

**Roles and Benefits of Mass Transit System
to Sustainable Development of Bangkok:
The SKYTRAIN Experiences
2nd ATRANS Symposium**

**27-28 August, Imperial Queen's Park, Bangkok,
Thailand**

By

**Surapong Laoha-Unya, Chief Operating Officer
Bangkok Mass Transit System PCL**

Key Notes Summary

- The Problem of Transport in Bangkok and Vicious Cycle of Urban Decline
- Skytrain' s Roles and Benefits to Sustainable Development
- SkyTrain – Helping to Create a Virtuous Cycle of Urban Re-development
- Conclusions

The Problem of Transport in Bangkok and Vicious Cycle of Urban Decline

The Bangkok Metropolitan Region

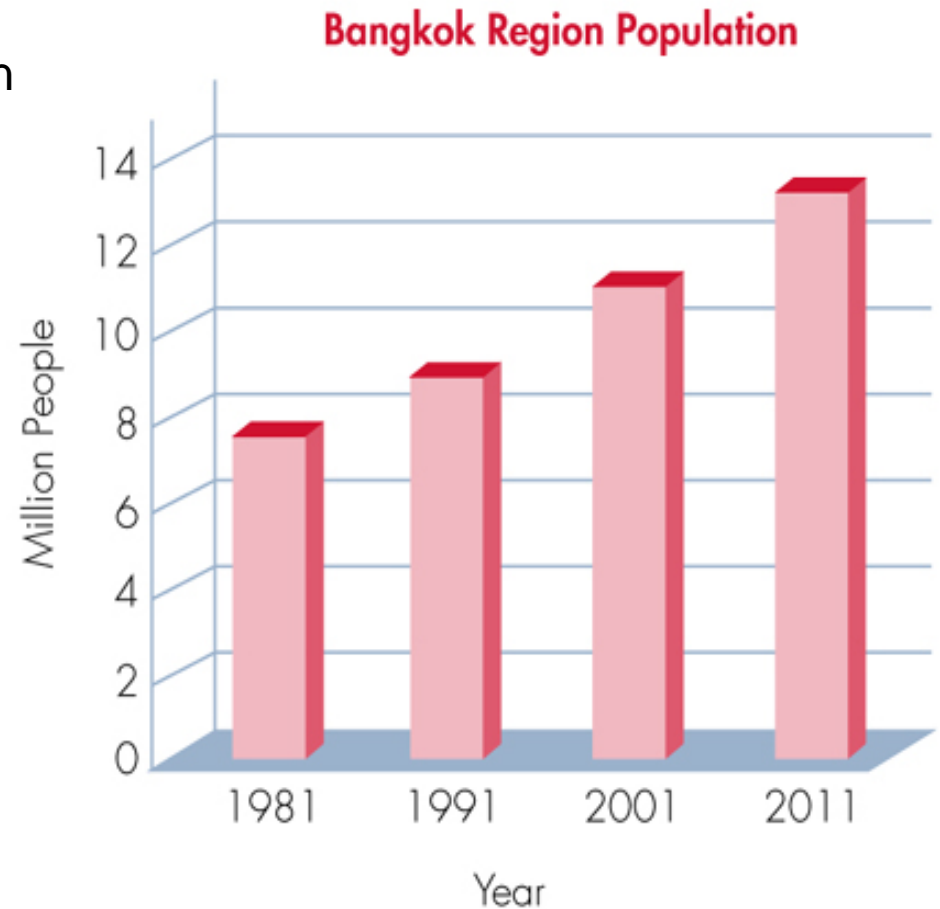
- Dominant urban center of Thailand, generating more than 50% of GDP
- Contains about 20% of Thailand's population
- Rapid commercial & industrial development
- Fast growing tourism, fashion and regional commercial offices



