

# Achieving the Vision for a World-Class Metro System

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- II. Characteristics of a World-Class Metro System**
- III. Best Operational Practices to Implement for a World-Class Service**

# Recent Challenges Encountered by Metros



# Recent Challenges

Failures in operation  
and maintenance

Loss of Government  
Subsidies

Operational  
Failure

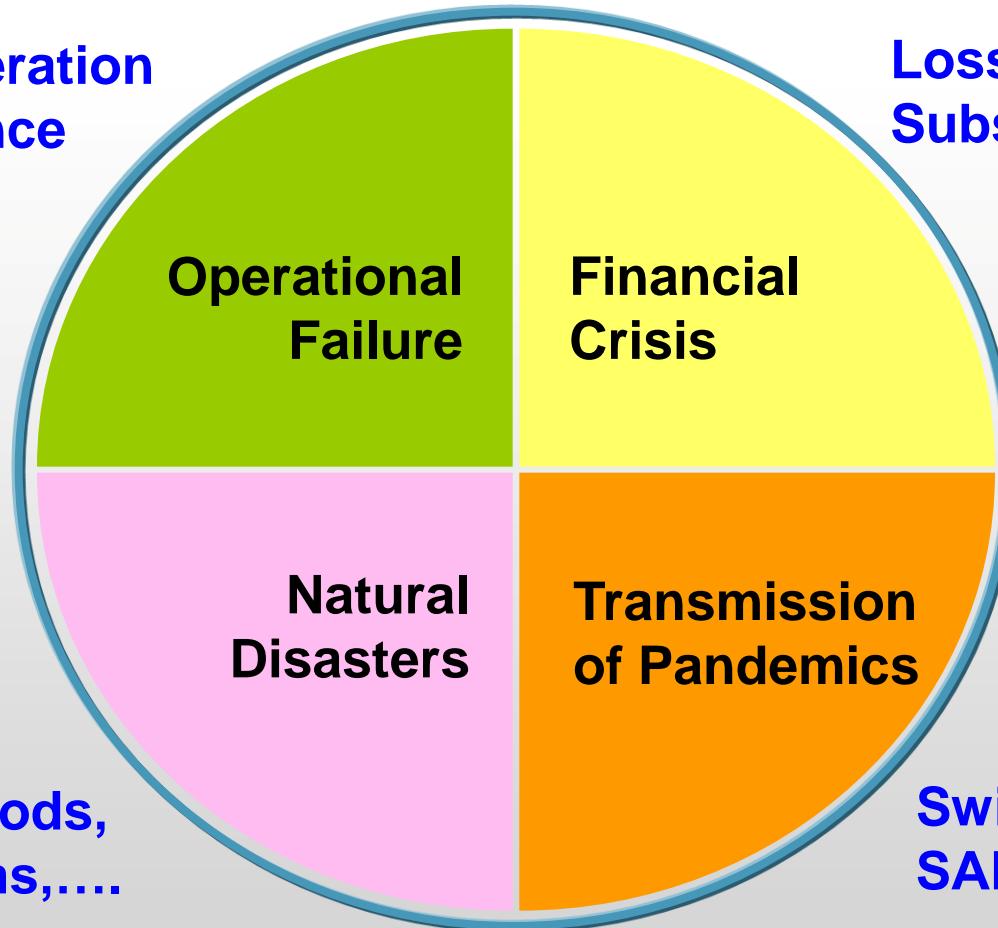
Financial  
Crisis

Natural  
Disasters

Transmission  
of Pandemics

Earthquakes, Floods,  
Typhoons,....

Swine flu,  
SARS,....



## Operational Failure

- Berlin S-Bahn's entire network shutdown due to maintenance failure in December 2011



## Financial Crisis

- New York City Transit faced a reduction of \$143 million in state subsidy 2009



# SARS/Flu Transmission



*Passengers wearing masks  
during the outbreak of SARS*



*On Mexico city metro,  
during the outbreak  
of Swine Flu*

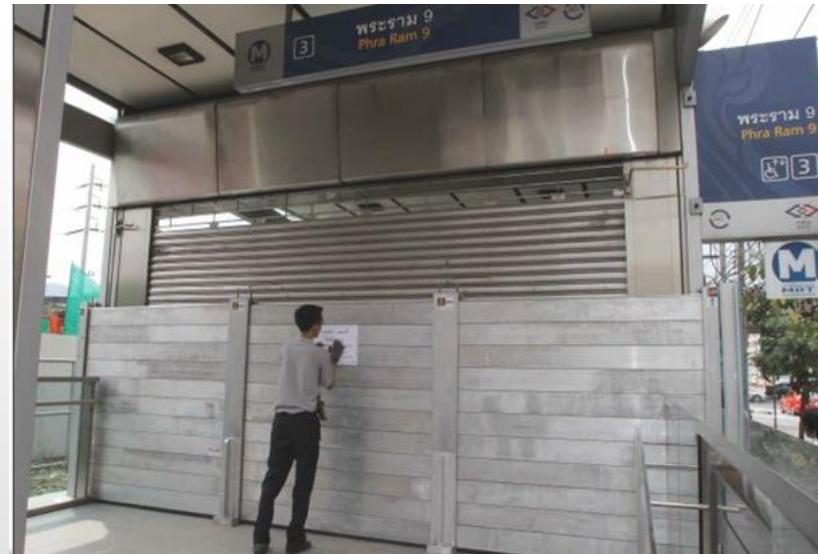
# Natural Disaster

- **Annual Disaster Statistical Review 2010 by WHO**
  - 385 reported natural disasters in 2010
  - Number of victims increased from 198.7 million in 2009 to 217.3 million in 2010
- **Impact on Metro Systems**
  - The 311 earthquakes and tsunami in Japan, 2011 caused heavy damage to roads and railways
  - Metro service disrupted due to heavy rain in Seoul, Bangkok, and Beijing in 2011
  - Typhoon Nari struck Taiwan, causing service disruption in Taipei Metro in 2001

