



# MRV of Transport Action in Indonesia

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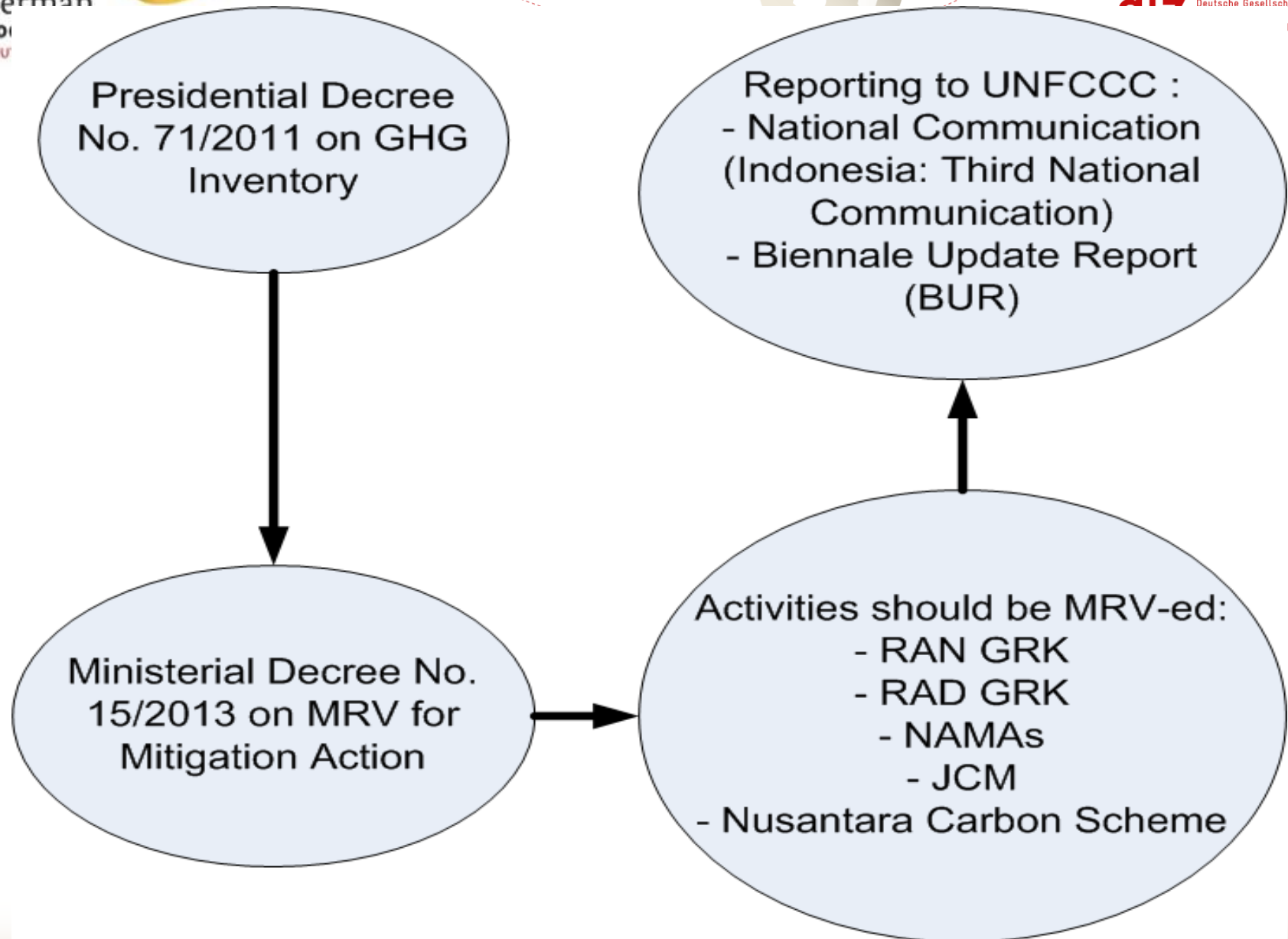
# Regulation on Climate Change in Indonesia

