CASE STUDY : LOW EMISSION ZONE IN BANGKOK , THAILAND

(PATHUMWAN CLEAN AIR FOR ALL)

STRATEGIES FOR IMPLEMENTATION OF LOW EMISSION ZONES (LEZ) IN ASIA

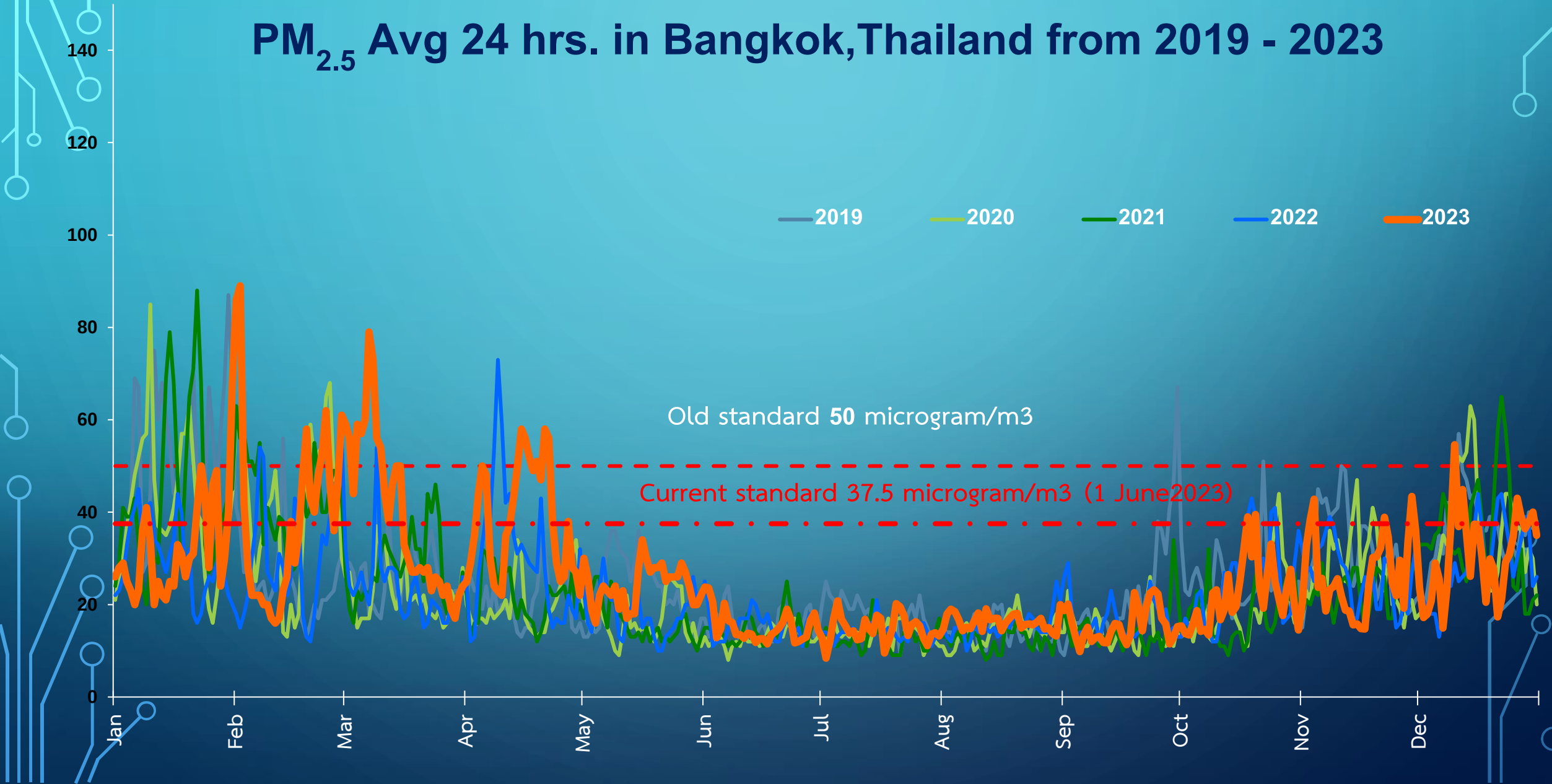
BANGKOK,THAILAND

MAY 9,2024

CONTENT

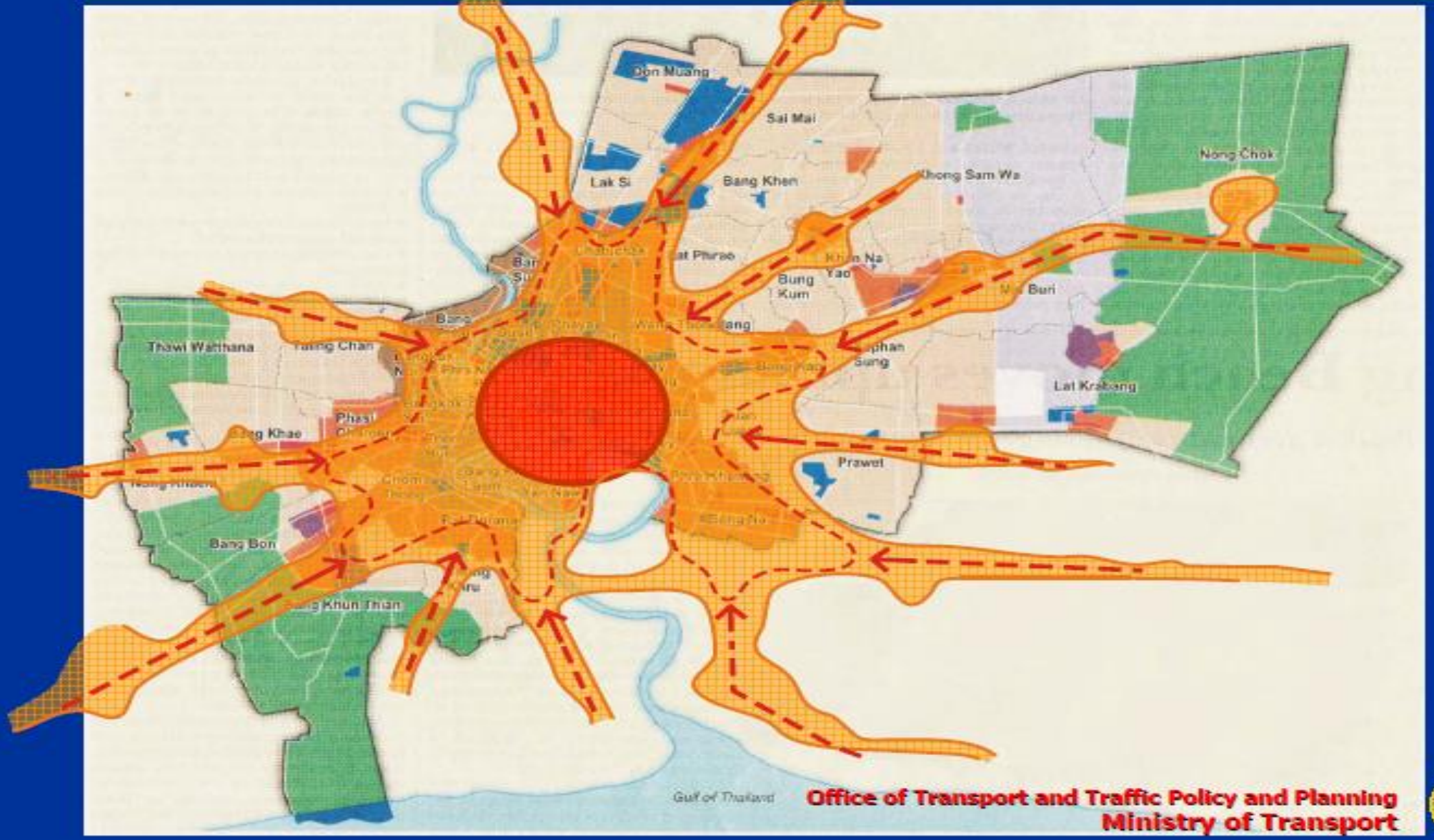
- Background & Air Pollution Problem
- Phase I of LEZs in Bangkok (Pathumwan Model)
- Phase II of LEZs in Bangkok (5 Cities)

