



ทั้งชีวิต..เราดูแล

“เรา”..ห่วงใย..ใส่ใจ..และสัญญาว่า
“ทั้งชีวิต (ของคนกรุงเทพฯ)”..เราดูแล

ATRANS
ASIAN TRANSPORTATION RESEARCH SOCIETY

สมาคมวิจัยวิชาการขนส่งแห่งเอเชีย

ESTABLISHED 2008
HEADQUARTERS, THAILAND
REGISTERED NO. JAW.4674/2551

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

Date & Time Friday, 4 th June 2010	Descriptions	Remarks
09:00 – 09:30	Registration	
09:30 – 09:35	Opening remarks	Mr. Silpachai, Head of Inspector-General, MOT
09:35 – 09:40	Welcoming remarks	Director-General, OTP
Morning session: Transit Oriented Development (TOD) and the Environment moderates by Dr. Tuenjai Fukuda (ATRANS)		
09:40 – 10:00	Mechanism to Realize TOD along Urban Railway System in Japan	Prof. Fukuda, Nihon U.
10:00 – 10:20	Land use and mass transit in Japan from planning to implementation	Mr. Yamamoto, JPN Embassy
10:20 – 10:40	Development of Tama Plaza Station Area and Other Residential Area along Denen Toshi Line	Mr. Ueno, Tokyu, Japan
10:40 – 10:50	Coffee break (will be served during session)	
10:50 – 11:10	Transit Oriented Development plan for BMA	Mr. Oravit Hemachudha, BMA
11:10 – 11:30	Integrating congestion pricing for mass transit	Dr. Sittha, UBU
11:30 – 11:50	Mobility and accessibility of rail transit network in Bangkok	Dr. Varameth, KU
11:50 – 12:00	Discussion	
12:00 – 13:00	Luncheon	Lunch box will be provided



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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• *Speaker*



Oravit Hemachudha

Deputy Director-General

Traffic and Transportation Department, Bangkok Metropolitan Administration

44 Vibhavadi Rangsit Road, Din Daeng,

Bangkok 10400, THAILAND

Tel/Fax: (662) 354 1201 M: (668) 1241 9791

Email: oravit@hotmail.com

PROFILE

EDUCATION :

Bachelor of Engineering (Civil Engineering), Chiang Mai University 1970-1974

Master of Engineering (Transportation Engineering), AIT 1980-1984

WORK EXPERIENCE:

Bangkok Metropolitan Administration

Deputy Director-general, Traffic and Transportation Department 2009-present

Director of Traffic Engineering Division, Traffic and Transportation Department 2007-2009

Director of Transportation Division, Traffic and Transportation Department 2005-2007

Director of Planning and Public Utility Coordination Division, Public Works Department 2005

Chief of Planning Subdivision, Public Works Department 1989-2004

Civil Engineer, Public Works Department 1976-1989

The Samut Sakhon Municipality 1975-1976

The Prince Royal's College 1974-1975



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• **Speaker**

PROFESSIONAL INVOLVEMENT

- Ratchada-Vibhavadi Rangsit Interchange (Ratchavibha)
- Thai – Belgian Bridge
- Thai – Japanese Bridge
- National Economic and Social Development Plan (NESDP)
- International Studies/Cooperation (STTR/SPURT/RIP/SIMR/**BEIP**/CMIP/MTS)
- Bangkok Mass Transit System Project (BTS)
- Mass Rapid Transit Project (MRT)
- Road Safety Audit Project of Public Works Department, Bangkok Metropolitan Administration
- Bus Rapid Transit Project (BRT)
- Bangkok Monorail
- Bangkok Transit and Transfer Facilities
- Traffic signs, markings, control devices and CCTV

PAPER

- ***“Planning and Implementation of Mass Transit in Bangkok”*** presented at Regional Development Dialogue Vol . 13 Magazine of United Nations Centre for Regional Development, 1992
- ***“Research and Development on Public Works Concerned with Reducing Environmental Impact for Sustainable Development”*** presented at Executives' Seminar on Public Works and Management, Japan, October 2001.



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10:50 – 11:10

Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Thailand and BMA

Thailand is the world's 51st largest country in terms of total area, roughly equal in size to Spain, with a surface area of approximately 513,000 km² (198,000 sq mi), and the 20th most populous country, with approximately 63 million people. About 75% of the population is ethnically Thai, 14% is of Chinese origin, and 3% is ethnically Malay; the rest belong to minority groups including Mons, Khmers and various hill tribes. The country's official language is Thai.



Capital (and largest city)	Bangkok ¹ 13°45'N 100°29' E
Official languages	Thai
Demonym	Thai
Government	Parliamentary democracy and Constitutional monarchy
– King	Bhumibol Adulyadej
– Prime Minister	Abhisit Vejjajiva
Formation	
– Sukhothai Kingdom	1238
– Constitutional Monarchy	24 June 1932
– Later Constitution	24 August 2007
Area	
– Total	513,115 km ² (50th) 198,115 sq mi
– Water (%)	0.4 (2,230 km ²)
Population	
– December 2007 estimate	63,038,247 (20th)
– 2000 census	60,606,947 ^[1]
– Density	122/km ² (85th) 317/sq mi
GDP (PPP)	
– Total	2008 estimate \$546.095 billion ^[2]
– Per capita	\$8,224 ^[2]
GDP (nominal)	
– Total	2008 estimate \$273.248 billion ^[2]
– Per capita	\$4,115 ^[2]
Gini (2002)	42
HDI (2006)	0.786 (medium) (81st)
Currency	Baht () (THB)
Time zone	(UTC+7)
Internet TLD	.th
Calling code	66



10:50 – 11:10

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• Thailand and BMA



Population



Location: Central Plain, Thailand

Overview

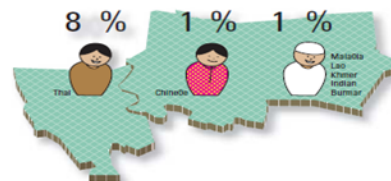
Bangkok is located in the central part of the country on the low-flat plain of the Chao Phraya River, which is the most important river in the country and can be considered to be the main artery of the nation. Bangkok's official location is at latitude 13.0° 45' north and longitude 100.0° 28' east.



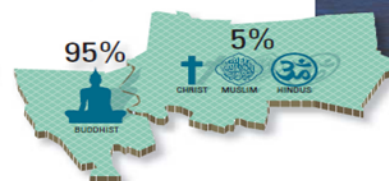
QUICK FACTS about BANGKOK

Location:	Central Plain, Thailand
Time Zone:	GMT + 7
Established:	A.D.1782
Area:	1,568.737 sq. km.
Population:	5,658,953 (2005)
Population Density:	4,051 persons/sq. km. (2005)
No. of Districts:	50 districts
Country-City Dialing Code:	66-2
Ethnic Mix:	80% Thai, 10% Chinese, 10% Others
Religions:	95% Buddhist, 5% Muslim, with the remainder being a mix of Christians, Hindus and Sikhs
Electricity:	220 volts AC, 50Hz; two-pin plugs are standard
Average January Temp:	26°C (79°F)
Average July Temp:	29°C (84°F)
Annual Rainfall:	1,500 mm. (58.5 inches) (2005)
Administration:	Special Administration Zone
Head of City:	Governor (Elected)

Ethnic mix



Religions



Climate

Bangkok has a monsoon type of climate, which can be classified into three main seasons: rainy (May-October) cool (November-January) and summer (February-April). The average annual temperature was 29.2°C (2005)

	January	February	March	April	May	June	July	August	September	October	November	December
Average daily maximum temperature (°C)	32	33	34	35	34	33	32	32	32	31	31	31
Average daily minimum temperature (°C)	20	22	24	25	25	24	24	24	24	24	22	22
Average total rainfall (mm)	8	20	36	58	198	160	160	175	305	206	66	5
Average number of rain days	1	1	3	3	9	10	13	13	15	14	5	1
MONTH	January	February	March	April	May	June	July	August	September	October	November	December

Source: BBC Weather Centre



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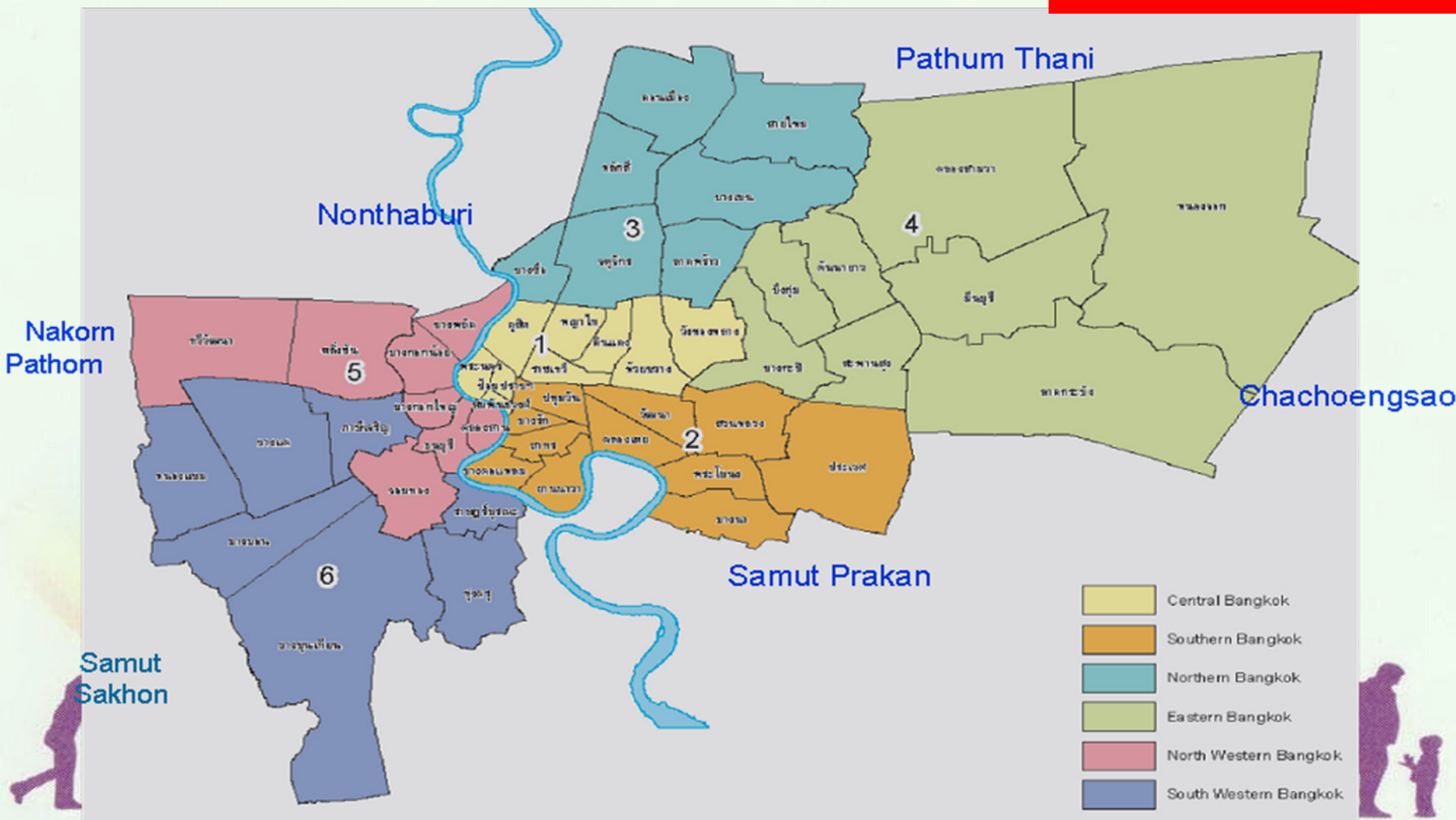
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Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• **Thailand and BMA**