The Bangkok Metropolitan Region

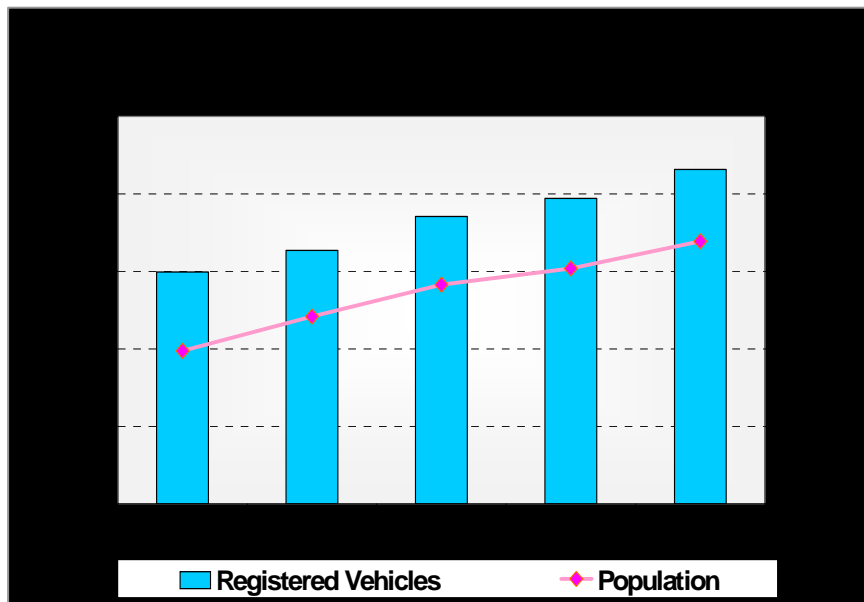
- Bangkok's Rapid Growth
- Current population : 11.3 million
- By 2011 will grow to 13.7 million

This have created major problems including use of land, traffic congestion, pollution, declining quality of life...



Rapid Growth in Car Ownership

- Uncontrolled Growth of Car Ownership
- Currently 2 million cars or 2 cars per 10 persons in Bangkok, projected to rise to 3 million by 2011.



Automobile Oriented City

- Bangkok is a bottleneck for rail operations as road based traffic takes priority over rail traffic in the city area
- Preventing the development of a suburban and intercity service
- Road based public transportation is slow, inconvenient and not attractive

Bangkok Bus Network

- Bus ridership is declining
- Commercial speed of buses is reducing
- Air-con buses are becoming more popular, but declining lately
- Car ownership is increasing

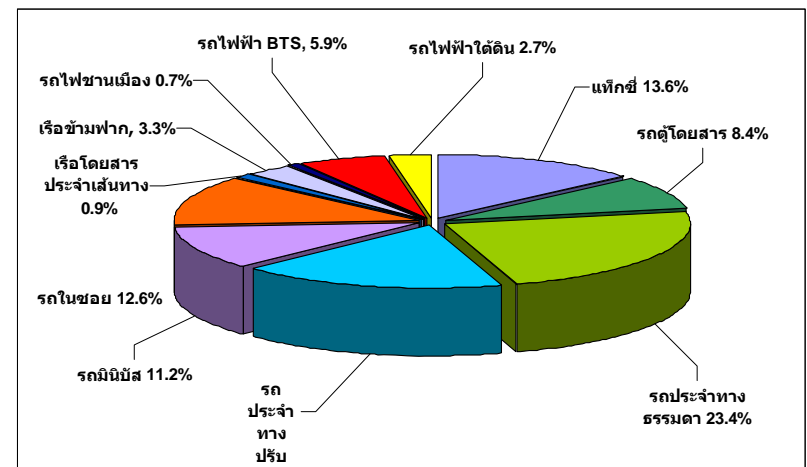
สถิติจำนวนผู้โดยสารที่ใช้บริการรถเมล์ ขสมก.ต่อวัน ตั้งแต่ปี 2535-2548

ประเภทรถ ปีงบประมาณ	รถปรับอากาศ	รถธรรมดา	รวม
2535	253,605	3,820,278	4,073,883
2536	426,440	3,360,663	3,787,103
2537	483,860	3,022,395	3,506,255
2538	548,453	2,831,131	3,379,584
2539	581,856	2,743,496	3,325,352
2540	688,142	2,664,412	3,352,554
2541	814,182	2,366,444	3,180,626
2542	1,123,083	1,805,892	2,928,975
2543	1,215,083	1,596,357	2,811,440
2544	1,090,099	1,480,557	2,570,656
2545	1,123,242	1,401,931	2,525,173
2546	1,264,011	1,106,315	2,370,326
2547	900,460	1,164,862	2,065,322
2548	830,793	1,124,346	1,955,139
2549	766,545	999,846	1,766,391
2550	747,805	932,947	1,680,752
2551	708,240	894,936	1,603,177

จำนวนผู้โดยสาร/วัน รวมการขายตั๋วล่วงหน้าแล้ว
(ซึ่งเริ่มขาย 20 กุมภาพันธ์ 2545)
ไม่รวมรถโดยสารฟรี เริ่ม 1 สิงหาคม 2551

Buses will Continue to Dominate Public Transport

- Buses and Vans carry 74% of the public transit passengers in Bangkok (more than 6 million trips per day)
- BTS and Underground are now accounting for nearly 10% of total trips (less than 5% few years ago)
- By 2011 with the extension of the Rail Network, particularly on the Green Line and ARL the rail share will increase to 20-25% of trips