$PM_{2.5}$ Avg 24 hrs. in Bangkok,Thailand from 2019 - 2023



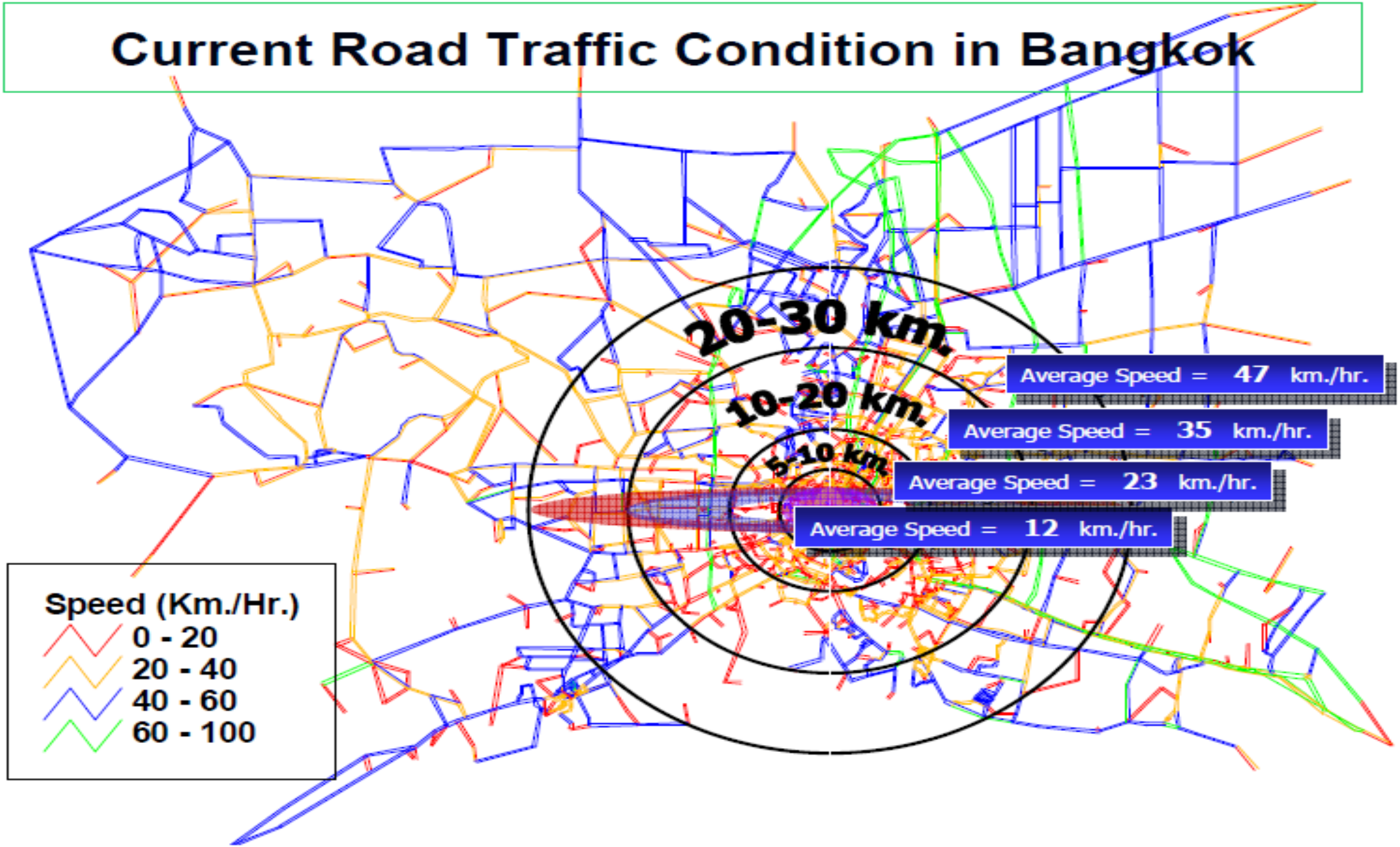

“ประเทศไทย”
รถติดที่สุดในโลก!!!

Traffic congested in urban center



Office of Transport and Traffic Policy and Planning
Ministry of Transport

Current Road Traffic Condition in Bangkok



Travel Pattern of people in Bangkok

Total
17
Mil.Trips/Day

Bus 35%
6
Mil. trips/Day

Mass Transit 4%

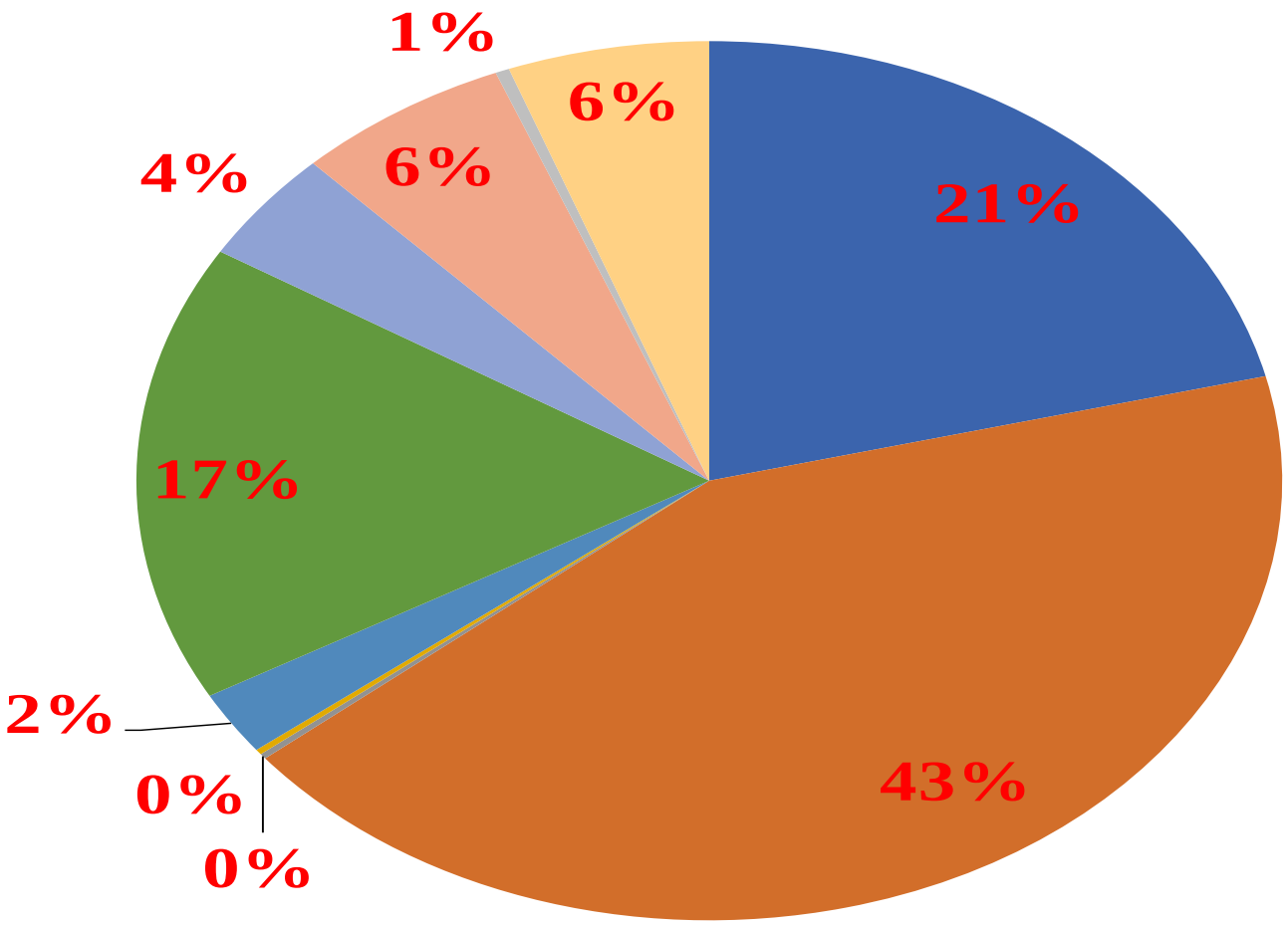
Sky Train
0.45
Mil. Trips/Day

Subway
0.18
Mil. Trips/Day

Car 56%
9.5
Mil. Trips/Day

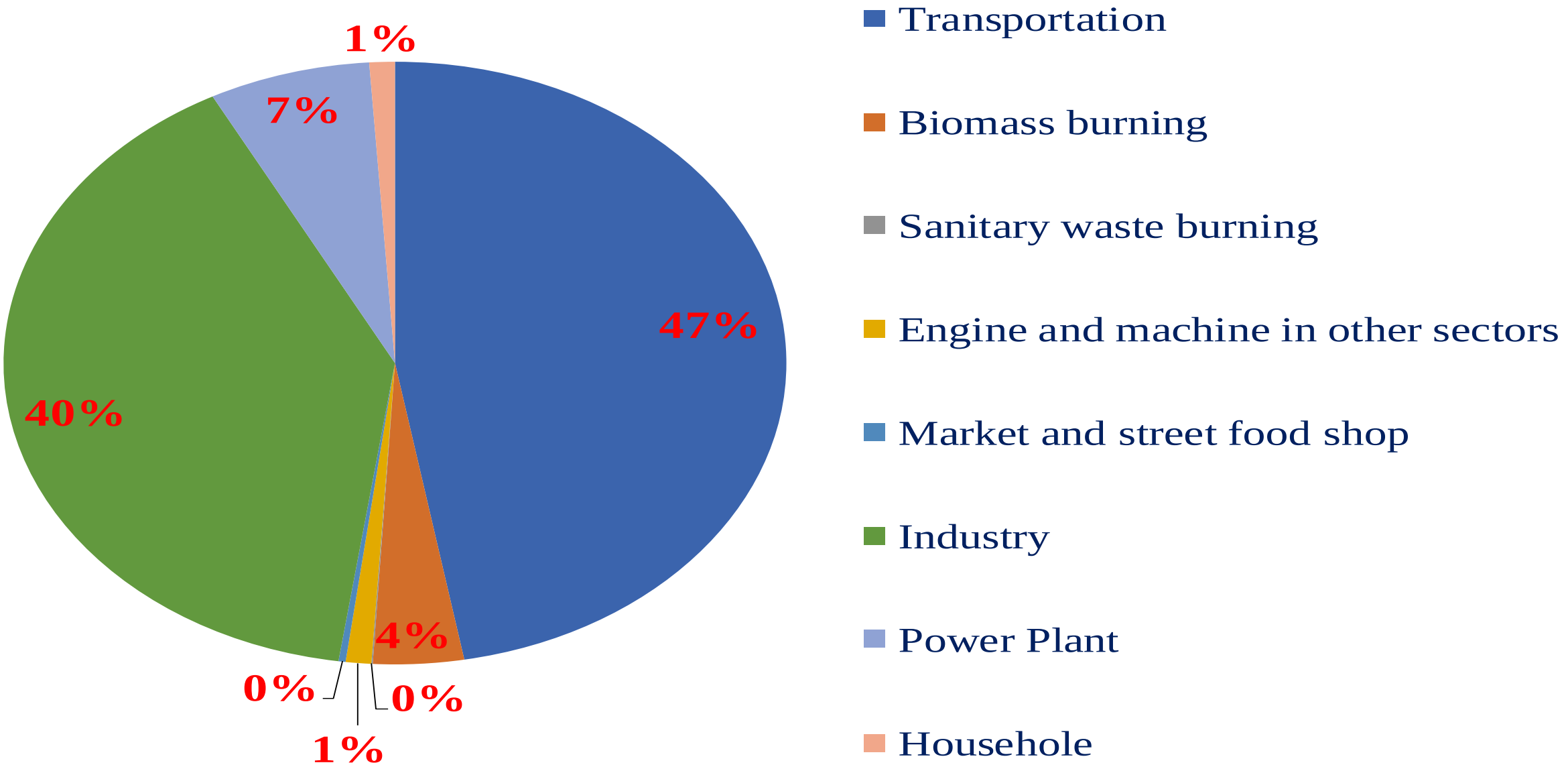
Office of Transport and Traffic Policy and Planning
Ministry of Transport