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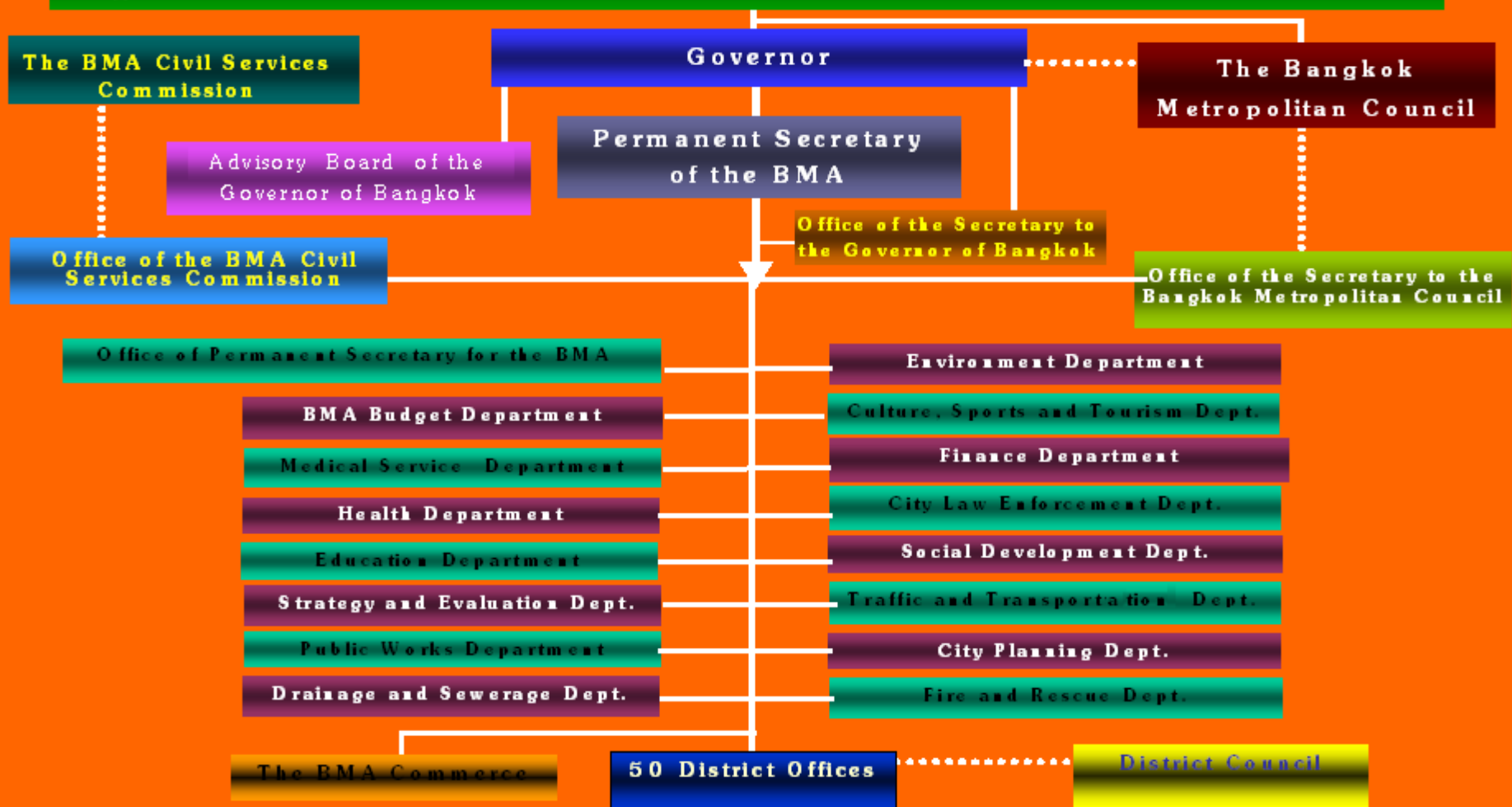
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• **Thailand and BMA**



Organization Chart of the Bangkok Metropolitan Administration





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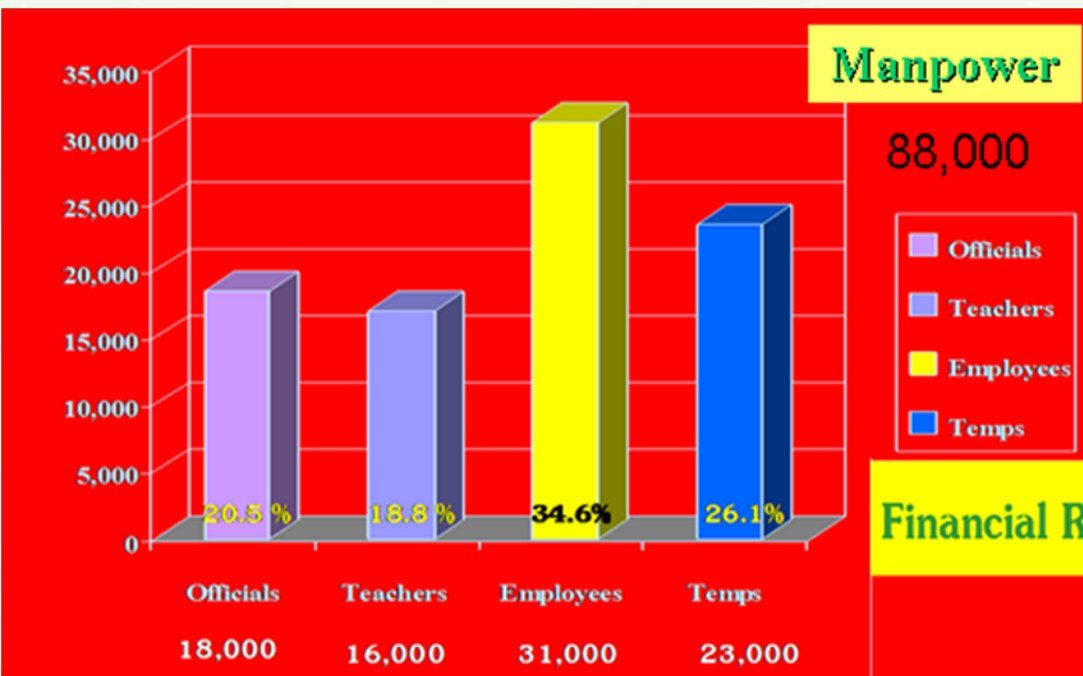
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• *Thailand and BMA*



Financial Resources





ทั้งชีวิต..เราดูแล

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Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA
for BMA

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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Governor's Policy



MR Sukhumbhand Paribatra
15th Governor of Bangkok

MR. Sukhumbhand Paribatra
15th Governor of Bangkok

Personal Background

Date of Birth: 22 September 1952

Marital Status: Married, with two children

Educational Background

1963 – 1970

Primary and secondary educational levels at Cheam School (Head of the School) and Rugby School (Head of the House), and awarded the best scholarship for outstanding study

1971 – 1977

Bachelor Degree (second honor) and Master Degree at Pembroke College, Oxford University, United Kingdom with the honor of Political Philosophy and Economics (PPE)

1978

Master of International Relations, Georgetown University, United States of America

Working Experiences:

1980 – 1996

•Lecturer at the Faculty of Political Science, Chulalongkorn University

1987 – 1993

•Director of the Institute of Security and International Studies (ISIS), Chulalongkorn University

1987 – 1991

•Advisor of the Committee on Foreign Affairs of the National Legislative Assembly

1989 – 1991

•Advisor of the Parliamentary Business Committee

1988 – 1989

•Advisor for the Policy of the Prime Minister (Gen. Chartchai Choonhavan)

1991 – 1993

•President of the Social Science Association of Thailand

1992 – 1994

•Chairman of the Commercial Advisory Committee for foreign affairs of the Ministry of Commerce

1992 – 1993

•Chairman of the ASEAN – Vietnam Joint Working Group to study and propose ways of promoting the ASEAN – Vietnam cooperation

•Chairman of the ASEAN – Cambodia – Laos Joint Working Group to study and propose ways of promoting the ASEAN – Cambodia – Laos cooperation

•Advisor to Governor of Bangkok (Dr. Bhichit Rattakul) in various committee; namely,

•Chairman of the Advisory Committee for public participation

•Chairman of the Committee for the administration of BMA City Market Office

•Chairman of the Advisory Committee for the BMA Supervision and Counter Corruption

•Advisory Committee for Law and Justice

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

Governor's speech on March 4, 2010

• Governor's Policy

Today, I am declaring a campaign among my team called **'Krungthep Gao-na'**. ('Bangkok – Getting Ahead')

'Krungthep Gao-na' is a programme designed to get us focused on delivering enduring solutions – to providing big solutions to big problems.

The **'Krungthep Gao-na'** programme will be the biggest, most far-reaching set of infrastructure programmes, ever, to help Bangkok leapfrog into becoming one of the most livable cities in the world.



The **'Krungthep Gao-na'** programme will embrace five major activity areas:

- Flood Management
- Greening of the City
- Traffic Issues
- Garbage Management, and
- Security in the City.



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Transit Oriented Development plan
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Governor's speech on March 4, 2010

• **Governor's Policy**

*"...I would like to see Bangkok have infrastructure ready to handle the worst of any rainfall and any high tide. To be able to do that, I have charged the team responsible for flood prevention to find a way to **double our current drainage capabilities in key areas, within the next 4 years...**"*

1. FLOOD MANAGEMENT

Big So
for Big

"...Within three years, as part of the new way of thinking to 'stop just thinking about temporary fixes, and bring in long-term solutions', I would like Bangkok to have 5 new, major parks of an international standard where citizens can go to get fresh air, exercise and relax with their families in a clean and green, tree-filled environment..."

2. GREENING OF THE CITY

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

Governor's speech on March 4, 2010

• Governor's Policy

"...In three years, I would like to see a **feeder network** of public transport and other services that can help ensure that **more people** will prefer to use the BTS and other mass transit systems, and **leave their cars at home!** I would, also, like to see a major infrastructure undertaking that can **reduce traffic bottle-necking** at some key points in the city..."

3. TRAFFIC ISSUES

"...Within three years, Bangkok must have a **sustainable solution** to waste disposal that is hygienic, safe, and which minimizes pollution..."

4. GARBAGE MANAGEMENT

"...I have already outlined my plan to **install 20,000 CCTV cameras and 50,000 more street lights** within 2555. I have instructed my team to systemize these installations so that we can report to the public, on a quarterly basis, our progress towards that goal..."

5. SECURITY IN THE CITY

Big Solution
for Big



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Mr. Oravit Hemachudha, BMA

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Governor's speech on March 4, 2010

• **Governor's Policy**

*“...The five major activity areas – flooding, greening of the city, traffic, garbage, and security – are all extremely challenging. However, they are not impossible tasks. They are five missions which are going to be the BMA's important ‘**Mission Possible**’ during my term in office ...”*

Big Solutions
for **Big Problems**

10:50 – 11:10

Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment



9 มาตรการ...
เพื่อการขนส่งที่ยั่งยืน

กรุงเทพมหานคร ได้ส่งเสริมให้ประชาชนหันมาใช้รูปแบบการเดินทางแบบระบบการขนส่งมวลชนที่ส่วนหัวต้นเป็นแนวทางที่จะช่วยลดปัญหาการจราจรได้อย่างเป็นรูปธรรม ภายใต้โครงการ "ลดใช้รถยนต์ ช่วยประหยัดพลังงาน และรักษาสิ่งแวดล้อม" โดยมี 9 มาตรการด้านการจัดการจราจรและขนส่ง ดังนี้

1. จัดสิทธิพิเศษบนถนนใหม่

ด้วยการให้ความสำคัญและสิทธิพิเศษต่างๆ กับระบบขนส่งสาธารณะ เพื่อให้มีความสะดวกและเพียงพอต่อความต้องการทางด้านการเดินทางและพร้อมทั้งเป็นต้นแบบสำหรับการเดินทาง



9 Measures ... for Sustainable Transportation

The BMA promotes alternative modes of transport in lieu of private car to reduce global warming under the mission, **"Reduce Car Usage, Save Energy and the Environment"** using the following nine traffic and transportation measures:

1. Set New Street Privileges

Give priority and privilege to public transport in order to offer convenient, efficient and sufficient services by expanding and extending safe pavements and bicycle routes.

• Strategies Applied for Car Usage Reduction



2.
ระบบขนส่งมวลชน

2. Extend the Mass Transit Network

This highly efficient system should be developed to become a major mode of transport since it is safe, fast, and time-saving. It can accommodate many passengers and truly address the lively lifestyles of city dwellers. BMA has planned for more rail mass transit coverage including the Second Phase of the Silom Extension (Taksin-Bang Wa), the First Phase of the Sukhumvit Extension (On Nut-Bearing), Mo Chit Extension (Mo Chit-Saphan Mai), the Second Phase of the Sukhumvit Extension (Bearing-Samut Prakan), and Phra Pinklao (Silom) Extension (National Stadium-Phran Nok).