## Presidential Decree No.61 year 2011

- National Action Plan to Reduce GHG Emission (16 activities/project based on transport sector)
- Activities mentioned in the Action Plan to reduce GHG emission (16 activities on transport sector) claimed as Indonesia's commitment to reduce 26-41% in 2020 compare to BAU
- Mandated provincial government to issued local action plan to reduce GHG emission (33 local action plan to reduce GHG emission)
- Monitoring, Evaluation and Reporting of GHG emission reduction mentioned in the local action plan. **33 Province report to Bappenas (Ministry of National Development Planning) annually**

## Presidential Decree No.71 year 2011

- GHG Inventory. **Ministry of Environment (MoE) report to UNFCCC** on the GHG inventory every 2 years as National Communication of Republic of Indonesia
- Ministerial Decree No 15 year 2013 on MRV (Measurement, Reporting and Verification) of Mitigation Action
- Mandated every project in charged to report their GHG emission reduction from each mitigation action implemented
- **MoE report the MRV of each project to UNFCCC as Biennale Update Report (BUR)**





# Ministerial of Environment Decree No. 15 year 2013 on MRV for Mitigation Action

<p><b>Objective</b></p>	<p>Provide guidelines for Project in Charge to implement the measurement, reporting and verification (MRV) of mitigation actions to the Climate Change, so the CC mitigation actions are accurate, transparent and accountable.</p>
<p><b>Stages of MRV</b></p>	<ul style="list-style-type: none"> <li>- Measurement</li> <li>- Reporting</li> <li>- Verification</li> </ul>
<p><b>Project in charge</b></p>	<ul style="list-style-type: none"> <li>- Government</li> <li>- Non government</li> </ul>



# Ministerial of Environment Decree No. 15 year 2013 on MRV for Mitigation Action

<b>Measurement</b>	
Stages of Activity that should be measured	<ul style="list-style-type: none"> <li>- Planning</li> <li>- Implementation</li> </ul>
Result from measurement	<ul style="list-style-type: none"> <li>- <i>Baseline emission</i></li> <li>- The amount of GHG emissions reduction targets or increased of emission sinks during targeted time</li> </ul>
method to achieve emission reduction target from mitigation action to CC	Comparing the measurement's result at planning period with results during implementation

# Ministerial of Environment Decree No. 15 year 2013 on MRV for Mitigation Action

## Reporting

## Contents

- Calculation of the amount of GHG emissions in the absence of mitigation intervention (BAU).
- Determination of baseline as well as the assumptions used in the preparation of the baseline
- Methodology used to calculate emission reduction, the results of the monitoring activities based on data; including the size, location, and implementation period of the action
- Description of action taken on Climate Change Mitigation activities, including size, location, and implementation period of the action
- Statement on emission reduction target that achieved, as well as the aggregate of emission reduction
- Description of the implemented managerial system, included the name of project in charge as well as built system to monitor and collect data related to the activities of Climate Change Mitigation actions
- Obstacles and barriers



# Ministerial of Environment Decree No. 15 year 2013 on MRV for Mitigation Action

<b>Verification</b>	
<b>Objective</b>	To ensure all information in the document/report is accurate
<b>Verifier</b>	<ul style="list-style-type: none"> <li>- appointed by the Project in Charge</li> <li>- Not directly involved in the implementation of the project</li> <li>- Has a certificate of competency as a verifier on Climate Change Mitigation actions</li> <li>- The procedures and requirements to obtain a certificate of competence stipulated in a separate Ministerial Decree</li> </ul>
<b>Mechanism to submit MRV report</b>	<ul style="list-style-type: none"> <li>- Project in Charge should submit the results of the measurement, reporting, and verification to the Minister</li> <li>- Minister will assess the results of the measurement, reporting, and verification through quality checks and data accuracy of the action on Climate Change Mitigation.</li> <li>- Assessment results can be either rejection or approval, the Minister shall issue a certificate and paper to register the CC Mitigation Actions or issue a refusal</li> </ul>