EI of PM2.5 in BMR (AIT,2019)

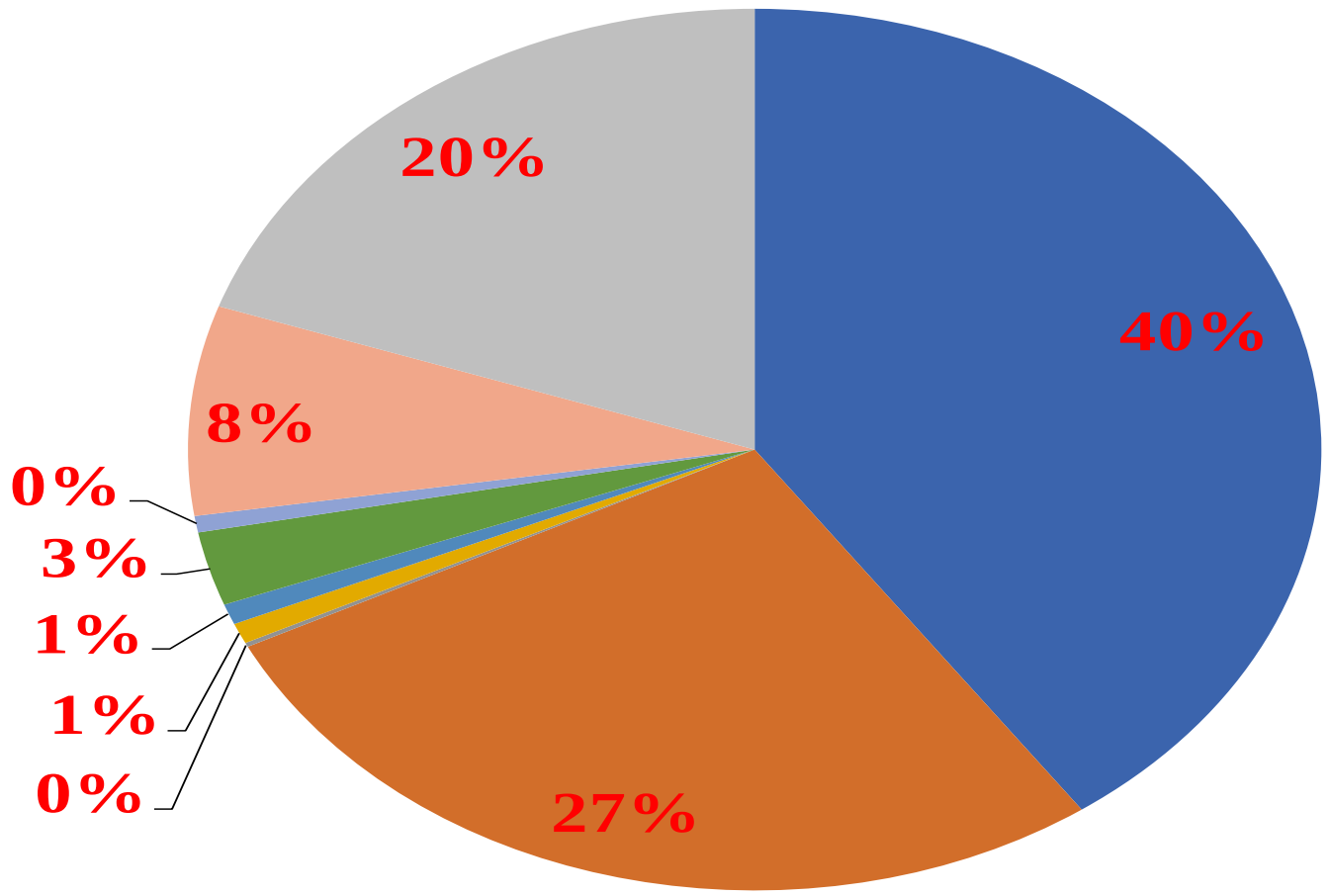


- Transportation
- Biomass burning
- Sanitary waste burning
- Engine and machine in other sectors
- Market and street food shop
- Industry
- Power Plant
- Household
- Construction
- Road dust

EI of NOx in BMR (AIT,2019)

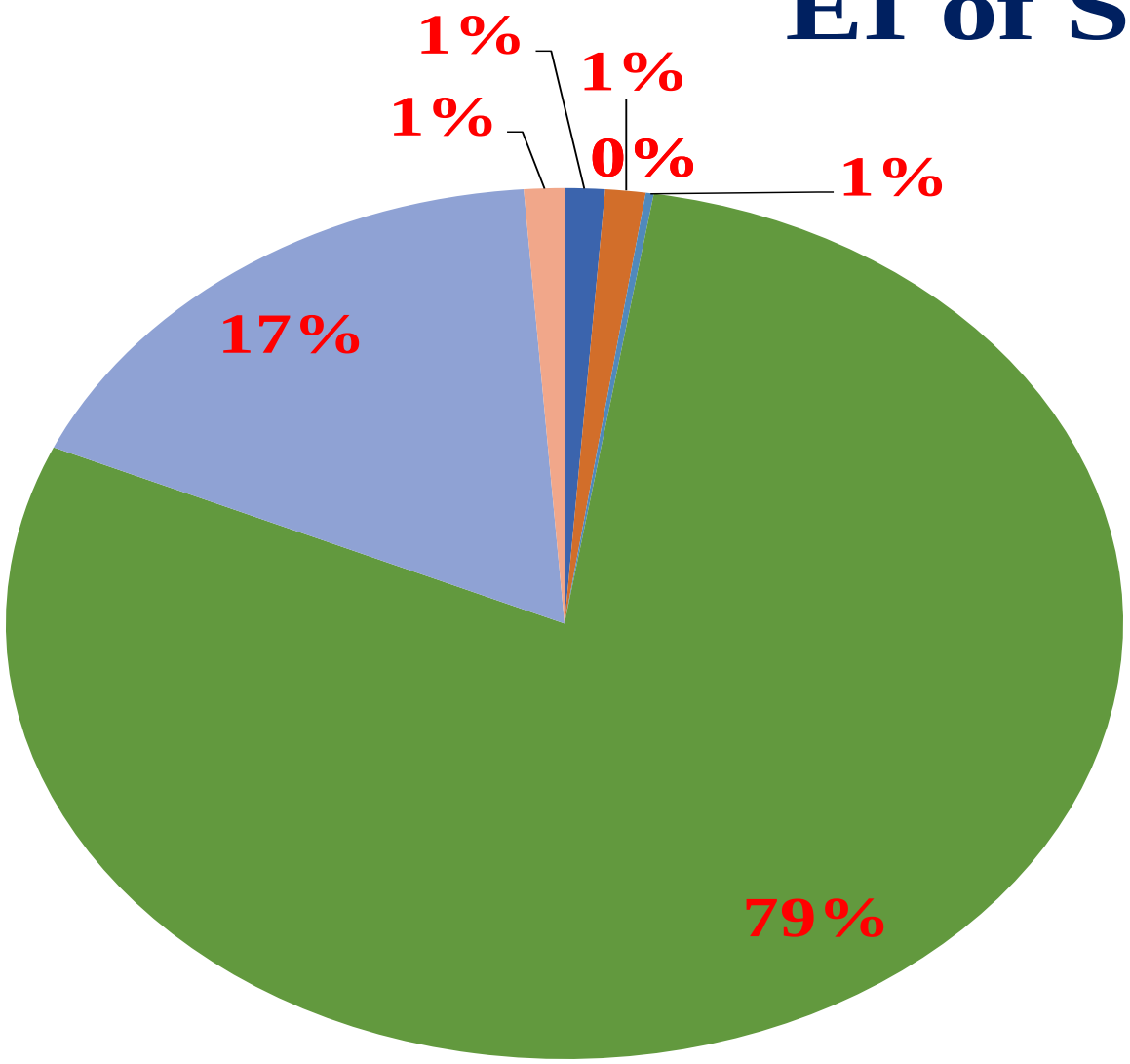


EI of NMVOC in BMR (AIT,2019)



