



Improving Transit System Performance The STM's Experience

February 2010

MOUVEMENT COLLECTIF



- STM in brief
- How to improve transit performance
- Overview of international benchmarking
- Benefits for STM



STM in brief

- 8 400 employees
- 2010 budget = \$1,8 B (can)
- Ridership = 382 M trips/year
- Modes
 - Bus
 - Paratransit
 - Subway



STM Territory



1,8 million inhabitants

Bus Service

- 224 million boardings/year
- 192 bus routes :
 - 172 day routes
 - 20 night service routes
 - 124 wheelchair accessible routes
- Paratransit
 - 2.5 million trips/year
- Bus operating cost : 1.30\$ per boarding





➤ **MR63**

- **Canadian Vickers**
- **336 cars**
- **43 years**
- **mdbf : 180 000 miles**

➤ **MR73**

- **Bombardier**
- **423 cars**
- **33 years**
- **mdbf : 250 000 miles**



How to improve transit performance?

- You need to know your strengths and weaknesses
 - Benchmarking is essential but not easy
- You must know what to do to be better
 - You have to know the Industry best practices
 - What the others did to improve?
- Do it
 - Cultural change
 - Accountability
 - Visibility
 - Continuous and long term process
 - Unions??

We needed help!

STM's Performance Compared with International Peers

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Montréal

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Opening Statement: The Nova Group of Metros

Nova and its sister group CoMET are the world's metro benchmarking groups

- **Principle Objective:** to identify and share best practices in a confidential environment
- 27 metros provide a wealth of knowledge for operators to provide an even better service



Community of Metros
CoMET

Less than 500m trips/year

More than 500m trips/year



Why do Nova and CoMET exist? Urban railways share similar problems and challenges and can share solutions



Communication between metros is essential for generating ideas to achieve world class performance and service quality at a reasonable cost



Rarely is there a challenge that another operator hasn't already faced

27 metros compare metro performance to identify and share best practices



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Elements of the benchmarking process

- KPI system to compare performance and show where to look for best practices
- Case Studies
 - In-depth research on topics of common interest, to identify best practices
- Expert workshops
- Online Forum - Rapid Response
 - Nearly 400 questions answered in 3 years



Outline of the benchmarking process

- Benchmarking group owned and run by the participants with Independence, Speed and Confidentiality being central attributes
- Project Management, administration and analysis carried out by Imperial College London
- Annual cycle - long term approach to benchmarking
- Confidentiality agreement to allow full data and information exchange within the group but not externally – overcomes political sensitivity

Members such as STM have initiated studies on a large variety of topics:

➤ Case Studies (> 60)

- Crowding and Service Planning
- Rolling Stock Procurement
- Escalator Management
- Service Quality and Customer Satisfaction
- Energy Saving
- Passenger Information Systems

➤ Website Forum (nearly 400 topics)

- Diversity Programmes for an inclusive workplace
- Tactile tiles cleaning
- Suicide prevention in train design
- Social fares
- Technical specifications for rolling stock maintenance equipment

➤ Clearinghouse Studies (>100)

- Productivity of metro cleaners
- Waste and recyclable product management
- Fare System Maintenance
- Management of Security Calls

➤ Nova Phase 12 Case Studies

- Signalling Upgrades
- Fares Funding and Financing
- Train Service Reliability
- Risk Management

Secure web site



International Bus Benchmarking Group

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History

Benchmarking

Publications

Links

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Welcome to the International Bus Benchmarking Group website

The Bus Benchmarking Group is a programme of international benchmarking of bus operations and public transport. It is made up of a consortium of eleven bus organisations: TMB (Barcelona), STIB/MIVB (Brussels), Dublin Bus, Carris (Lisbon), London Buses, EMT (Madrid), NYCT (New York), STM (Montreal), RATP (Paris), Sydney Buses and Coast Mountain Bus Company (Vancouver).

The objectives of the International Bus Benchmarking Group are to:

- Establish a system of measures for internal management
- Use the system of measures to identify best practice
- Support decision making within the organisations
- Provide comparative information for senior management and stakeholders.

All the group's activities are determined by the member bus organisations. A senior manager from one of the members is elected annually as President and a work programme is developed to accomplish the group's objectives.

The Group is jointly owned and driven by the members with project management and administration carried out by the RTSC at Imperial College London on their behalf. Imperial also provides many of the research resources for the group.

All International Bus Benchmarking Group activities are carried out within a framework of confidentiality. Any information that is released is generally anonymised. No confidential information is allowed to be released to third parties without the expressed permission of

Access Secure Area

Email:

Password:

Login

Members



RATP



EMT



New York City Transit



Transports Metropolitans de Barcelona



Forum discussions allow Metros to quickly obtain information from up to 27 other metros.