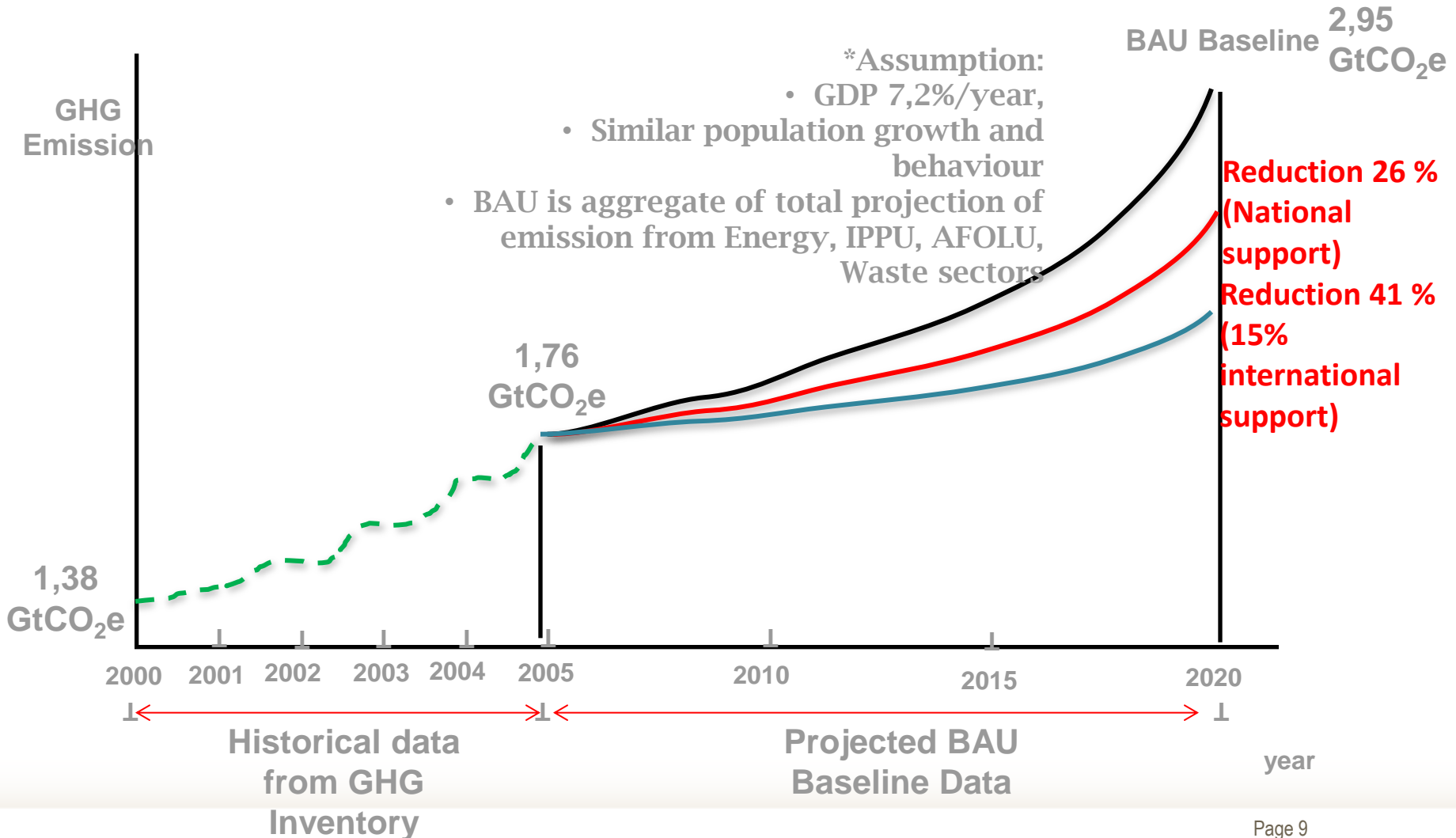
# Ministerial of Environment Decree No. 15 year 2013 on MRV for Mitigation Action