# Suspension of Operations



*The 311 Earthquake in Japan*



*Metro Personnel in Bangkok  
Preparing for the Flood*



# ***A Flooded Stairway at a Subway Station in Central Beijing***

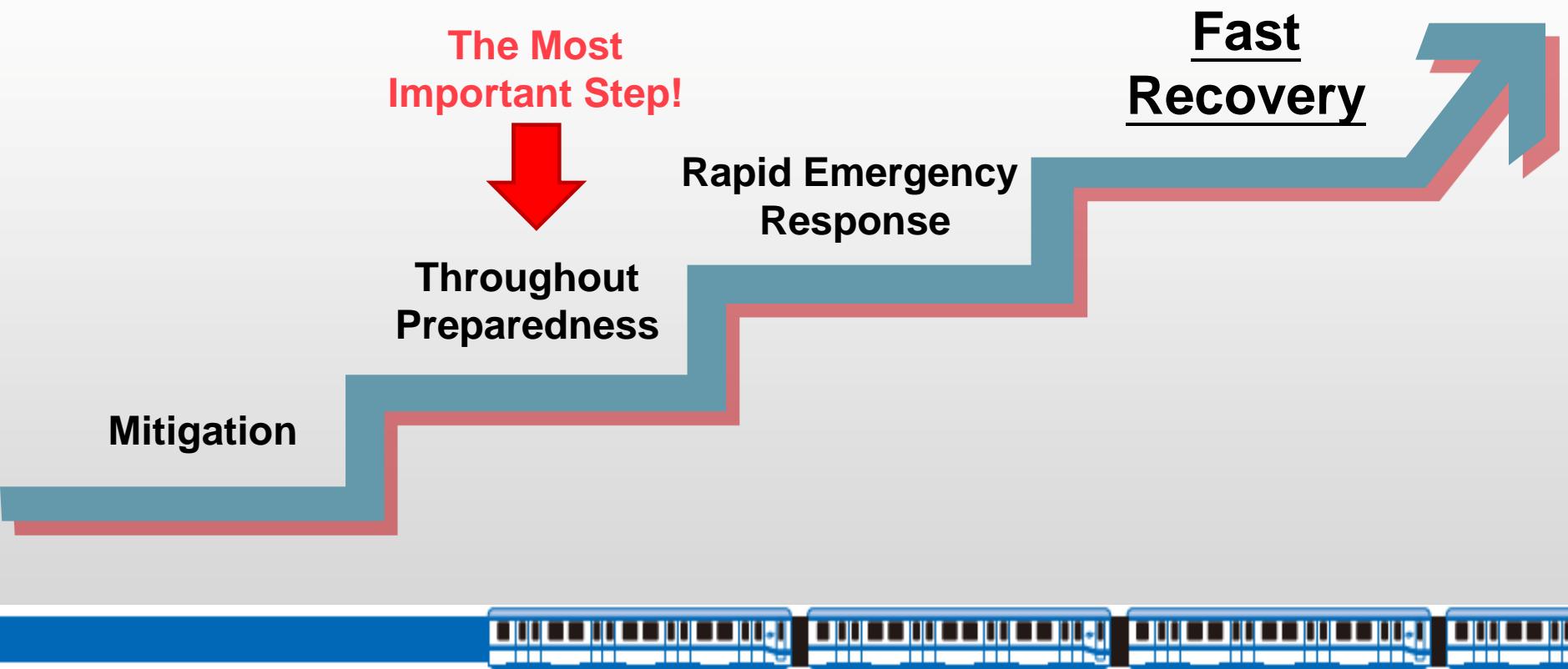


# ***The Flood Outside of Seoul Subway's Bangbae station***



***Typhoon Nari struck Taipei in 2001***

# 4 Phases of Emergency Management



# Characteristics of a World-Class Metro System



## **Safety**

- 1. Reliable operations**
- 2. Trustworthy operations**

## **Service**

- 1. Friendly services**
- 2. Services that exceed passengers' expectations**

## **Quality**

- 1. Comfortable and humanistic traveling environment**
- 2. Total Quality Management**

## **Sustainability**

- 1. Acceptable fares**
- 2. Green transport service**
- 3. Financial profitability**

# Best Operational Practices to Implement for a World-Class Service



# Background

- Taiwan has the highest disaster coverage ratio in the world – World Bank, 2005
- Most open media in Asia –Freedom House, 2008



# Taipei Metro

- 101 stations
- 110.0 km
- 1.66 million passengers/day
- 50.6% PT share in Taipei