COMET

Home

Resource

Tools

Forum

Title

Forum

Forum List / Short questions /

Short questions

Topics	Replies	Author	Last Post	UD	1	x
Lockers in stations	2	Francesc Plana 2008-04-23 02:52:11	Estela Fernandez Alfageme 2008-04-23 08:10:44	UD	1	x
Tactile tiles cleaning (Tiles to guide visually impaired people)	1	Dominique Lemay 2008-04-20 13:39:28	Dominique Lemay 2008-04-20 13:44:08	UD	1	x
Recruitment of Traffic Supervisors	2	Marcia Baptista da Silva 2008-04-18 20:55:50	Francesc Plana 2008-04-23 10:19:40	UD	1	x
Quality of the air and PM10 levels on trains and stations	2	Marco Perego 2008-04-18 10:26:17	Estela Fernandez Alfageme 2008-04-23 08:05:32	UD	1	x
Wi-Fi suppliers	4	Estela Fernandez Alfageme 2008-04-14 07:17:16	Prawit Impornrugee 2008-04-23 04:08:46	UD	1	x
Visually disabled people to tell which side of the train door will open	5	Kai Yu 2008-04-14 03:29:40	Prawit Impornrugee 2008-04-23 03:27:41	UD	1	x
Employee Recognition and Incentive Programs	3	Ross Kapilian 2008-04-11 13:37:39	Dominique Lemay 2008-04-20 13:11:50	UD	1	x
Tunnel cleaning standards	11	Dave Bird 2008-03-28 17:40:01	Prawit Impornrugee 2008-04-23 03:00:53	UD	1	x
First Aid and Fire Fighting training	6	Prawit Impornrugee 2008-03-19 23:21:36	Felix Ng 2008-04-08 04:14:43	UD	1	x
Investment in Asset Replacement	7	Ross Kapilian 2008-03-14 07:35:33	Amitabh Banerjee 2008-04-16 07:15:39	UD	1	x
Use of Key Equipments for Control of Terrorist Activities in Metro	10	Amitabh Banerjee 2008-03-14 06:23:07	Estela Fernandez Alfageme 2008-04-23 04:21:43	UD	1	x
Integration tickets	19	Marcia Baptista da Silva 2008-02-27 17:51:22	Wang Chao 2008-04-22 08:03:26	UD	1	x
Peak Hour Passenger Loading	15	Lui Weng Chee 2008-02-26 04:25:13	Wang Chao 2008-04-22 08:11:06	UD	1	x
Ticket refund policies	14	Dave Bird 2008-02-22 16:47:06	Wang Chao 2008-04-22 08:17:20	UD	1	x
Passenger Information Display (PID) - COMPLETE	13	Prawit Impornrugee 2008-02-21 22:45:41	Wang Chao 2008-04-22 08:20:00	UD	0	x
Control room voice recordings - COMPLETE	14	Dave Bird 2008-02-20 16:13:42	Wang Chao 2008-04-22 08:21:30	UD	0	x
Computerised Maintenance Management System (CMMS) - COMPLETE	11	Roque Rosa 2008-02-20 14:53:15	Teresa Arruda 2008-04-21 14:54:55	UD	0	x
Rolling stock air conditioning refrigerant liquid - COMPLETE	15	Francesc Plana 2008-02-14 04:43:51	Wang Chao 2008-04-16 21:11:15	UD	0	x
Track Ballast - COMPLETE	11	Roque Rosa 2008-02-07 07:39:59	Dave Bird 2008-03-19 16:02:44	UD	0	x

The Key Performance Indicator System

Growth, Learning & Innovation

- G1a/b % change Network Size & Passenger Journeys
- G2a/b % change Operated Capacity km & Car km
- G3 Number of Training Hours / 1000 Staff Hours
- G4 Non-fare Commercial Revenue / Fare Revenue

Financial

- F1 Total Commercial Revenue / Operating Cost
- F2 Operating Cost / Revenue Car km
 - F2a Service Operations Cost / Car km
 - F2b Maintenance Cost / Car km
 - F2c Administrative cost / Car km
- F3 Investment cost / Car km
- F4a/b Operating Cost / Passenger Journey & km
- F5a/b Fare Revenue / Passenger Journey & km

Customer

Capacity Provision & Utilisation

- C1 Capacity km / Route km
- C2 Passenger km / Capacity km

Service Quality

- C3 Passenger Hours' Delay / Passenger Journey
- C4 Passenger Journeys On Time / Passenger Journey
- C5 Trains On Time / Total Trains
- C6 Train Hours Operated / Hours of Train Delay

Internal Processes

Reliability & Availability

- P1a/b % of Cars Available & Used in Peak Hour
- P2a/b Car km / hours between Incidents (by category)

Efficiency

- P3 Passenger Journeys / Staff + Contractor hours
- P4a/b Capacity & Car km / Staff + Contractor hours
- P5 Train hours / Driver Hours
- P6 % Employee Absenteeism
- P7 Traction Energy Consumed / Car km
- P8a/b Total Energy Consumed / Passenger Journey & km

