PARALLEL
SESSIONS

Parallel Session 2E (16 August 2016. Tuesday)
Seminar Room 3. Block B12 – Level 3. Faculty of Built Environment
Theme: Rural Governance

Time	Papers
11:00	**Sustainable Community-Based Tourism: Assessing The Relationship Between Leadership, Government Support, Commitment and Community Participation** Aziz Amin, Yendo Afgani, Hawa Husna, Ahmad Puad Mat Som, Mohd Shaladdin Muda
11:15	**Solutions Process of Customary Land Ownership Dispute: A Case Study of Pango Village, Efate Island, Vanuatu** Daniel Tabi, Somsak Srisontisuk
11:30	**Fiscal Decentralization, Government Quality and Inequality in Peninsular Malaysia** Khalid Zanudin, Ibrahim Ngah
11:45	**Factors on The Growth And Development Of Bandar Gelang Patah Small Town: An Overview** Mohamad Hussaini Harun, Hamid Saad & Gobi Krishna Sinniah
12:00	**Rural Water Supply and Sanitation in Nigeria: A case of local empowerment and environmental management project (LEEMP) in Adamawa State** Aminu Liman, Ibrahim Ngah
12:15	**Factors Analysis of Household Poverty in Rural Area of West Kalimantan, Indonesia** Susilo Nur Aji Cokro Darsono, Mongkon Donkwa
12:30	**The Dynamics of Rural-Urban Transformation: Towards an Accountable Village Governance: Case Study of Tunjungtirto Village, East Java, Indonesia** Yunie Nurhayati Rahmat, Cecilia Luttrell
12:45	**The Challenge of Rural-Urban Development in the Shape of Sustainable Land Transportation in Indonesia** Judiantono, Tonny
13:00	Lunch / Break

THE CHALLENGE OF RURAL-URBAN DEVELOPMENT
IN THE SHAPE OF SUSTAINABLE LAND TRANSPORTATION
IN INDONESIA

Tonny Judiantono
Urban dan Regional Planning Programe, Faculty of Enginering, Bandung Islamic University
Jl. Tamansari 1 Bandung 40116

E-mail: tjudiantono@yahoo.com

Abstract

Sustainable development issues especially on sustainable transportation has become global issues. It push every countries to point toward their responsibility, appropriate with their problems and local needs.

The measuring of sustainable land transportation indicator in the future, will cover economic, social, environment, technical operation and institutional dimension.

Inline with this developing global issues, the urban development in Indonesia, which often analogism with the succesfull on increasing economic indicator, has to attent the indicator of that land sustainable transportation and their challenges on implementation.

The measurement result of gas emission from transportation at 5 cities in the blue sky programe at 2011 for Surabaya, Medan, Samarinda, Makasar and Batam, indicate tend to increase in HC emission (55%), Nox (36%), and CO (49%), comparing with the data at 1992 and 2000.

Base on the causal multi regression analysis on that gas emission measurement result, indicate significan relation with sustainable land transportation indicator, especially for Ind(1) Transportation volume relative to GNP, Ind(17) Fair Quality of road pavement, Ind(18) Total Road length (each mode) and Ind (19) Road density (Km/Km2). Cross analysis result on any transportation policies in the rural-urban development give indicate that future challenge to shape sustainable land transportation is needed special attention on the institutional dimension, social and technical operation especially in human resources development.

Key words: Rural-Urban Development, Economic Indicators, Land Transportation, Sustainable Land Transportation indicators.

