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2nd Regional Workshop on Sustainable Transport Indicators

29 March, 2017

Bangkok, Thailand

Sustainable Transport Indicators on Energy Efficiency and GHG Emissions

Sudhir Gota

**ASEAN-German Technical Cooperation Project
“Energy Efficiency and Climate Change Mitigation in the Land Transport Sector”**

Overview

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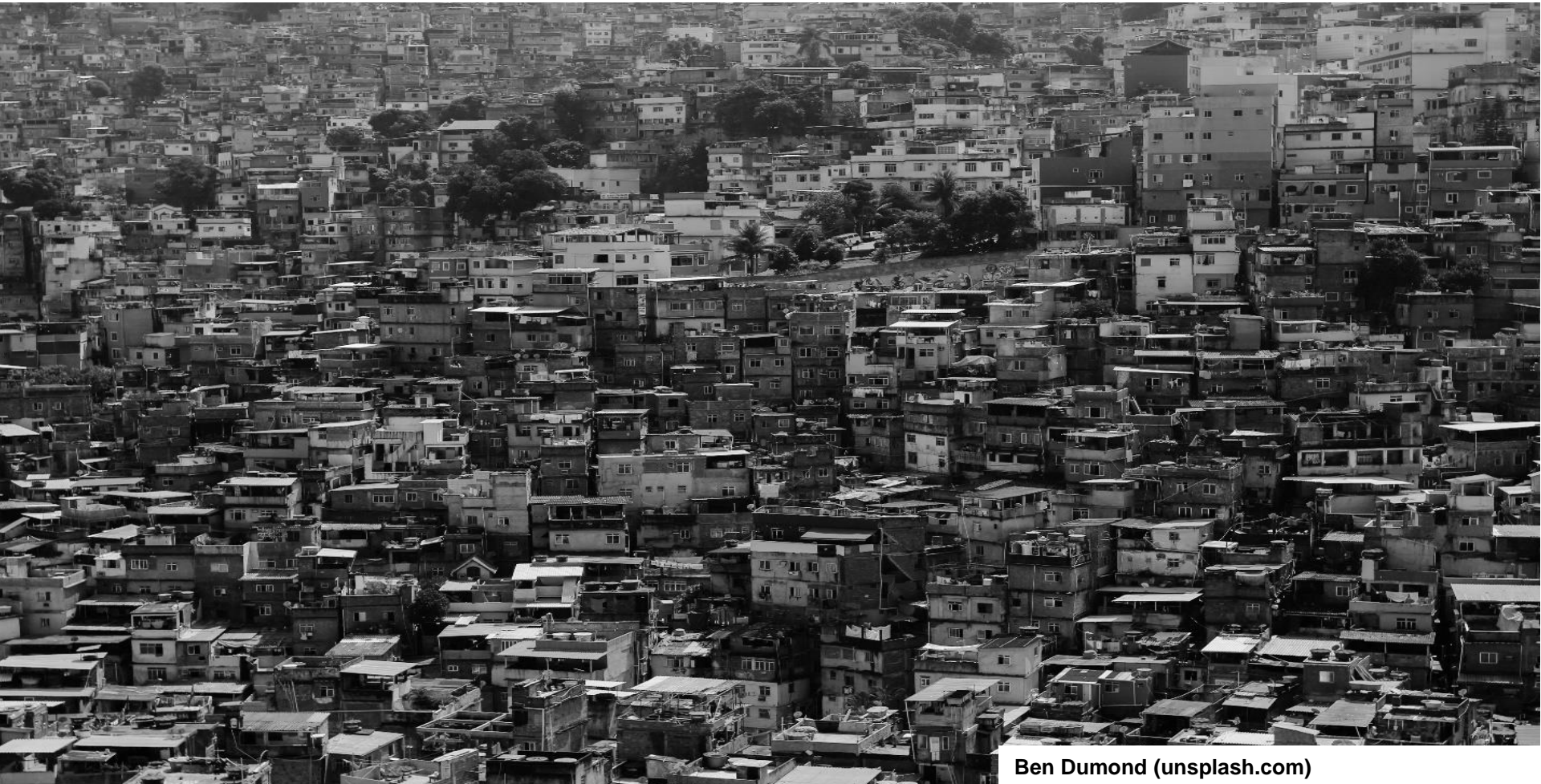
1. What “indicators” are recommended?
2. Availability of Data and Indicators?
3. Should we “wait” for the perfect storm ?
4. Guidelines and Action Plan