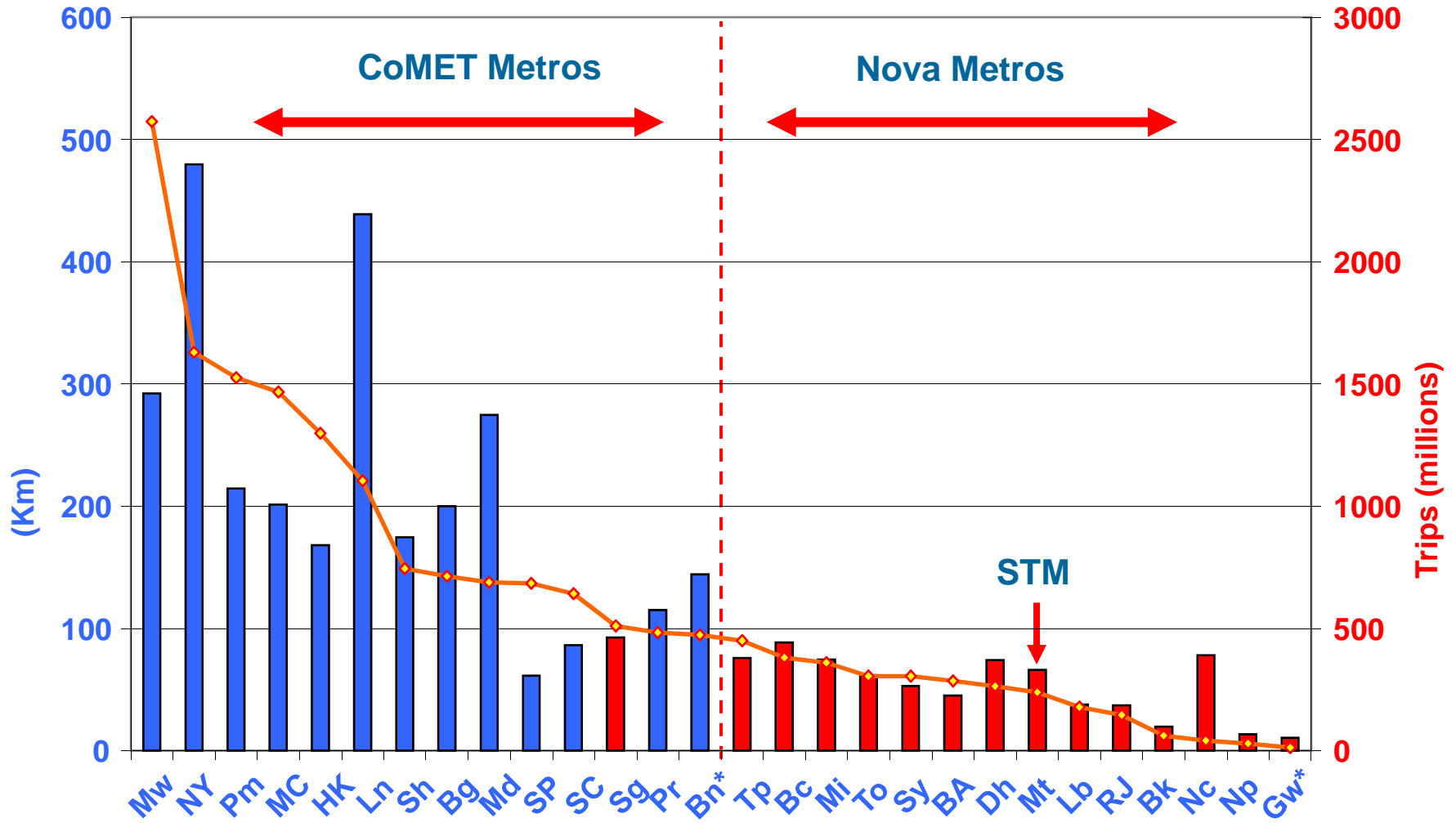
Safety & Security

- S1 Total Fatalities / Passenger Journeys
 - S1a Deaths from Suicide / Passenger Journeys
 - S1b Deaths from Accidents / Passenger Journeys
 - S1c Deaths from Illegal Activity / Passenger Journeys
- S2 Incidences of Crime / Passenger Journeys
- S3 Staff Lost Time through Accidents / Staff Hours

