GROW A VISION with PUBLIC TRANSPORT

OBSERVATORY OF AUTOMATED METROS

2013 data and activities
The Observatory is formed by the **main UITP references** with Automated Lines

- From pioneering experiences to the most recent ones
- Systems with multiple technological solutions & transport capacity
- Global cultural diversity: Europe, Asia, Middle East, America...

**Different profiles**

- Vancouver
- Hong Kong
- Dubai
- São Paulo
- São Paulo
- Rome
- Nuremberg
- Lille
- Paris
- Lille
- Lyon
- Barcelona
- Singapore
- Lille
- Paris
- Rennes
- Lyon
- Barcelona
- Copenhagen
- Lausanne
<table>
<thead>
<tr>
<th>Company</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.DK</td>
<td>The Metro Company-Metroselskabet I/S</td>
</tr>
<tr>
<td>RTA</td>
<td>Roads &amp; Transport Authority</td>
</tr>
<tr>
<td>MTR</td>
<td>Mtr Corporation Ltd.</td>
</tr>
<tr>
<td>TL</td>
<td>Transports publics de la region Lausannoise</td>
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<tr>
<td>KEOLIS</td>
<td>Keolis</td>
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<td>VAG</td>
<td>Verkehrs Aktiengesellschaft Nürnberg</td>
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<td>RATP</td>
<td>Regie Autonome des transports parisiens</td>
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<td>ATAC SpA</td>
<td>Agenzia del trasporto autoferrotranviario del Comune di Roma</td>
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<tr>
<td>CCR</td>
<td>Companhia de concessoes rodoviarias</td>
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<td>Land Transport Authority</td>
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<td>British Columbia Rapid Transit Company Ltd.</td>
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<td>Alstom</td>
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<td>TMB</td>
<td>Transports Metropolitans de Barcelona</td>
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The Observatory represents a **significant part of the UTO km in service in the world**
The Observatory **MISSION** is to **disseminate and share** the most current and relevant **knowledge about automated metro lines** with a **cross-cutting approach** to all business perspectives.
Grades of automation

According to IEC 62267

The Observatory focuses on level 4
The annual world report of automated metros is presented in the Open Seminar


- Global view of the **current situation** on metro automation
- Analysis of the **evolution**
- Identify **trends** and major **milestones**

The **Atlas** is becoming a **reference**
- 2011 Feb. **Management of Unauthorized Presence in Tracks**
- 2011 Nov. **Energy Savings in Automated Driving Modes**
- 2013 Mar. **The human side of Automated Lines:**
  Cooperation with the BHRM Commission
- 2013 Jun. **Quick survey:** “Attendants on board driverless metros”
- 2013 Oct. **Final report:** “Attendants on board driverless metros”
2013 Apr. *Website of the Observatory of Automated Metros*

http://metroautomation.org

- Official launch on **23rd April 2013**
- Reference point for all those interested in metro automation, providing frequent **news** and **up-to-date information**
- **Exclusive contents** for UITP members.
- **2nd phase** already on preparation

*The web appears in top 1st position in Google searches for Metro Automation*
Structure

• Home
• Who we are
• Atlas
• Annual world report
• Automation essentials
• Publications
• Contact
• News
UITP Automated Metro Seminars

- 4th edition
- Location: London

**General vision on automation 4 blocks:**

- Strategy
- Operation
- Human
- Technology

- Oriented to Operators and focused on discussion (panels)

- The annual report of the Observatory is presented in the Seminar

- Over 180 participants
Selection criteria applied in the Atlas:

- **Unattended Train Operation (UTO):** Only metro lines without staff on board are considered.

- **Public transport service:** Private lines have been discarded (airport services, people movers, ...)