<b>National MRV Committee</b>	
Formed by	Minister of Environment
Objective	<ul style="list-style-type: none"> <li>- Assessing the results of the measurement, reporting and verification (MRV) actions on Climate Change Mitigation</li> <li>- Organizing the National Registration System action on Climate Change Mitigation</li> </ul>
Structure of Member	MRV National Commission chaired by the Deputy Minister responsible for Climate Change and consists of the first echelon officials of the ministries or agencies related
<b>National Registration System</b>	
Objective	<ul style="list-style-type: none"> <li>- information on Certified CC mitigation action, includes its target result</li> <li>- information on result of MRV of CC mitigation actions</li> </ul>





# Climate Change Mitigation (Source, MOE 2011)





# MRV for Transport Sector



## Project in charge on MRV of transport mitigation action

Activity	Project in Charge
<p>Transport Activities (16 Activities/project based) mentioned in the National Action Plan to Reduce GHG emission</p>	<p>Ministry of Transportation</p>
<p>Local Action Plan (transport activity)</p>	<p>Provincial Government</p>
<p>Joint Crediting Mechanism</p>	<p>JCM Body</p>
<p>NAMAs Sutri</p>	<p>Ministry of Transportation</p>



# National Action to Reduce GHG Emission (Presidential Decree No. 61/2011) Project In Charge: Ministry of Transportation

- ITS
- Traffic Impact Control (TIC)
- Parking Management
- Congestion Charging/ERP
- BRT/Semi BRT
- Public transport improvement
- Converter Kit
- Eco Driving
- Non Motorized Transport (Sidewalk & bikelane)
- Railway Bandung
- Double track Railway
- Electric train (railway)
- Substitution of Diesel to Electric for Electric train
- Metro (Subway)
- Railway Airport
- Monorail



# Measurable



germa  
coopera

# Existing Methodology to calculate GHG emission reduction from Transport sector

emented by



No	Activity	Existing Methodology				
		MER Bappenas	TEEMP/GEF STAP	CDM	DG Land Transport	DG Railway
1	ITS	x			X	
2	TIC	x			X	
3	Parking	x	x			
4	Congestion Charging/ERP					
5	BRT	x	x	x		
6	Public Transport Improvement	x				
7	Converter kit					
8	Eco driving	x	x		X	
9	NMT (Sidewalk & Bikelane)		x		X	
10	Railway Bandung		x			
11	Double track		x			
12	KRL (electric railway)		x			X
13	Substitution Diesel to electric Railway					
14	MRT (Metro)		x	x		
15	Railway Airport		x			
16	Monorail					



# Methodology

## (Example of Methodology of BRT in the MER Bappenas)



Year	Bus Transit System			Type of Motor Vehicle	Type of Fuel	Mode Shift (%)	Occupancy (Passenger)	Number of motor vehicle that shift to BRT (Unit)	Operation day per year (day)	Average trip per day (Trip)	Average trip length per day (Km/Trip)	Average fuel consumption per day (Liter/Km)	Fuel consumption per year (Liter)	Emission factor** (kgCO <sub>2</sub> /liter)	Emission saving from shifting PMV to BRT (tCO <sub>2</sub> e)
	Number of Bus Transit System (Unit)	Bus Capacity (Passenger)	Bus Operational per day (Rit)												
	1	2	3	4	5	6	6A	7	8	9	10	11	12	13	14
	91	86	6	Car	Gasoline	10	1.9	2,471	300	2	7.36	0.13	1,399,175	2.6	3,638
				Motorcycle	Gasoline	30	1.2	11,739		2	4.9	0.05	1,605,240	2.6	4,174
				Conventional Bus	Diesel	60	13	2,167		2	13.3	0.18	3,144,410	2.2	6,918
				Other Public Transport***											
	<b>TOTAL</b>							<b>16,378</b>							<b>14,729</b>