## **Natural disasters**

- typhoons
- earthquakes
- floods

## **Public awareness of human rights**

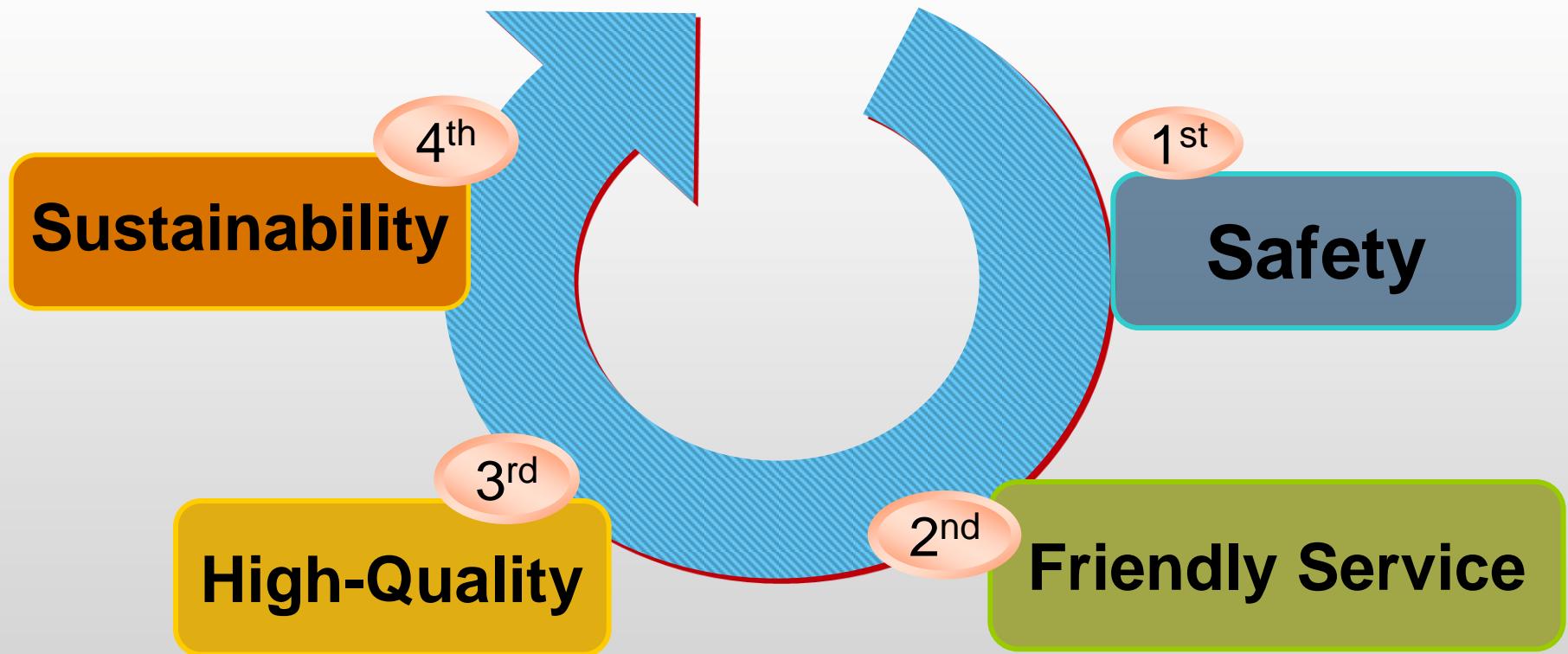
## **Fierce competition among media**

### *Mission*

*Providing a Safe, Reliable, Cordial, and High-Quality Transportation Service*

# From Mission to Action

High  
Customer Satisfaction



# Safety



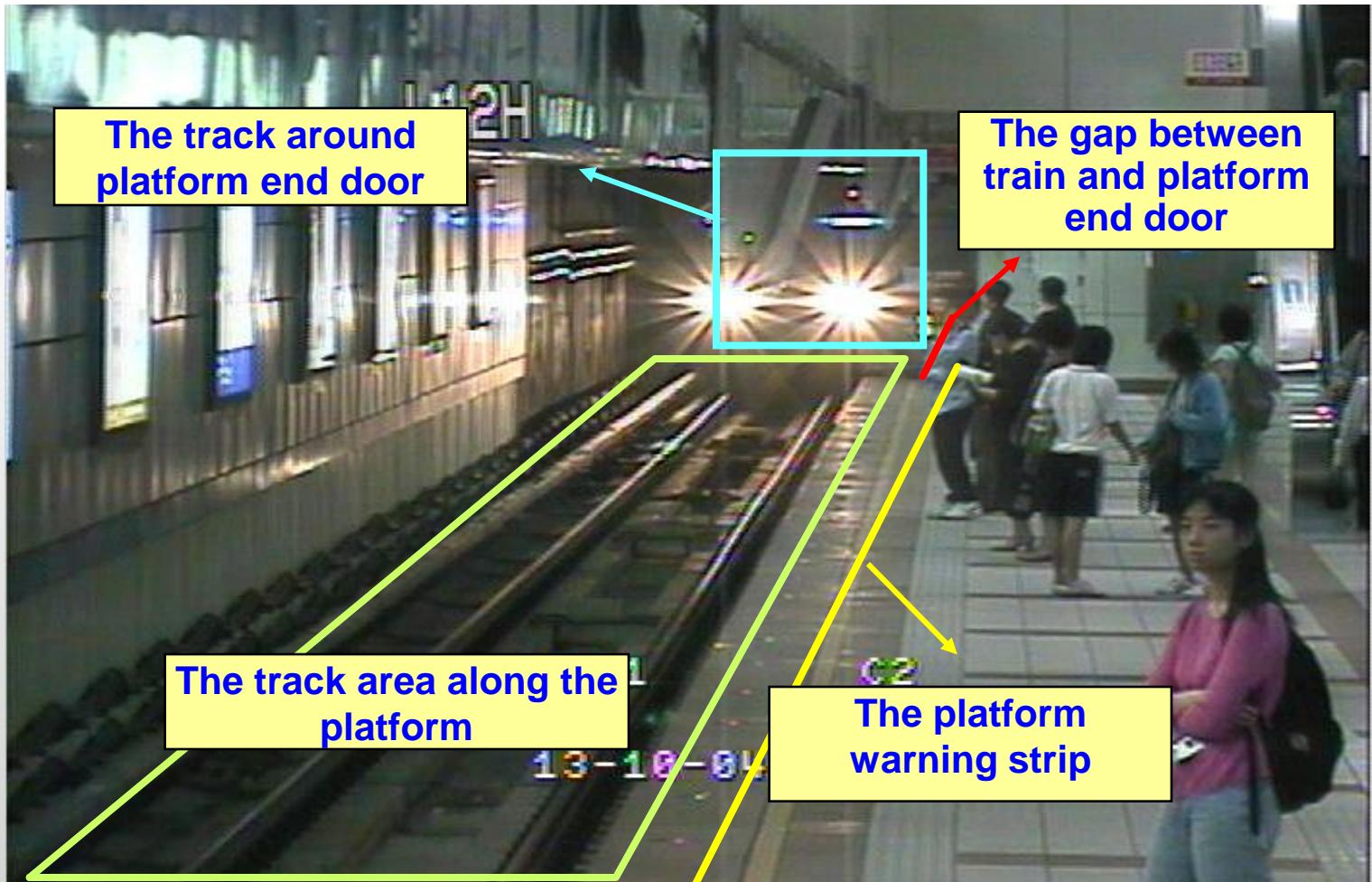
# Platform Screen Doors

- Installation of more PSD on operating metro lines
  - PSD: 49 stations
  - Without PSD: 52 stations
- By 2014, PSD will be installed in 15 more stations (transfer stations or stations with high traffic volume)



# Track Intrusion Detection System

- Installed in stations without PSD

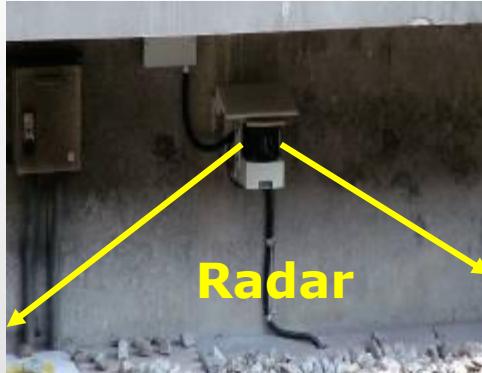


- How does it work?