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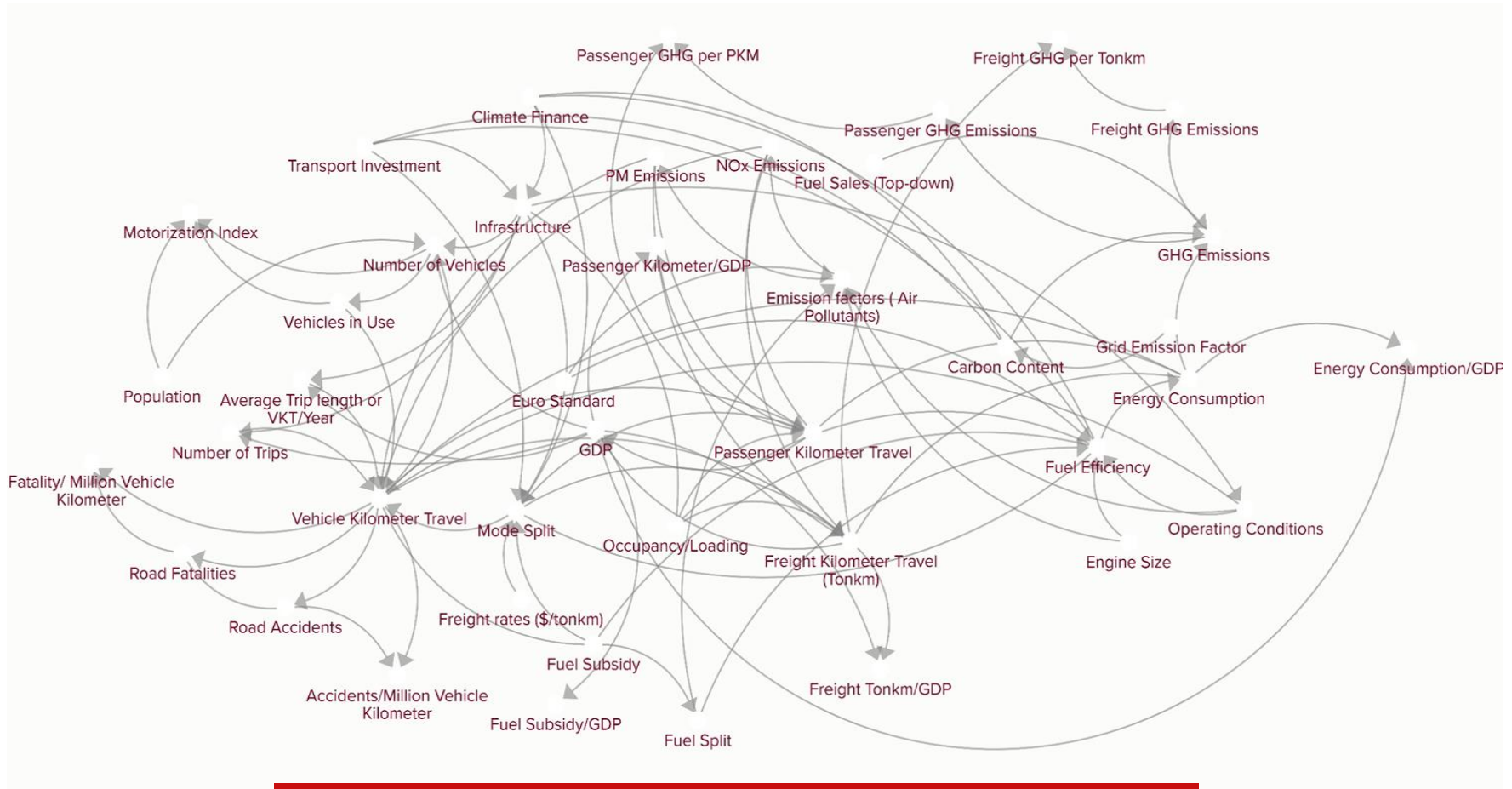
“Good data are weapons in the hands of the ones which wants to change for a more sustainable” future” - Dr. Axel Friedrich



Ben Dumond (unsplash.com)



