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กรมควบคุมมลพิษ
POLLUTION CONTROL DEPARTMENT

Project of Vehicle Emission reduction in Thailand

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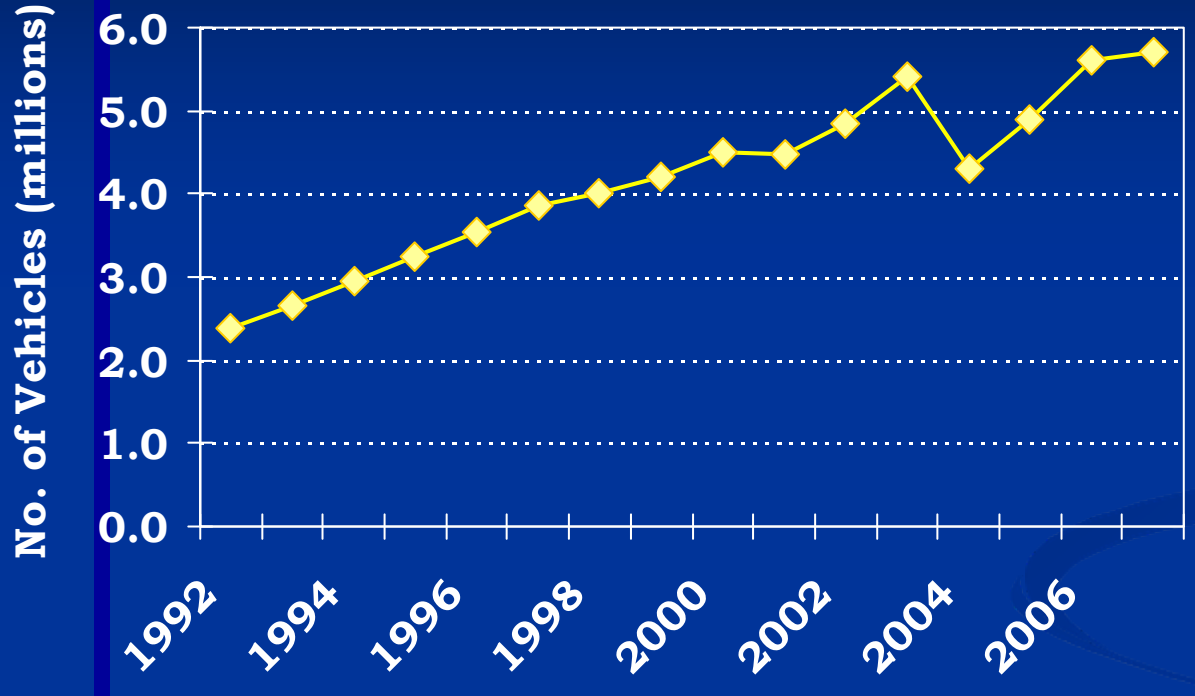
Statistic of Vehicle and Motorcycle in Thailand