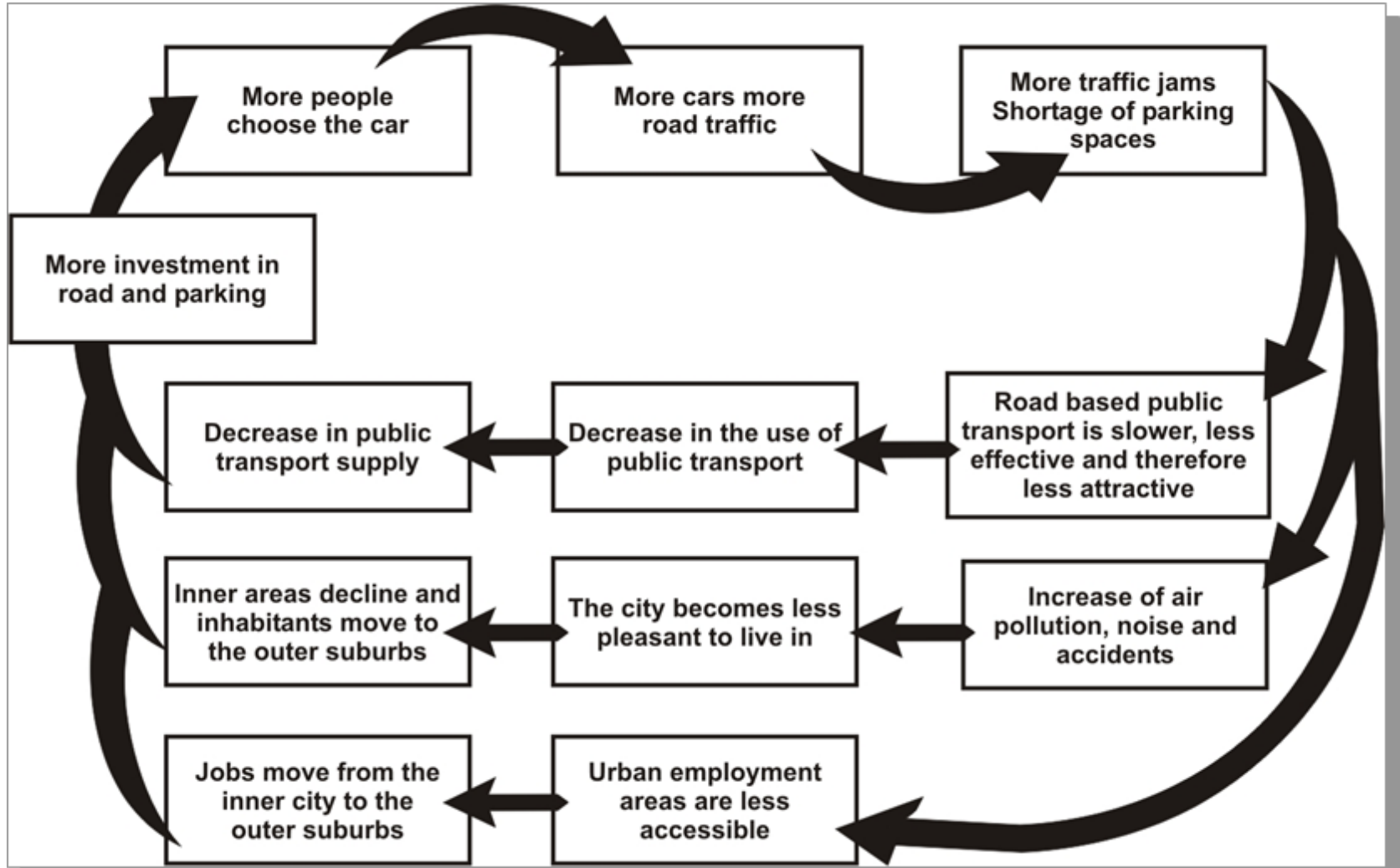


• Produced from OTP report 2008

Implication of Poor Public Transport

- Very poor mobility on the road at about 7 kms/hour in the peak and for much of the day
- The development of new towns, with lower cost living, is marred by poor public transport, necessitating the move to private transport to access the city
- Bangkokians need to pay a very high energy cost / km, for private vehicle transport in :
 - Fuel
 - Running costs
 - Express way fees
- Leading to Vicious Cycle of Urban Decline