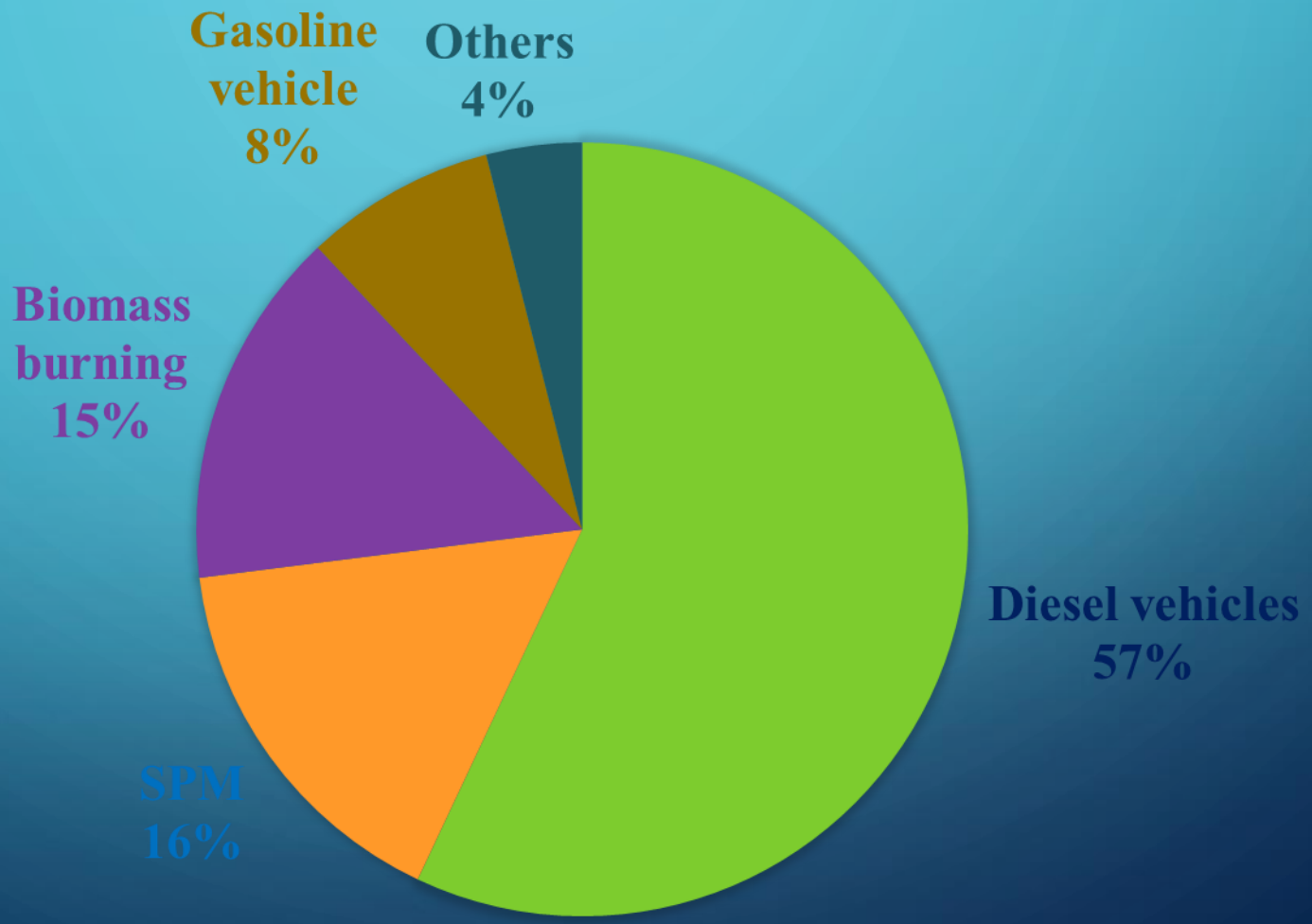
- Transportation
- Biomass burning
- Sanitary waste burning
- Engine and machine in other sectors
- Market and street food shop
- Industry
- Power Plant
- Household
- Fuel station

EI of SO2 in BMR (AIT,2019)



- Transportation
- Biomass burning
- Sanitary waste burning
- Engine and machine in other sectors
- Market and street food shop
- Industry
- Power Plant
- Household

IDENTIFY SOURCES OF PM2.5 IN BMR (PMF MODEL,2022)



$PM_{2.5}$ NATIONAL AGENDA
1 OCTOBER 2019

Prime Minister Gen Prayut Chan-o-cha said the concentrations of particulate matter smaller than 2.5 and 10 microns in diameter in most areas are beneath the national ambient air quality standards (Daily average of 50-microgram-per-cubic-meter for PM2.5), while calling on all sides of society to give active cooperation to the country's air pollution control effort (1 october,2019)

AIR POLLUTION CONTROL AND MANAGEMENT IN THAILAND

1.End of pipe control

1.1 New Motor Vehicle Emission Standards/In-used Motor Vehicle Emission Standards

1.2 Fuel quality /Clean fuel (B7,B10,B20,E10,E20)

1.3 I/M Program (Black smoke,CO/HC,Noise Level)

1.4 Promote clean vehicle technology such as EV , Hybrid, H2, LPG, CNG ect.

1.5 Retrofit Program (DPF/DOC)

2.Traffic management for traffic volume and number of vehicle reductions

2.1 Promote mass transportation system (BTS/MRT)

2.2 Improving intelligent traffic management system

2.3 Promote more non-motorized modes (Sky walks, green walkways, bicycle lanes ect.)

2.4 Establishing Low Emission Zone : LEZ

2.5 Work From Home Policy

LOW EMISSION ZONE IN BANGKOK : PHASE I (2022-2023)

Objectives

1.Establishing collaboration among various sectors in city

2.Raising public awareness regarding air pollution and climate change potential sources in city

2.Capacity building to officials from various sectors on LEZs

3.Improving air quality in city

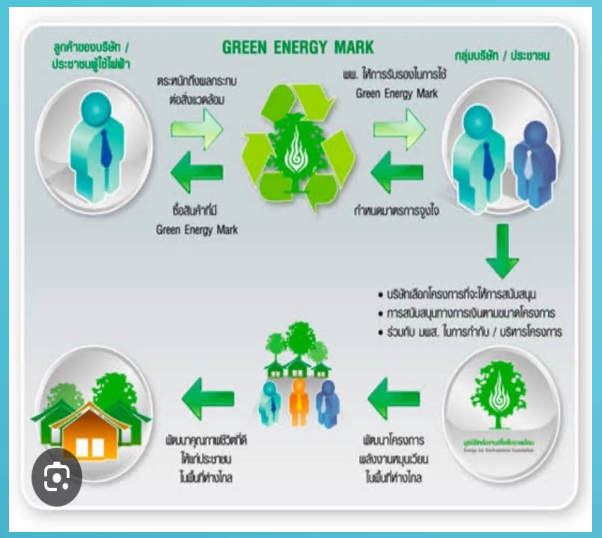
4.Reduce social impacts such as health ,economics and tourism ect.

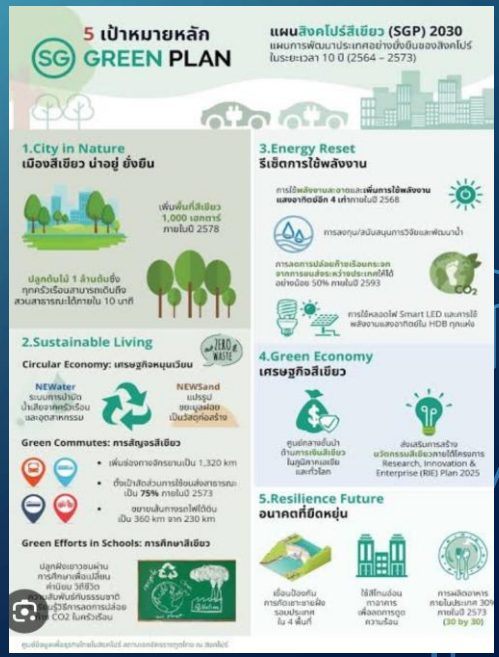
5.Linkage of Green Campaigns in city

LOW EMISSION ZONE AREA : PATHUMWAN CITY

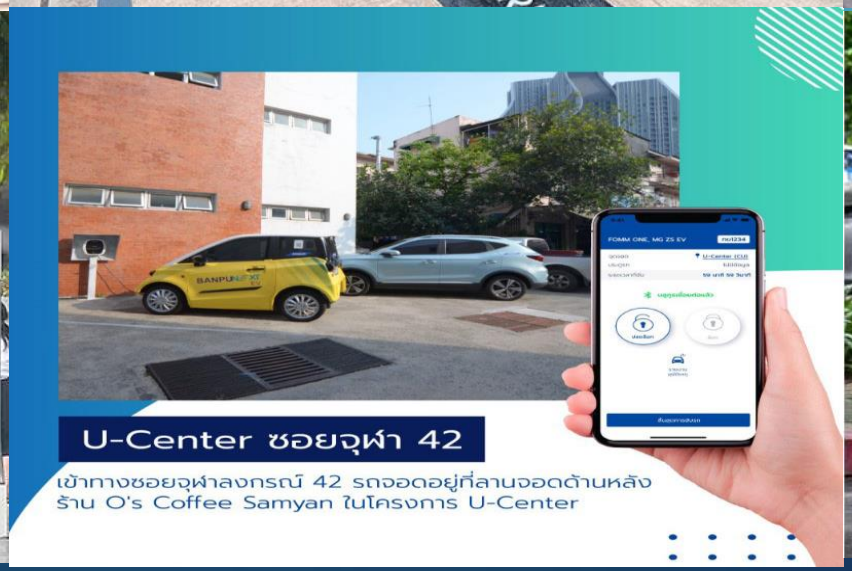
LINKAGE OF GREEN CAMPAIGNS IN CITY

EXAMPLE OF GREEN CAMPAIGNS IN CITY





INTRODUCE GREEN UNIVERSITY (CHULALONGKORN UNIVERSITY)

