, 2010





Presentation Outline

- **Introduction**
- **Service Improvement Strategy**
- **Platform Edge Doors (PEDs)**
- **Business Case**
- **Reliability/Capacity Improvement**
- **Summary/Recommendations**



Introduction

The YUS line is the most critical asset of the TTC:

- **Provides 78% trips to the Central Business District**
- **Of TTC's 1.5M riders each day, 700k use YUS**
- **Equivalent capacity of 5 DVPs**
- **Currently operating at a 10% shortfall in capacity**



Introduction

AVERAGE DAILY COMMUTES

IN MINUTES

	Commute time	Grade
Barcelona	48.4	A
Dallas	53.0	A
Milan	53.4	A
Seattle	55.5	A
Boston	55.8	A
Los Angeles	56.1	A
San Francisco	57.4	B
Chicago	61.4	B
Berlin	63.2	B
Halifax	65.0	C
Sydney	66.0	C
Madrid	66.1	C
Calgary	67.0	C
Vancouver	67.0	C
New York	68.1	C
Stockholm	70.0	C
London	74.0	D
Montreal	76.0	D
Toronto	80.0	D

SOURCE: TORONTO BOARD OF TRADE
JONATHAN RIVAIT / NATIONAL POST

Toronto's commute times are a "glaring downfall" in the city's economic picture -- even worse than the notorious traffic snarls in Los Angeles, according to a new Board of Trade report.

National Post, March 30, 2010

There is no capacity left in the GTA's road and highway systems to address this challenge.



Service Improvement Strategy

Current capacity is 26 trains/hour in peak

Need to move to 35 trains/hour to meet required forecast capacity in 2030

How do we increase capacity and reliability?

- **Move more trains per hour; currently constrained by signal system headway**
- **Train capacity**
 - **More efficient use of trains interior space**
 - **Longer trains**
- **Reliability, ensuring that the line is operated at peak capacity**



NOVA's International Benchmarking *

Industry Best Practices

- **Toronto will not achieve the target level of reliability through automation alone**
- **Even with TR and ATC, Toronto needs to reduce total incidents by 75% to achieve the target reliability level of 1 peak failure per week**
- **Toronto needs to target key areas first and then evaluate every aspect of the subway in terms of reliability**



* Presented by NOVA at the June 2, 2010 Commission Meeting



PLATFORM EDGE DOORS (PEDs)



Platform Screen Doors

Rosedale Station View 4 (Full Height- Partially Segregated with Grille)



PEDs

PEDs are commonly being installed around the world and are primarily used to:

- **Maintain physical segregation between passengers waiting on the platform and the track.**
- **Prevent passengers from moving between the platform and the train unless the train is fully stationary in its correct position.**



General PED Benefits/ Impacts

Stakeholders	Impacts	
Public	Safety	↑
	Improved Reliability	↑
	Reduction in Noise	↑
	Air quality	↑
TTC	Operation & Maintenance	↔
	Staff stress and trauma	↑
	Perception of the TTC network	↑
	Capital costs / Residual value	↓



SYSTRA Deliverables

- Review of TTC's Constructability Study of PEDs in our current stations
- Review of TTC's cost estimates for PEDs in existing and new stations
- Business Case for the installation of PEDs



PED Business Case

The Business Case is based on an analysis of the impacts for the community considering positive and negative impacts of an investment over the economic life of the project

Two criterion were evaluated:

- Economic Net Present Value (ENPV)
- Economic Internal Rate of Return (EIRR)





PED Business Case

Major Assumptions:

- 30 year benefit
- Ridership increase 1.5% per year
- Installation for the complete TTC network over 6 years
- Capital installation cost of \$9.8M per station





Summary of Net Present Value

Values in 2010 CAD
Discount rate at 8%

- YUS + TYSSE
- BD
- SHEPPARD

Economic Benefits	M\$	567.1
Investments	M\$	-511.6
Economic Net Present Value	M\$	55.5

Notes:

1. Additionally, options of installing PEDs on individual lines was examined. As expected, due to the high passenger volume on the YUS, it provided the greatest return.