Area of interest:
1. Transportation Planning
2. Environmental Science
3. Rural-Urban development

THE CHALLENGE OF RURAL-URBAN DEVELOPMENT IN THE SHAPE OF SUSTAINABLE LAND TRANSPORTATION IN INDONESIA

I. INTRODUCTION

1.1 Background

Regional development in Indonesia, often analogized with economic growth, which push to increase of transportation demand. The growth of vehycle ammount increase very fantastic, but it is imbalance with the growth of transportation infrastructure at city or district level area, even at province, and national level. That all problems can not untight from the unplanned transportation planning as comprehensive and continuing plan at the past. The transportation problems wll not become worst if since the early the government at the national level or local level would be apply *sustainable transport system.*

Center for Sustainable Development (1997) has define the sustainable transportation system as a system who deserve access to the individual basic needs or abroad people in save way and consistent tighten relationship with people health and the sustainabillity of the ecosystem, and judge to the people, for now and the future. Reach to Finance, efficient in operation, preparing alternate modal choice and supporting economic growth at all condition.

The concept of sustainable transport has implemented in policy form. That policy obiter are improving on regional accessibility, improving on transportation productivity, improving on efficiency of transportation activity, improving on capacity of transportation institution, improving on transportation safety, and managing on negative transportation externalities to the environment. So sustainable transportation has to attend *global sustainability,* which consist of three important components, that are: 1) Accessibility: force by transportation network planning and diversity of transport mode with high level integration among each other; 2) Equality: force by transportation services which reach for any level of people, transport with high supporting to the competttive health business, and spatial uses distribution and using infrastructure judgeable and transparent in any policy decission; 3) Environmental impact: begin by force reduction on negative impact by using friendly environment of energy, using transport mode with minimize polution and planning on safety priority.

So that, in order to realize sustainable transport has to analyst and special seriously attention to the environment side, social and economic. Economic indicator is the indicator aim to people welfare, commonly in relation with wage increasing, welfare, employee, productivity and social welfare. Economic indicator in the reach of transportation sustainabillity as a comprehensive economic action in relationship with others indicator in the reach of transportation sustainabillity. The role of economic indicator in sustainable transportation is very big so it become special attention in the reach of sustainable transportation, but the heavier attention of regional development more force to economic, and did not accompanied with the social and environment will causes obstructed the development of sustatinable transport which is become "world trending topic now". Considering this condition, it is need to study the threat of regional development in Indonesia in the shape of sustainable land transportation.

1.2 Objectives

The objectives of this activities are:
1. To capture the economic, social and environment condition an area, in relationship head to sustainable land transportation.
2. Analyzing to get a comprehensive base relationship ammong sustainable land transportation indicators for that area.
3. Giveing a propose economic, social and environment policy alternatives to realize a sustainable land transportation for this area;

1.3 Beneficiary

Benefiaciary of this study is:
1. An early identifikation sample of economic, social and environment problem at the area to realize sustainable land transportation;
2. Capturing an early policy of economic, social and environment at the area from the transportaion view to realize sustainable land transportation;
3. Denote an early step to create a national policy to realize sustainable land transportation.

II. METHODOLOGY

2.1 Approach of the study

This study will be complished by deductive approach, that is partial analysis to the phenomena of the economic, social, environment and land transportation indicators at Surabaya, Medan, Samarinda, Makasar and Batam area, get valid conclusion and then generalized the effectuation.

Variables measured appropriate with economic, social, environment and land transportation indicators which commonly uses by national and international, so it will be easier to undertand as indicators relate to the sustainable land transportation. This steps work completion can be seen at **Figure 2.1**.

2.2 Data collecting and analysis

To support this study, need to collect an ammount of data, as well primary data and secondary data. The data and data source can be seen at appendix 1.

Base on data has collected, then compile the measuring variables of economic for sustainable transportation. Analysis that compilation result to analize the relationship of Economic indicators in the exertion of the sustainable land transportation.