Intrusions  
detected

- Activates tunnel/platform end searchlights
- Camera zooms in

- Warns station agent
- Informs approaching driver to stop the train

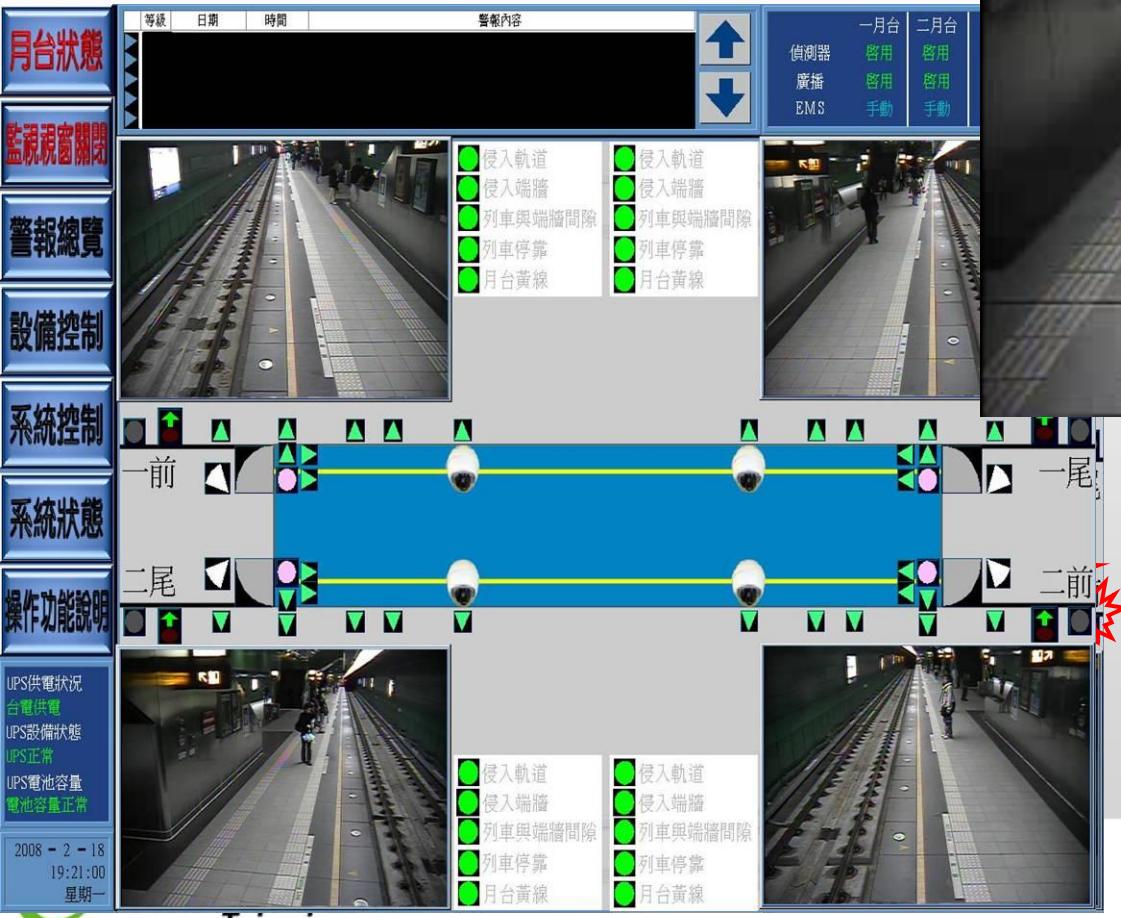


- Number of successful detections over the years

Year	Person	Object	Animal	Total
2006	5	30	0	35
2007	9	14	0	23
2008	55	159	5	219
2009	72	118	8	198
2010	38	101	9	148
2011	38	81	6	125
<b>Total</b>	<b>217</b>	<b>503</b>	<b>28</b>	<b>748</b>
<b>Percentage</b>	<b>29%</b>	<b>67%</b>	<b>4%</b>	<b>100%</b>

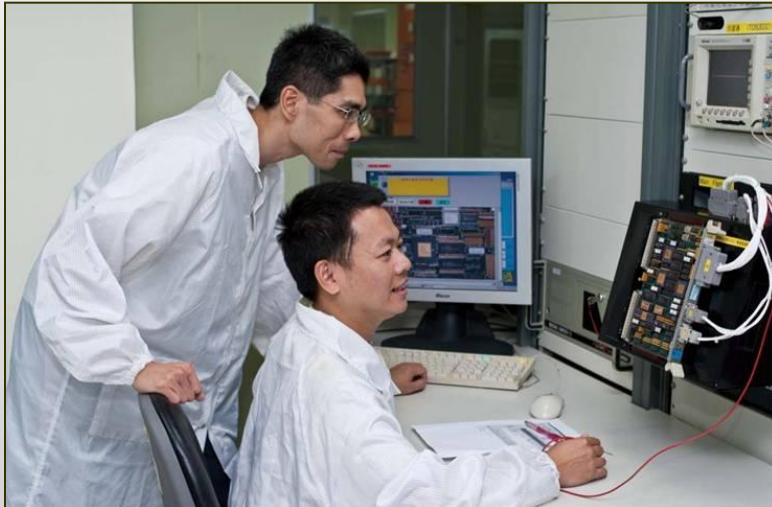
- Instantaneous response to emergencies

## The monitor screen in PAO



## R&D Center

- **Repair electronic circuit boards ourselves to ensure smooth operation**
- **Over 19,000 circuit boards repaired from 1996 to 2011 (i.e. 1,200 per year)**
- **Save tremendous maintenance time and cost**