2. While not displayed, the Economic Internal Rate of Return exceeded the 8% set by the Treasury Board.



Sensitivity Analysis

A sensitivity analysis was conducted with the following parameters:

- Capital cost
- PED O&M costs
- Rate of growth of GDP/capita
- Ridership forecast
- Value of severe/fatal injuries
- Value of time

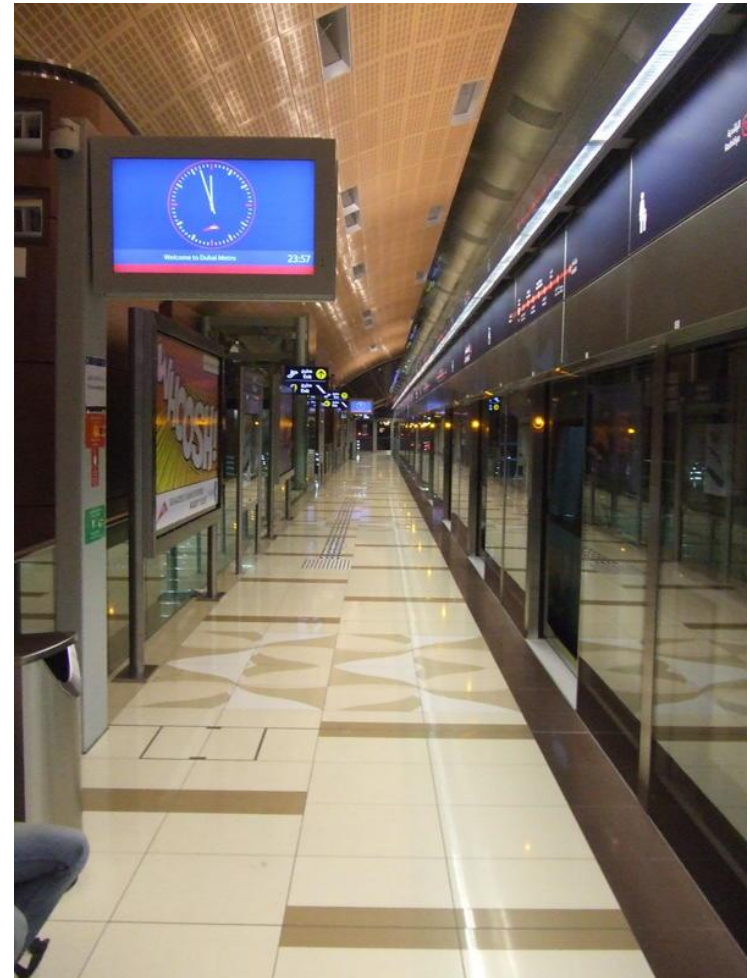
Analysis determined that NPV and EIRR remained favorable





Conclusion

- PED are necessary to achieve TTC performance objectives
- CBA gives a positive NPV and an EIRR $> 8\%$
- PED installation a complex task, must be operation focused





SYSTRA Recommendations

- Install the PEDs which is a viable, economic and operational solution which would enhance the overall TTC operations
- Co-ordinate all new improvement as a whole to implement a global engineering approach
- Carry out detailed reconnaissance of sites
- Ensure installation plan is:
 - Performance based schedule
 - Efficient to minimize disruption to service
- Take advantage of the market situation



SYSTRA Recommendations (2)

- Mitigate risk through:
 - Managing scope creep
 - Identifying and managing interfaces
 - Tight controls on PED Supplier
 - Involving Operations Departments early in design and implementation process
 - Developing a prototype installation