เป็นระบบหลักในการเดินทาง เพราะมีประสิทธิภาพสูง สามารถรองรับโดยสารได้ครอบคลุมทั่วทั้งกรุงเทพมหานคร รวดเร็ว ปลอดภัย ประหยัดเวลา สามารถตอบสนองความต้องการและวิถีชีวิตของเมืองได้เป็นอย่างดี โดยกรุงเทพมหานครมีแผนดำเนินการต่อขยายเส้นทางให้ครอบคลุมยิ่งขึ้น ได้แก่ ส่วนต่อขยายสายสีลม ระยะที่ 2 (ถนนสีลม-พญาไท-บางนา) ส่วนต่อขยายสายสุขุมวิท ระยะที่ 1 (อ่อนนุช-แบริ่ง) ส่วนต่อขยายสายหมอชิต (หมอชิต-สะพานใหม่) ส่วนต่อขยายสายสุขุมวิท ระยะที่ 2 (แบริ่ง-สุขุมวิท) และส่วนต่อขยายสายพระราม 9 (สนามกีฬาห้วยขวาง-พระราม 9)



Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment



3. พัฒนารถโดยสารด่วนพิเศษ (BRT)

เป็นระบบการเดินทางที่มีประสิทธิภาพ คือสามารถลดเวลาเดินทางและลดการจราจรติดขัดได้เป็นอย่างดี ทำให้มีความสะดวก รวดเร็ว ปลอดภัย และตรงต่อเวลา เป็นที่ยอมรับในระบบรถไฟฟ้า อีกทั้งยังสามารถก่อสร้างได้รวดเร็ว ใช้พื้นที่น้อย ไม่ส่งผลกระทบต่อสภาพภูมิทัศน์ ทำให้ประชาชนมีทางเลือกในการเดินทางที่สะดวกยิ่งขึ้น โดยกรุงเทพมหานคร มีแผนเปิดให้บริการ 2 เส้นทางช่วงต้น คือ สายดอนเมือง-รังสิต และ สายอนุบาล-ศูนย์ราชการ-บางขุน

3. Develop Bus Rapid Transit (BRT)

The BRT has been designed to provide segregated traffic lane to this feeder transportation system for fast, safe, convenient and punctual travelling comparable to the rail mass transit system. Construction is fast, and requires less road space with minor traffic disturbance. The BMA plans to offer services along two routes: Chong Nonsi-Ratchaphruek and Mo Chit-Government Complex-Nonthaburi

• Strategies Applied for Car Usage Reduction

4. พัฒนารถไฟฟ้ารางเดี่ยว / รถไฟฟ้าขนาดเล็ก (Monorail / Light Rail)

เป็นระบบการเดินทางที่มีขนาดเล็ก ใช้พื้นที่ก่อสร้างน้อยกว่ารถไฟฟ้า จึงเหมาะสำหรับพื้นที่ที่มีความต้องการเดินทางสูง แต่มีพื้นที่ในการก่อสร้างน้อย ซึ่งกรุงเทพมหานครมีแผนเปิดให้บริการ 2 สาย ได้แก่ สายลาดพร้าว-ถนน 2-ถนนเพชรบุรี-ถนนพหลโยธิน และสายสุขุมวิท-สวนจตุรมิตร

4. Initiate Monorail/Light Rail System

These feeder systems, ideal for dense community and business area, are to facilitate accessibility to the rail mass transit system which require narrow construction space. The first two lines are the BMA 2-Petchburi Road-Lan Luang Road and Chula-Silom-Sam Yan.



10:50 – 11:10	Transit Oriented Development plan for BMA	Mr. Oravit Hemachudha, BMA
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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

พัฒนาเรือโดยสารในคลอง

5.

ได้มีความสะดวก ปั่นคล่อง และประสิทธิภาพยิ่งขึ้น
ด้วยการปรับปรุงท่าเทียบเรือ ปรับปรุงรถเข็นโดยสารเชื่อมต่อไป
ปรับปรุงภูมิทัศน์ และปรับปรุงเรือโดยสาร ในคลองที่มีอยู่เดิม
เพื่อเสริมระบบการเดินทางของกรุงเทพมหานคร โดยการพัฒน
3 เส้นทางเดิมคือ ฟัน 5 คลอง ได้แก่ คลองแสนแสบ
จากท่าบ้านใหม่-สวน. เขตปทุมธานี คลองลาดพร้าว คลองดิน
และคลองพระโขนง จากตลาดแจ้งเจริญ-พระโขนง และ
คลองลาดพร้าว-วังจันทน์ จากเขตปทุมธานี 69-บางบัว



5. Extensive Canal Transport

Canal transport is to be provided with more convenient, safe and efficient services by reviving routes, refurbish piers accessibility and transfer facilities, and also the passenger boat. The first three routes under development crisscross five canals, viz. Saen Seab Canal (Phan Fah-Min Buri District Office), Lat Phrao Canal, Khlong Tan Canal, Phra Khanong Canal (from Talat Ying Charoen-Phra Khanong), and Phasi Charoen Canal (from Phetchkasem 69-Bang Wa).

• Strategies Applied for Car Usage Reduction

6. พัฒนาลำดับ ความสะดวกต่างๆ

เมื่อถึงรอบให้บริการปรับปรุงระบบขนส่งสาธารณะมากขึ้น โดยอำนวยความสะดวกในด้านต่างๆ ได้แก่ ระบบรถโดยสารระยะสั้น (Shuttle Bus) มีบริการส่งผู้โดยสารจากสถานีรถไฟฟ้า สถานีรถไฟ และรถโดยสารที่ ทางเดินเชื่อมระหว่างรถไฟฟ้า และรถโดยสาร (Skywalk) เพื่อให้บริการสะดวกแก่ผู้โดยสารในการเดินทางไปยังสถานที่ใกล้เคียง และเปลี่ยนระบบการเดินทาง การจอดรถต่อคิว (Park & Ride) สำหรับประชาชน ที่จอดรถต่อคิวผู้โดยสารระยะสั้น การให้บริการรถโดยสารร่วม รถจักรยานยนต์รับจ้าง การให้บริการผู้พิการ และระบบตั๋วร่วม (Common Ticket) เพื่อเชื่อมโยงการเดินทางทุกรูปแบบให้สะดวกและง่ายต่อการเดินทางยิ่งขึ้น



6. Transportation Facilities Development

Promote public transport use by providing more supporting facilities including shuttle bus services to provide accessibility to the BTS and BRT, skywalks, park & ride areas, bus shelter, motorcycle and taxi stands, travel information services and introducing common ticketing system for all urban transportation system for more convenient and affordable city transit travelling.



10:50 – 11:10	Transit Oriented Development plan for BMA	Mr. Oravit Hemachudha, BMA
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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

7. ปรับปรุงทางเท้า

เป็นความสะอาดและปลอดภัยให้กับผู้ใช้บริการในท้องถิ่น ได้แก่ การจัดหา
คู่มือ ช่อแบบ และปรับปรุงทางเท้าอย่างสม่ำเสมอ ปรับปรุงจุดตัดกับที่จอดรถ
รับขึ้น โดยเฉพาะย่านท่องเที่ยว จัดให้มีทางข้าม สัญญาณไฟจราจรอัจฉริยะ
และกล้องเฝ้าระวังการจราจร เมื่อการเดินเท้าปลอดภัยของผู้นักทำ และจัดให้มี
จุดเชื่อมต่อการเดินทางที่สะดวกและเหมาะสม



7. Pavement Refurbishment

Enhance safe and convenient movement for pedestrians by construction and maintenance of footpath, streetscape especially in tourist attraction areas, providing safe at grade crossings, intelligent traffic lighting, traffic signs and modal interchange facilities.

• Strategies Applied for Car Usage Reduction

8. พัฒนา/เส้นทางจักรยาน



เป็นการส่งเสริมและบรรเทา
ให้ชาวกรุงเทพฯ ใช้จักรยานในการเดินทาง
เมื่อลดการใช้รถยนต์ การก่อมลพิษ และลดปัญหา
โลกร้อน อีกทั้งยังเป็นช่องทางสำหรับนักท่องเที่ยวเชิงแรง
ปัจจุบันมีเส้นทางจักรยานแบบทางเท้าและถนน 25 เส้นทาง ระยะทาง
ทั้งหมด และทำเป็นแผนที่เป็นต้นฉบับ 5 เส้นทางภายในปี 2554 ส่วนที่จังหวัดได้
สร้างจักรยานสาธารณะ ให้ประชาชนสามารถเช่าจักรยานจากจุดบริการทั่วเมือง เพื่อไปใช้
และส่งเสริมยังจุดบริการอื่นๆ ที่กำลังถูกพัฒนาและขยายวงออกไปอีกทั่วประเทศ

8. Bicycle Network Development

Promote and encourage for more bicycle travelling to reduce fuel consumption, pollution, and global warming in addition to physical exercise. Presently, there are 25 bicycle routes with a total length of 193 kilometers. Five additional routes are slated for completion within 2011. Public Bicycle with convenient collection and distribution stations will be introduced





ทั้งชีวิต..เราดูแล

10:50 – 11:10

Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA

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สมาคมวิจัยวิทยาการขนส่งแห่งเอเชีย

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• Strategies Applied for Car Usage Reduction

**9. รณรงค์สร้างความร่วมมือ
จากประชาชนทุกภาคส่วน**

นอกเหนือจากการเตรียมความพร้อมด้านโครงสร้างพื้นฐาน
และสร้างหน่วยความระดมทุนในการเดินทางด้วยระบบขนส่งสาธารณะ
รูปแบบต่างๆ แล้ว สิ่งที่สำคัญได้ก็คือความร่วมมือกันของทุกภาคส่วน
โดยเฉพาะชาวกรุงเทพฯ และกรุงเทพมหานคร ซึ่งจะได้ร่วมกัน
“จุดประกาย” ให้ทุกหน่วยงานของรัฐ ภาคเอกชน และภาคประชาชน
ตระหนักถึงความสำคัญและร่วมกันลดใช้รถยนต์ส่วนบุคคลและหันมาใช้ระบบขนส่งสาธารณะ
ต่างๆ ใช้จักรยาน หรือเดิน เพื่อลด
การใช้น้ำมัน ลดปัญหามลภาวะ
ทางอากาศและเสียง และ
ลดภาวะโลกร้อน

9. Create Public Participation Network

In addition to providing more infrastructure and facilities to support mass transit travelling, the crucial key success factor is public participation and cooperation of all parties concerned, especially the BMA and Bangkokians to jointly “**inspire**” public entities with other sectors (public, private and citizen) to reduce private car usage and switch to public transportation, bicycle and walkways to reduce gasoline usage, pollutions and global warming.

**สมาคมวิจัยวิทยาการขนส่งแห่งเอเชีย****สมาคมวิจัยวิทยาการขนส่งแห่งเอเชีย**

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Transit Oriented Development plan
for BMA

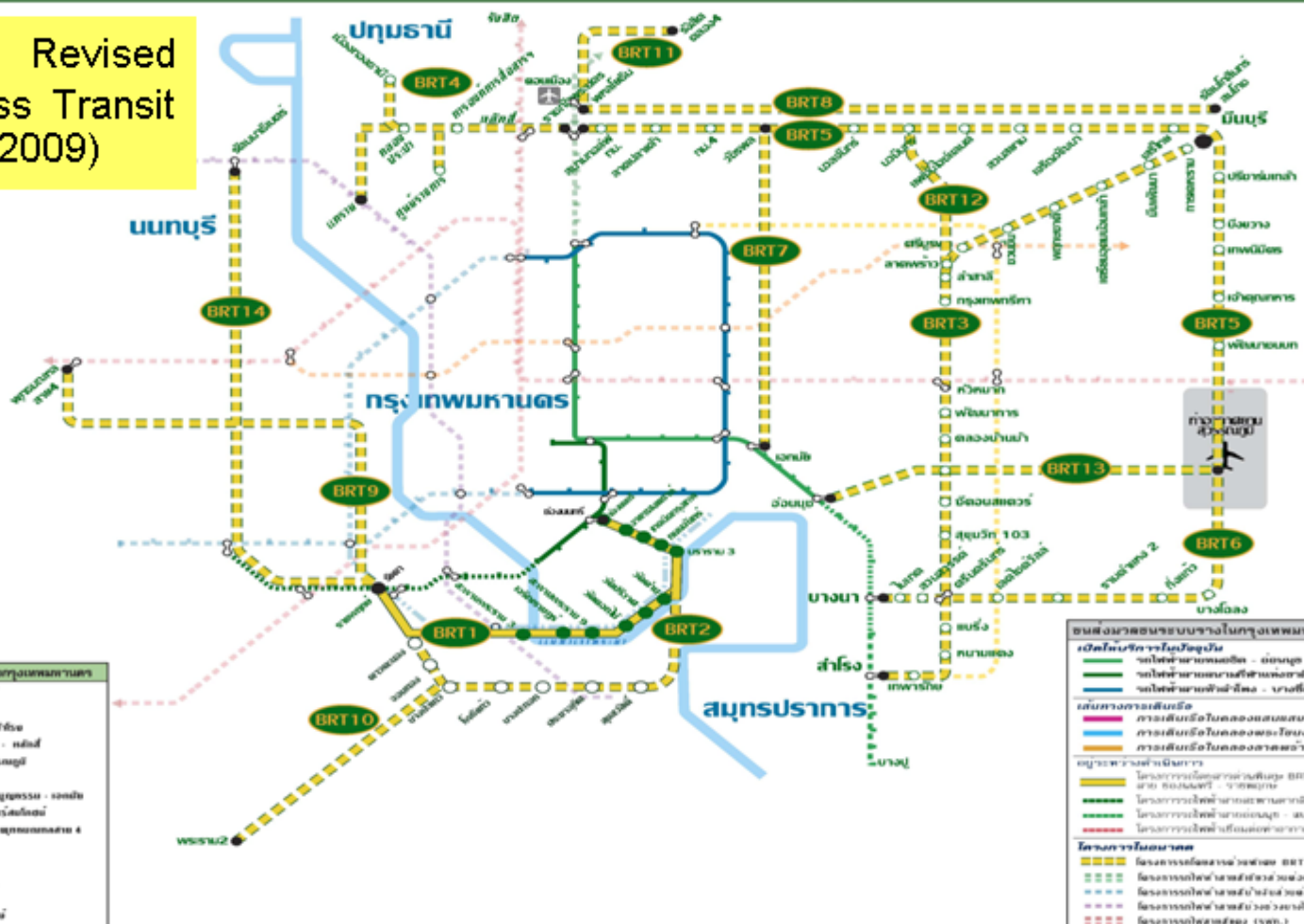
Mr. Oravit Hemachudha, BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