The models of analysis will be used in this study is simple regression and multiple regression, and correlation test, continued by analysis and sintesys by quantitative and qualitative model on the relationship between variable indicators economic for sustainable transportation, and fhen can be make conclusion:
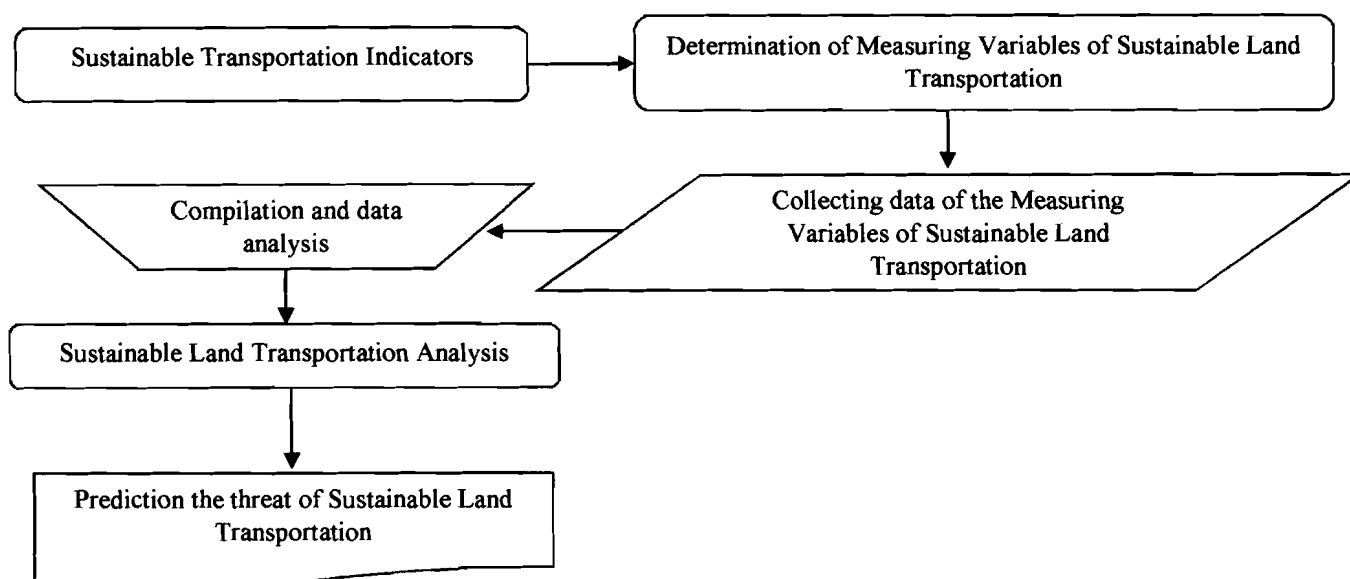
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┌─────────────────────────────┐      ┌─────────────────────────────────────────┐
│ Sustainable Transportation  │─────▶│ Determination of Measuring Variables of   │
│ Indicators                  │      │ Sustainable Land Transportation           │
└─────────────────────────────┘      └─────────────────────────────────────────┘
                                                         │
                                                         ▼
┌──────────────────────────┐       ┌───────────────────────────────────────────┐
│  Compilation and data    │◀──────│  Collecting data of the Measuring          │
│  analysis                │       │  Variables of Sustainable Land             │
└──────────────────────────┘       │  Transportation                            │
         │                         └───────────────────────────────────────────┘
         ▼
┌──────────────────────────────────┐
│ Sustainable Land Transportation  │
│ Analysis                         │
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┌──────────────────────────────────┐
│ Prediction the threat of          │
│ Sustainable Land                  │
│ Transportation                    │
└──────────────────────────────────┘
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Figure 1. Steps of the Study

III. DATA ANALYSIS AND DISCUSSION

3.1 The Threat of Global Transportation

The relationship between transportation and environment covered a wide spectrum. The rise impact can be caused by the existence of that transportation infrastructure which physically influence the environment or caused by operating that facilitation. Factor of level disturbance depend on the uses volume, modes type, and technology which uses. The impact which felt caused by this transportation operation commonly become lenght issues, cause it is continuing develope concomitant with people activities

In the macroscopic scope, the level and scale of disturbance to the environment caused by transportation, influenced by many factors be related, that is national and global economic, transportation policies (procurement system, environmental standart, etc.), structure of transportation sector (operationalization modes of transport, institutional, government and private involvement, market characteristic, etc), and operational aspects of transportation activities (management system, level of uses, technology applied, etc).