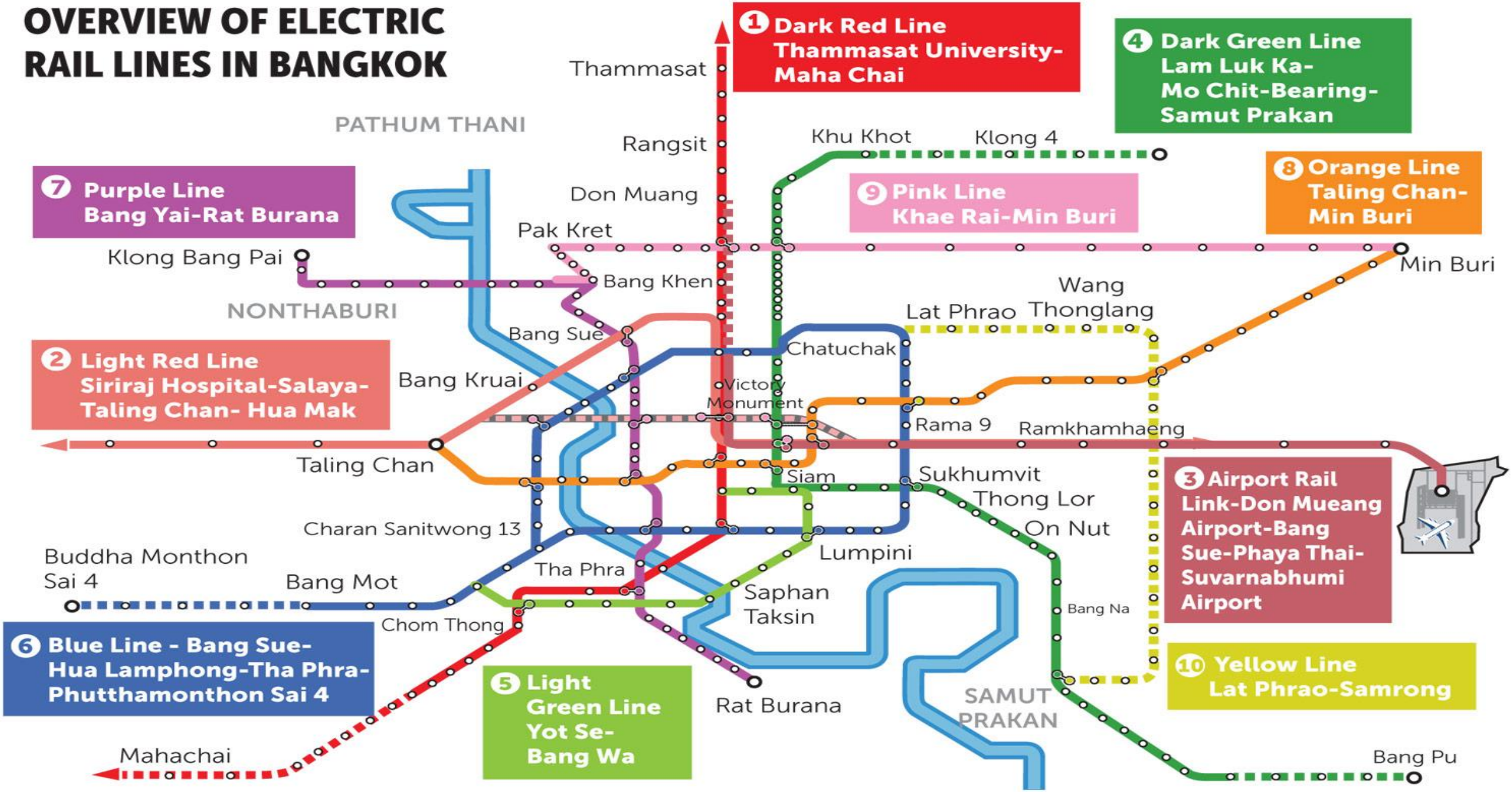


IMPROVEMENT OF MASS TRANSPORTATION SYSTEM

Minimize number of vehicles on the road

- **Expansion of Skytrainand Metro system**
- **Express way**
- **Urban planning**
- **Estimate by using traffic models**

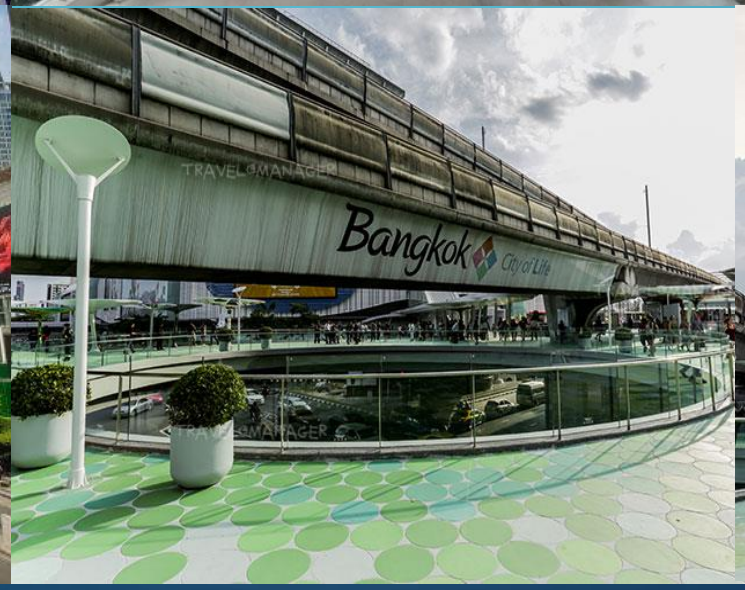
OVERVIEW OF ELECTRIC RAIL LINES IN BANGKOK