- **BMA's Mass Transit Master Plan**

โครงการพัฒนาระบบขนส่งมวลชนในกรุงเทพมหานคร

BMA's Revised
Bangkok Mass Transit
Master Plan (2009)

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10:50 – 11:10 Transit Oriented Development plan for BMA Mr. Oravit Hemachudha, BMA for BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

BRT 01: Sathorn-Ratchaphruk

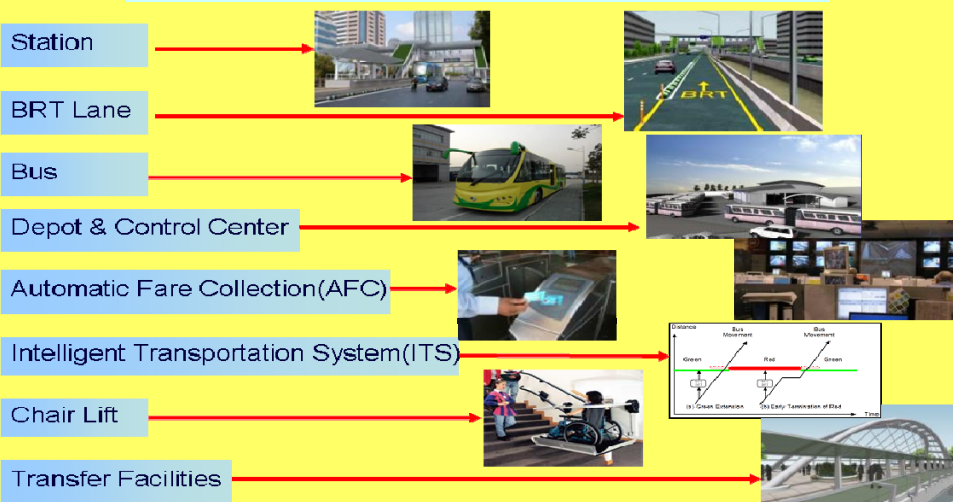


• Recent Mass Transit in Bangkok

Brief System Information

Route Length	15 km.
No. of stations	12 Stations (B1-B12)
Ridership (forecasted) per day	35,000
No. Buses in service	25-30
Bus capacity	80 passenger (20 seats and 1 wheel chair)
Average speed	30 km/hr.
Estimate travelling time	30 mins
Fuel	NGV Euro III
Opening date	May 15, 2010
Fare collection system	contactless smartcard like BTS and MRT. For passenger convenience, BRT ticket can be used in BTS system and, in the future, can be modified to connect MRT system when the common ticket of BSS (Bangkok Smartcard System) is completely implemented.

Elements of Bangkok BRT: Route 1



Fare table

For the handicap

distanced based from 12-20 baht (while it is 14-22 baht for Euro2 buses) which will be applied after 2 January 2011. From May 29, 2010 to August 31, 2010 is the 3.5 months period of trial run so no fare will be collected. Then the flat fare of 10 baht will be collected after revenue operation on September 1, 2010. After Automatic Fare Collection, AFC, is completely installed on January 2, 2011, the distance based fare structure of 12-20 baht will be officially applied. the station already install handicap stair lift for convenience.



ทั้งชีวิต..เราดูแล

10:50 – 11:10

Transit Oriented Development plan
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Mr. Oravit Hemachudha, BMA

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สมาคมวิจัยวิทยาการขนส่งแห่งประเทศไทย

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• **Recent Mass Transit in Bangkok**

Soft Opening on May 29, 2010

First Tests on May 9, 2010

	Item	Cost (M Baht)
1	Station Construction	652
	Construction Consultant	33
2	Transfer Facilities Construction	196
	Construction Consultant	6
3	BRT Lane Renovation	100
	Construction Consultant	4
4	Depot&Control Center Construction	63
	Construction Consultant	5
5	ITS	63
	Construction Consultant	5
6	Chairlift Installation	100
7	AFC Installation	357

Bus rental & Operating Cost about 20 M Baht/month

Management Consultant about 80 M Baht

Pre-operation Service about 5 M Baht



Not for reference



10:50 - 11:10	Transit Oriented Development plan for BMA	Mr. Oravit Hemachudha, BMA for BMA
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เพื่อรอยยิ้ม
คนกรุงเทพฯ

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Recent Mass Transit in Bangkok



Public Relation Program



**สมาคมวิจัยวิทยาการขนส่งแห่งเอเชีย**

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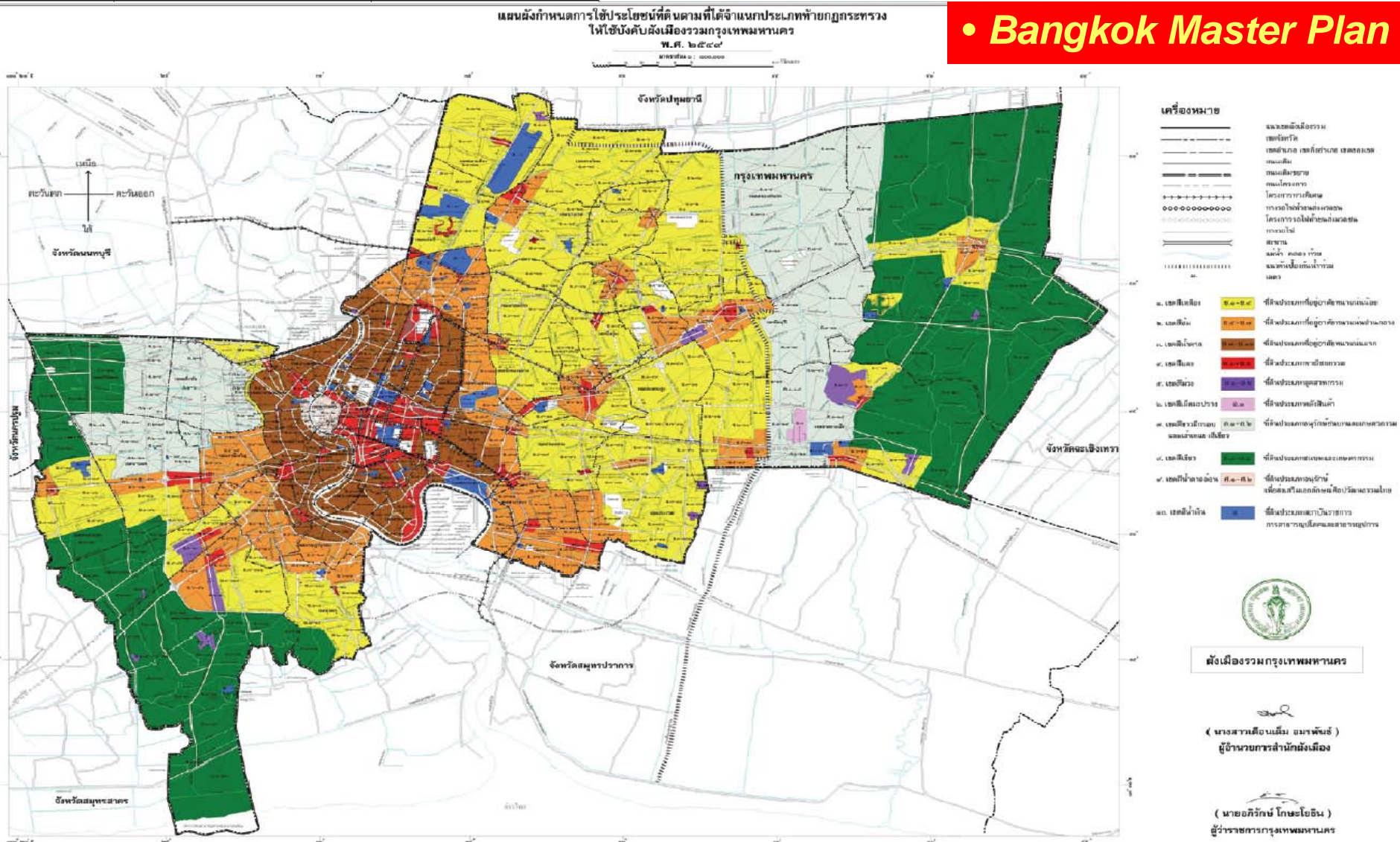
10:50 – 11:10

Transit Oriented Development plan for BMA

Mr. Oravit Hemachudha, BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

- **Bangkok Master Plan**





ทั้งชีวิต..เราดูแล

10:50 – 11:10

Transit Oriented Development plan
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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Bangkok Master Plan

The Bangkok Master Plan Regulation.

Landuse Categories	R. 1	R. 2	R. 3	R. 4	R. 5	R. 6	R. 7	R. 8	R. 9	R. 10	C. 1	C. 2	C. 3	C. 4	C. 5	I. 1	I. 2	I. 3	A. 1	A. 2	A. 3	A. 4	H. 1	H. 2
Factory < 100 sq.m.	12	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	12	9	9	x	x
Factory < 200 sq.m.	x	x	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	5	x	9	9	x	x
Factory < 300 sq.m.	x	x	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	x	x	5	5	x	x
Factory < 500 sq.m.	x	x	x	x	9	9	9	9	9	9	9	9	9	9	9	9	9	9	x	x	5	5	x	x
Factory > 500 sq.m.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	9	9	9	x	x	x	x	x	x
Concrete Plant (Tempory)	x	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	x	x
Gas Storage/ Gas Station	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	x	x
Petral Storage/ Petral Station	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	x	x
Animal Farm Com.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		x			x	x
Marine Ani. Farm	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	4	4	x	x
Cemetery	x	x						7	7	7	7	7	7	7	x	x		x		x			7	7
Hotel	x	x	x	x	x											x	x	x	x	x	x	x	x	x
Theater	x	x	x	x	2	2	2	2								x	x	x	x	x	x	x		
Night Service	x	x	x	x	x	4	4	x	4	x	x	x	x	x	4	x	x	x	x	x	x	x	x	x
Single House																								
Twin House	x																		x	x	x			
Row House	x	x																	x	x	x			
Residential Bld.	x	x	1															x	x	x	4			
Large Bld. Res.	x	x	3	1												x	x	x	x	x	x	x	x	x
High Bld. Res.	x	x	x	x	2											x	x	x	x	x	x	x	x	x
Extra L Bld. Res.	x	x	x	x	3	3	3									x	x	x	x	x	x	x	x	x
Com. Bld. < 100 sq.m.																								
Com. Bld. < 200 sq.m.	x	1																x	1	1	1			
Com. Bld. < 300 sq.m.	x	2																x	2	2	2			
Com. Bld. > 300 sq.m.	x	x	2													x	x	x	x	x	x			
Row Bld. Commercial	x	x																x	x	x	x			
Large Bld. Com.	x	x	3	2												x	x	x	x	x	x	x	x	x
High Bld. Com.	x	x	x	x	3	3	3	3			2					x	x	x	x	x	x	x	x	x
Ex. L. Bld. Com	x	x	x	x	x	x	x	3	3	3	x	3				x	x	x	x	x	x	x	x	x
Market > 300 sq.m.	x	2	2	2												x	x	x	2	2	2	2		
Market < 400 sq.m.	x	2	2	2												x	x	x	2	2	2	2		
Market > 400 sq.m.	x	2	2	2												x	x	x	x	x	2	2		

Condition X = Prohibited B = Bonus

- 1 = Road Width 10 m./or 500 m. from subway station
- 2 = Road Width 16 m./or 500 m. from subway station
- 3 = Road Width 30 m./or 500 m. from subway station
- 4 = Location
- 5 = Related Activities
- 6 = BMA Regulation

* FAR (Floor Area Ratio) is not enforce to single house and twin house

** OSR (Open Space Ratio) is not enforce to single house and twin house

*** Set Back : not include single house size of land plot <40 sq.wa or width/ length < 6 m. which subdivided before this ministerial enforces

7 = Reconstruction

8 = Size/Service Level

9 = Component Table

10 = Temporary locate in construction area or surroundings

11 = Except some activities in ministerial law

12 = Only waste water treatment plant



ทั้งชีวิต..เราดูแล

10:50 – 11:10 Transit Oriented Development plan for BMA Mr. Oravit Hemachudha, BMA for BMA