Environment

- E1 CO2 per Passenger km

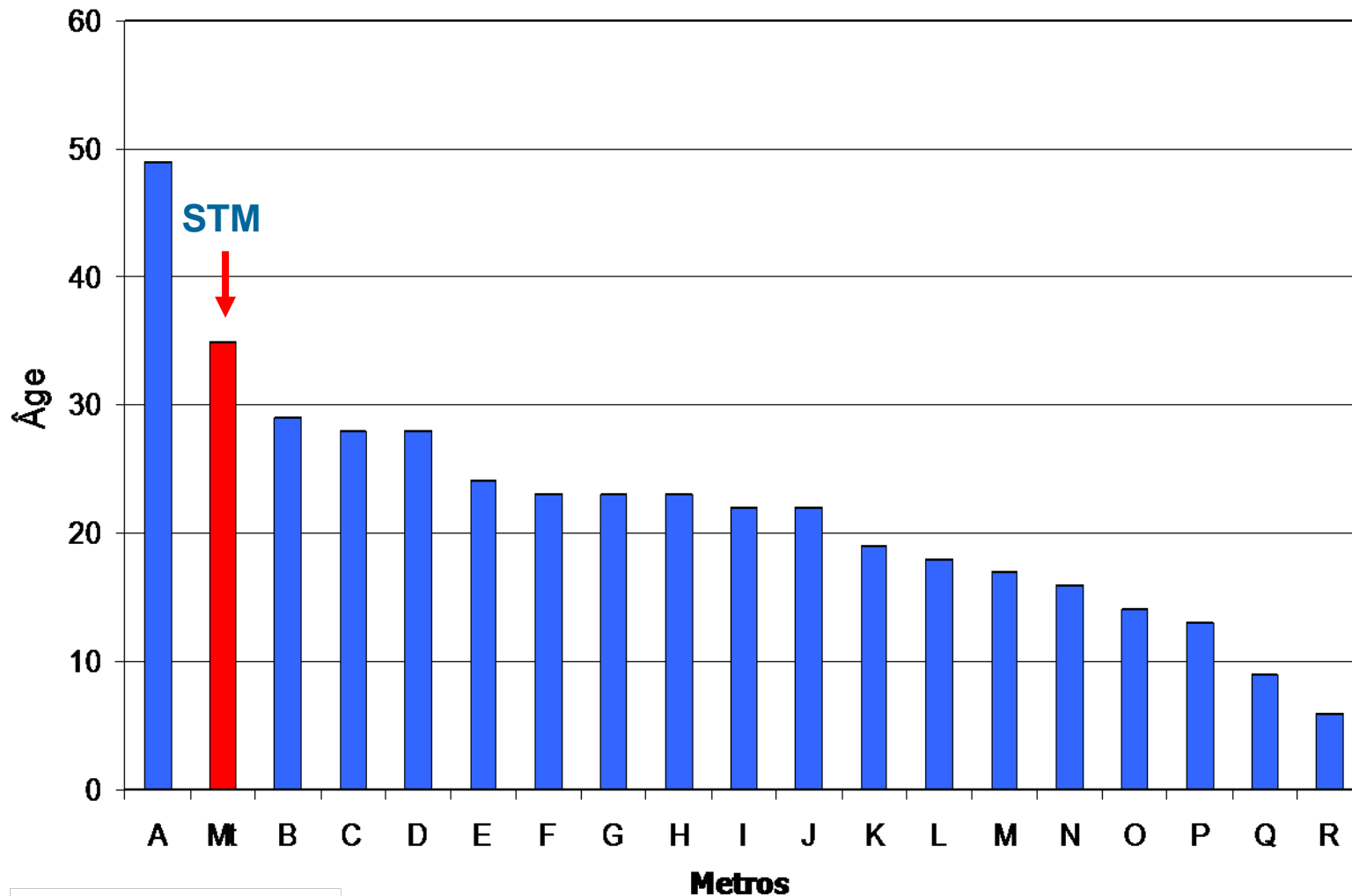
Metro size



■ Network length (Km)
 ◆ Passenger journeys

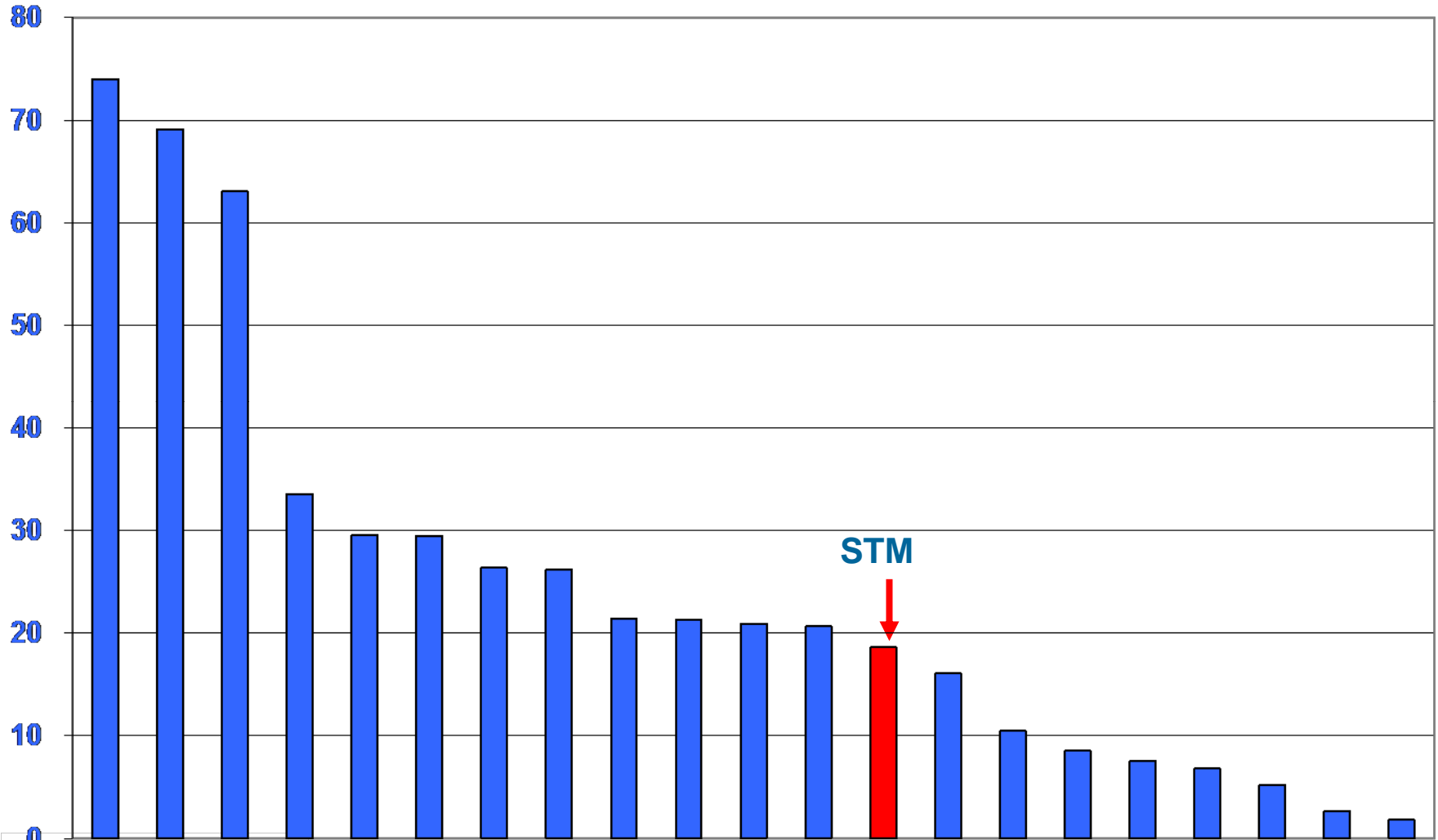
STM has one of the oldest rolling stock fleets in the world