Source: Mass Rapid Transit Authority

POSTgraphics

IMPROVING SKY WALKS

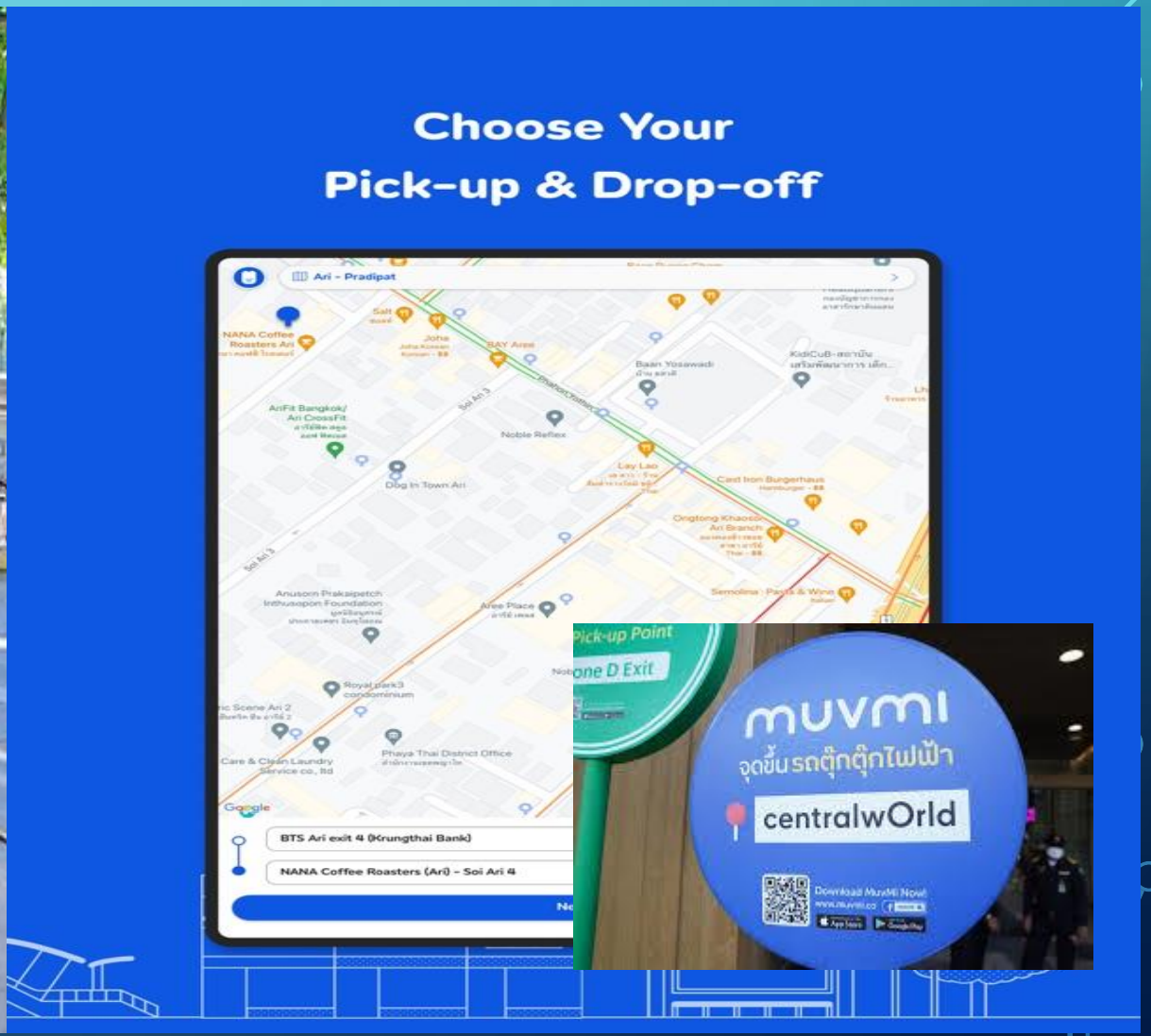


INTRODUCE ELECTRIC BUSES INSTEAD OF DIESEL BUSES

Electric Buses

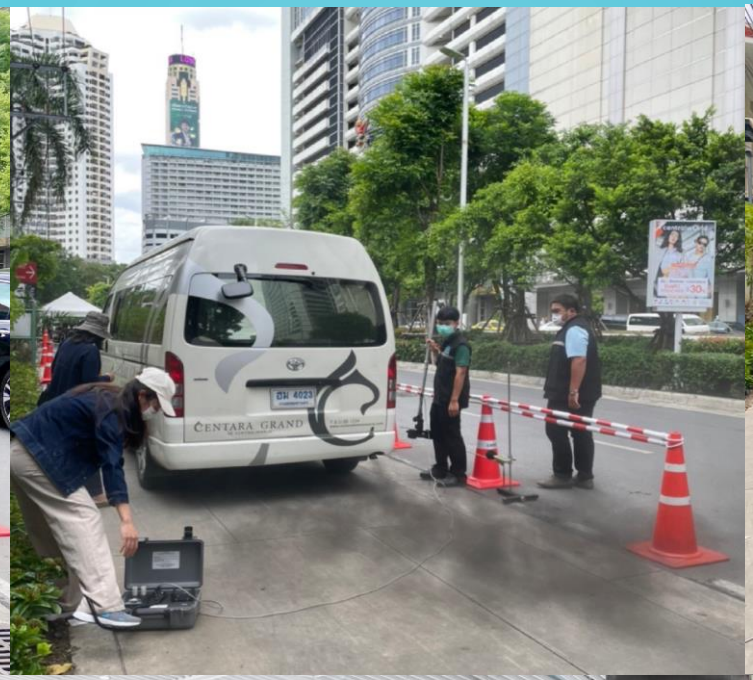
Diesel Buses

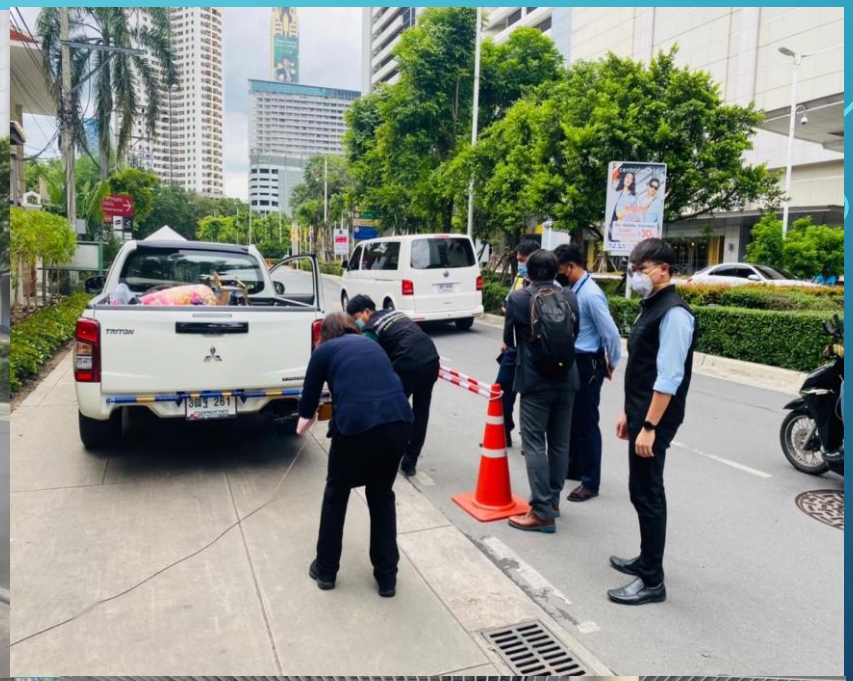
INTRODUCE ELECTRIC TUK-TUK (MUVMI)

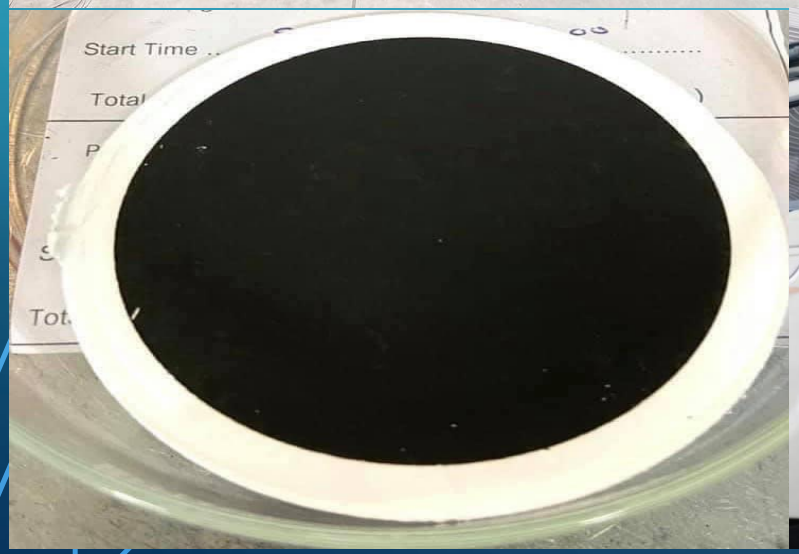


INTRODUCE BICYCLE LANES

GREEN HOTEL & SHOPPING MALLS





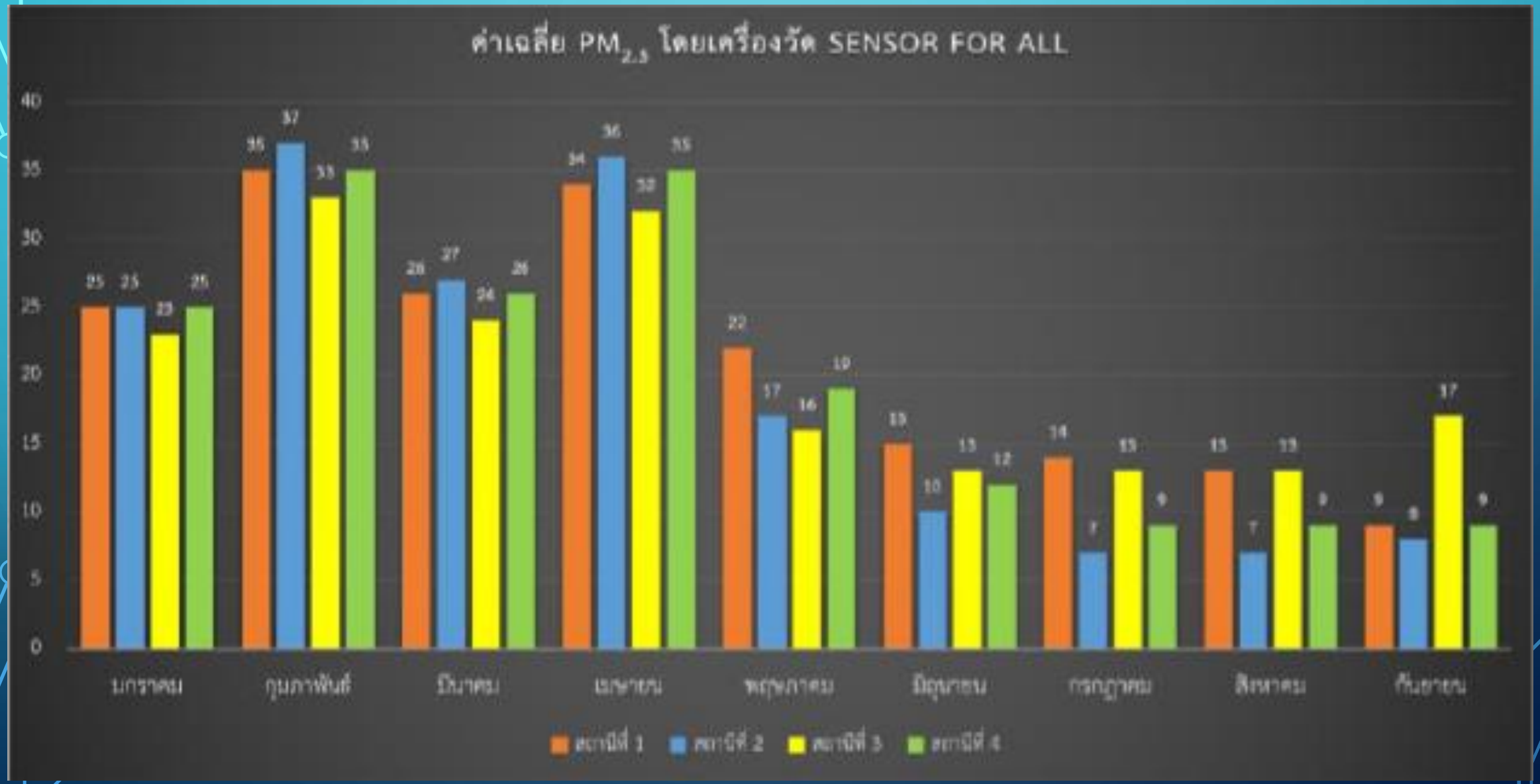


PROMOTE INSPECTION AND MAINTENANCE PROGRAM

Roadside Inspection Program

INSTALLING PM2.5 LOW COST SENSORS BY CHULALONGKORN UNIVERSITY (GREEN UNIVERSITY)

MONITORS OF PM2.5 IN 2022



ONSITE OBSERVATION AND EVALUATION

ONSITE OBSERVATION AND EVALUATION

MEETING ,EVALUATING AND REPORTING

50 ORGANIZATIONS WERE AWARDING FOR EXCELLENT GREEN ORGANIZATIONS IN 2023

LOW EMISSION ZONE IN BANGKOK : PHASE II (2024-2027)

Objectives

1.Establishing collaboration among various sectors in city

2.Raising public awareness regarding air pollution and climate change potential sources in city

3.Capacity building to officials from various sectors on LEZs

4.Improving air quality in city

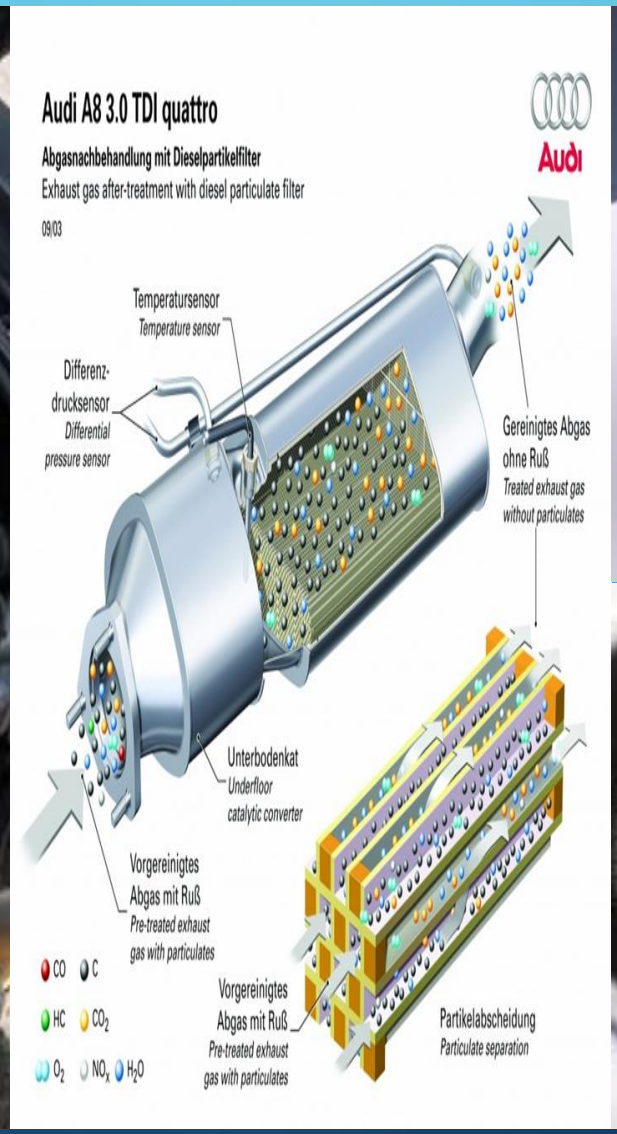
5.Reduce social impacts such as health ,economics and tourism ect.