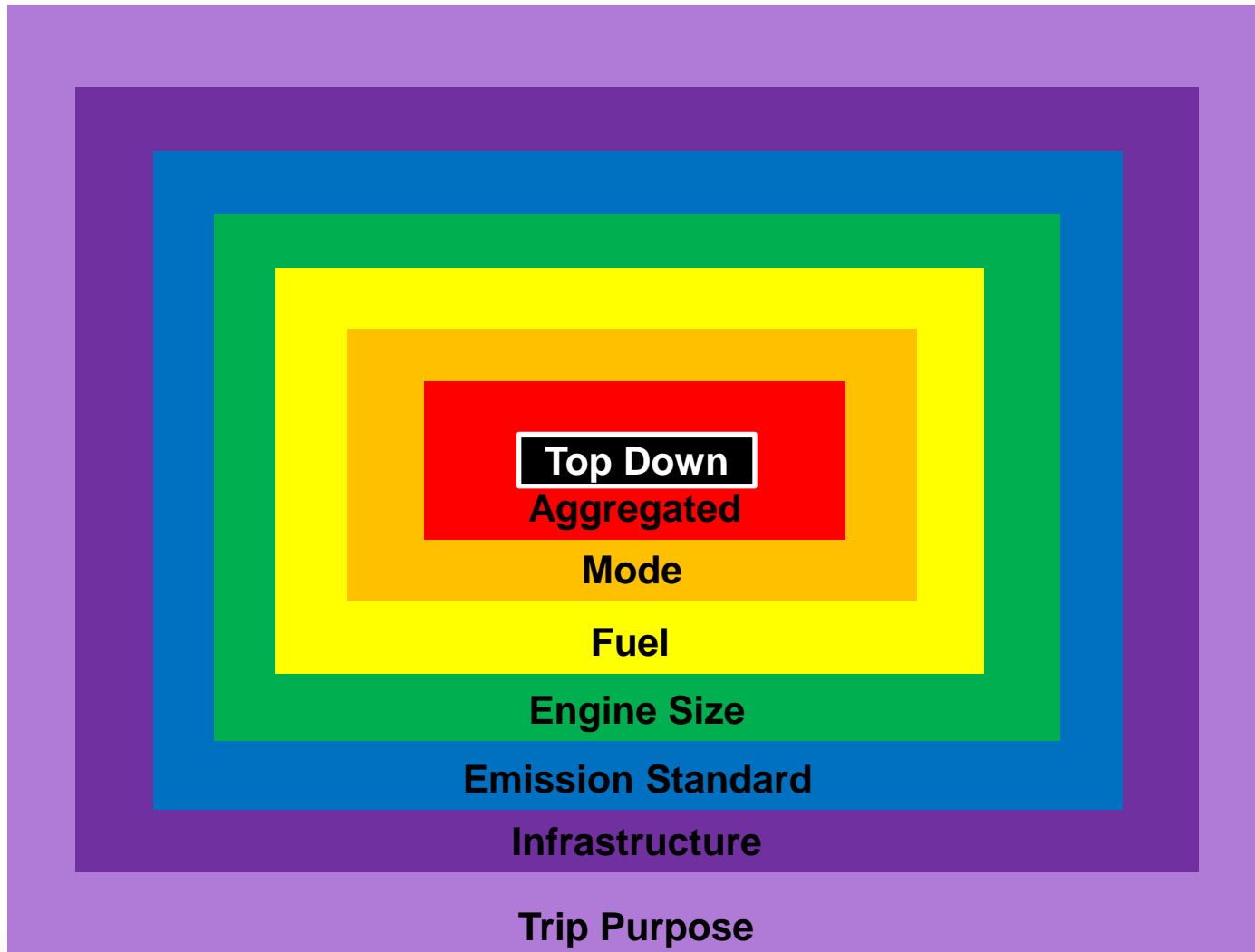
Indicators - “ASIF” + “DPSIR” Framework



Criteria based identification
Framework based selection
Consultation and review based “recommendation”



Transport GHG Data



Indicators on Energy Efficiency & GHG Emissions

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<u>Approach</u>	<u>Parameter</u>	<u>Data</u>	<u>Tier 1 (First Priority)</u>	<u>Tier 2 (Second Priority)</u>
Top Down	Energy Use	Fuel sold	Amount of Fuel sold/consumed (litre/MJ) fuel type in transport sector	
Headline Indicators	Transport Activity		Total vehicle kilometre travel (VKT) per population	
			Freight Tonkm/GDP	
			Passenger kilometre travel/GDP	
	Energy Consumption		Transport energy consumption per GDP	
	GHG Emissions		GHG emissions from transport sector segregated by modes	
			Transport GHG per capita	
			Passenger GHG per PKM	
			Freight GHG per TKM	
	Air Pollutants		PM Emissions from transport sector segregated by modes	
			NOx Emissions from transport sector segregated by modes	
	Fuel Type		Proportion of vehicle fleet by alternative fuel type	
			Share of renewable energy in total transport fuel consumption	
	Road Accident		Fatality/Million VKT	
			Accidents/Million vehiclekm	
	Motorization		Passenger and Freight Motorization Index (vehicles/1000 population)	
Freight Rates		Unit Price (\$) per Tonkm for different modes		
Fuel Subsidy		Fossil Fuel Subsidy/Unit of GDP		
Investment		Transport Investments		
		Climate Finance share in transport investments		