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Large Bld. Market	x	x	x	2												x	x	x	x	x	2	2	x	x
Office < 100 sq.m.																			x	x	x			
Office 100-300 sq.m.	x	x																	x	x	x			
Office > 300 sq.m.	x	x	2	1	1	1													x	x	x	5		
Row Bld. Office	x	x																	x	x	x			
Large Bld. Office	x	x	3	2	2	2	2									5	5	5	x	x	x	x	x	x
High Bld. Office	x	x	x	x	3	3	3	3			2					x	x	x	x	x	x	x	x	x
Ex.L.Bld.Office	x	x	x	x	3	3	3	3	3	3	x	3				x	x	x	x	x	x	x	x	x
Large Bld. Club house in land subdivision Proj	x	x	x	x	x	x										x	x	x	x	x	x			
Ad. Sign	x	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	x	x
Ware House	x	x	x	x	2	2	2	2	2	2	2	2	2	2	2				x	x	2	x	x	x
Convention Hall	x	x	3	3	3	3	3	3	3	3	3					x	x	x	x	x	3	3	5	5
Slaughterhouse	x	x			x	x	x	x	x	x	x	x	x	x	x			x		x			x	x
Agro. Warehouse	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x			x		x			x	x
Amusement park/ Zoo	x	x	3	3	3	3	3	3	3	3	3	3	3	3	3	x	x	x	x	x	3	3	x	x
Education Bld.	8															x		x						
Hospital	8															5	5	8						
Garbage Disposal	x	6	6	6	x	x	x	x	x	x	x	x	x	x	x	6	6	6	x	x	6	6	x	x
Risk Gar. Disposal	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	5	5	5	5	x	5	x	x	x
Used Machine	x	x	x	2	2	2	2	x	x	x			x	x	x					x		x	x	x
Scrap Material	x	1	1	1	x	x	x	x	x	x	x	x	x	x	x				x		x	x	x	x
Elderly House																x	x	x						
Child Nuser																5	5	5						
% of Minor use	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	5	10	5	10	5	5
FAR* (: 1)	1	2	3	3	4	5	5	6	7	8	5	6	7	8	10	2	2	1	1	1	1	2	3	4
OSR** (%)	40	20	13	10	8	7	6	5	5	4	6	5	5	4	3	15	20	40	40	40	40	15	10	8
Bonus																								
Public Parking					B	B	B		B				B	B										
Openspace								B	B	B			B	B	B									
Front Set Back (m.)***	2	2																	2	2	2	2		
Side Set Back (m.)***	2	1																	1	1	1	1		
Back Set Back (m.)***	2	2																	2	2	2	2		
Min. Land Plot in land subdivision Project(sq.w	100	50																	1,000	##	##			
Max. High of Bld. (m.)	12	12																	12	12	12	12		

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10 = Temporary locate in construction area or surroundings

11 = Except some activities in ministerial law

12 = Only waste water treatment plant

* FAR (Floor Area Ratio) is not enforce to single house and twin house

** OSR (Open Space Ratio) is not enforce to single house and twin house

*** Set Back : not include single house size of land plot <40 sq.wa or width/ length < 6 m. which subdivided before this ministerial enforces



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REGISTERED NO. JAW.4674/2551

10:50 – 11:10

Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Bangkok Master Plan

Transit interchange:

โครงการก่อสร้างศูนย์คมนาคม: พหลโยธิน





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• Bangkok Master Plan

Transit interchange :

โครงการก่อสร้างศูนย์คมนาคม: มักกะสัน



ARCHITECT : DESIGN CONCEPT CO., LTD.



Makkasan Station

10:50 – 11:10	Transit Oriented Development plan for BMA	Mr. Oravit Hemachudha, BMA
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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Station Development Study

Construction costs of all ITF and commercial developments by phases are as follows:

Station	Construction Cost (Million Baht)									Total	
	Immediate Plan			Mid Term Plan			Long Term Plan				
	ITF 1	ITF 2	COM	ITF 1	ITF 2	COM	ITF 1	ITF 2	COM	2001 Price	Current Price
Hua Lamphong	0.6	1.3	-	11.2	-	-	7.3	-	-	20.4	23.8
Queen Sirikit N C Centre	1.2	-	26.5	2.4	-	1.9	89.7	-	-	121.7	148.3
Sukhumvit	0.6	-	0.9	16.6	5.6	39.1	-	-	-	62.8	69.5
Phetchaburi	1.8	-	0.7	7.0	14.6	42.0	11.5	11.5	205.8	294.9	367.2
Rama 9	-	-	0.4	1.6	-	-	358.8	-	-	360.8	463.4
Thiam Ruam Mit	1.2	-	33.4	2.3	11.3	24.8	30.5	152.4	426.8	682.7	861.7
Ratchada	1.2	-	2.1	1.7	8.7	18.8	62.9	90.2	252.6	438.2	557.3
Lat Phrao	1.2	-	8.3	-	-	15.8	-	-	-	25.3	27.1
Total	7.8	1.3	72.3	42.8	40.2	142.4	560.7	254.1	885.2	2,006.8	2,518.4
Grand Total	81.4			225.4			1,700.0				

Remarks - ITF 1 means for Intermodal Transfer Facilities that would not generate revenue
- ITF 2 means for Intermodal Transfer Facilities that would generate revenue
- COM means for Commercial development that integrate with the ITF



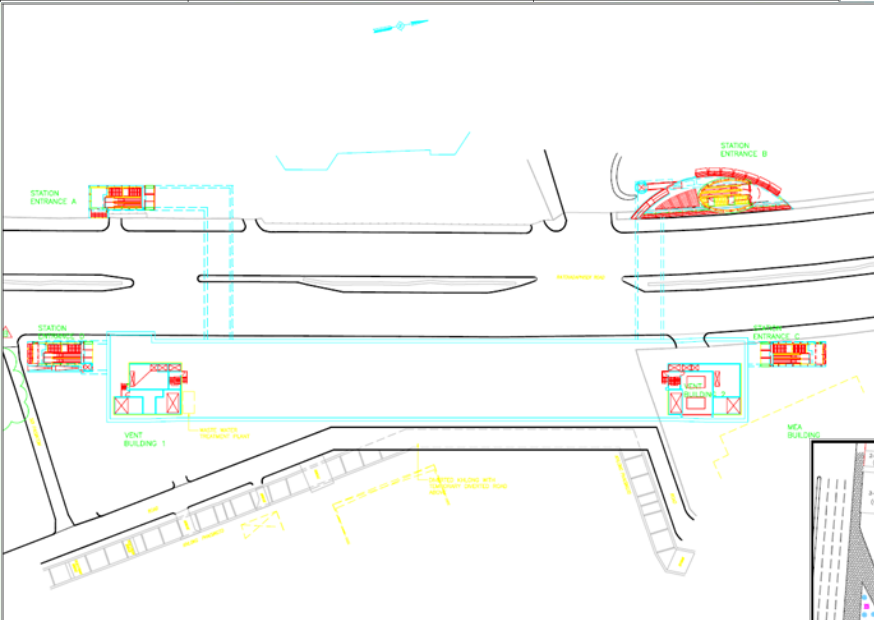
MASS RAPID TRANSIT AUTHORITY OF THAILAND

2002

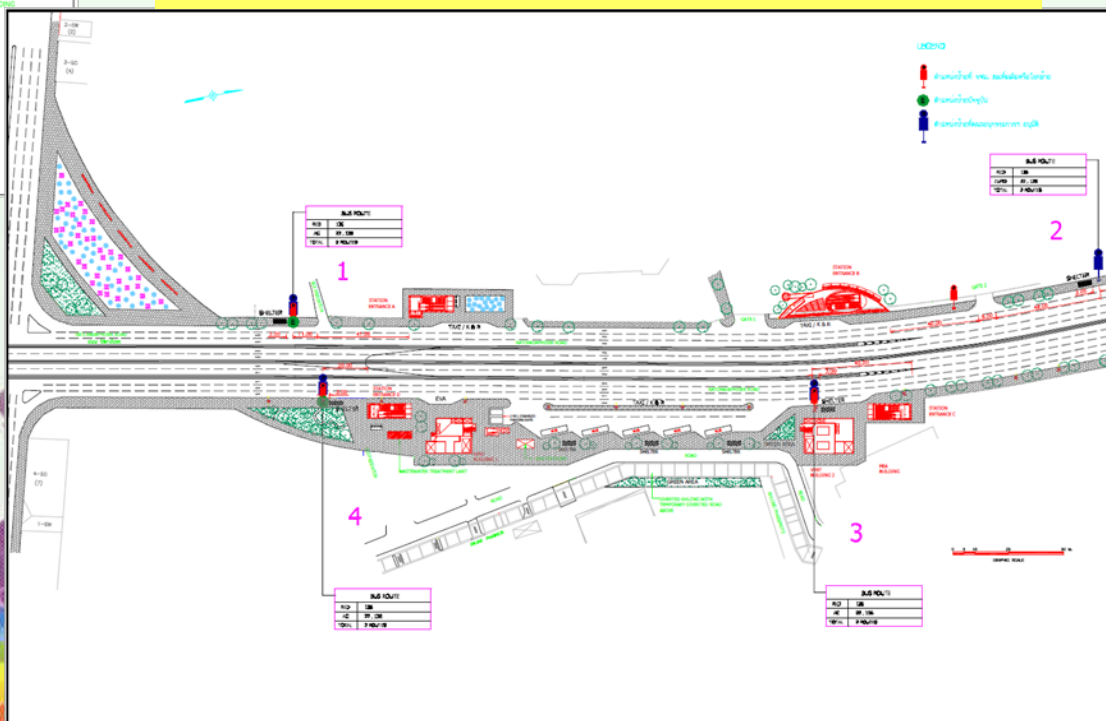
THE STUDY AND DESIGN OF INTERMODAL TRANSFER FACILITIES AND STATION AREA DEVELOPMENT FOR THE M.R.T. CHALOEM RATCHAMONGKOL LINE AND EXTENSIONS

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Station Development Study



An Example of Queen Sirikit Station



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Transit Oriented Development plan
for BMA

Mr. Oravit Hemachudha, BMA
for BMA

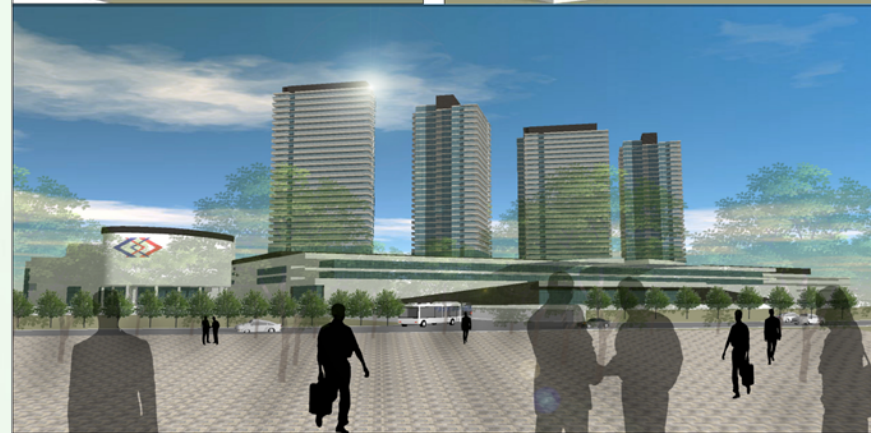
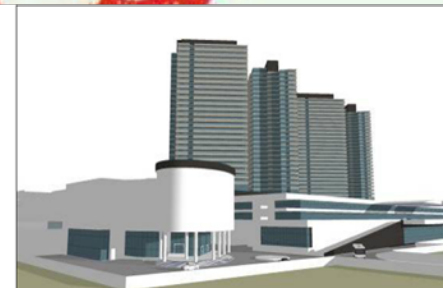
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2010
Consulting Service for the Study of Non-Fare Business Development
relating to Mass Rapid Transit Systems, and Preparation of
Commercial Development Master Plan for MRTA Depots