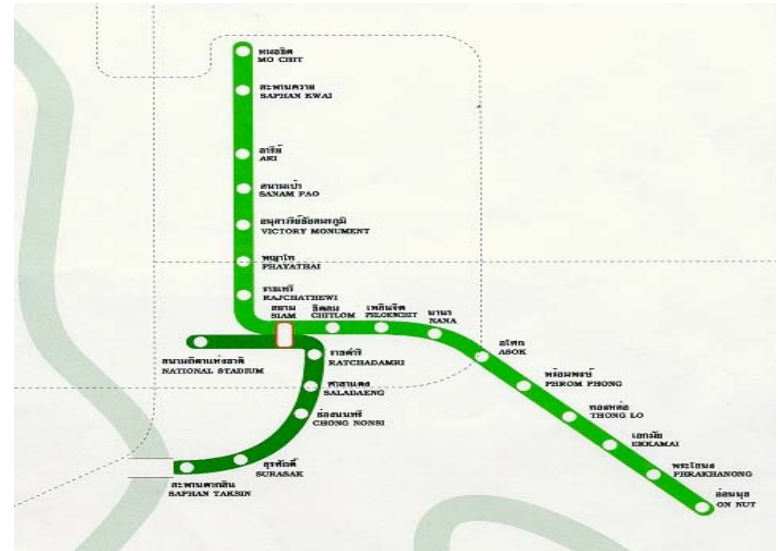
Vicious Cycle of Urban Decline



Skytrain' s Roles and Benefits to Sustainable Development

System Overview

- Original Concessions :
2 Lines: Sukhumvit & Silom Line; 23.5 Km and 23 Stations
- Additional 2.2 Km extensions and 2 Stations as Contracted Operator and System Maintainer
- Operating Hours: 6:00 - 24:00hr



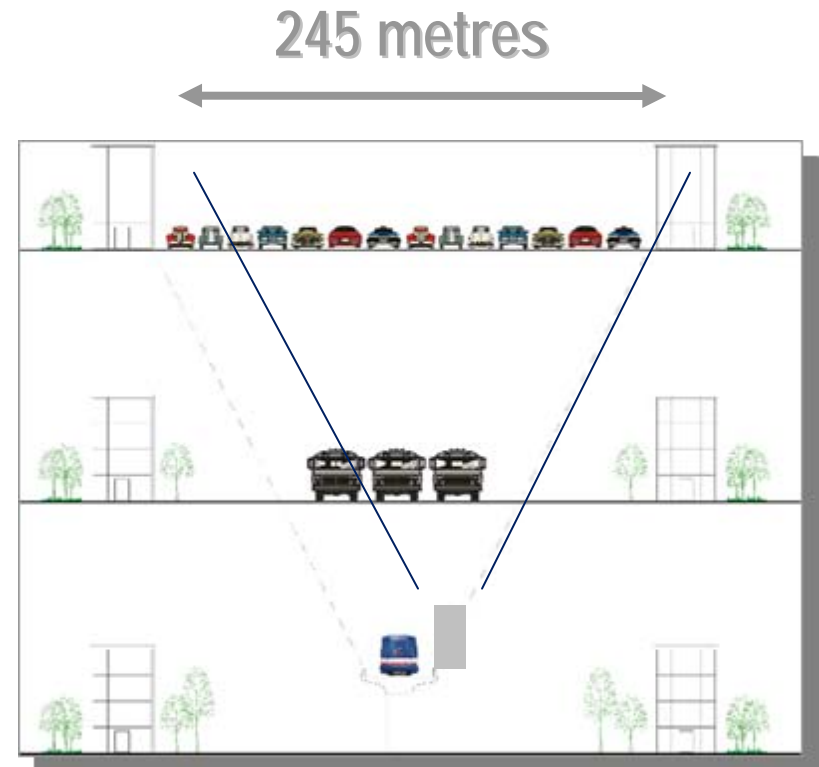
Successful Construction Project

- Stations are located in some of the world's busiest streets
- No Land Resumption
- No Full Street Closure
- Implemented entirely by private sector
- Silom Extension were implemented in similar method by BMA



SkyTrain Increases Capacity

- Increasing capacity in major business corridors in Bangkok
- BTS Skytrain requires only 9m wide corridor for elevated structure, carries 60,000 people per hr. per direction.
- Equivalent to 245 m wide road by cars for the same capacity



Multi-Level Land Use



- Optimum Utilisation of CBD Area

Reduced Numbers of Cars in the City

- There is limited space for parking cars in the City
- Skytrain has reduced the number of cars entering the city by about 60,000 each day
- The cost of building multi-storey car parking for each car is Baht 400,000/car or Baht 40 Billion per 100,000 car