Indicators on Energy Efficiency & GHG Emissions

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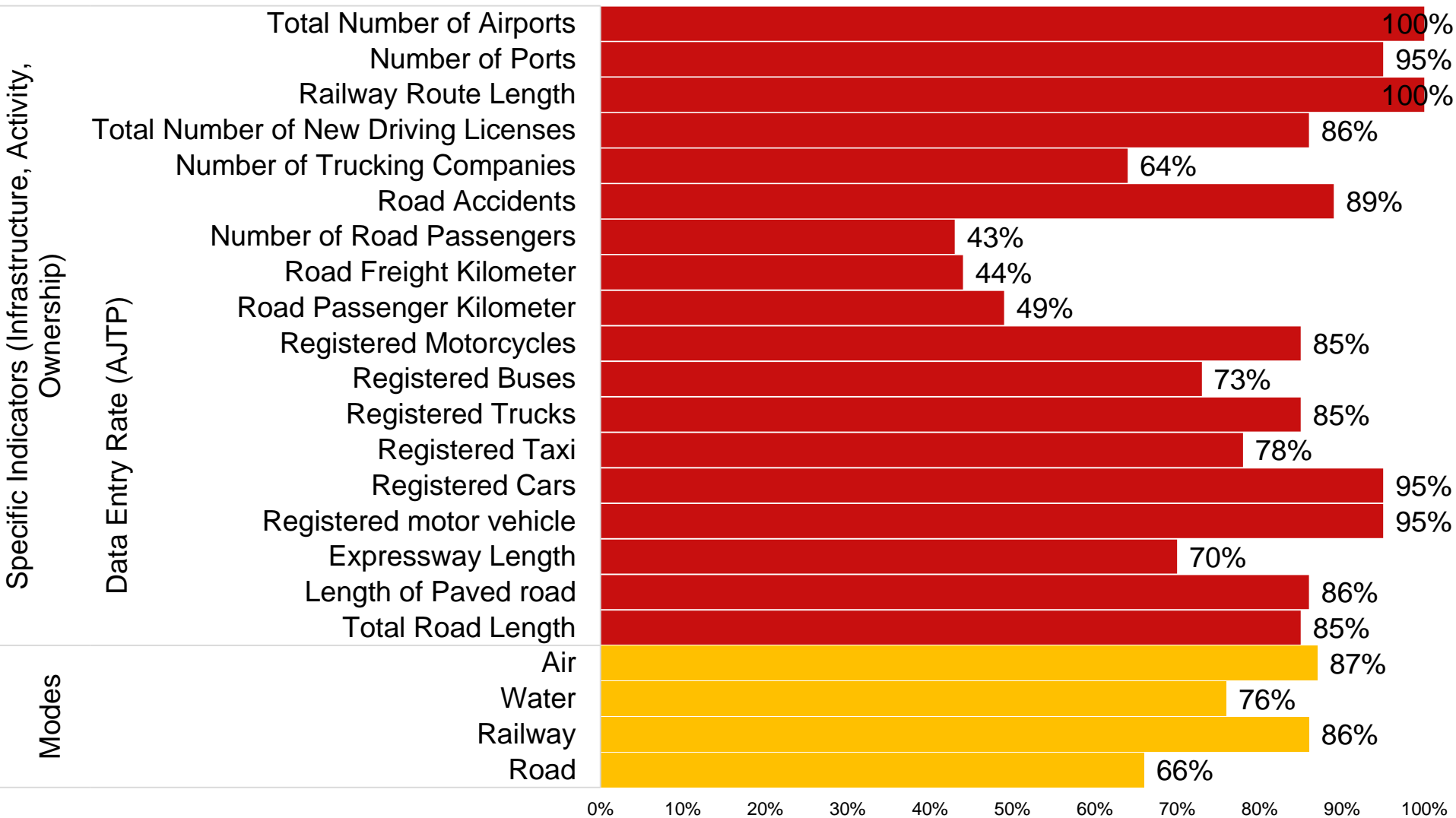
Approach	Parameter	Data	Tier 1 (First Priority)	Tier 2 (Second Priority)
Bottom-up	Travel Activity & Modal Split	Fleet	Number of vehicles by vehicle registration type & fuel type	No of Vehicle in use/mode/fuel type/by engine size/emission standard/operating conditions
		Distance Travelled	Vehicle kilometre by vehicle type (in vkt) (mode & fuel)	Vehicle Kilometre/mode/fuel type/by engine size/emission standard/operating conditions
			Passenger Kilometre (pkm) (mode & fuel)	Passenger Kilometre/mode/fuel type/by engine size/emission standard/operating conditions
			Ton Kilometre (tkm) (mode & Fuel)	Ton Kilometre/mode/fuel type/by engine size/emission standard/operating conditions
		Trips	Total Number of Trips/Mode/Fuel type	Total Number of Trips/mode/fuel type/by engine size/emission standard/operating conditions
		Load Factor	Average Occupancy (No of persons/Vehicle) (by mode & fuel type)	Average Occupancy (No of persons/Vehicle)/mode/fuel type/by engine size/emission standard/age/operating conditions/geographical area
	Average Loading (Tons/Vehicle) (by mode & fuel type)		Average Loading (Tons/Vehicle)/mode/fuel type/by engine size/ emission standard/age/operating conditions/geographical area	
	Fuel Intensity	Fuel Efficiency	Fuel Efficiency (kmpl or L/100km or MJ/km) (by mode & fuel type)	Fuel Efficiency (kmpl or L/100km or MJ/km)/mode/fuel type/by engine size/ emission standard/age/operating conditions/geographical area
		Speed	Speed by mode/fuel type	Speed by mode/fuel type/by engine size/ emission standard/age/infrastructure type/geographical area
	Emission factor		Emission factors for air pollutants in g/KM per vehicle/fuel type	Emission factors for air pollutants in Kg/KM per vehicle/fuel type/technology type
Normalizing factors for Intensity		Population	No of inhabitants	
		Economic Development	GDP/Capita or GDP	
		Infrastructure	Km of infrastructure	