## Interactive Emergency Evacuation Exhibition Center

- Educational venue installed with 18 theme activities
- Educates citizens & staff to operate emergency equipment which cannot easily be accessed in stations



Fire Safety Education



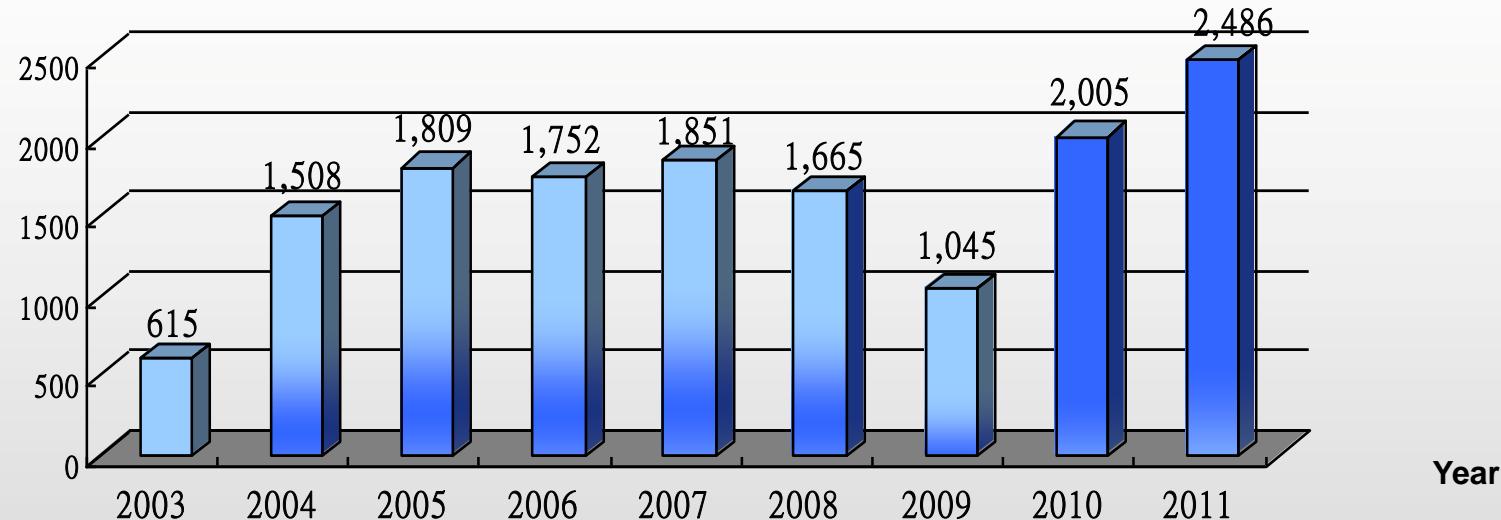
Emergency Exits in  
MRT Rolling Stock



Smoke Safety Room

# Taipei Metro - the **most reliable** metro system among the Nova/CoMET members from 2004 to 2008

Car-km (x1,000)  
between Every 5 + Mins.  
Delay Incident



1. Nova, a program of international railway benchmarking, is made up of 14 medium sized metro systems with annual ridership of less than 500 million, such as Montreal, Barcelona, Sydney, Lisbon, etc.
2. CoMET, a program of international railway benchmarking, consists of 14 metro systems with annual ridership of at least 500 million, such as London, New York, Moscow, etc.