Safety, Reliability and Environmental Benefits

Benefit

Safety

Reliability

Intentional and unintentional train contact



Unauthorized at track level



Debris and Fires



Train Doors



Environmental ✓



Reliability Improvement

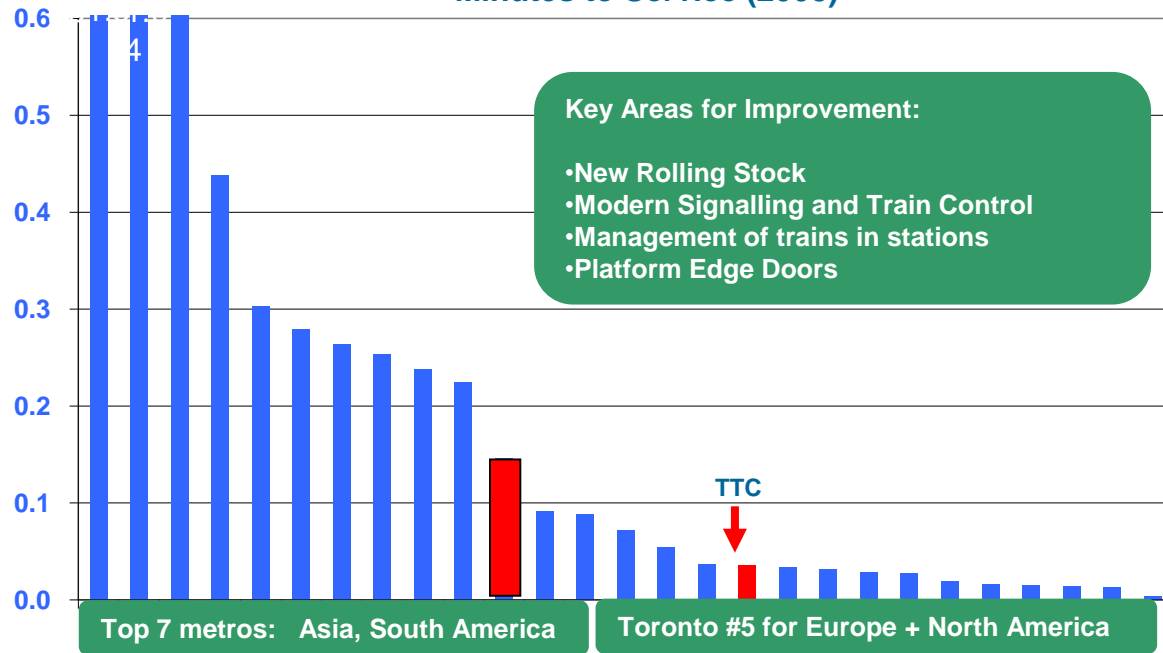




Reliability Improvement

➤ Reliability improved to top European or North American property and equivalent to Asian properties

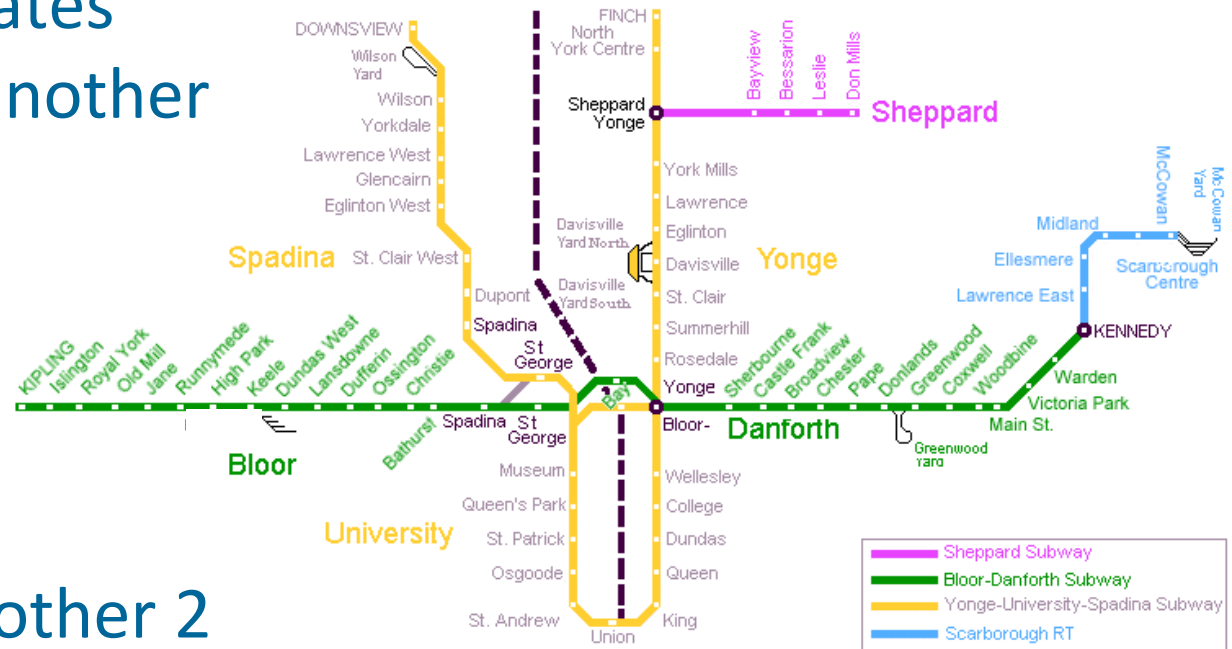
Million Car Kilometres Between Incidents Causing a Delay > 5 Minutes to Service (2008)





Capacity Improvement

Adopting these improvements creates the equivalent of another YUS branch



This represents another 2 DVP equivalents



Summary

- **Future transportation growth can only be achieved by Transit, not roads (2002 Official Plan)**
- **The YUS Line is the most critical Transit Asset**
- **The YUS Line requires TRs, ATC, PEDs and Station Managers to meet the capacity & reliability challenge**
- **These initiatives will provide Toronto with a World Class Subway**



Recommendations

- **Direct staff to continue with planning for PED installation**
- **Staff to include PEDs in 2011 – 2015 Capital Budget**



Questions