Data Availability - AJTP Example



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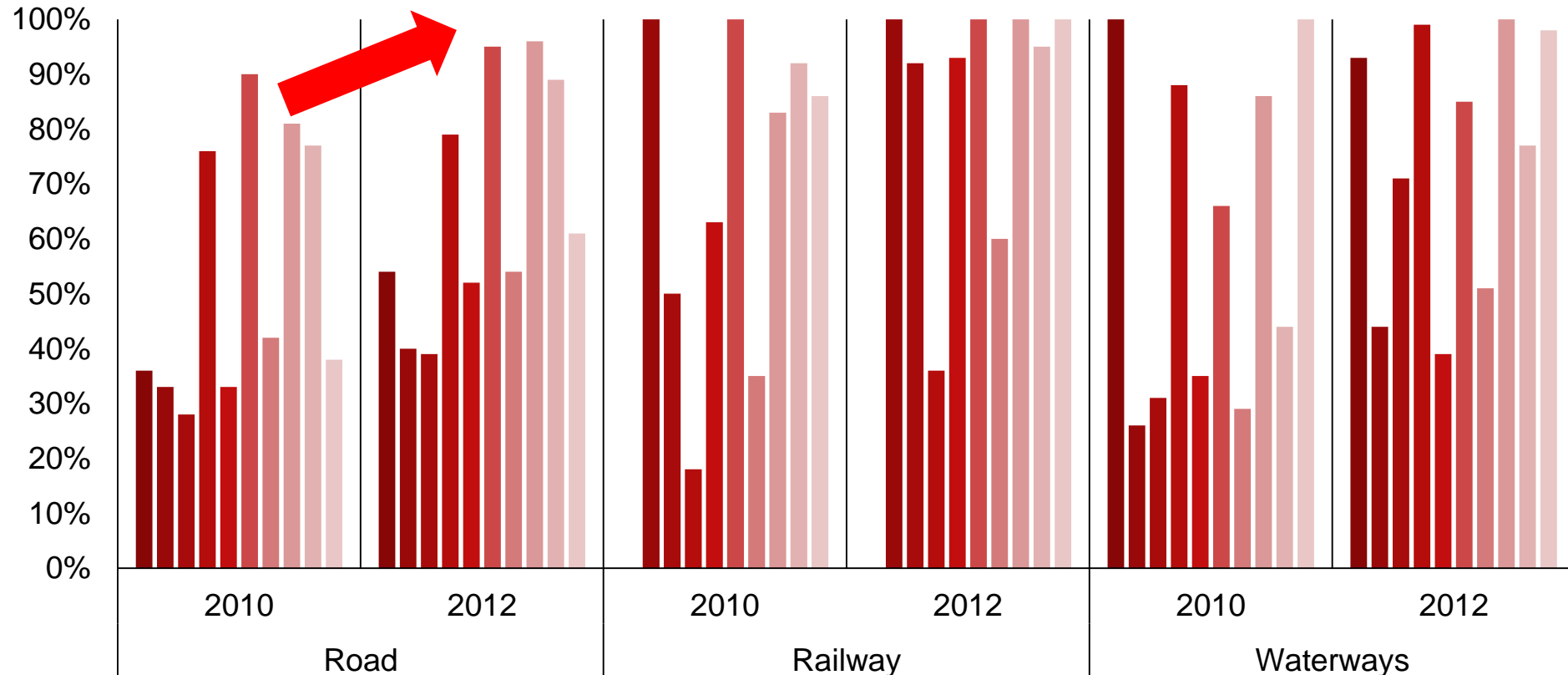
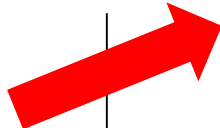




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Data Availability - AJTP Example



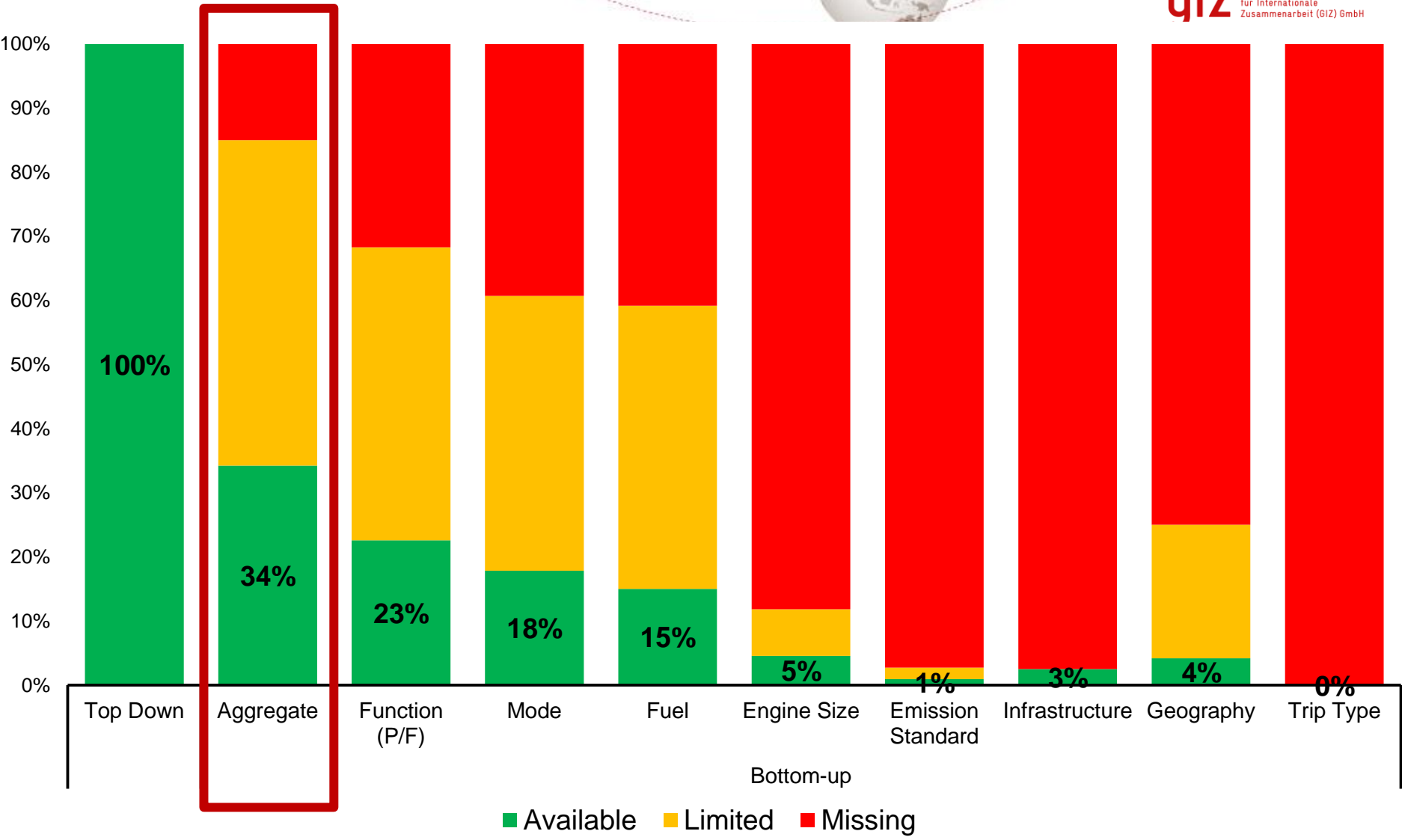
- Brunei Darussalam
- Cambodia
- Indonesia
- Lao PDR
- Malaysia
- Myanmar
- Philippines
- Singapore