Public Transportation Interchange Required

- Could reduce more cars in the city with more facilities



Speed, Reliability & Comfort

- Reliable and Punctual
- All trains are air conditioned
- Efficient Energy Uses
 - IGBT Motor for efficient use of electrical power
 - Regenerative Brake
 - Time Table Management
- Safe Operations



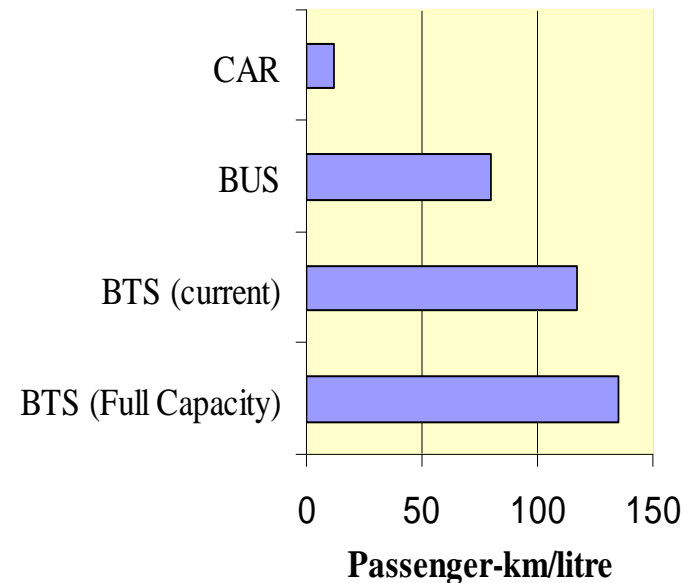
Efficient Use of Energy

- At 400,000 passengers per day (overall average), a BTS passenger consumes approximately 0.05 Kilowatt-hour of electricity to travel 1 km.
- If an average BTS passenger travel 6.26 Km, it would consume 0.313 Kilowatt-hour (0.05×6.26) per trip
- The system can be as efficient as 135 passenger-km per a liter of fossil fuel.

Trains are Far More Energy Efficient

- **CAR:** avg occupancy: 1.5 pax/car;
fuel consumption: 8 km/litre
 - pax-km/litre = $8 \times 1.5 = 12$
- **BUS:** avg occupancy: 30-40 pax/bus;
fuel consumption: 2 km/litre
 - pax-km/litre = 60 to 80
- **BTS:** avg: 400,000 pax/ day; avg travel = 6.26 km; traction consumption of 3,125,250 KW-Hour/month; 0.2 litre to produce 1 KW-Hour
 - pax -km/litre = $400,000 \times 30 \times 6.26 / 3,200,000 / 0.2 = 117.4$
- **BTS at Ultimate Capacity could even yield better efficiency as estimated at 135 pax-km/litre**

**Fuel Consumption Comparison
Different Modes of Transportation**



BTSC - Outstanding Safety Record

- More than 1,100 Million passengers carried safely



International Safety Standard



Certificate No: BKK52691/1

CERTIFICATE - SAFETY MANAGEMENT SYSTEM BANGKOK MASS TRANSIT SYSTEM PUBLIC COMPANY LIMITED

This is to certify to the Bangkok Mass Transit System Public Company Limited ("BTSC") that:

In September 2008, Lloyd's Register International (Thailand) Ltd (LRIT) conducted a Review and Audit of BTSC's Safety Management System (SMS) against the LR Rail Best Practice Model¹ (BPM) and found that the BTSC system was compliant and adequate for its current operations. Audit report 52691R01 describes the audit in detail and presents the findings of the audit in full.

This certificate is valid for three years from date of issue, subject to:-
- Satisfactory surveillance audits at 6-monthly intervals
- Continuing implementation by BTSC of their Safety Management System
- No significant change to BTSC Safety Management System
- No significant change to the scope or nature of BTSC activities.

Issued at Bangkok on: 30 September 2008.


Jonathan Bouchard

Operations Manager, Lloyd's Register International (Thailand) Limited

This certificate and associated reports are supplied to BTSC in accordance with the terms of The Contract for Provision of Consultancy Services between Bangkok Mass Transit System Public Company Limited (BTSC) and Lloyd's Register International (Thailand) Limited (LRIT) (Purchase Order 1170/08, 25 July 2008). LRIT assumes no responsibility and shall not be liable to any third party for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, except as is specifically provided in the terms and conditions of this Agreement.