Average fleet age (2006)



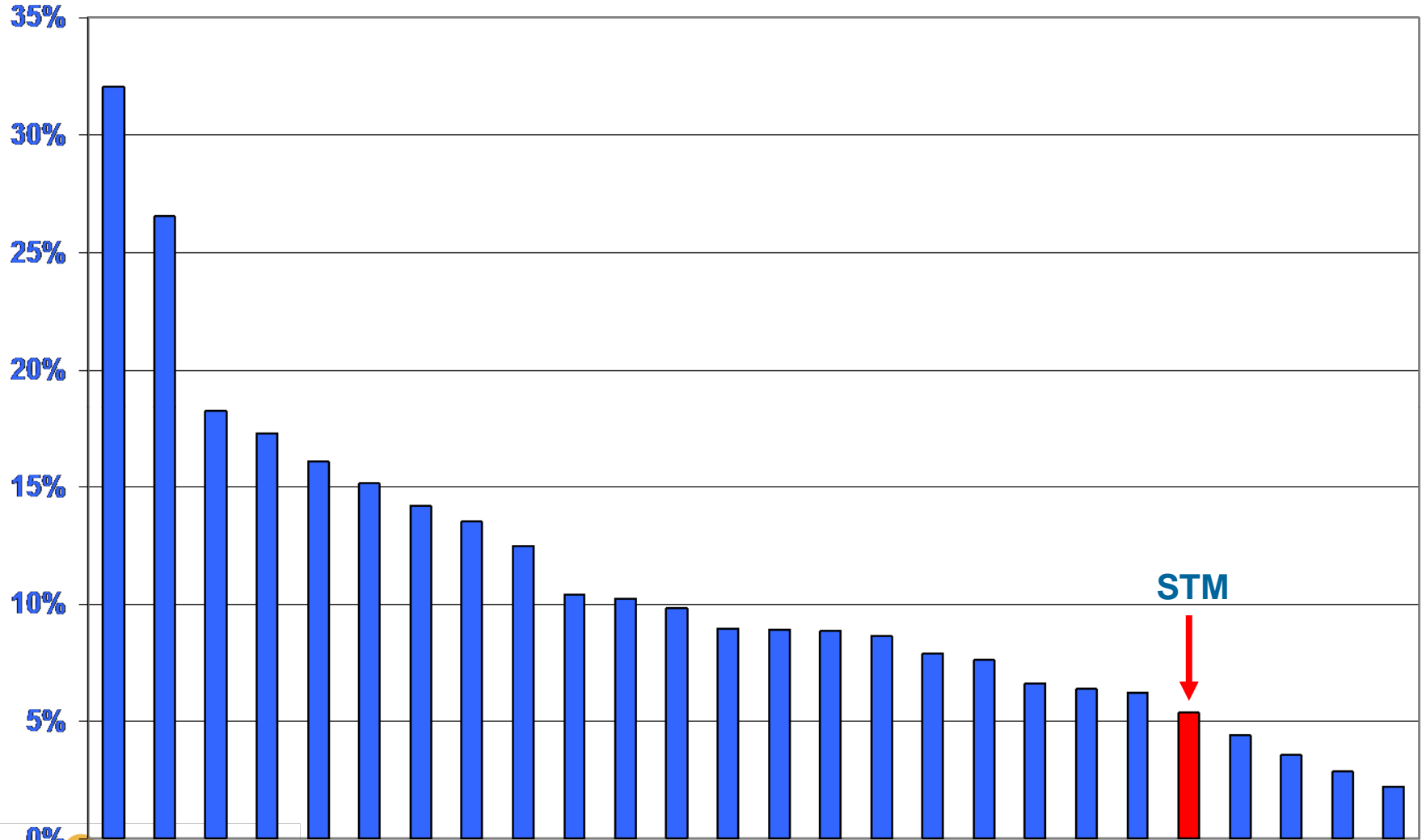
Levels of training in STM are a little below average

Number of Training Hours / 1000 Staff Hours (2008 or latest Year)