ASEAN Transport GHG Data & Indicators



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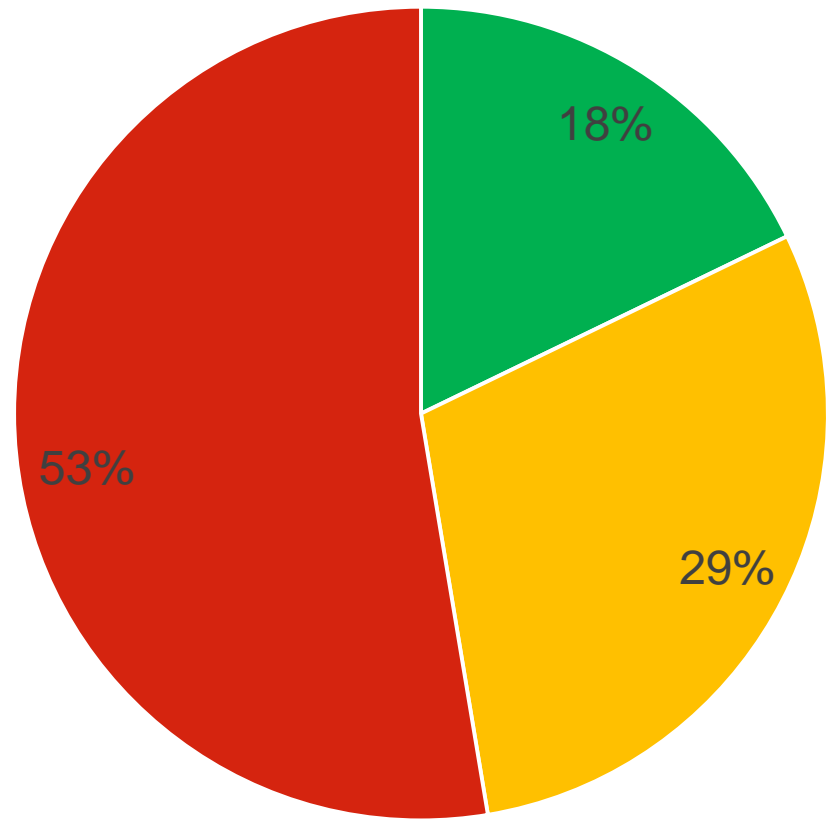
ASEAN Transport GHG Data & Indicators



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ASEAN (transport GHG data)



■ Available ■ Limited ■ Missing

“Not just statistical reporting of indicators BUT comprehensive analysis and focus reports”



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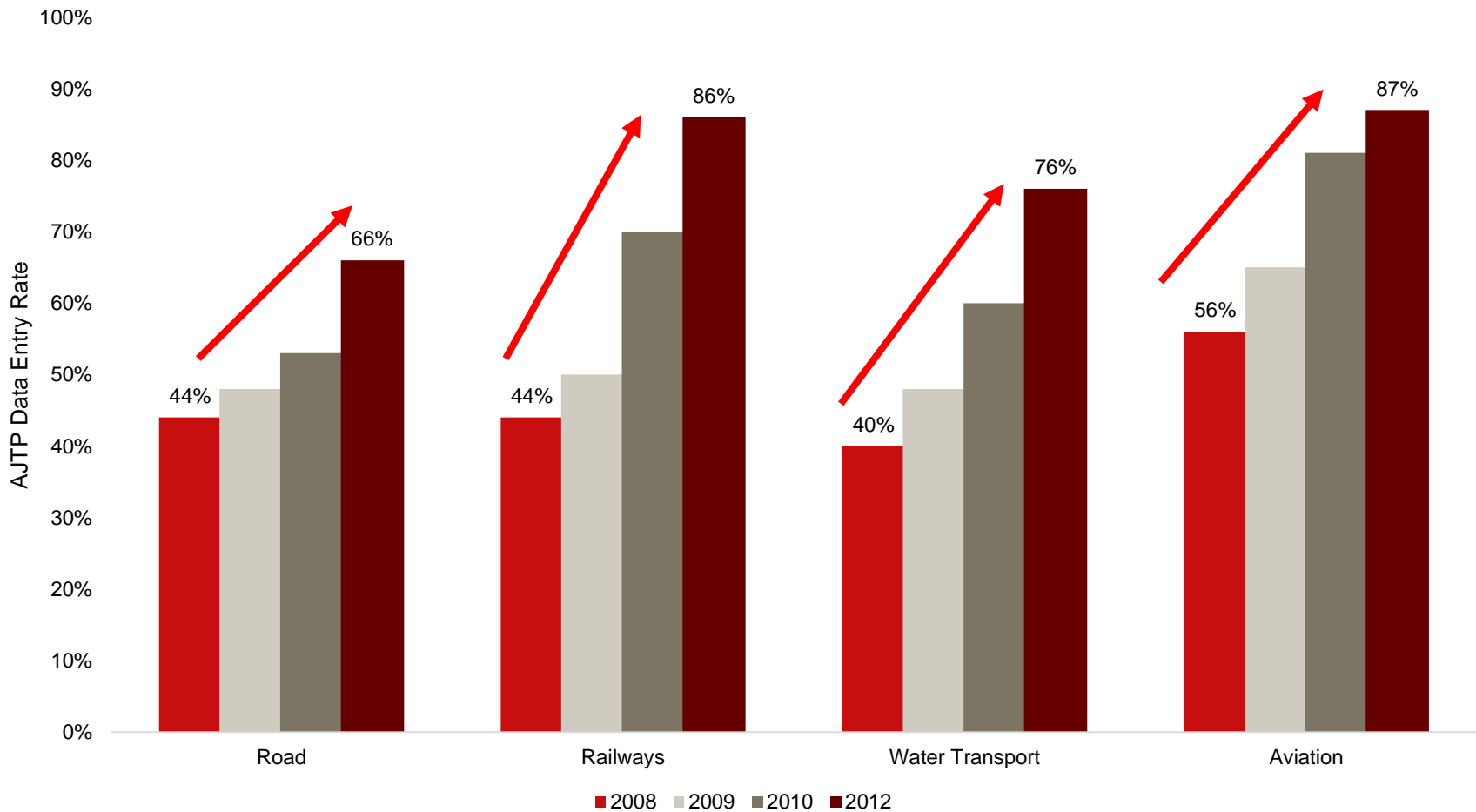
Should we “wait” for the perfect data ?