# *Friendly Services*



## Wi-Fi Access in Metro Stations



- **276 Free Wi-Fi access points installed in:**
  - **101 Taipei MRT stations**
  - **3 underground shopping malls**
- **Signal covers concourse and platform levels in station. No Wi-Fi coverage onboard trains or inside tunnels**
- **Free battery charging service for laptops and cell phones available in 6 major stations**

## Barrier-free Access

- **Caring for disadvantaged groups**
  - Install more elevators and escalators in stations
  - Voice announcement about which side train doors will open
  - Wheelchair recharging service in stations
  - Visually-impaired passengers guide service (call the customer service hotline 10 mins before arrival)



## Breast-feeding Rooms

- Available in 18 stations  
(transfer stations and stations with high traffic volume)
- Will be installed in 3 more stations in 2012



## Restroom Real-time Display

- To monitor the usage status of restrooms by using sensor device and real-time display
- Allows users to know which toilet partition is occupied/free to use, which may save passengers' time in finding a free toilet



# *High-Quality*



## Metro etiquette

- Developing a unique urban culture



Priority Seats

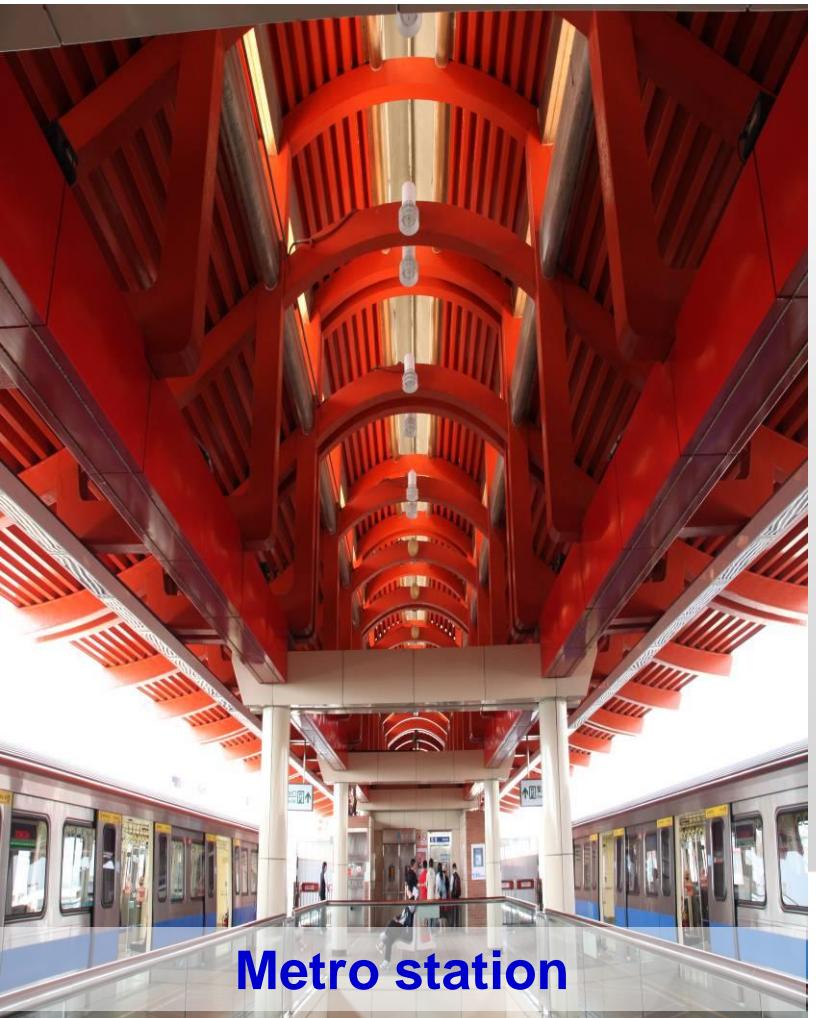


Eating, drinking and smoking  
prohibited on the Metro

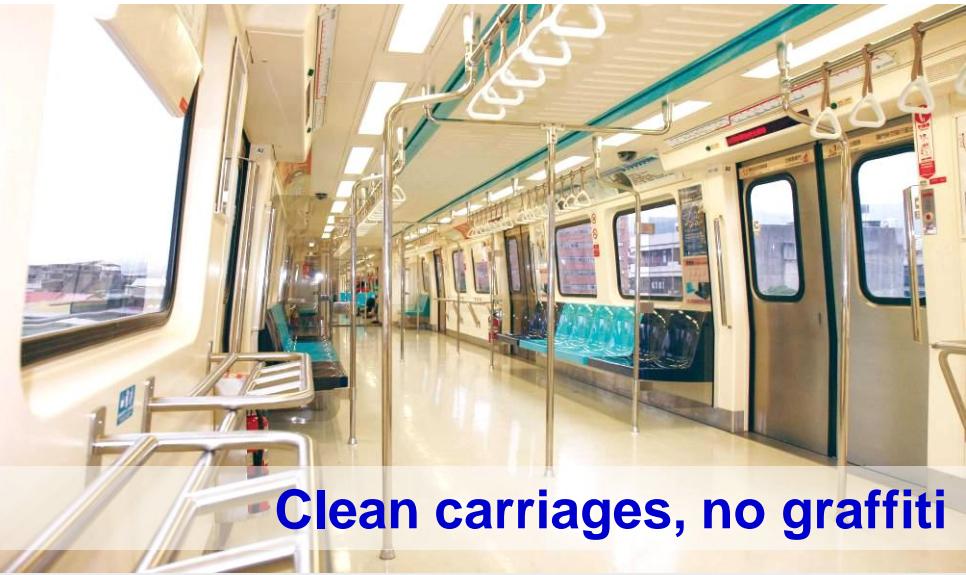


Queuing for trains

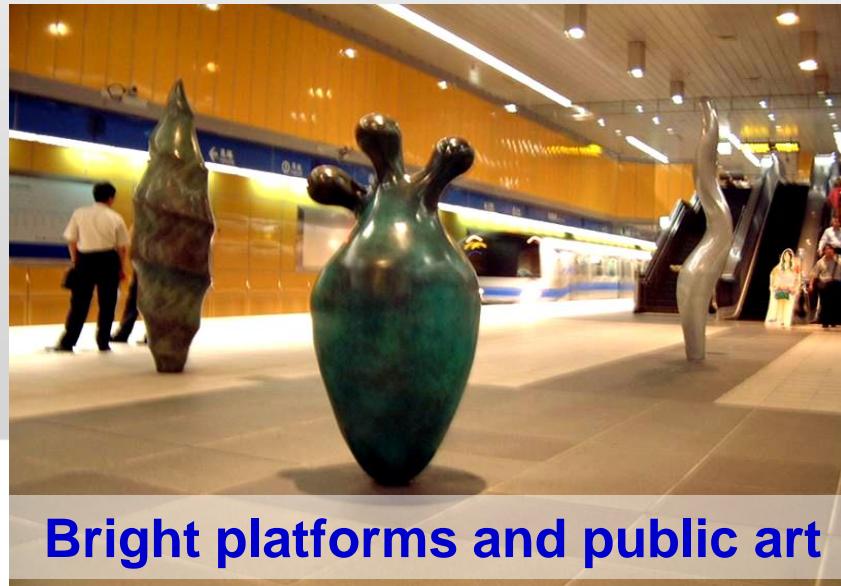
# High-Quality



**Metro station**



**Clean carriages, no graffiti**



**Bright platforms and public art**

## Total Quality Control (TQM)

Implementing ISO Quality Management System

- Obtains the ISO 9001: 2008 Certification

Promoting Quality Control Circle (QCC) Activity

- Started in 2000
- Contributed 872 improvements

Implementing Employee Suggestion System

- Started in 2000
- Received 8,393 suggestions

*Empower from the "bottom up!"*



# *Sustainability*



## Fare Types

- **IC EasyCard (Usage rate 92%)**

- **20% off** the single-journey ticket fare
- Can also be used for small value purchase at convenience stores, and pay for parking lots, buses, high speed rail, etc.



- **Single-journey IC Token**

- Fare: US\$ 0.7 – 2.2

- **Others**

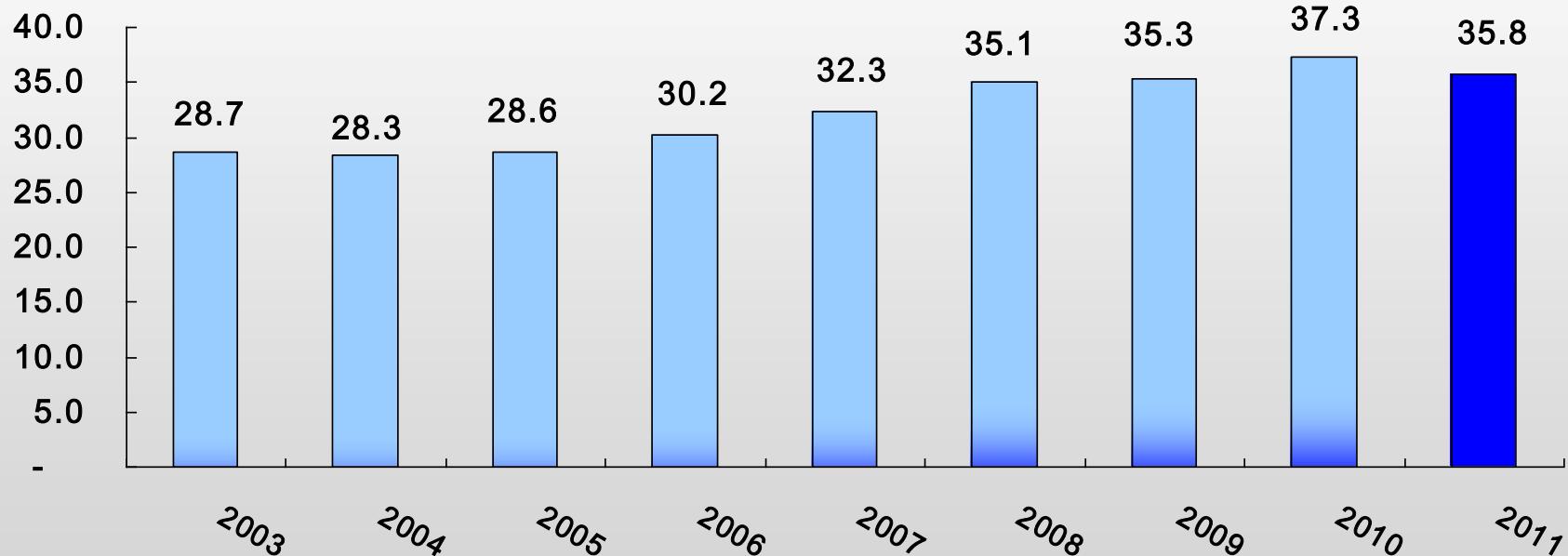
- One day pass (US\$ 5.0)
- Group tickets for group of 20 or more
- Single-journey ticket for cyclists (US\$ 2.7, flat rate)