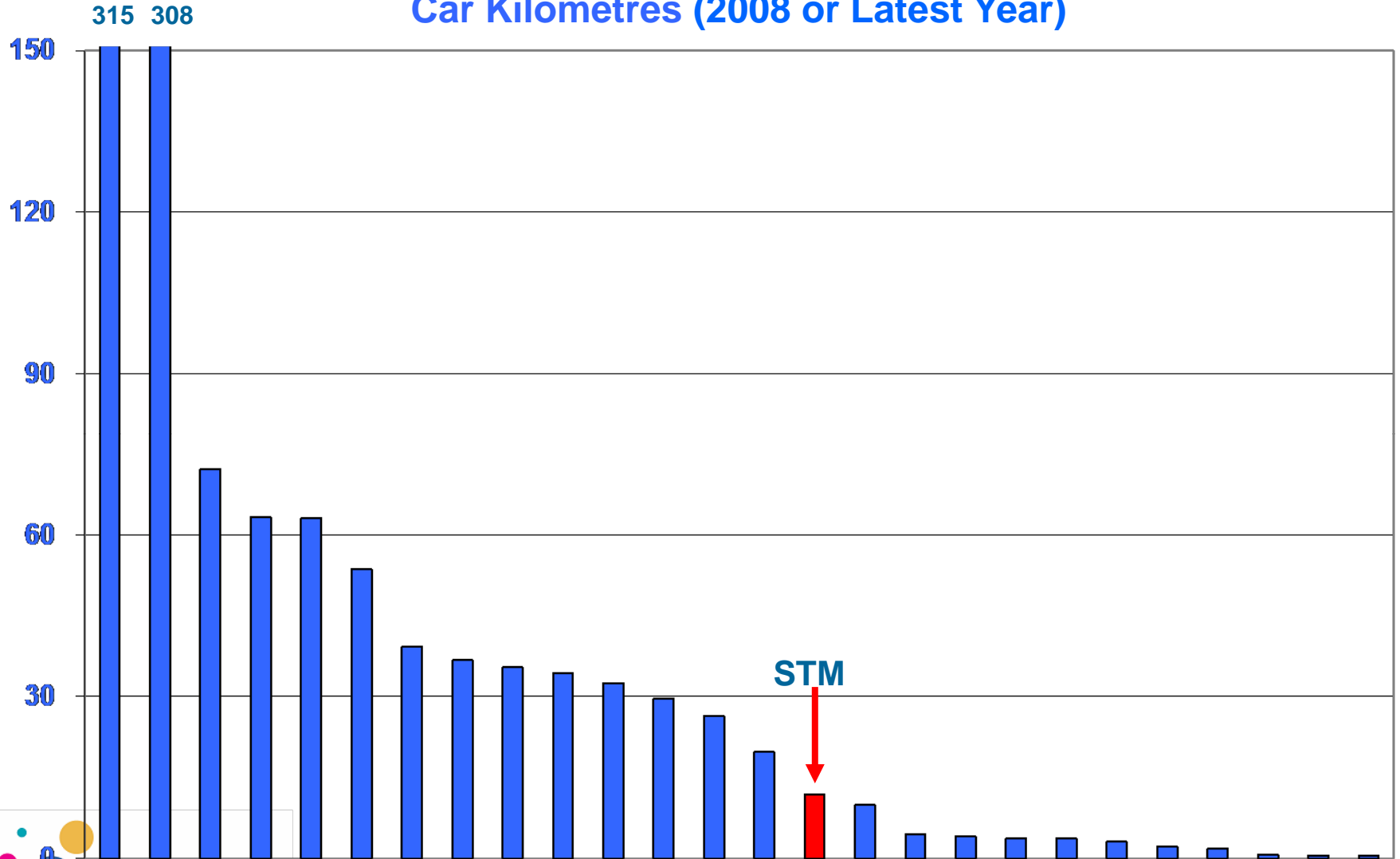
KPI analysis suggests that STM could leverage extra non-fare revenue from stations, trains, and tunnels

Non-fare Commercial Revenue / Fare Revenue(2008 or latest Year)



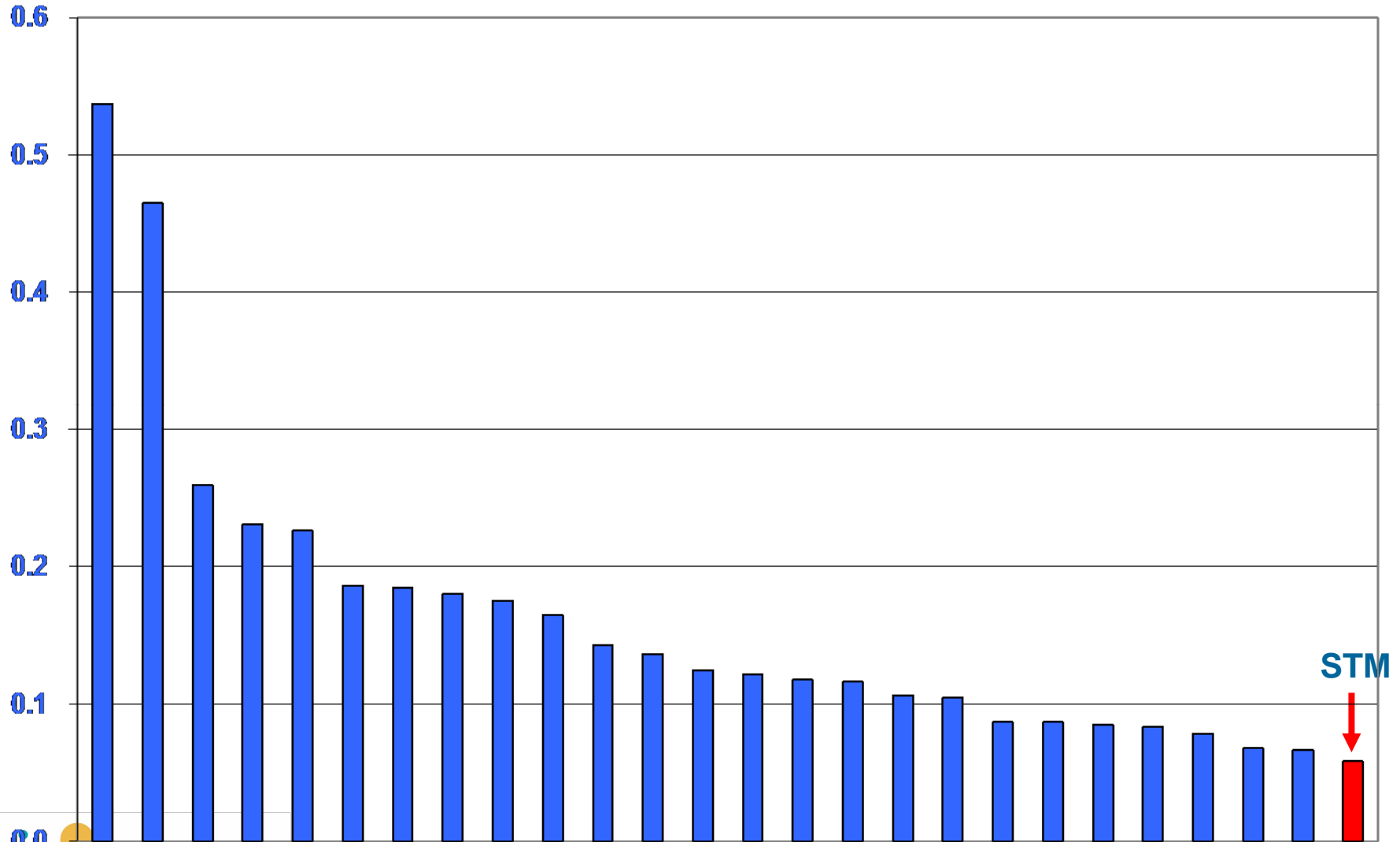
Train service reliability is good, despite old rolling stock