In Urban transportation, the air polution from land transport pose the worst problematics, especially at the developing countries where is the infrastructure development still left behind comparing with the increasing demand of transport, which is causes extensive congestion. Beside it, another traffic factors (noise, vibration, physical damage, unsafe/ uncomfort), and road factors (visual intrution/ aestetic, land divided, land consumption, access change, land value, influence to the natural life, cultural sites, historical) each gives special impact to the around.

Base on experience involve in more than 1.000 projects transportation sector a round the world since 1940 which is covering fund almost 50 bilyun US$,a (World Bank, 1995 in Ade Syafrudin,2009) has identify the chalenges towards sustainable transportation system. That

4

chalenge consist repairing *unfinished business*, and to anticipate the new problem caused the changing on people aspiration, implication from global competitiveness, and diverse consequency more fast than motorization changing.

The chalenge has not yet resolved covered:
1. Improving access and affordability. That are especially inrelationship with the developing country, where is access from rural area which is left behind to the market and others facilities which need to improve. Need give attention focus on rural transportation network and public transport services so that the cost of transport in general can be reduce, as well for freight or passenger.
2. Handling crisis on maintenance. Not yet adequet on maintenance road infrastructure causes very big cost in the form of reducing asset value, and in the longterm will causes increasing total management cost. Any rupiahs to posphone maintenance will cause increasing three times on vehycle operating cost.
3. New chalenge will cover aspecs as like.
    a. Improvement response to customer demand. Improving people revenue and changing of market characteristic will generate more variaty requirement and better quality of services.
    b. Adaptation to the global trade pattern. Trade liberalization bring trend higher on goods volume and delivery distance. Developing countries very rely on economic growth through export manufacturing goods.
    c. To resolve the fastest level of motorization. Cities become as motor for economic development, especially in developing countries, and population in urban area will increase very fast. Accelerate by revenue improvement, vehycle owners in the cities in developing countries increase more faster than proportion of urban space for road.

3.2 Land Transportation Chalenge in Indonesia

From various environment factors, air polution is a direct impact factor to human lifes, that is various health disruption. Many studies has been done in Indonesia and other countries shown that traffic of motorize vehycle especially in urban area is main source of air polution. Ade Syafrusin (2009) in his written said, resulting research in the big five cities in Indonesia, that is Jakarta, Surabaya, Bandung, Semarang and Medan, by Lembaga Pengabdian pada Masyarakat ITB (Soedomoet.al., 1992) has reported the contribution of emission HC, NOx, and CO from transportation each reach around 70-88%, 34-83%, and 97-99% from the total of air polution sources. The magnitude emission contribution this sector not only determinded by traffic volume and amount of vehycle, but also by traffic pattern and it's circulation in inner city, especially in the CBD dan trade area. Often happen the congestion in CBD, causes decrease of fuel uses efficiency.

It's condition follows by bigger level of emission, especially CO, HC, and dust. Isnaeni and Lubis (2000) did a simulation to the trend at two bg cities, Jakarta and Bandung, and the impact to air polution caused by exaust gas. In general that simulation result shown that composition of the main polutan, as an impact by interaction urban transportation system is CO (+ 80%), NOx (+10%), and HC (+ 9%). Meanwhile SO_2 and SPM only gave minor contribution. Total emission of exausted gas for Jakarta at 1995 predicted arround 430 tausands ton/year and for Bandung arround 150 taousands ton/year. This finding of simulation at Jakarta and Bandung at least gave indication about most significan influence from fullfill the needs of urban transport to the environment condition.