¹ LR Rail's "Best Practice Model" represents the consolidation of a selection of international standards and practices for safety management to reflect the best appropriate safety management system for rail transport systems

Lloyd's Register International (Thailand) Limited whose registered office is at 14th Floor, Srinrat Building, 3388/46 Rama IV Road, Klong Toey, Bangkok 10110 Thailand

BUREAU VERITAS
Certification



Certification

Awarded to

BANGKOK MASS TRANSIT SYSTEM PUBLIC COMPANY LIMITED

1000 PHAHONYOTHIN RD., CHOMPON, CHATUCHAK, BANGKOK 10900, THAILAND

Bureau Veritas Certification certify that the Management System of the above organization has been audited and found to be in accordance with the requirements of the management system standards detailed below

Standards

OHSAS 18001:2007

Scope of supply

ELEVATED RAIL MASS TRANSIT SYSTEM OPERATIONS AND SERVICES

Original Approval Date: 20 August 2008

Subject to the continued satisfactory operation of the organization's Management System, this certificate is valid until: 19 August 2011

To check this certificate validity please call (+862 870 4800)

Further clarifications regarding the scope of this certificate and the applicability of the management system requirements may be obtained by consulting the organization

Date: 20 August 2008

Certificate Number: TH 08000469

CERTIFICATION ATTESTATION - Bureau Veritas Certification (Thailand) Ltd
100 Phra Nakhon Si Ayutthaya Rd, 10100 Bangkok, Thailand
Bureau Veritas Certification (Thailand) Ltd
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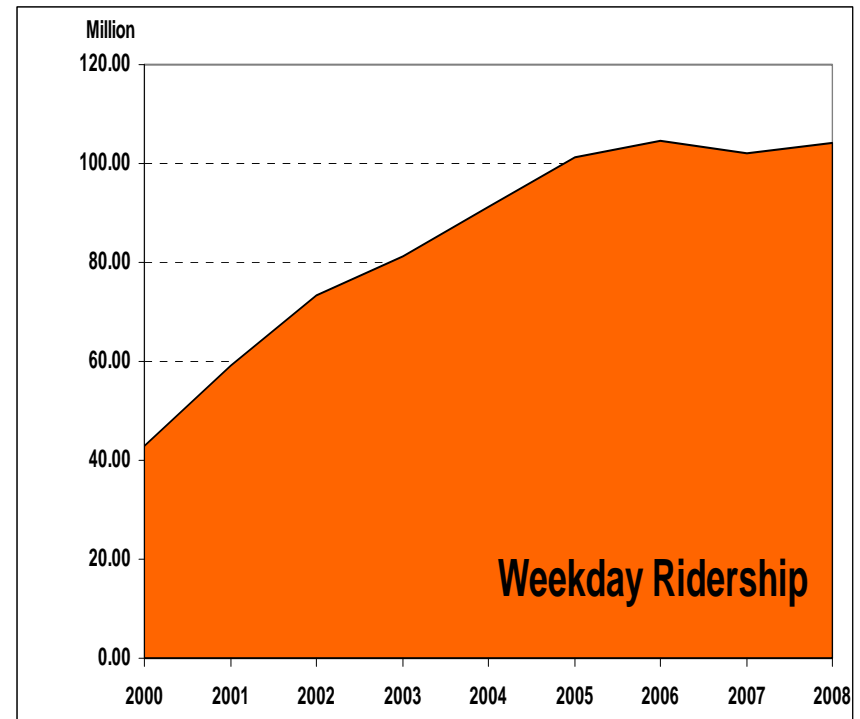
SkyTrain Management and Staff are Commitment to Customer Care

- Regular measurement of Customer Satisfaction
- Services tailored to Customers needs
- Awarded ISO 9001 – 2000 in July 2002



SkyTrain Patronage Growth

- Achieving over 200% growth since opening
- Passengers Carried
 - 2000-2003 330 million
 - 2004 91.15 million
 - 2005 101.21 million
 - 2006 104.79 million
 - 2007 101.99 million
 - 2008 104.29 million
- Weekday ridership is over 430,000



Skytrain Improves Accessibility and Mobility

- Twenty Seven Buildings connected by SkyBridges
- Four in planning/approval stage
- The properties have increased in value because of their proximity to BTS



Major Shopping Centers and Hotels are now Connected by Skybridges



SkyTrain is a Catalyst for Tourism

- Linking :
 - Hotels
 - Convention Centers
 - Shopping Centers and Shops
 - Temples
 - Museums and
 - The Chao Phraya River





BTS Skytrain Stimulates Tourism And Growth to Property Market



BTS Tourism Services

- To ensure that tourists have an excellent stay in Bangkok, that they return and tell their friends about the great time they had!
- To help Bangkok win tourist and convention business from competing cities.
- To position BTS as the best choice of transportation in Bangkok for tourists.
- To erase the negative image that people have about transport in Bangkok.