Number of Incidents Causing a Delay > 5 Minutes to Service per million Car Kilometres (2008 or Latest Year)



Per car kilometer, STM has world beating labour productivity

Total Own Staff and Contractor Hours per Car Kilometre (2008 or Latest Year)



Conclusion

Montreal metro has an excellent value for the price

Benefits for STM

- New way to manage our business – Performance management is a must at all levels
- Motivation tool for the workforce
- We use the data to convince stake holders that :
 - We are well managed
 - We needed more capital funds
- We were able to identify some weaknesses at STM and who are the best in those fields
 - Seat layout in subway train was not optimal (75M\$ savings)
- Finally, we know what to do to get better
- The internal culture is changing



Unions???

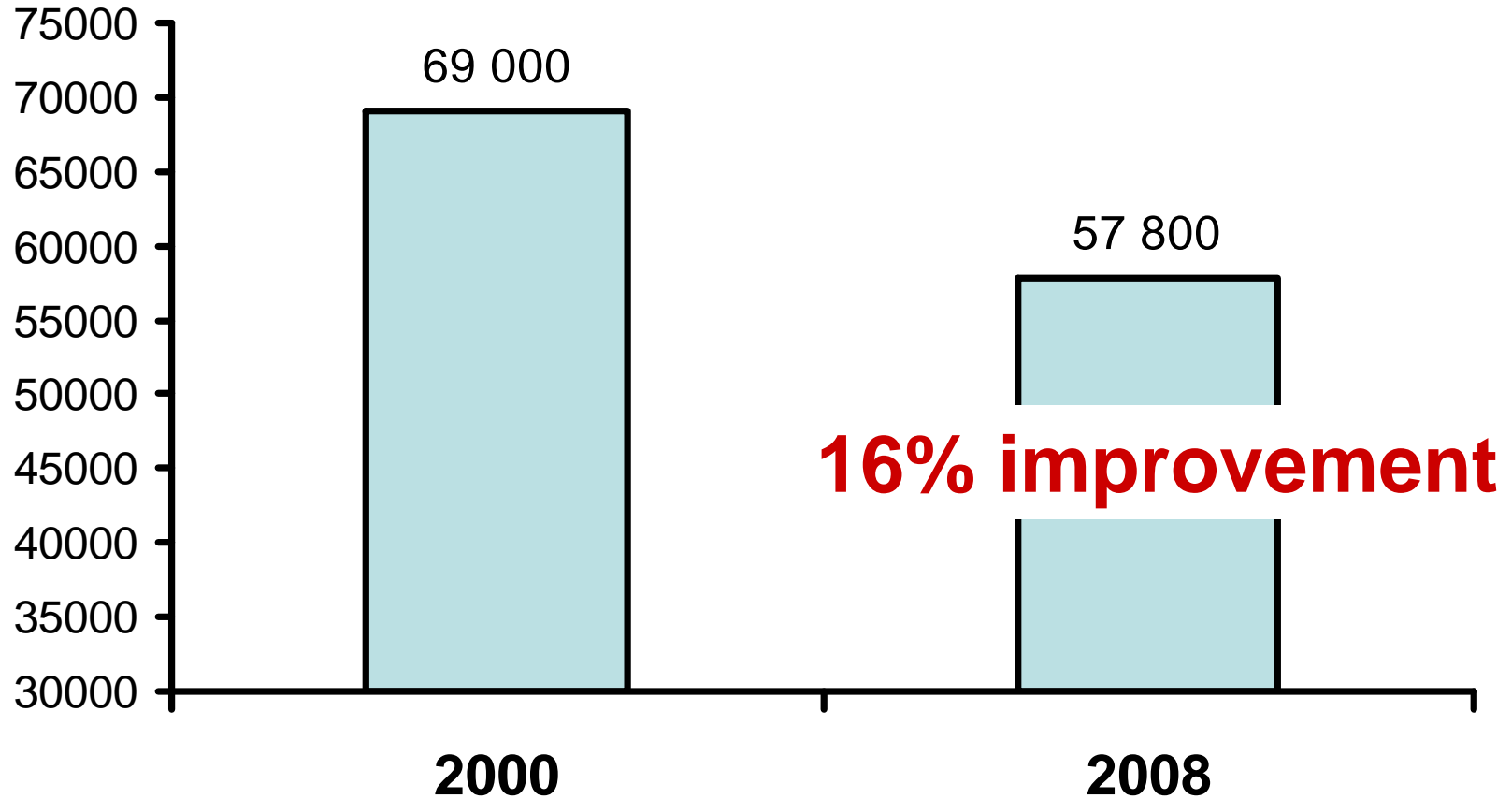
- Mechanics union
 - Left wing
 - Very old fashioned
- 2009 contract
 - Performance base
 - Productivity improvement shared with the employees
- How to calculate the savings
 - Variable maintenance cost savings per kilometer
 - Spare ratio reduction
 - We pay only if quality of service is good
- Results so far
 - Bus spare ratio down by 25%
 - 2 000 000\$ savings in 8 months