- **Minimum train capacity required:** More than 100 passengers/train.
Pioneers era: 1980-90

83 km
Early Adopters: 1990-2000

196 km

Map showing early adopters of automated metros in cities such as Vancouver, Detroit, Miami, Paris, Lyon, Toulouse, Kobe, Tokyo, Osaka, Taipei, Kuala Lumpur, and Singapore.
A proven reality: 2000-Today

674 km
674 km
48 lines
700 st.
32 cities

UTO today

THE ATLAS 2013
UTO % of km per world region

- Asia: 40%
- Europe: 32%
- North America: 19%
- Middle East: 12%
- South America: 1%
UTO lines length (in km)

Dubai Red: 52 km
Singapore CCL: 33 km
Lille L2: 31 km
Constructive models: underground vs elevated (#stations)

50.5%
49.5%
THE ATLAS 2013

Line capacity: passengers/train (% of km)

- 300-700 pax/train: 50%
- < 300 pax/train: 32%
- > 700 pax/train: 18%

Observatory of Automated Metros
1st July 2012:

U Line

Uijeongbu, Republic of South Korea

- 11.1 km - 15 stations
- Operator: Uijeongbu Light Rail Ltd.
- Platform Screen Doors
- Small capacity train (Siemens)
- Signaling tech: Inductive loops
- Third rail power
- Rubber-tyred wheels
- Line fully elevated
10th February 2013: Line 5
Milano, Italy

- 4.1 km - 7 stations
- Operated by Azienda Transporti Milanesi s.p.a.
- Platform Screen Doors
- Medium capacity train (Ansaldo Breda)
- Signaling tech: Inductive loops
- Third rail power
- Steel wheels
- Fully underground
2nd March 2013:

**Line 1**
Brescia, Italy

- 13.7 km - 17 stations
- Operated by Brescia Mobilità
- Platform Screen Doors
- Medium capacity train (Ansaldo Breda)
- Signaling tech: Inductive loops
- Third rail power
- Steel wheels
- 13 st. underground
26th April 2013: EverLine
Yongin, Republic of South Korea

- 18.1 km - 15 station
- Operated by Yongin LRT Consortium
- Platform Screen Doors
- Small capacity train (Bombardier)
- Signaling tech: RF-Free propagation (discrete antennae)
- Rubber-tyred wheels
- Line fully elevated
THE ATLAS: TRENDS

Capacity:
Passengers/train (as a % of last decade new km)

- Medium: +50%
- Big: +26%
- Small: +24%

< 300 pax/train
300-700 pax/train
> 700 pax/train

OBSERVATORY OF AUTOMATED METROS
THE ATLAS: TRENDS

Signaling:
Current share of Inductive loops / Radio / µWave

Inductive Loop

RF free propagation
THE ATLAS: TRENDS

Track protection systems: PSD vs Intrusion Detection Systems
(as % of last decade new stations)

Platform Screen Doors

Intrusion Detectors

Observatory of Automated Metros
THE ATLAS: TRENDS

Wheel systems: Rubber vs Steel
(as % of last decade new km)

+ 69% Steel Wheel
+ 29% Rubber-tyred
+ 2% Mag Lev

Observatory of Automated Metros
Constructive model: Elevated vs Underground
(as % of last decade new stations)

Underground

Elevated

+ 55%

+ 45%
Conversions: High potential, few realities

Nürnberg U2 2009

Paris L1 2012
Exponential growth!
Exponential growth relative to previous decade.

Observatory of Automated Metros
A proven reality: 2000-Today

674 km
Exponential Growth! 2014-2025

674 km  future 1888 km
THE ATLAS: PROJECTIONS

Growth distribution (% of new km 2014-2025)

- Australia: 2%
- North America: 4%
- South America: 10%
- Middle East: 21%
- Asia: 27%
- Europe: 37%

Observatory of Automated Metros
Growth distribution
UTO km% per world region in 2025

- Australia: 1%
- South America: 7%
- North America: 8%
- Middle East: 17%
- Asia: 32%
- Europe: 35%

Observatory of Automated Metros
Metro Automation is a ...

✓ proven
✓ scalable
✓ adaptable

...solution that meets the needs of diverse mobility scenarios
A bright future for metro automation
Thank you!
www.metroautomation.org