BRT corridor length (Km)	BRT fuel used	Fuel Efficiency (L/Km)	Bus fuel consumption (L)	kgCO <sub>2</sub> /L	Total CO <sub>2</sub> from BRT operation	Total CO <sub>2</sub> emission reduction (tCO <sub>2</sub> )
15	16	17	18	19	20	21
12.90	Diesel	<b>0.18</b>	380,344	<b>2.2</b>	837	<b>13,892</b>

**Benchmark of calculation** : Shifting passenger to BRT

**Parameter of emission calculation** =  $f$  {Number of passenger, % shifting, average trip length, Occupancy}

**Emission from BRT Operation**: BRT fuel consumption

**Existing Regulation**: Ministerial Decree No. 10/2012 on Minimum Standard of Service of Road Mass Rapid Transit

## Primary Data Required:

- Number of BRT Passenger → BRT Ticket sales/ year
- Average Trip Length → Interview survey
- %Shifting → Interview Survey
- Occupancy → Primary survey on number of passenger of each category of vehicle
- Speed → Primary Survey using each category of vehicle



# Challenge on developing methodology in Indonesia

- Lack of data (cliché)
- Not yet any standard to validate methodology and data
- Additional work to the government official (not in their performance index)
- Difficulties on communication between national government and local government (implementation in the local level)
- Lack of understanding on the concept of emission reduction, emission inventory and BAU Baseline
- Lack of understanding on what kind of data needed to do the emission calculation and how to get the data (survey and other sources of data)
- Not yet any guidelines on standardization of methodology and data for emission calculation from transport sector



# Verification

# Example Checklist developed by Ministry of Environment

## Checklist of Verification

Name of Action : TRANS JAKARTA BUSWAY  
 Description : Jakarta BRT  
 Location : DKI Jakarta  
 Project in Charge : Provincial Government of DKI Jakarta

No	Checklist of Data and explanation of Mitigation action of Government	Supporting document as Data Resources	Remarks
A	<b>Data</b>		
1	<b>Baseline</b> <input type="checkbox"/> Baseline <input type="checkbox"/> Base year <input type="checkbox"/> Baseline Indicator  <input type="checkbox"/> Projection year <input type="checkbox"/> Methodology		
2	<b>Data on activity of Mitigation action</b> <input type="checkbox"/> Activity data <input type="checkbox"/> Year		
3	<b>Emission Reduction Calculation</b> <input type="checkbox"/> Emission Reduction <input type="checkbox"/> Methodology <input checked="" type="checkbox"/> Emission factor		
4	<b>Monitoring</b> <input checked="" type="checkbox"/> Parameter to be monitored <input type="checkbox"/> Period of monitoring and reporting <input checked="" type="checkbox"/> Schedule of monitoring of each parameter <input type="checkbox"/> Monitoring instrument <input type="checkbox"/> System of monitoring data storage		
5	<b>Managerial System</b> <input checked="" type="checkbox"/> Hierarchy of project in charge <input type="checkbox"/> Name and Position		
6	<b>Financing</b> <input type="checkbox"/> Source of financing <input type="checkbox"/> Total funding for project preparation <input checked="" type="checkbox"/> Total funding for project implementation <input checked="" type="checkbox"/> Total grant accepted		



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**Energy Efficiency and Climate Change Mitigation in the Land Transport Sector in the ASEAN Region**

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**Project Overview**  
In order to move towards sustainable transport in the ASEAN region, this project aims at improving energy efficiency and thereby mitigating greenhouse gas emissions arising from land transport. This requires comprehensive strategic orientation of decision makers at the level of national, regional and local governments.  
More.

**Transport & Climate Change**  
A certain level of mobility creates benefits for economic and social development, however the current trends in the transport sector in Asia are unsustainable. Having the 2<sup>nd</sup> largest vehicle fleet in Asia just after China, ASEAN already faces serious problems including congestion, fossil fuel consumption, air pollution and road safety.  
More.

**Regional Programme**  
Cities - Environment - Transport

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**Transport and Climate Change in ASEAN**  
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Non-Profit Organization  
In order to move towards sustainable transport in the ASEAN region, our giz project aims at improving energy efficiency and mitigating GHG emissions from land transport. We are active in Thailand, Indonesia, Malaysia, The Philippines and Vietnam.