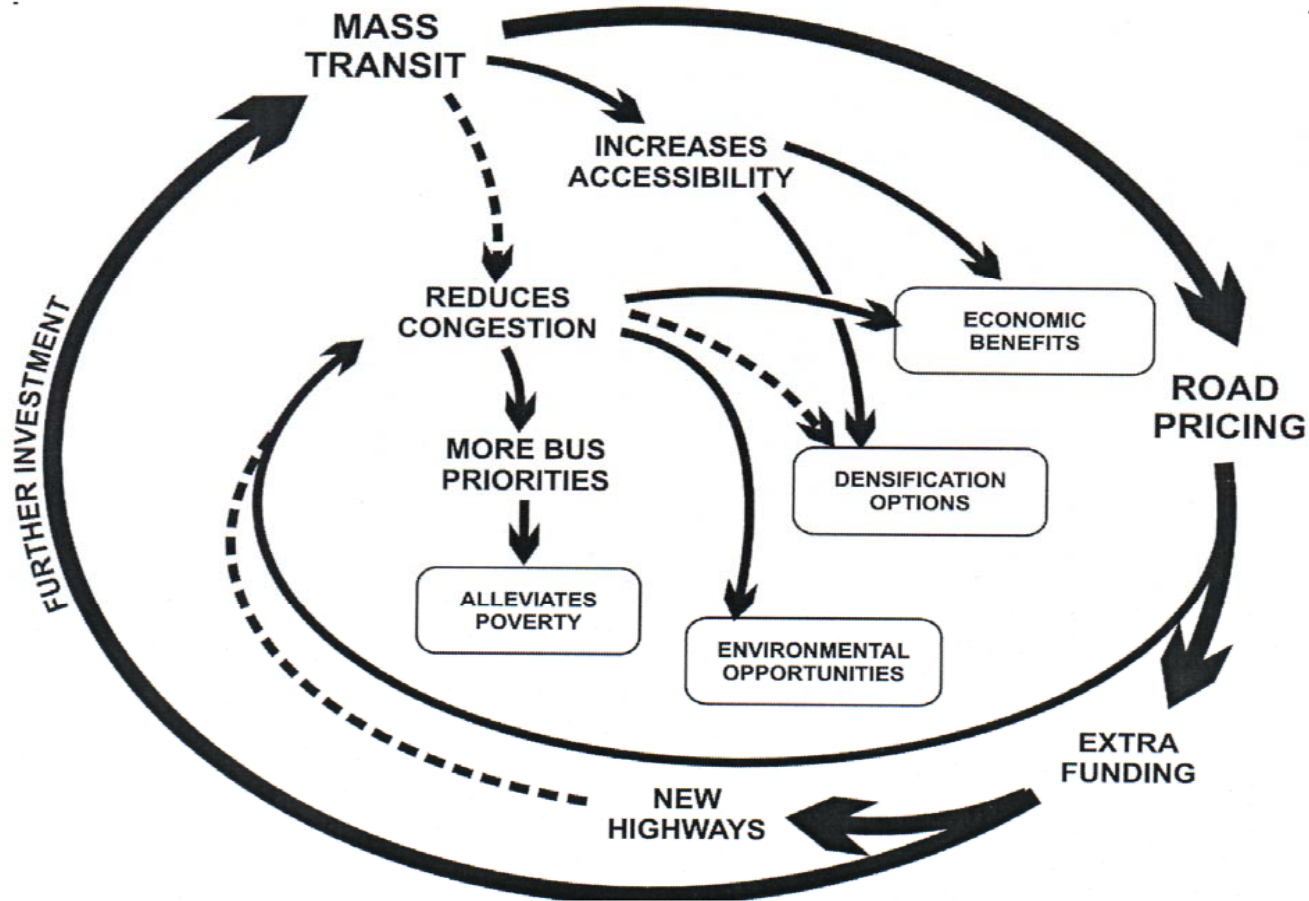
BTS Tourist Information Centers



Skytrain Improves Property Prices and Encourages Development



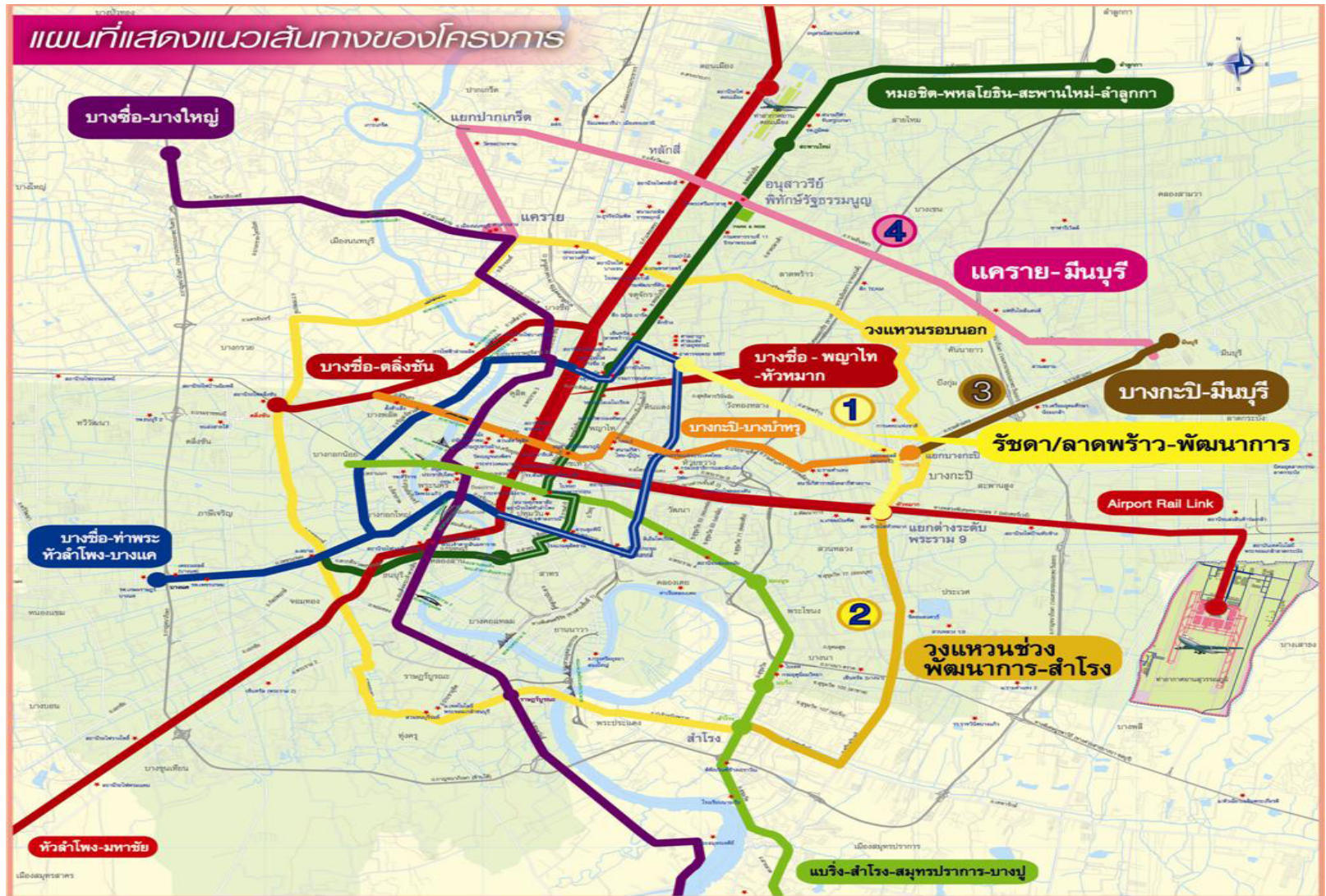
SkyTrain – Helping to Create a Virtuous Cycle of Urban Re-development



Conclusions

- Bangkok's needs to move from road based private transport to improve increase mobility in the city and improve the quality of life
- SkyTrain has demonstrated the economic corridor effect with property close to the alignment being higher valued
- Other significant benefit, e.g., energy savings, no pollution etc.
- Government have the plans, but implementation needs to follow quickly
- SkyTrain has made a significant contribution but in itself its not enough.
- More networks are required

Supporting Networks



Upcoming Extensions

- On-Nut – Bearing Extensions
 - Stations, Viaduct and Trackworks are nearly completed
 - E & M is anticipated to start by the end of 2009
- Wongwian Yai – Phetkasem
 - Viaduct is completed
 - Stations, Trackworks and E&M is anticipated to start in early 2010
- Mo chit – Saphan Mai
 - Anticipated to start in 2010
- Bearing – Samutprakan
 - Anticipated to start in 2011



thank you