Number of Car Product, Sale and Export

Number of Motorcycle Product, Sale and Export

Source: Thailand Automotive Institute

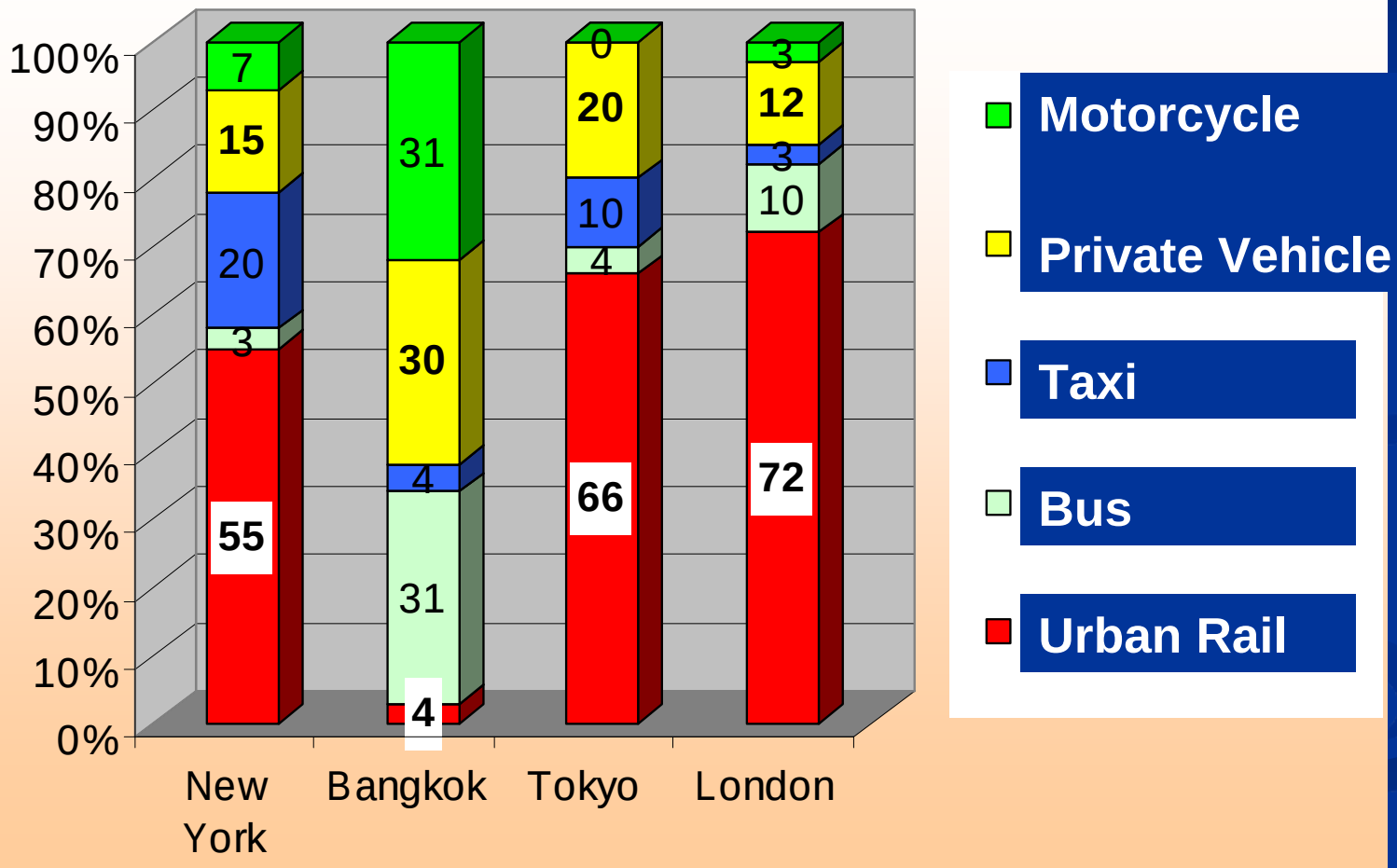
Number of vehicle Registered in Bangkok



Total Numbers of Vehicles Registered in BKK in 2007

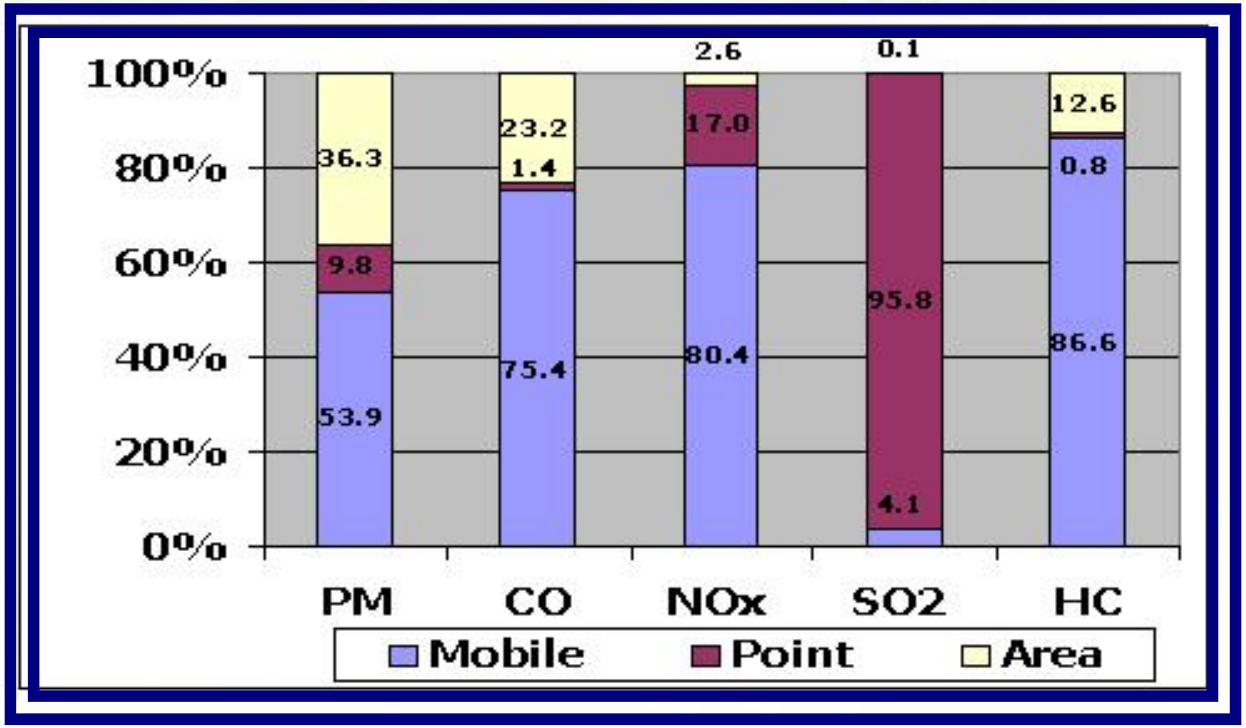
5,715,078

Current Urban Transport Systems

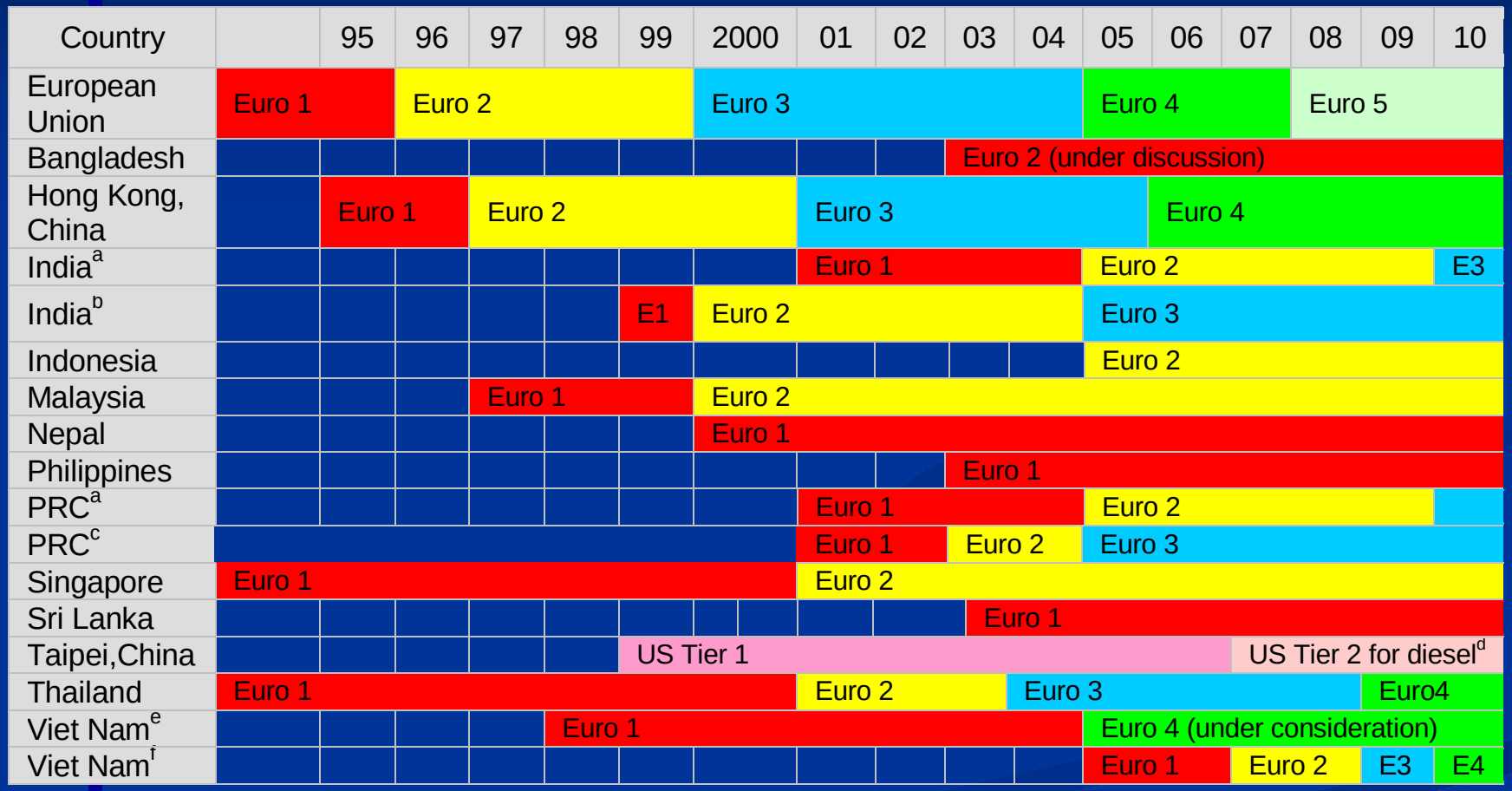


SOURCE OF AIR POLLUTION BKK (1997)

Source	Emission Load (Ton/Year)				
	PM	CO	NOx	SO2	HC
Mobile Source	20,602	349,771	264,648	9,973	232,973
Point Source	3,735	6,266	56,002	229,859	2,005
Area Source	13,855	107,738	8,511	184	33,904



Vehicle Emission (and fuel standards) in Asia



Emission Reduction from New Vehicle

Passenger Vehicle (Gasoline Vehicle)

- **Current Standard : EURO III**

Maximum Mass ≤2.5 tons				2.5 tons < Maximum Mass ≤ 3.5 tons				