• Depot Development Study



Khlong Bang Phai Depot



Lak Song Depot



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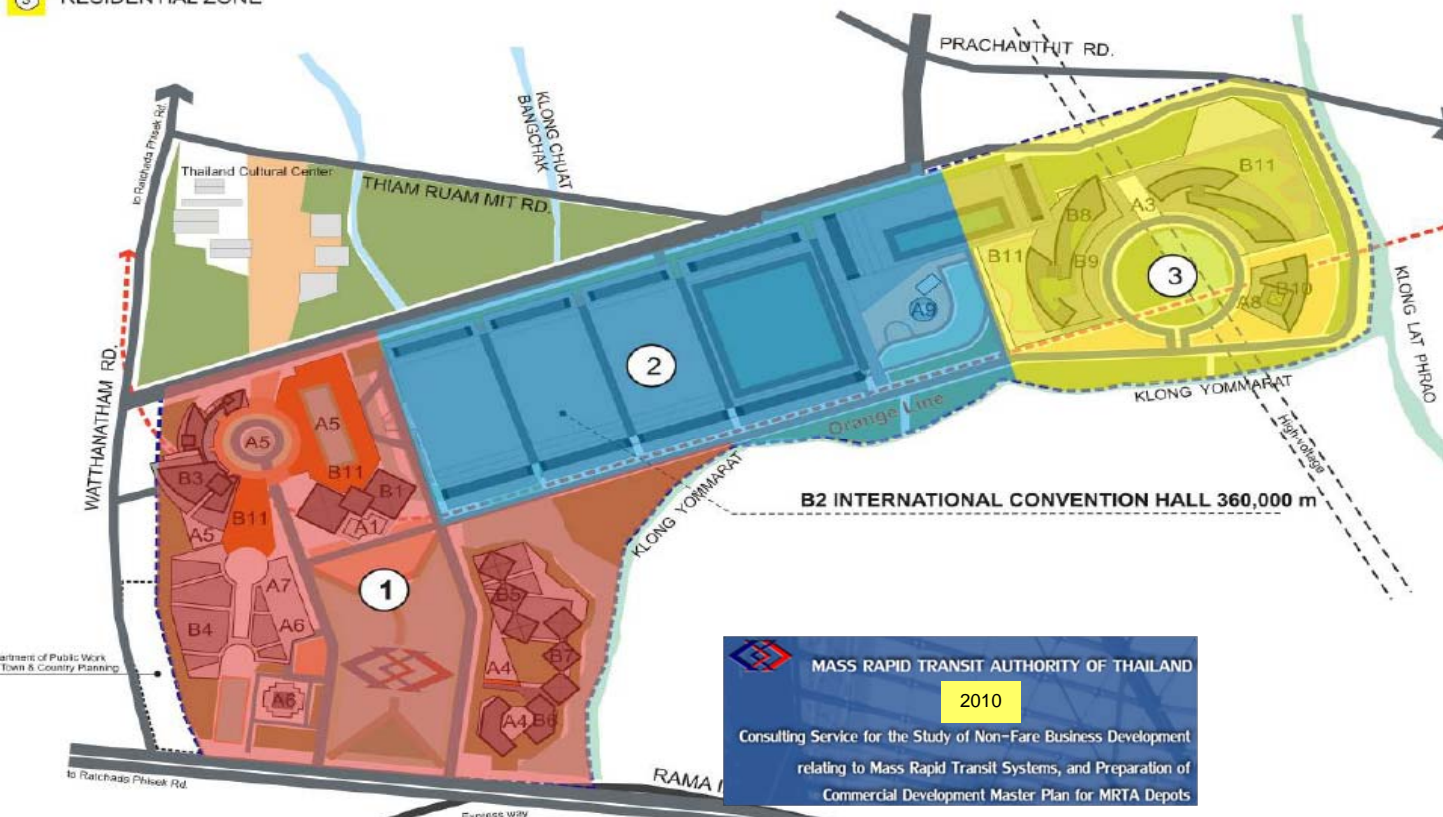
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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

DESCRIPTION OF AIR RIGHT DEVELOPMENT

- 1 BUSINESS AND SOCIAL ZONE
- 2 INTERNATIONAL CONVENTION HALL ZONE
- 3 RESIDENTIAL ZONE

• Depot Development Study



MRTA DEPOT DEVELOPMENT MASTER PLAN

- A1 : MRTA HEADQUARTERS
- A2 : DEPOT AREA , WORKSHOP AND STABLING AREA FOR BLUE LINE
- A3 : DEPOT AREA , WORKSHOP AND STABLING AREA FOR ORANGE LINE
- A4 : PARK & RILDE BUILDING
- A5 : ROLLING STOCK AND EQUIPMENT ASSEMBLY SHOP (FUTURE WORKSHOP EXPANSION)
- A6 : MRTA TRAINING CENTER / INDOOR SPORT
- A7 : MRTA MUSEUM
- A8 : ORANGE LINE STATION
- A9 : BMCL HEADQUARTERS

AIR RIGHT DEVELOPMENT : PODIUM & TOWER

- B1 : MRTA HEADQUARTERS TOWER (EXPANSION)
- B2 : INTERNATIONAL CONVENTION HALL (CASE STUDY)

MRTA CULTURAL PLAZA ZONE

- B3 : - BEST IN 75 PROVINCES (EXHIBITION HALL)
- CULTURAL PLAZA
- GOODS FOODS
- THAI ENTERTAINMENT
- B4 : THAI - EXPORT TRADE CENTER OFFICE

MRTA COMMERCIAL COMPLEX ZONE

- B5 : OFFICE TOWER/COMMERCIAL PODIUM
- B6 : LUXURY HOTEL
- B7 : CITY HOTEL

RESIDENTIAL ZONE

- B8 : RESIDENTIAL (TOWER)
- B9 : COMMUNITY (SCHOOL / HOSPITAL / LOCAL)
- B10 : COMMUNITY COMMERCIAL
- B11 : ROOF GARDEN

Consulting Services for The Study of Non Fare Business Development relating the Mass Rapid Transit System, and Preparation of Commercial Development Master Plan at MRTA Depots



MRTA Development Master Plan
Additional Study ; 2009
Mass Rapid Transit Authority of Thailand

Chotichinda Mouchel
Chotichinda Mouchel Consultants Limited



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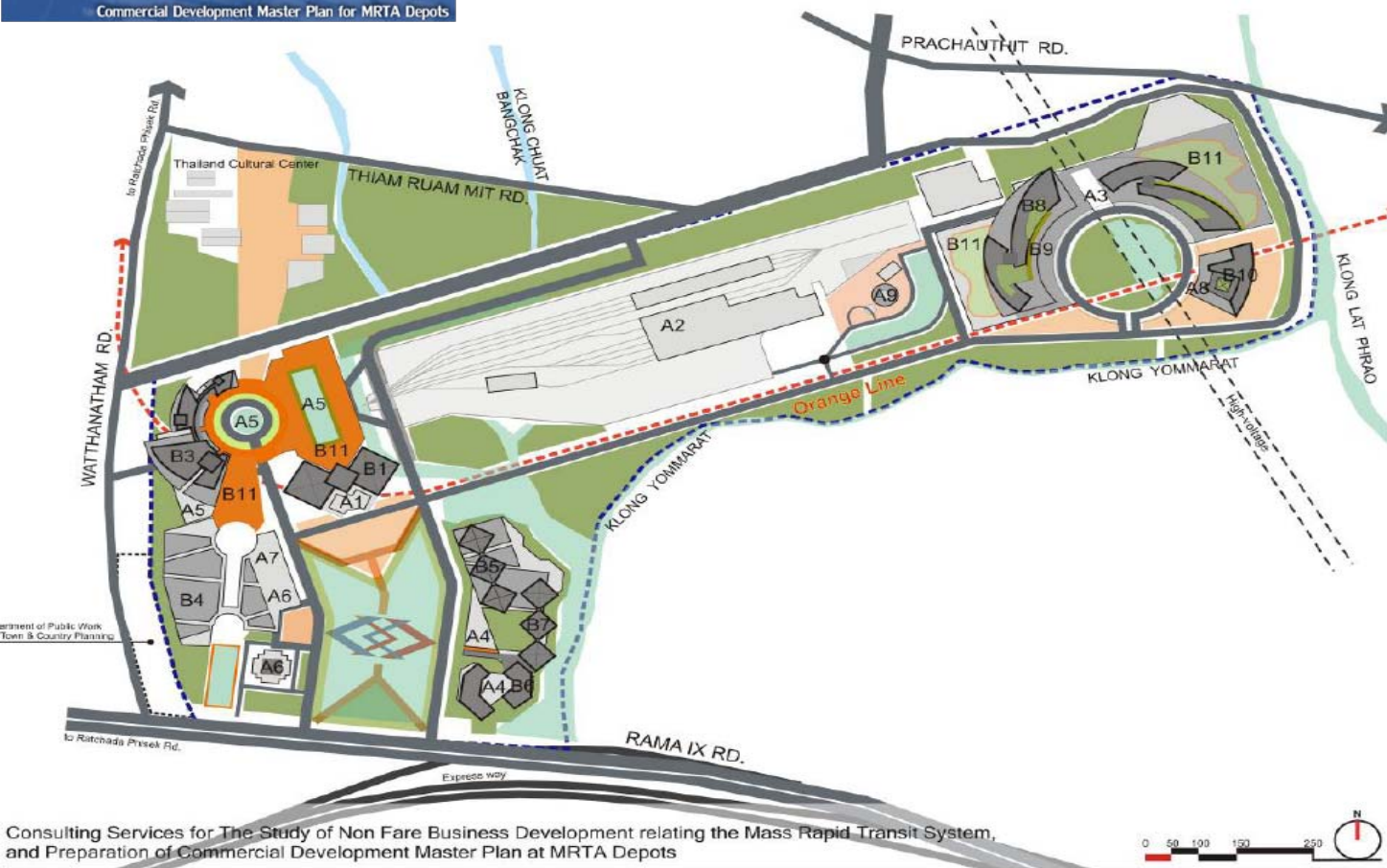
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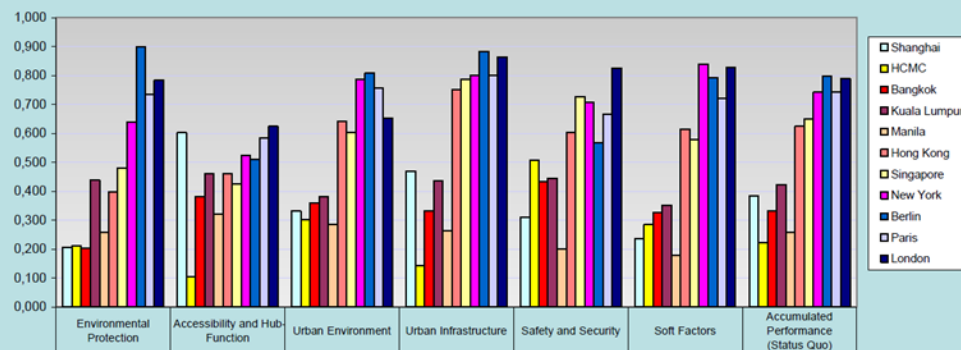
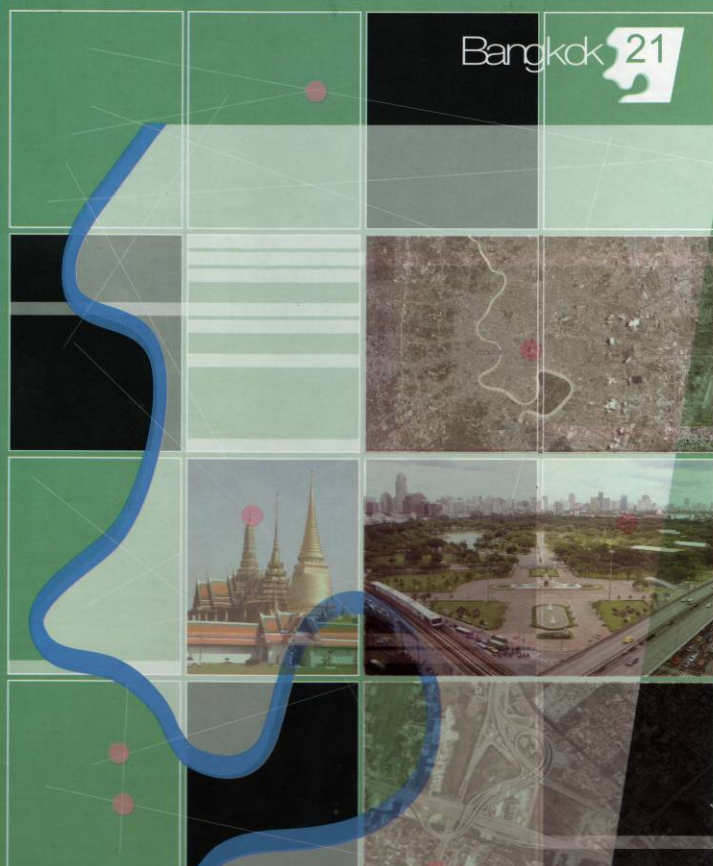
**MRTA Development Master Plan
Additional Study ; 2009
Mass Rapid Transit Authority of Thailand**

Chotichinda Mouchel
Chotichinda Mouchel Consultants Limited

Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Development Study

Bangkok 21: Towards a World-Class Transit Oriented Metropolis



Best practice	Berlin	London	Berlin	Berlin	London	New York	Berlin
Bangkok's relative performance	23 %	61 %	45 %	37 %	53 %	39 %	42 %

Overall Performance (Status-Quo, 2006)

Demographic change In 2050, around 35 to 40% of Bangkok's inhabitants will be above 65 years of age. The average fertility rate will be reduced to 1.5 births per female or less	Urbanization Thailand's urbanization is below world's average but rapidly growing. 2030, 20% of Thai population will live in BKK, generating > 50% of Thailand's GDP
Mobility Traffic congestion on inner city streets in Bangkok is expected to increase significantly if no traffic demand management is in place	Globalization Exports and imports are growing by almost 2.5% and 3% above GDP growth, indicating Thailand's growing participation in the global economy
Scarcity of natural resources Bangkok consumes more than half of Thailand's purified water (year 2000); a further increase of the share is to be expected	Climate change, global warming Climate change and intensive use of resources increase Bangkok's vulnerability to flooding: rising sea and sinking ground levels have accumulated to 1 meter in 30 years
GHG emission hot spots Bangkok causes around 70% of Thailand's greenhouse gas (GHG) emissions, but covers less than 10% of the nation's land mass	