Are we better now?



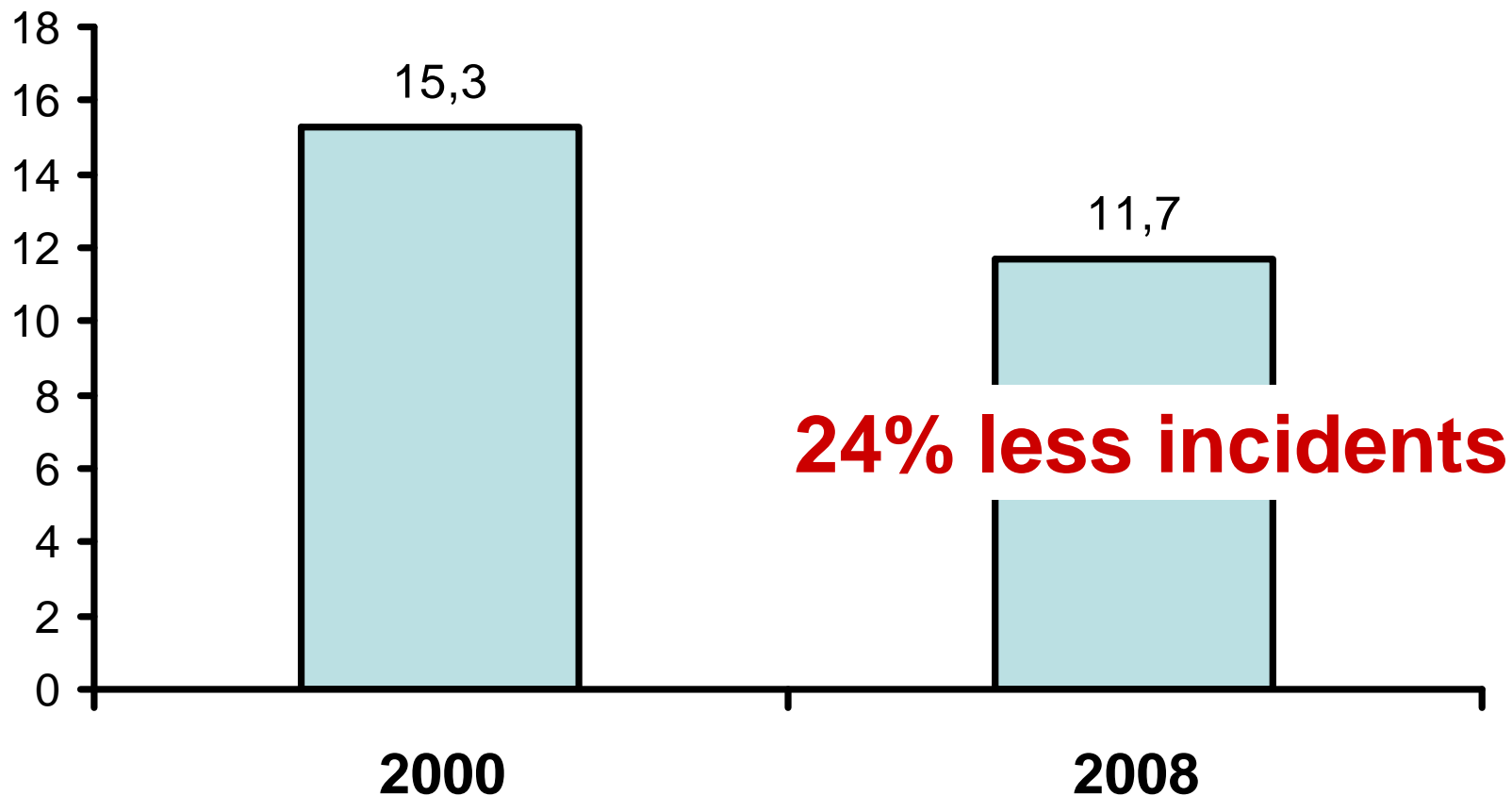
Evolution since 2000

Productivity (working hours per million km)



Evolution since 2000

Reliability (incidents/mcar-km)



Conclusions

- Management by performance and benchmarking are not common nature to our industry
- Because contexts are quite different from one transit agency to another, it is often difficult to do comparisons
- It requires a lot of effort from all operators in order for benchmarking to be efficient
- If the process is well done, it is an essential element for industry-wide performance improvements.
- It works!!



Thank You