CO (g/km)	HC (g/km)	HC+NOx (g/km)	NOx (g/km)	RW (kg)	CO (g/km)	HC (g/km)	HC+NOx (g/km)	NOx (g/km)
2.3	0.2	-	0.15	≤1305	2.30	0.20	0.15	-
				1305<R ≤1760	4.17	0.25	0.18	-
				≥1760	5.22	0.29	0.21	-

- **Future Standard : EURO IV (Year 2012)**

Light Duty Diesel Vehicle

- **Current Standard : EURO III**

Maximum Mass ≤2.5 tons					2.5 tons < Maximum Mass ≤ 3.5 tons					
CO (g/km)	HC (g/km)	HC+NOx (g/km)	NOx (g/km)	PM (g/km)	RW (kg)	CO (g/km)	HC (g/km)	HC+NOx (g/km)	NOx (g/km)	PM (g/km)
0.6	-	0.56	0.5	0.05	≤1305	2.30	0.2	0.15	-	0.05
					1305<R ≤1760	4.17	0.25	0.18	-	0.07
					≥1760	5.22	0.29	0.21	-	0.1

- **Future Standard : EURO IV (Year 2012)**

Emission Reduction from New Vehicle

Heavy Duty Diesel Vehicle

- **Current Standard : EURO II**

HC (g/kWh)	NOx (g/kWh)	CO (g/kWh)	PM (g/kWh)
1.1	7.0	4.0	0.15

- **Future standard : EURO III (Year 2008)**

Motorcycle

- **Current Standard : TISI Level 5**

CO (g/km)	HC+NOx (g/km)	White Smoke (%)	Evaporative (g/test)
3.5 (3.5)	2.0 (1.8)	15	2.0 (2>Evap≤6)

- **Future Standard : TISI Level 6 equivalent EURO III std. (Year 2008)**

Emission Reduction from In-Use Vehicle

Pollutants	Type of Vehicle	Standard	Measuring Device	Test Procedure
Black Smoke	Diesel Vehicle	50% 45% 40% 35%	Filter Opacity Filter Opacity	Snap acceleration on test Snap acceleration on test Full load test Full load test
CO	-Gasoline vehicle registered before Nov. 1,1993	4.5%	NDIR	Idle Test
	-Gasoline vehicle registered from Nov. 1,1993	1.5%	NDIR	Idle Test
	-Gasoline vehicle registered from Jan. 1,2007	0.5%	NDIR	Idle Test
HC	-Gasoline vehicle registered before Nov. 1,1993	600 ppm	NDIR	Idle Test
	-Gasoline vehicle registered from Nov. 1,1993	200 ppm	NDIR	Idle Test
	-Gasoline vehicle registered from Jan. 1,2007	100 ppm	NDIR	Idle Test