6.Linkage of Green Campaigns in city

7.Integrating Air Pollution and Climate Change Management

LOW EMISSION ZONE AREA : BANGKOK PHASE II

INSTALLING DPF SYSTEM WITH HEAVY DIESEL VEHICLES PROJECT



PARTNERS OF THE DPF PROJECT


ELF
TELETEC
NLR


Device Status
AVL
DELL
DELL

EEFICIENCY OF DPF INSTALLING TO DIESEL VEHICLE

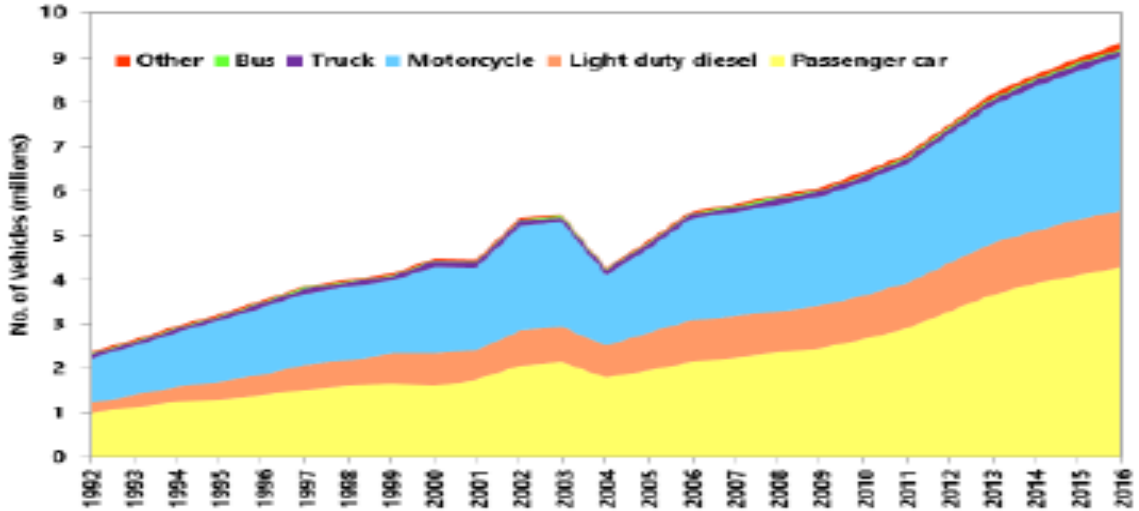
Parameters	Before installing DPF	Installing DPF	% of Reduction
Black smoke (%)	9.7	0	-100
PM (mg/km)	60.53	10.08	- 83.34
PN (Number)	1,566,518	51,277	- 96.72
CO (mg/km)	645.22	15.64	- 97.57
HC (mg/km)	186	74.95	- 59.70
NOx (mg/km)	1,260.92	1,175.67	- 6.76

Before installing DPF

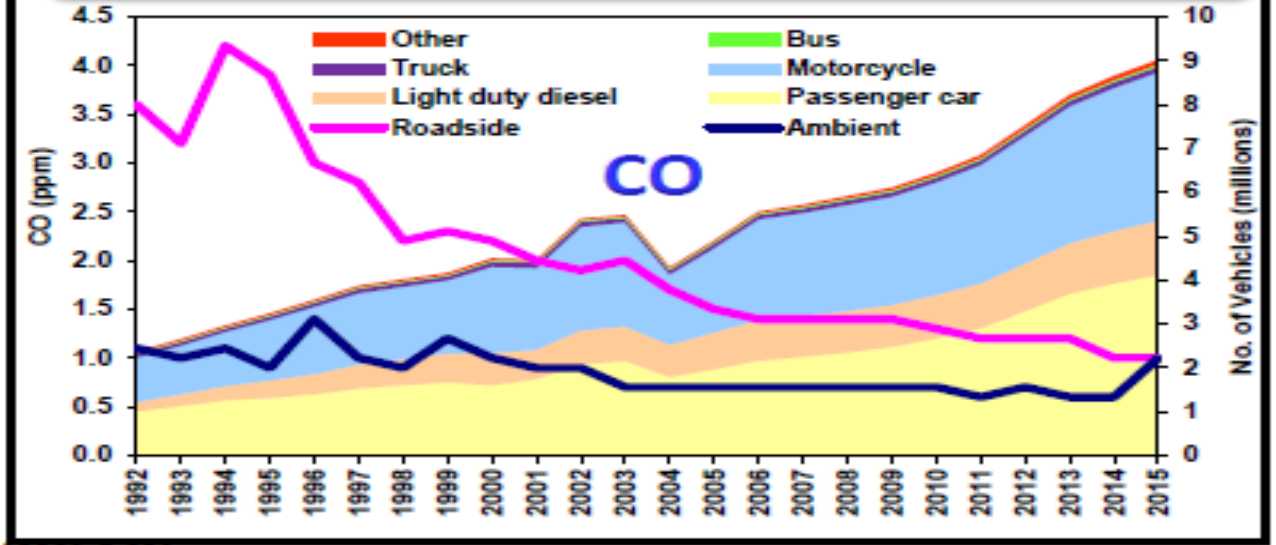
DPF Installing

Stage	Size (micron)	% Reduction
1	10	75
2	5.6	80
3	3.2	28.57
4	1.8	0
5	1	100
6	0.56	87.23
7	0.32	91.53
8	0.18	84.21
9	0.1	95.67
10	0.056	86.84

Trend of Vehicle Population in Bangkok

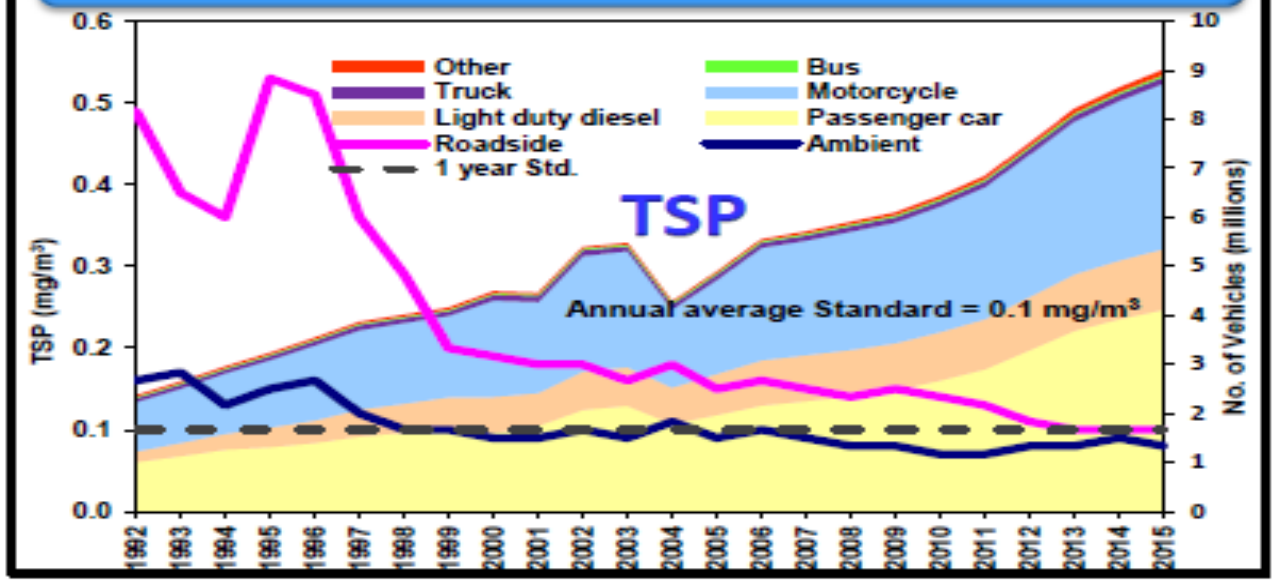


Trend of Air Quality in Bangkok

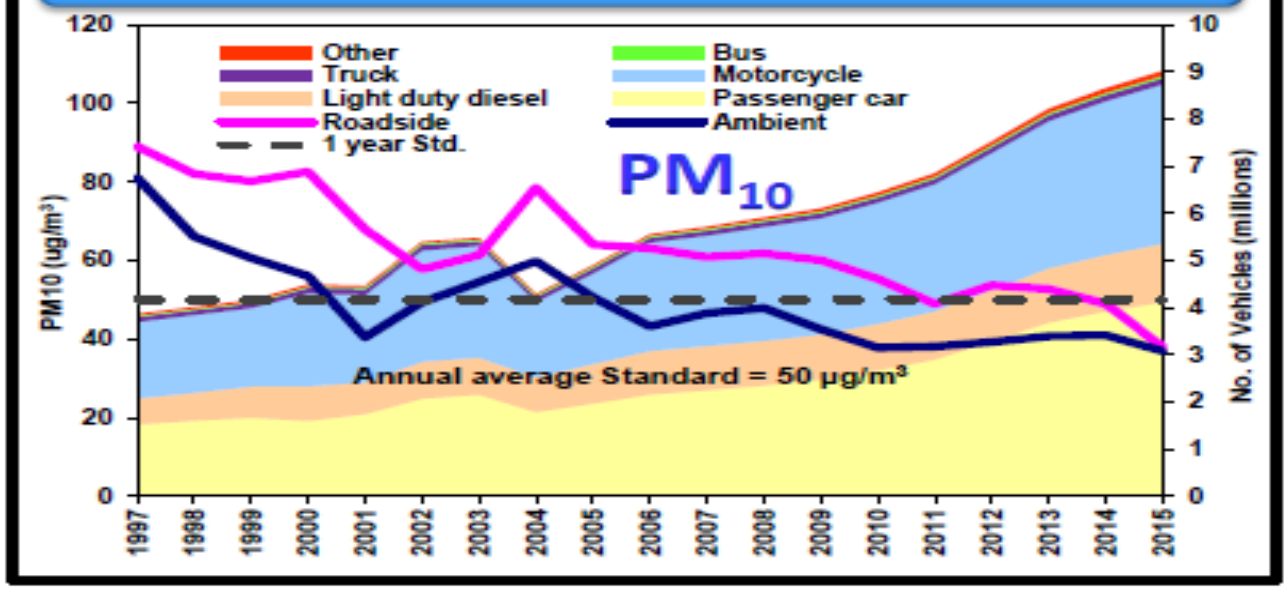


PCD (2016)