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Data Availability - AJTP Example



ASEAN-Japan Transport Information Platform Project



SSATP Transport Indicator initiative

- **2003, Africa**
- **Establish harmonized indicators**
- **Improve capacity**
- **Link to MDG's**
- **Led by World Bank**
- **6 High level and 60+ Secondary indicators**
- **Local consultants**
- **By 2006, 15 countries data collection**
- **Significant data gaps, poor quality of data, & institutional challenge**
- **End of the first cycle – Issues – consultants, capacity, reduced set of indicators**
- **Need for additional funding for data production**
- **ONLY four countries picked up the initiative locally**



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Example – Northern Corridor Data Observatory

The screenshot shows the homepage of the Northern Corridor Transport Observatory. At the top left is the logo with the text "NORTHERN CORRIDOR TRANSPORT OBSERVATORY" and "RELIABLE PERFORMANCE DATA". To the right are links for "Login", "English", and "French", along with flags for Nigeria, Kenya, and Tanzania. Below the header is a navigation bar with a "Home" button and a search icon. The main content area features four large buttons: "Dashboard" (green), "Indicators" (red), "GIS" (blue), and "Documents" (grey). To the right of these buttons is a text box titled "Northern Corridor Transport Observatory" containing a description of the monitoring tool. At the bottom, there is a "Stakeholders" section with a "view all" link and logos for Ogaferm.net, Rift Valley Railways, RRA, and rda.gov.nw.

NCTTCA transport observatory system

- Staff
- Capacity
- Infrastructure (hardware/software)
- Surveys
- Coordination
- 350,000 \$/Year
- 30+ Indicators
- Provides data for Country GHG policies
- Provides data for shippers and carriers



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EEA Report | No 34/2016

TERM Indicators Initiative

Core Indicators

- TERM 01: Transport final energy consumption by mode
- TERM 02: Transport emissions of greenhouse gases
- TERM 03: Transport emissions of air pollutants
- TERM 04: Exceedances of air quality objectives due to traffic
- TERM 05: Exposure to, and annoyance by, traffic noise
- TERM 12a/b: Passenger transport volume and modal split**
- TERM 13a/b: Freight transport volume and modal split
- TERM 20: Real change in transport prices by mode
- TERM 21: Fuel tax rates
- TERM 27: Energy efficiency and specific CO2 emissions
- TERM 31: Share of renewable energy in the transport sector
- TERM 34: Proportion of vehicle fleet by alternative fuel type.

Supporting Indicators = 29

After 15 years of assessment, "The importance of monitoring and the definition of targets against which progress can be measured has increasingly been recognised, as well as the role of proper ex-post evaluation of policies"

Transitions towards a more sustainable mobility system

TERM 2016: Transport indicators tracking progress towards environmental targets in Europe