Emission Reduction from In-Use Vehicle

Motorcycle

	CO (%)	HC (ppm)	White Smoke (%)
Registered before Jul 1, 06	4.5	10,000	30
Registered from Jul 1, 06	3.5	2,000	30
Registered from Jan 1, 09	2.5	1,000	30

Tuk Tuk

CO (%)	HC (ppm)	White Smoke (%)
4.5	10,000	30

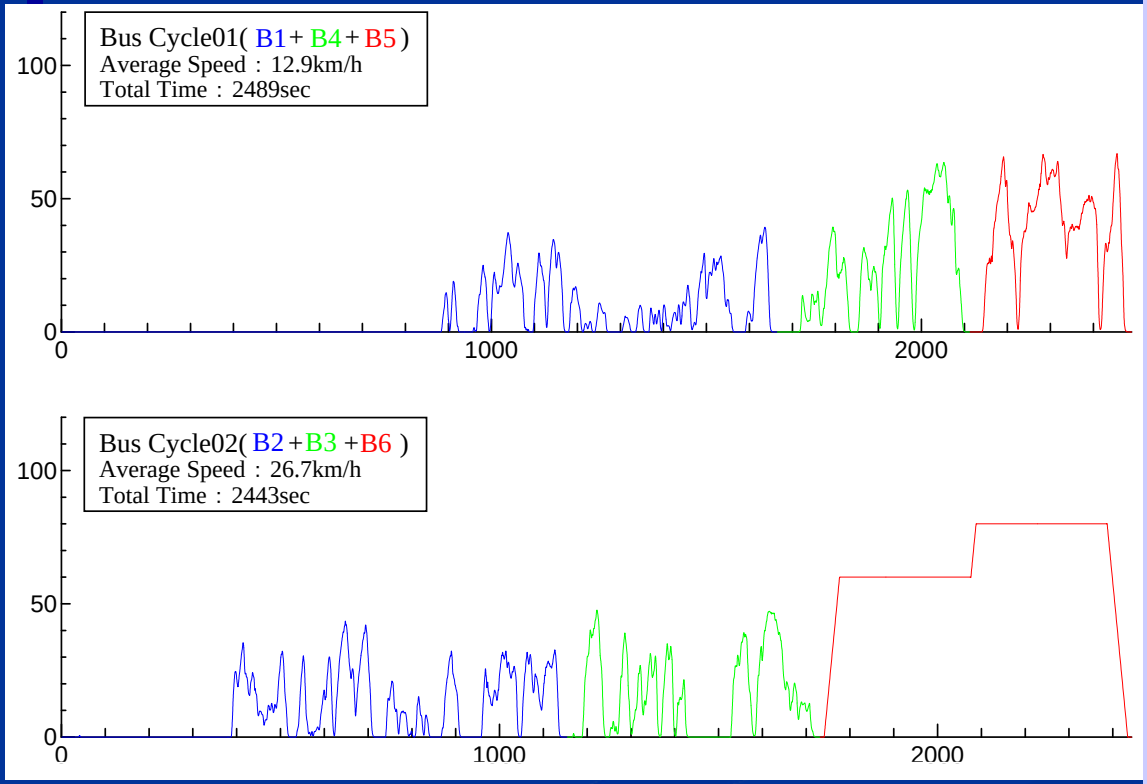
Developing Integrated Emission Strategies for Existing Land Transport Project (DIESEL Project)

The DIESEL Project has selected 4 potential options to reduce diesel pollution in Bangkok which are:

1) **Retrofit**
2) **Inspection/Maintenance**
3) **Alternative fuels**
4) **Transportation Management**

Potential Options to Reduce Vehicle Emissions

1. Development of Bangkok driving cycle and emission factor



Testing on Chassis Dynamometer

Emission Testing Results from Retrofit Vehicle
(Vehicle with DOC and DPF & 12 months operation)