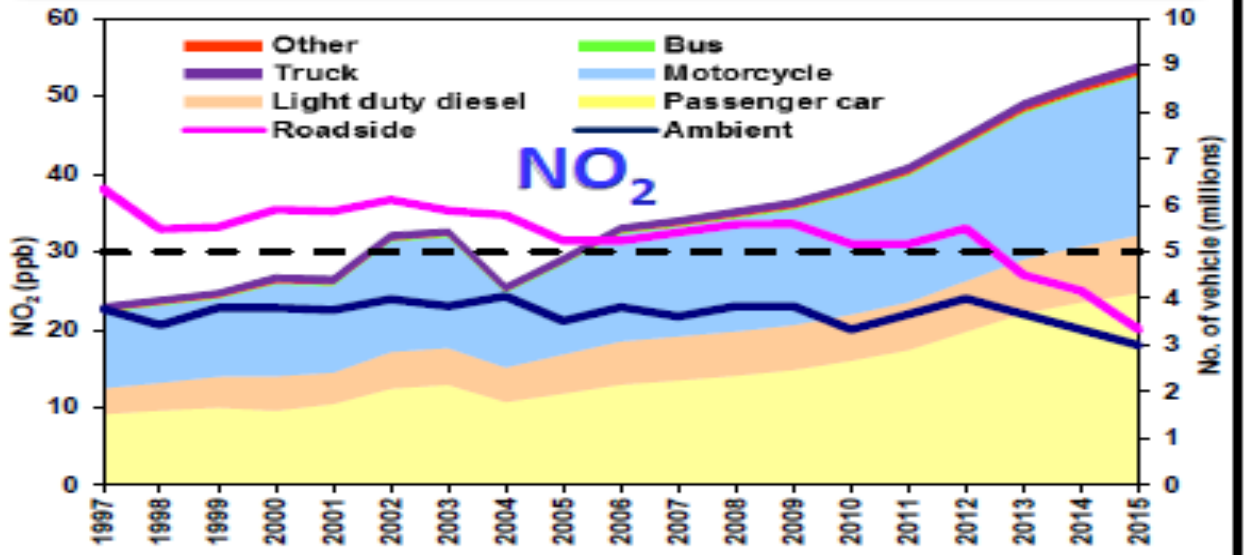
Trend of Air Quality in Bangkok



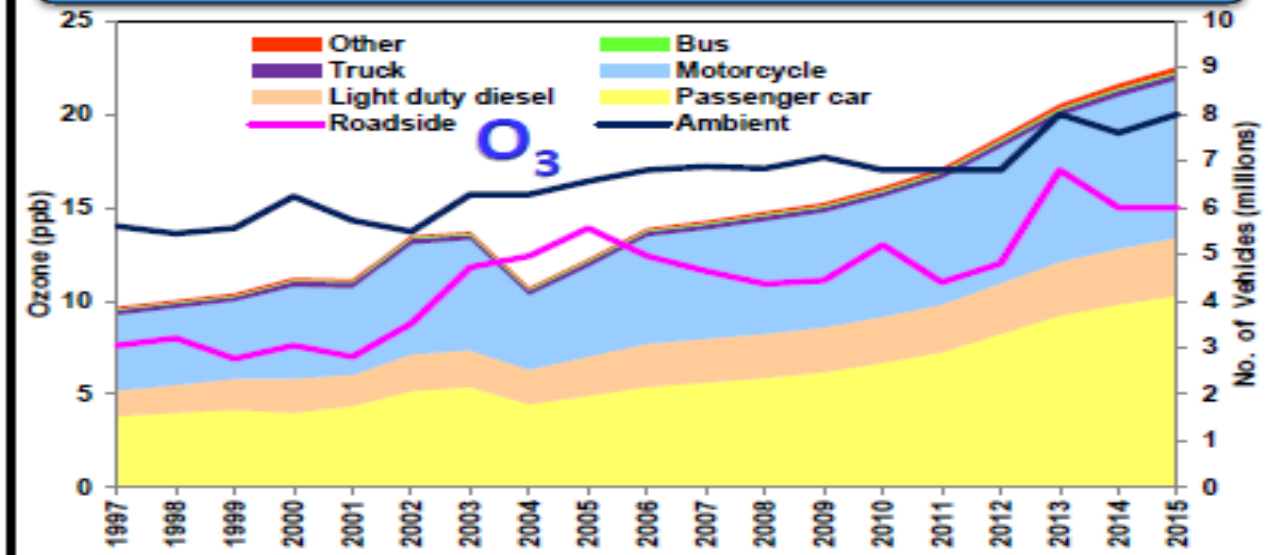
Trend of Air Quality in Bangkok



Trend of Air Quality in Bangkok

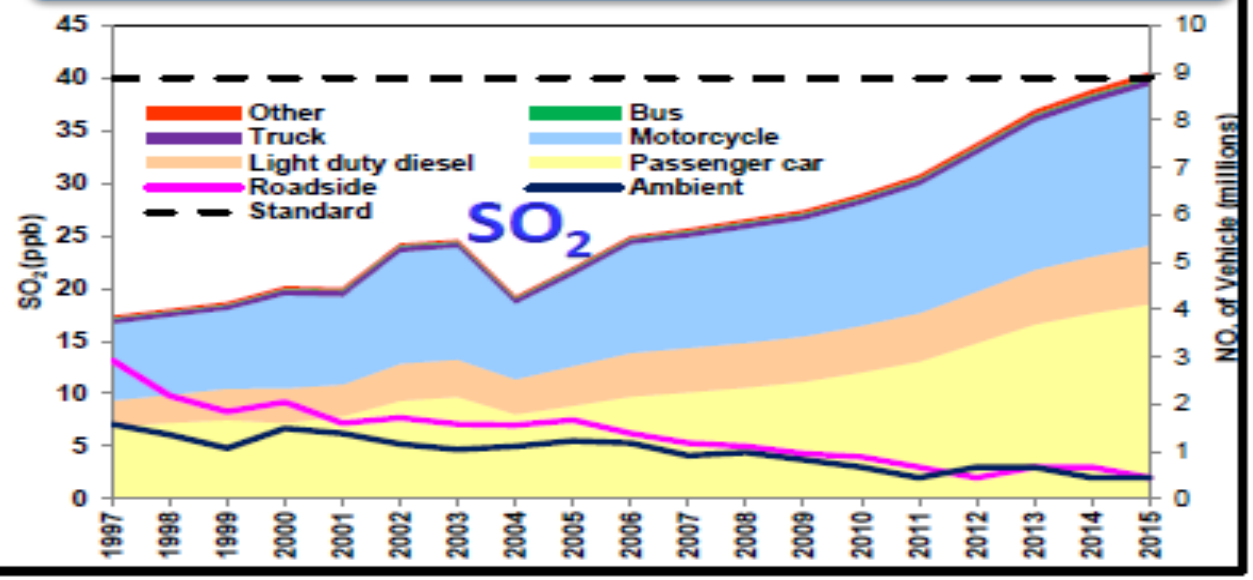


Trend of Air Quality in Bangkok

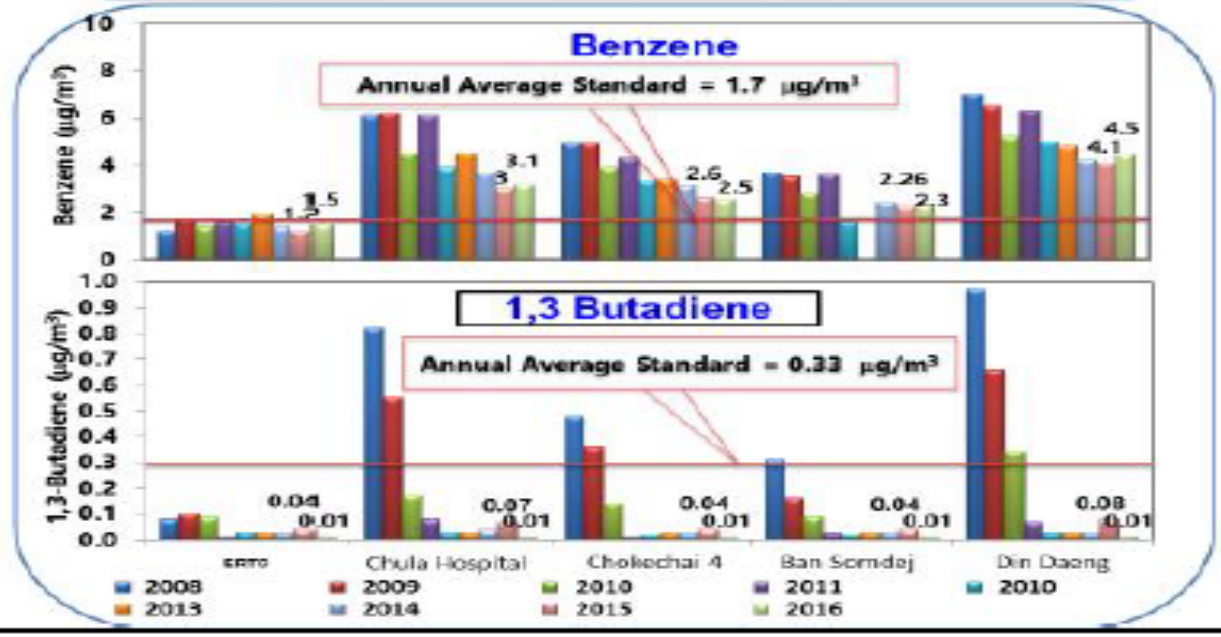


PCD (2016)

Trend of Air Quality in Bangkok



Trend of Air Toxics in Bangkok



THANK YOU FOR YOUR KIND ATTENTION

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