Measuring result of gas emission from transportation at 5 (five) area in the blue sky programme at 2011 (5 of 26 cities has been measured at Indonesia), that are Surabaya, Medan, Samarinda, Makasar and Batam city, in average indicate increasing trend on emission of HC(155%), Nox(36%), and CO(49%) comparing to that data at 1992 and 2000.

If we associated with economic indicators of sustainable land transportation DPSIR, especially for Ind(1), Ind(17), Ind(18) and Ind(19), shown causal corelation as like (Kementerian Perhubungan RI, 2013):

$$
\begin{aligned}
HC &= 208{,}153 - 151{,}621(Ind1) + 0{,}005(Ind17) - 0{,}037(Ind18) + 17{,}472(Ind19) \\
NO2 &= 26456{,}106 - 25667{,}321(Ind1) + 36{,}374(Ind17) - 56{,}910(Ind18) + 3302{,}147(Ind19) \\
CO &= 5647{,}069 - 1409{,}631(Ind1) + 1{,}411(Ind17) - 2{,}375(Ind18) + 228{,}432(Ind19) \\
SO2 &= 30{,}969 - 0{,}350(Ind1) - 0{,}023(Ind17) + 0{,}035(Ind18) - 1{,}454(Ind19) \\
O3 &= 208{,}321 - 50{,}121(Ind1) + 0{,}055(Ind17) - 0{,}079(Ind18) + 3{,}455(Ind19) \\
TSP &= 194{,}885 - 52{,}452(Ind1) + 0{,}055(Ind17) - 0{,}082(Ind18) + 2{,}634(Ind19)
\end{aligned}
$$

This corellation ($R=0{,}5$ up to $0{,}7$) shown that gas emission (environment indicator) trend increase paralel with increasing trend of economic indicators.

This trends will continue if we do not anticipate by real action. The congestion wich often occure at the big cities directly causes increase on fuel consumption and vehycle exhausted gas, whereas the transportation sector is one of the biggest fuel consumpsion besides household and industries sector. At Indonesia, in the early PELITA IV (1984), the transportation consume 39,7% of national fuel consumption (Dikun, 1999). At 1996 that ammount increase to 53,5 %, and at 1998 rise more than 60 %. Comparing with Japan energy consumption only 20-25 % of total national energy consumption (Ohta, 1998), the consumption of energy for transportation in indonesia can be said very extravagant. That ammount enough to draw about inefficiency transportation sector in Indonesia.

That above challenges highlight needs to reform transportation policy to support sustainable better quality of life. The essence is how to fullfill the needs of people activities this time without reducing the ability of next generation to fullfill their need.

3.3 Sustainable Land Transportation Chalenge

The development of Infrastructure for sustainable land transportation is a comprehensive effort from various sectoral dimension, area, actors involvement, and substance. Figure 3.1 shown a propose strategic steps to plan sustainable transportation system.

The development of transportation infrastructure is an integrale apart in each embodiment needs of that steps, because it will determine the efficiency and effectivity the uses of existing system. The plan which concern to technology aspect, regulation, and user behaviour have to give priority. The strategy to implementate must be define to reach more sustainable condition in operationality, availability of more friendly to environment, and resources uses. Public education needs more activated to improve public participation to desireable direction. Indonesia cities relative develope faster than cities in developed countries, mainly in population growth and urbanization which spark growth in needs of social-economic activity, its have no choice look the future, except as soon to response global demand of sustanable urban liveability.