10:50 – 11:10

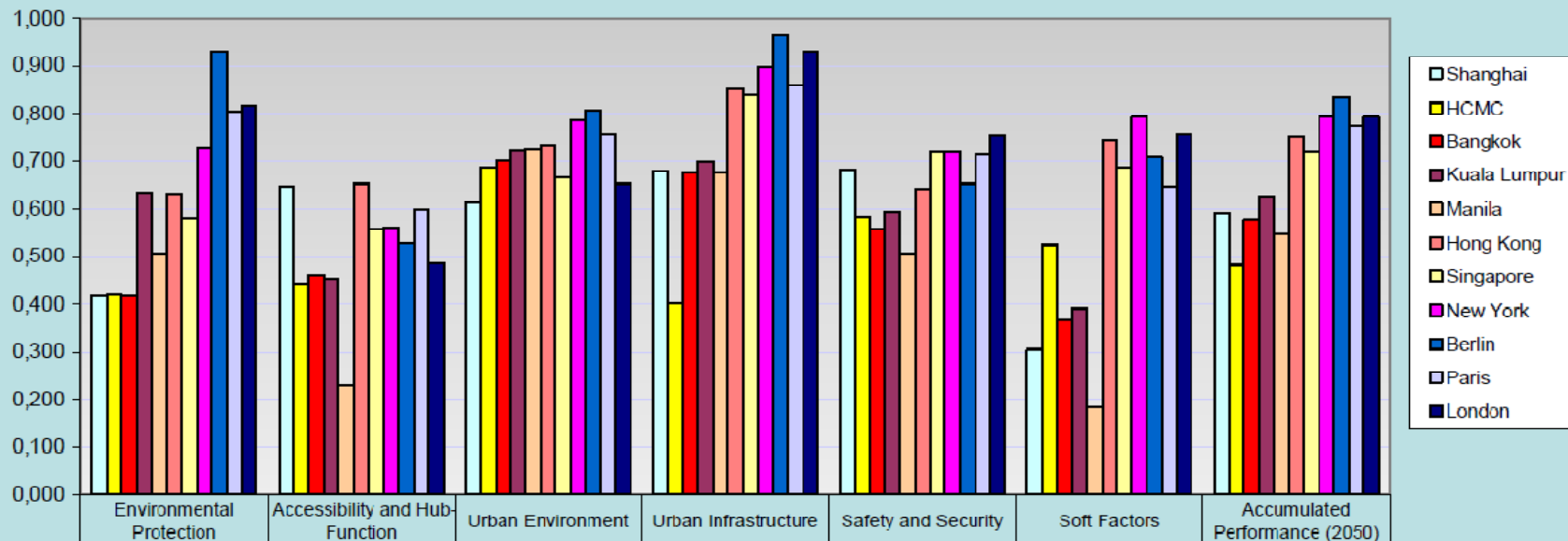
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for BMA

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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

Performance Achievement (2050)

• **Development Study**



Best practice	Berlin	Hong Kong	Berlin	Berlin	London	New York	Berlin
Bangkok's relative performance	45 %	70 %	87 %	70 %	74 %	46 %	69 %

Fig. 11: Overall Performance (Trend-Based Projection, 2050)



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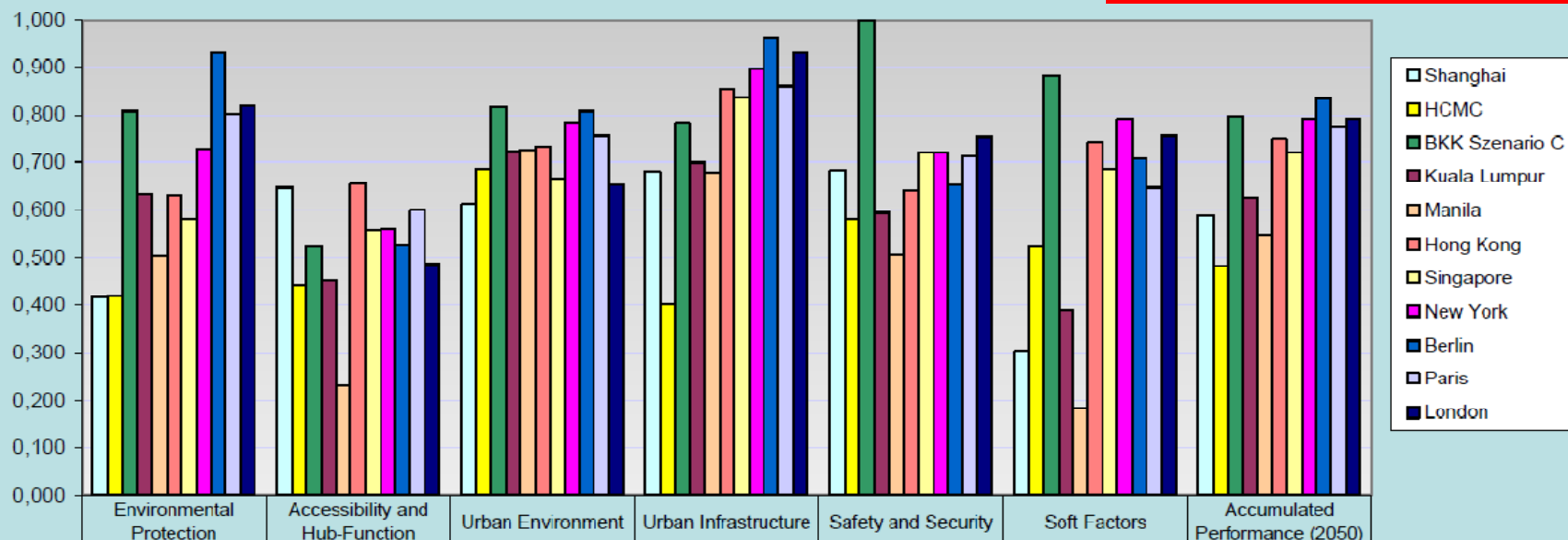
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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

Performance Achievement (2050)

• **Development Study**



Best practice	Berlin	Hong Kong	Bangkok	Berlin	Bangkok	Bangkok	Berlin
Bangkok's relative performance	87 %	80 %	100 %	81 %	100 %	100 %	96 %

Bangkok 21: Towards a World-Class Transit Oriented Metropolis

Fig. 20: Overall Performance (2050, optimized portfolio, 2.4% GDP annual investment)



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Bangkok 21: Towards a World-Class Transit
Oriented Metropolis

• **Development Study**

Transportation Infrastructure

Suburban Rail

Mass Rapid Transit (MRT)

**Bangkok Transit System
(BTS)**

Bus System

Immediate Action Needs

Extent the Airport Rail Link to Thammasat University via Don Muang Airport, facilitating seamless end-to-end services between both city airports on standard gauge

Extent MRT network by Blue Line Extensions and Purple Line, facilitating seamless services on Blue Line and concentration of heavy maintenance works at the existing MRTA depot

Extent BTS network along Sukhumvit Road, along Phahonyothin Road from Bearing to Samutprakarn, using consistent mechanical and electrical equipment to avoid unnecessary replacement cost

Start improving the Bangkok bus transit system by introducing a Bus Rapid Transit pilot line to convince Bangkokians about the merits of this technology, by re-aligning existing bus lines for feeder services for trunk lines



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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• **Development Study**

Transit System Integration

Centralized Ticketing System Operator and Clearing House



Immediate Action Needs

Deciding on fare structure and level:

This is the first step (zone or distance based). Affordability and revenue implications need to be assessed.

Deciding on an appropriate organisation for fares and ticketing management:

Role of public and private sector in operation and maintenance of ticketing system, incl. clearing house for revenue allocation to public transport services operating entities, handling of banking aspects, legal aspects

Deciding on technology and systems:

Based on functional specifications, a suitable technology is to be identified, preferably a rather open platform which allows technology upgrades from smart card based systems to cell-phone based fare payments



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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

Bangkok 21: Towards a World-Class Transit
Oriented Metropolis

• **Development Study**

Institutional Development

Centralized Planning Body:
Office for Transport and
Traffic Policy and Planning
(OTP)

**Centralized Body for System
Implementation:** Mass Rapid
Transit Authority (MRTA) for
urban railways, State Railway
of Thailand (SRT) for
suburban railways

Operational Diversity

Immediate Action Needs

OTP is the established centralized planning body for all of Thailand. Cooperation with the Bangkok Metropolitan Administration and the related bodies of the surrounding provinces needs to be harmonized to arrive at binding and integrated land use and transport planning for a transit-oriented world-class metropolis

Ownership and implementation responsibility for urban railway systems should to be concentrated in a single public body (MRTA). Suburban railways can be kept under SRT but should be outsourced into a corporatized subsidiary company with separate management

System operation of urban and suburban railways can be outsourced to public, private, or public-private concessionaires

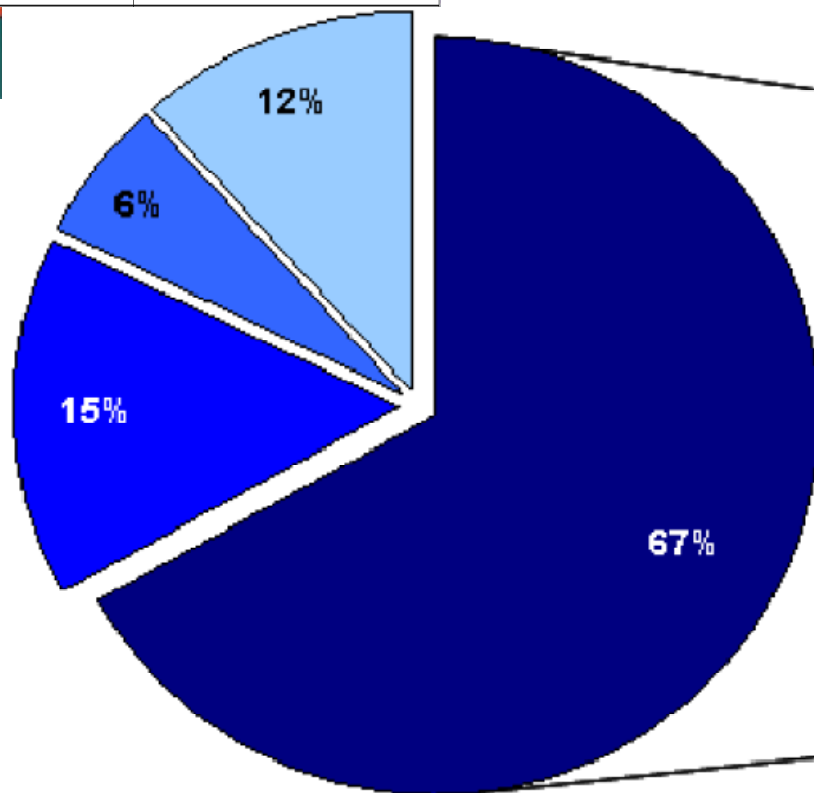


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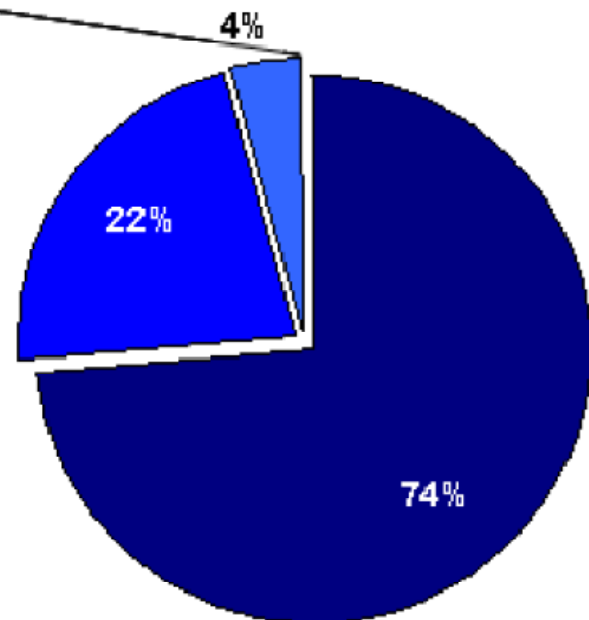
Bangkok 21: Towards a World-Class Transit
Oriented Metropolis

• *Development Study*

- Transportation
- Energy
- Flood Protection
- Others



Total Investment
8,658 Bill. Bath



Transportation Investment
5,869 Bill. Bath

Fig. 33: Proposed Investment Scenario



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Transit Oriented Development plan
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• *Development Study*

Revenue Generation
from Bangkok: approx. 58%

Revenue Generation
from Thailand: approx. 42%

Land Value
Increase:
20 Bill. Baht

De-Congestion
Charge:
10 Bill. Baht

Extended VAT by 1%:
60 Bill. Baht

Loan
Financing:
10 Bill. Baht

Fund Allocation to Bangkok: 63%

Fund Allocation
to Thailand: 37%



Bangkok



Thailand



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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Transit Integration Facilities