Selection Criteria for Retrofitted Vehicles

- **Condition of retrofitted vehicles should be fitted with manufacturer requirement and USEPA standard**
- **Vehicle must be well-maintenance, or follow normal manufacturer recommended maintenance schedule.**
- **Fuel selection, must consider sulfur content which may cause emissions and device damage**

Effectiveness of *Engines Tune up* and *Maintenance* of Bangkok's public buses run by private operators for emission reduction and energy saving

Environmental

After OVERHAUL and Tune up for Group 2

- CO : 15 – 90 % Reduction
- HC : 20 - 54 % Reduction
- NOx : 15 - 65 % Reduction
- PM : 28 - 89 % Reduction
- Black Smoke : 15 - 95 % Reduction

Fuel Consumption

After OVERHAUL and Tune up for Group 2

7 – 9 % Reduction

Air Pollution Control Strategies

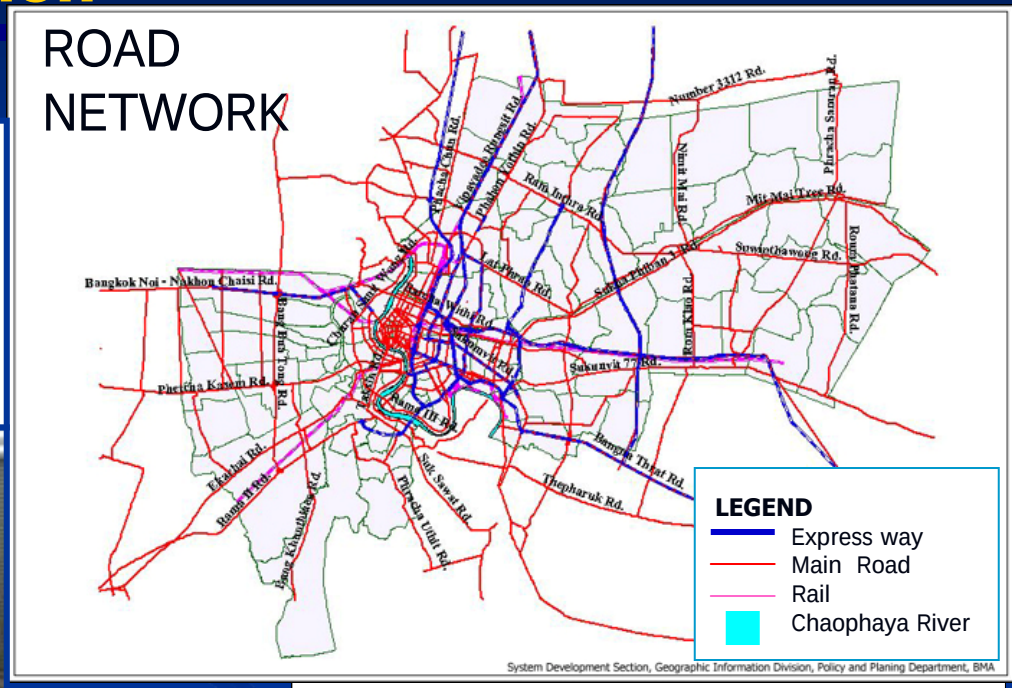
Inspection and Maintenance Programme

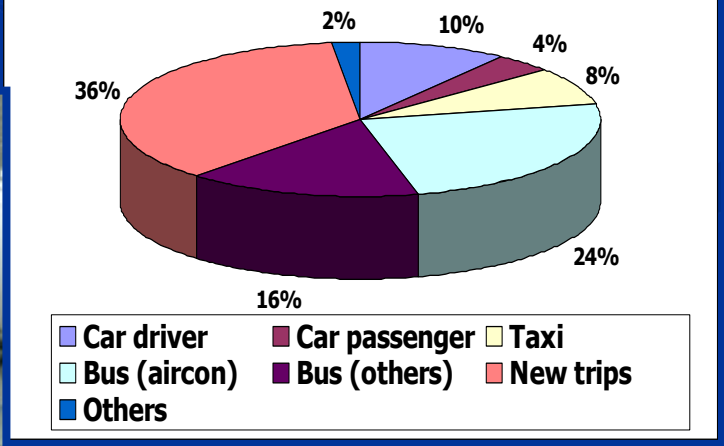
All vehicles are required to pass the in-use vehicle standards prior to the renewal of license.