Photos Likes



**Benchmark of calculation** : Comparing fuel consumption of old vehicle and new efficient vehicle

**Parameter of emission calculation** =  $f$  {fuel consumption, number of vehicle, fuel efficiency, Vehicle Kilometer Travel (VKT), emission factor}

**Emission from public transport activity:** fuel consumption of vehicle

**Data and Survey:**

- Fuel efficiency → L/Km new vehicle and old vehicle
- Fuel Consumption → Record of fuel bought or monitoring of odometer to get the vehicle kilometer travel (VKT)
- Record of inspection and maintenance of vehicle
- VKT of public transport → rotation and length of routes

## 3. Sidewalk



**Benchmark of Calculation** : Mode share of pedestrian

**Parameter of emission calculation** =  $f$  {Mode share, PKT, emission factor}

### Data and Survey:

- Number of pedestrian → Pedestrian counting survey
- Mode share → Pedestrian interview survey

### Pre and Post Condition Survey:

- Street seller (K5) localization and relocation
- Urban design for street amenity
- Parking management
- Public transport facility improvement (bus shelter, and BRT stop)



## 3. Bike Lane



**Benchmark of Calculation:** Mode share of cyclist

**Parameter of emission calculation** =  $f$  {Average speed, mode share, average trip length, average occupancy}

**Data and survey:**

- Number of Bike trip → Bike trip counting survey
- Mode share → interview survey
- Trip length → interview survey
- Occupancy → Primary survey on number of passenger of each category of vehicle



**Benchmark of calculation:** Vehicle fuel consumption

**Parameter of emission calculation** =  $f$  {fuel consumption, number of vehicle, VKT, emission factor}

**Data and Survey:**

- Number of vehicle drove by eco driving technique → Company Data
- VKT Monitoring → Odometer monitoring survey
- Fuel Consumption → Company data
- Inspection and maintenance record
- Vehicle Emission test record



**Benchmark of calculation:** Volume to Capacity (V/C Ratio) at each intersection

**Parameter of emission calculation** =  $f$  {traffic flow, average vehicle travel time, average vehicle speed, location of segment, length of segment, number of lanes in each direction, lane capacity for vehicle and total capacity for vehicle per hour, Total vehicle volume during peak hour, emission factor}

### Data and Survey:

- Scenario of traffic flow → Transport model
- Volume of vehicle → traffic counting
- Travel time/ speed → GPS/ trial using each vehicle category
- Location/ Length of segment → Map



## 9. Railway

**Benchmark of calculation:** Number of train passenger

**Parameter emission calculation** =  $f$  {Number of passenger, % shifting, vehicle kilometer travel (VKT), occupancy}

### Data and Survey:

- Number of train passenger → ticket sales/ year
- VKT → interview survey
- %Shifting → interview survey
- Occupancy → Primary survey on number of passenger of each category of vehicle
- Speed → GPS/ trial using each vehicle category



## 7. Parking Management

**Benchmark of calculation:** parking frequency

**Parameter of emission calculation** =  $f$  {parking frequency, number of vehicle, vehicle kilometer travel (VKT), travel time, emission factor}

Data and Survey:

- Parking frequency → Ticket sales/ primary survey
- VKT → Interview survey
- Number of vehicle → traffic counting
- Travel time → GPS/ trial using each vehicle category



## 8. Traffic Impact Control

**Benchmark of calculation:** Volume to Capacity (V/C Ratio)

**Parameter of emission calculation** =  $f$  {traffic flow, average vehicle travel time, average vehicle speed, location of segment, length of segment, lane capacity for vehicle and total capacity for vehicle per hour, Total vehicle volume during peak hour, emission factor}

### Data and Survey:

- Scenario of traffic flow → Transport model
- Volume of vehicle → traffic counting
- Travel time/ speed → GPS/ trial using each vehicle category
- Location/ Length of segment → Map