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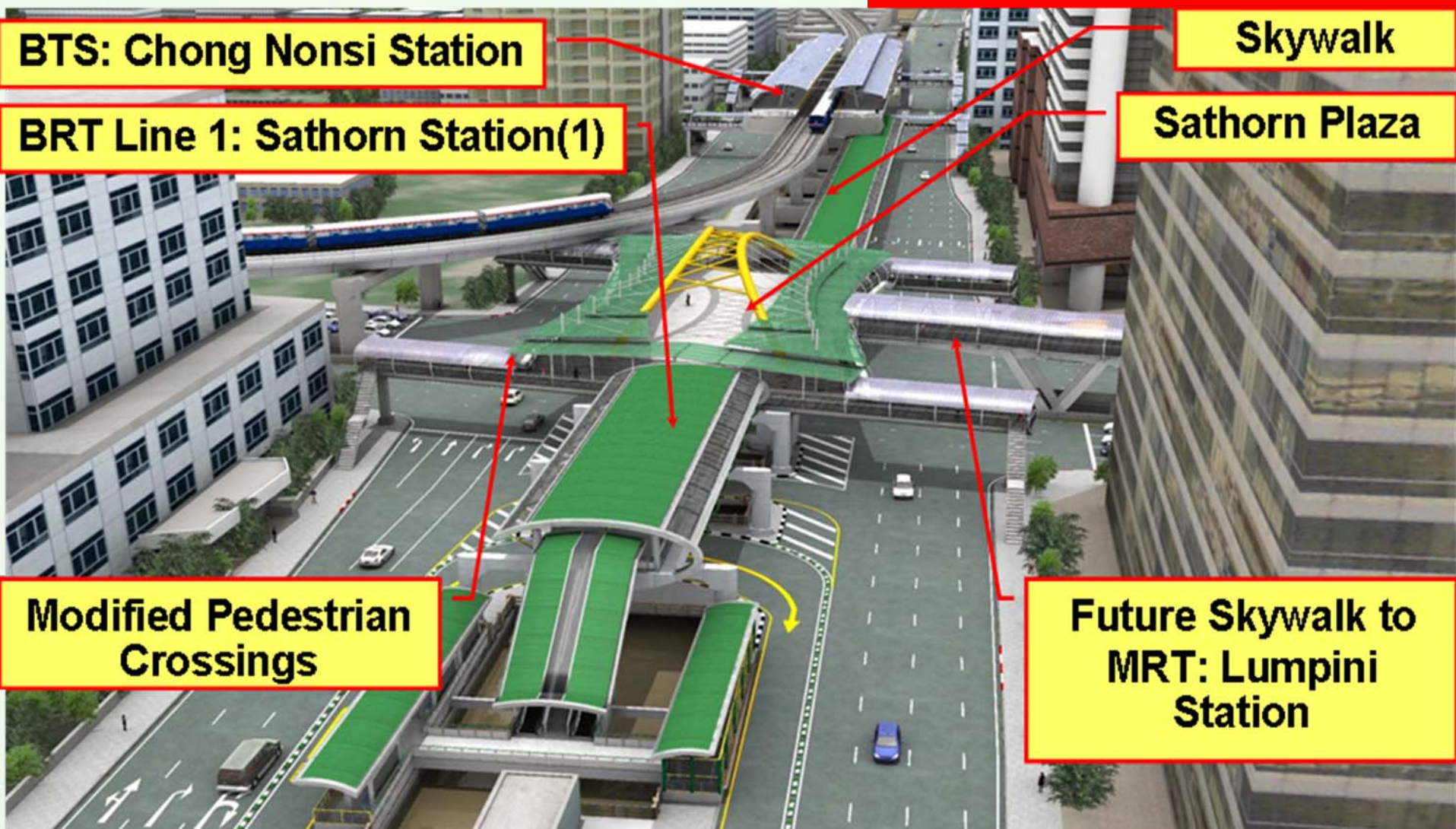
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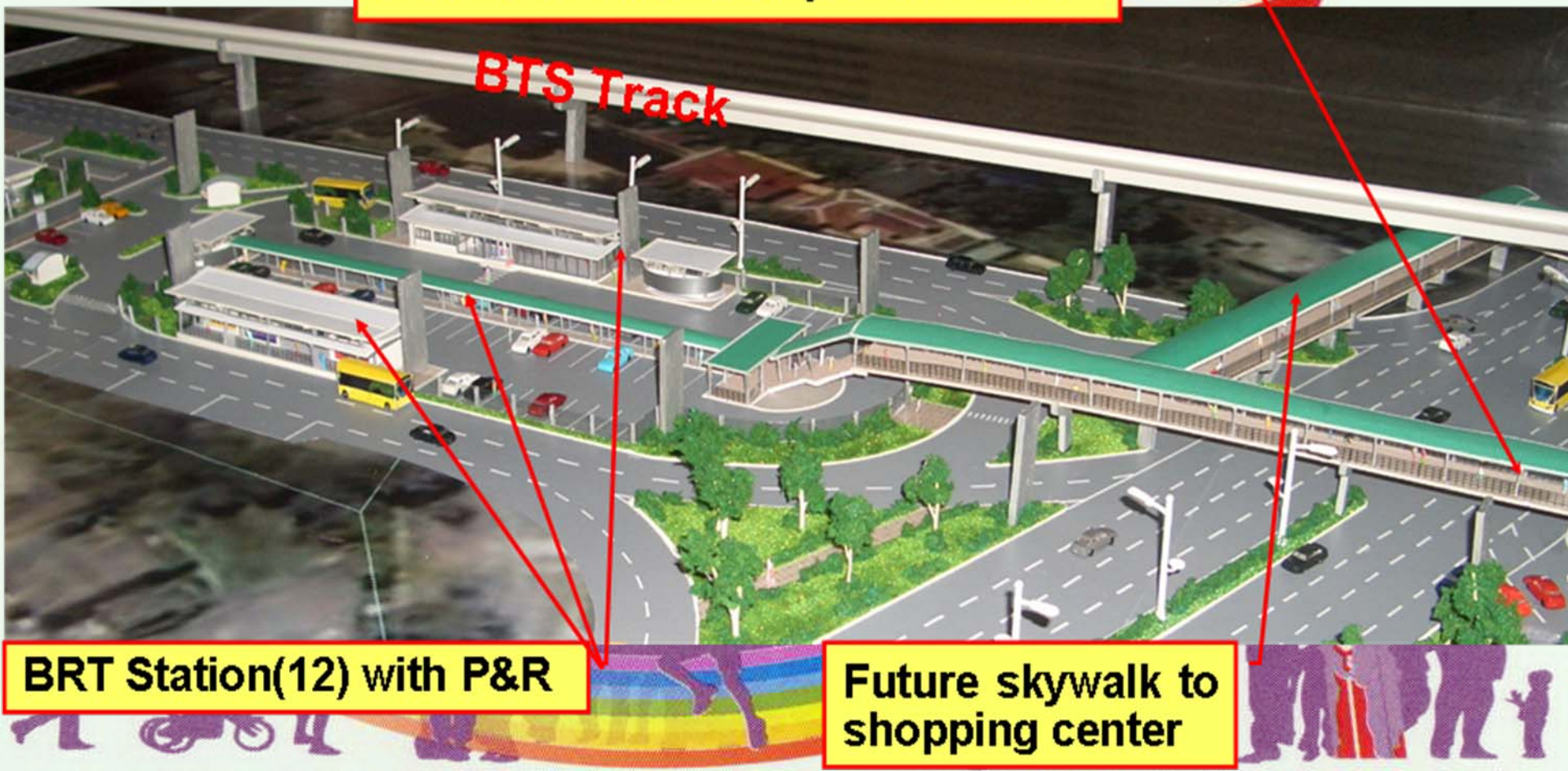
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**Future skywalk to BTS Silom Line
Extension: Ratchadaphisek Station**



BRT Station(12) with P&R

**Future skywalk to
shopping center**

Transit Oriented Development plan
for BMA

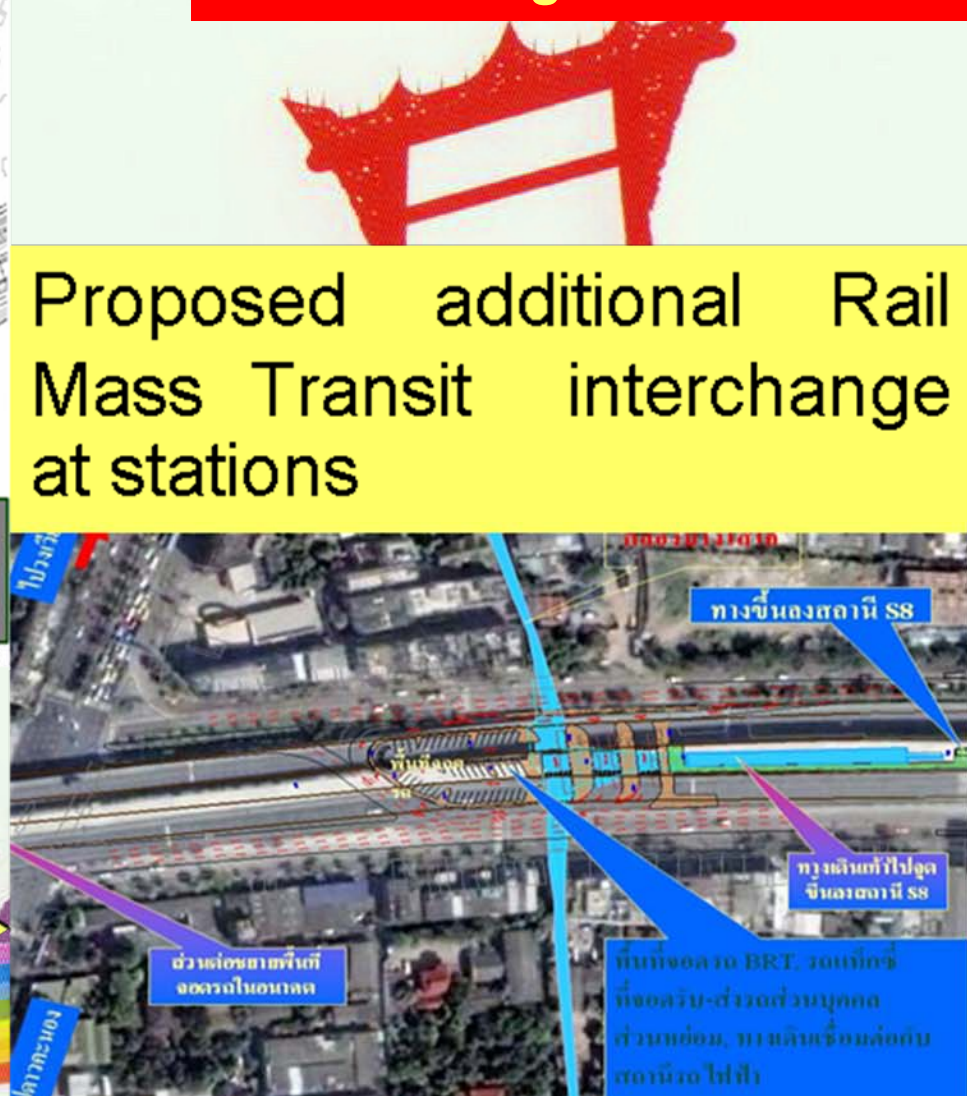
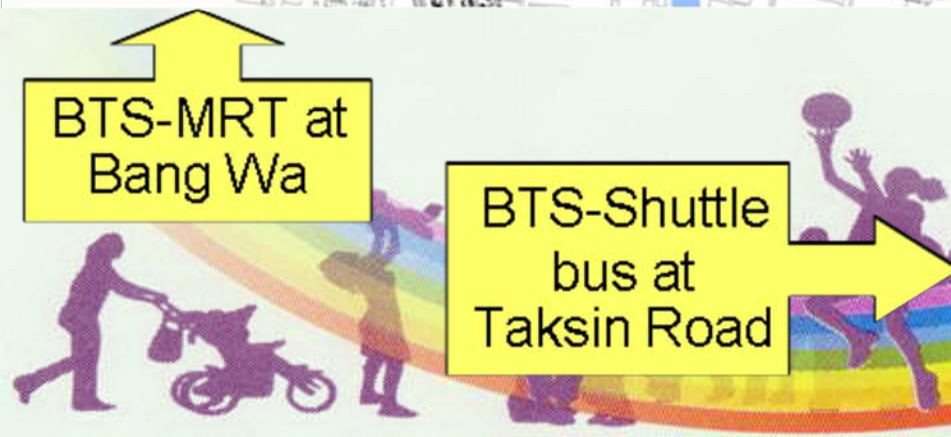
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- **Transit Integration Facilities**



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Sustainable Transport Development Aspect in Thailand: Transit-Oriented Development (TOD), Equity and the environment

• Transit Integration Facilities



Bus-BTS at
Victory
Monument

BTS-Boat at
Pratunam

Proposed modal
interchange at
locations





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• **Conclusions**

“...Sustainable Transport in Bangkok will be led through Gateway, Green and Good Life concept in 2020. Nine measures for sustainable transportation especially Bangkok BRT which have been established by the Traffic and Transportation Department, Bangkok Metropolitan Administration to **take care of the citizens travelling out of home**, will be achieved with cooperation, coordination and participation as part of our **lifetime responsibility...**”





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**Sustainable Transport Development Aspect in Thailand:
Transit-Oriented Development (TOD), Equity and the environment**

**Additional information:
oravit@hotmail.com**



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แก้เรื่อง
ที่ยังยืน

Thank You
for Big Problems

for Your Attention