Country Specific Data

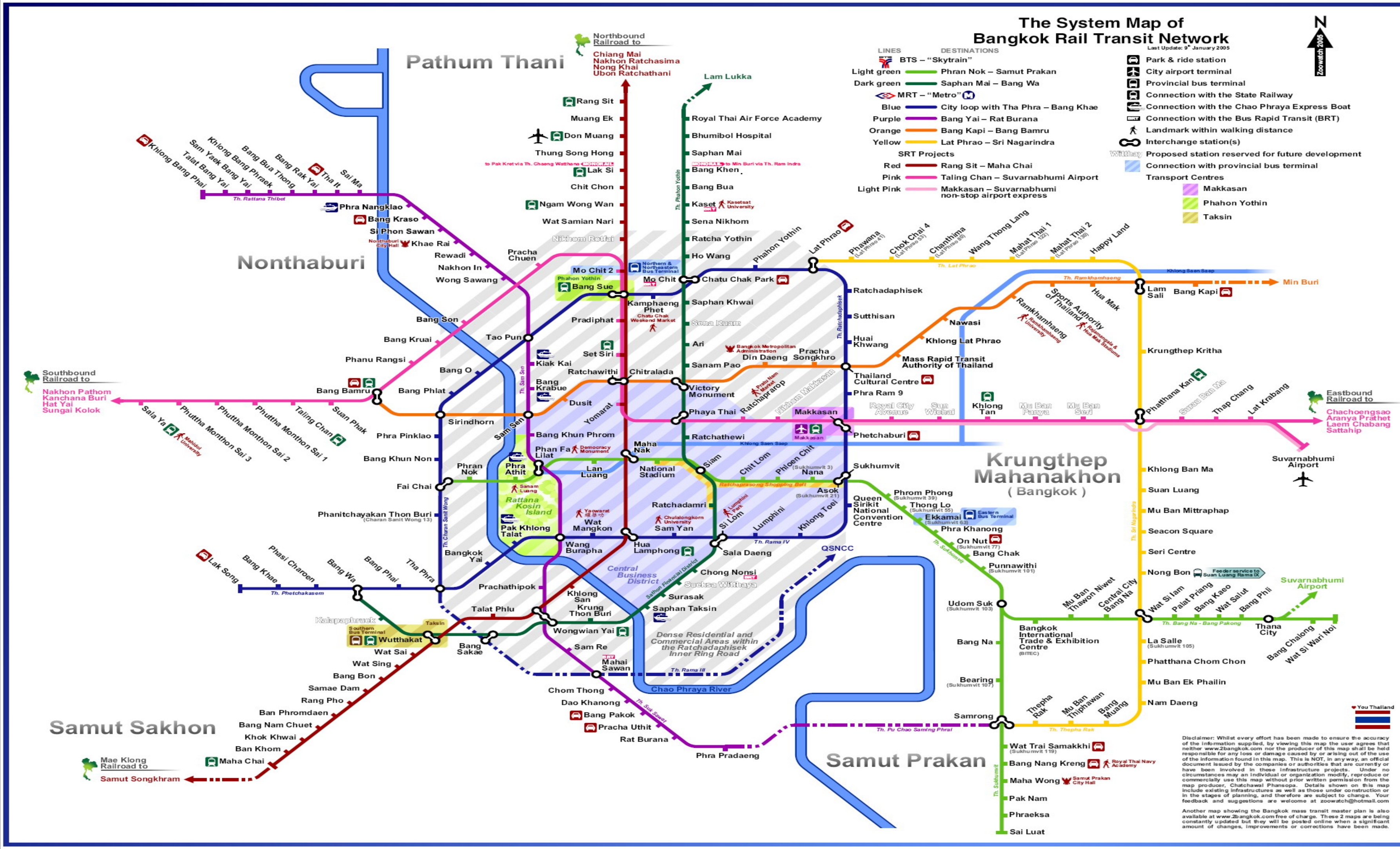
Bangkok Public Transportation

OPTRA





The System Map of Bangkok Rail Transit Network




Thank you for your attention
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