ISSN 1977-8449

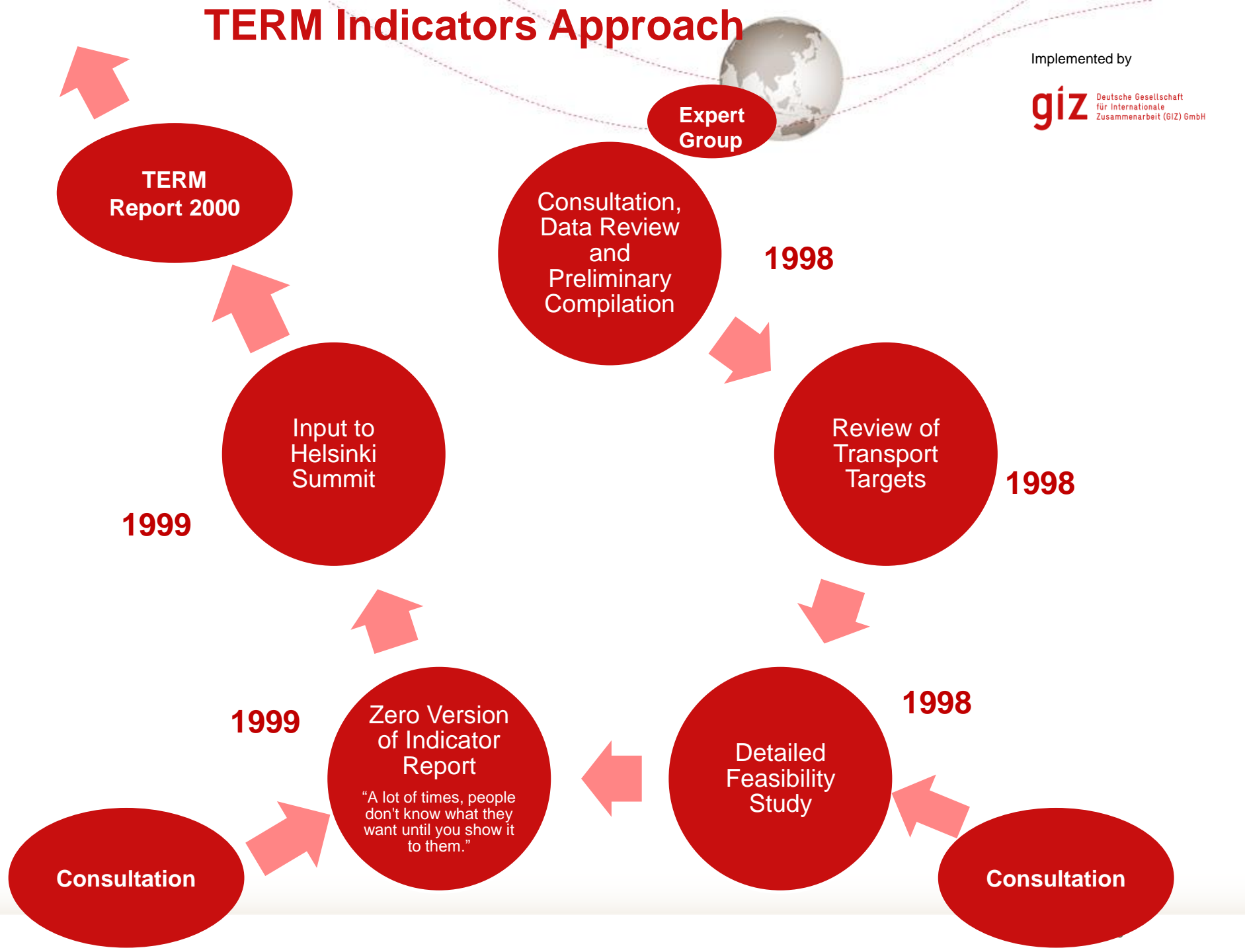


TERM Indicators Approach



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Third TERM Indicator Report (2002)

Indicators	Quality of Data	Source
Transport final energy consumption	Medium to High	Eurostat
Transport GHG emissions by mode	Medium to High	ETC/ACC
Transport emissions of air pollutants	Medium	ETC/ACC
Population exposed to exceedances of EU air quality standards	Low to Medium	ETC/ACC
% of population exposed to and annoyed by traffic noise	NA to Low	EEA
Fragmentation of ecosystems and habitats	Medium	ETC/TE
Proximity of transport infrastructure to areas	Medium	ETC/TE
Land take by transport infrastructure by mode	Low	ETC/TE
Number of transport accidents and fatalities	High	Eurostat
Passenger transport by Mode and purpose	Low to Medium	Eurostat / UNECE
Freight transport by Mode and purpose	Medium	Eurostat / UNECE
Access to transport services	NA to Low	Various
Average passenger journey time and length/mode	NA to Low	Various
Capacity of transport infrastructure by mode and type of infrastructure	Medium	Eurostat / UNECE
Investments in transport infrastructure/capita/mode	Medium	Eurostat
Real change in passenger transport price/ mode	NA to Medium	Eurostat
Fuel prices and taxes	Low to High	Eurostat / IEA
Total amount of external costs by mode	NA to Low	INFRAS/ ECMT
Subsidies	NA	Various
Expenditure on personal mobility/ person / income	NA to Low	Eurostat
Energy efficiency/ passenger-km & Tonkm/mode	NA to Medium	ODYSSEE
Emissions per passenger-km and Tonkm by mode	NA to Medium	ETC/ACC
Occupancy rates of passenger vehicles	NA to Low	Eurostat
Load factors for freight transport	NA to Low	Eurostat
Uptake of cleaner fuels	Low to High	Eurostat
Numbers of alternative-fuelled vehicles	Low to High	Eurostat
Size of the vehicle fleet	High	Various
Average age of the vehicle fleet	Low to Medium	Eurostat / REC
% vehicle fleet meeting Noise & air standards	Low	Eurostat / REC



Suggestions

1. Don't wait for the “perfect data” or the “perfect storm”
2. Use “Staircase” approach to indicators
3. Not just statistical compendium but **comprehensive analysis and focus reports using data from different sources**



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Thank you!



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