***Fares structure unchanged since first operated in 1996!!***

## Metro-Bus Transfer Concession

- EasyCard passengers receive a discount on the metro or bus fare when they transfer from metro to bus or vice versa within one hour
- Total expenditure: 291.6 million USD

Million \$



## Rental of the Metro System

- Leasing Contract between Taipei City Government and TRTC

### Rental fee

**Replacement fee**  
(withdrawn from 30 yrs  
renewal plan)

+

**(2001~2011) 4% of operating income**

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**(2012) 3% of operating income +  
50% of net profit**

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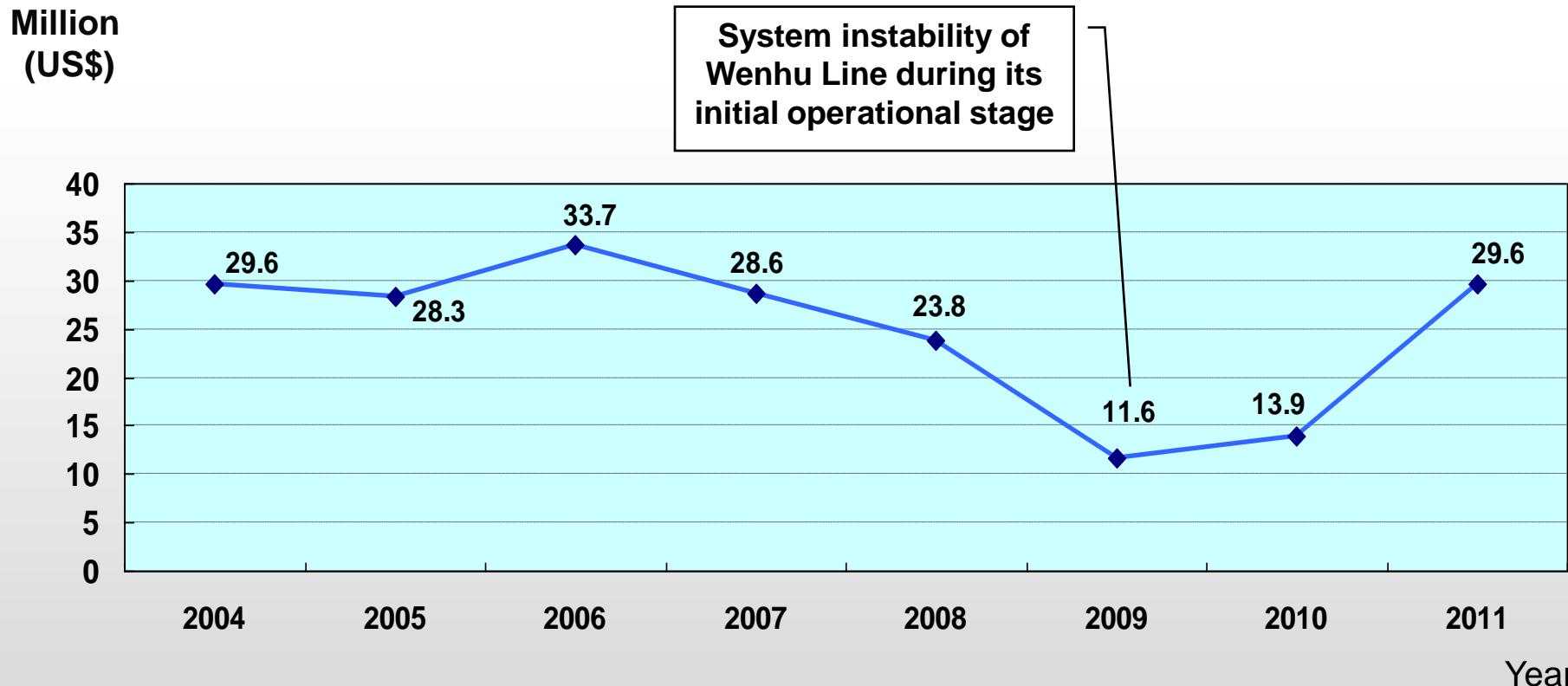
**(2013-15) 2% of operating income +  
50% of net profit**

\*Upper rental limit (2011-2015) : 4% of operating income

- Rental expenditure by year

Year	2004	2005	2006	2007	2008	2009	2010	2011
Rental Fee	79.2	79.7	80.5	81.1	81.6	81.9	87.3	103.9

# Net Profit Before Tax



\* After expenses 【Personnel costs, Rental fees, Metro/bus concession fees, and utilities (water, electricity)】

Accumulated ridership exceeded 5 billion journeys  
on Feb. 17, 2012



- Customer satisfaction rate has increased to **95.8%** in 2011, the highest ever



# Conclusion

- Numerous challenges and obstacles will be faced on the path toward a world-class metro. However, it's upper management's responsibility and challenge to learn the lessons from past failures so they are not repeated.
- Constantly improving and adapting to change is a fact of life in this fast-moving age. In response to the growing network, organizational structure, personnel hiring and training of employees need to be considered.
- More visionary projects and plans should continuously be proposed and explored to serve more passengers and meet external demand for high quality service.

# *Thank you*