A number of basic policies have to formulated that choice direction can be sharply and effectively answering the problems.
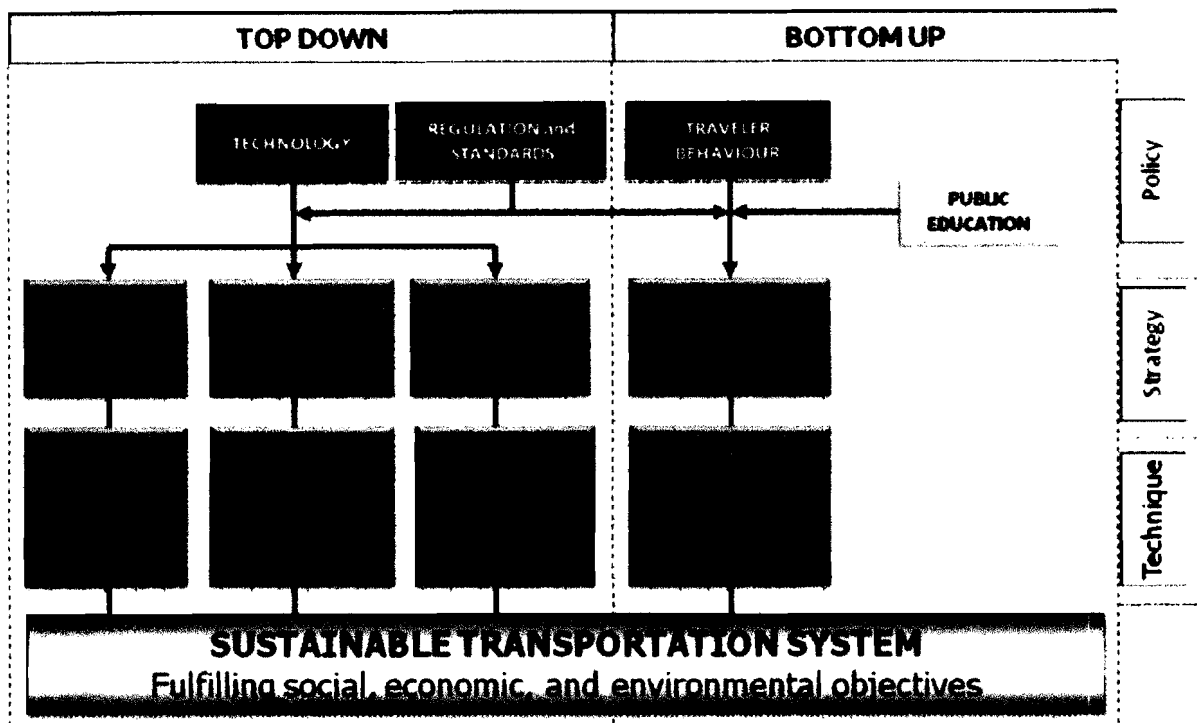

Figure 2. Road map to Sustainale Transportation System (Ade Syafrudin,2009)

To complete that road map, base on DPSIR indicators in several dimension,needs to be especially attent to complete social target, economic and environment, taht are:

1. Institutional dimension

The propblem of readines institutional is a one of central issues. How is that related institutional to response the global responsibility – environmental problem rise borderless – but sharply apply appropriate with local problem.

Participation from all interest group (*stake-holders*) – government, research institution, and academician, non governmental self-help, law enforcer, communities, profesional and practician – must be improved in determining process of the policies. In the otonomous region context, the role of regional government has to empowering so that regional aspiration can be more expressed.

This institutional function will give focus to the policy instruments which will be applied. For example, applied of "technology instrument" to choice technology in reducing environmental impact, " economic instrument" has the shape of fare policy to make people awareness to the cost have to paid (direct cost and impact cost), and "planning instrument" transportation and regional development leads to reduce private vehycle dependency.

In relation with institutional is regulation aspect, needs concern as well in planning stage and infrastructure development eventhough operational system. Standart of planning and design must be developed and adapted with future demand about *green infrastructures*. For example,

determining of quality standar of environment followed by regulation making to support and consistency law enforce, as well at central or regional level.

2. Social Dimension

Readiness of socialculture also needs to attent. Adapting policies and steps approach will be taken with the problems and local needs become very important. In the transportation context, the problem is how to control the private car dependency and control the demand, and it needs changing in people attitude and perception. The increasing of demand not at all has to fullfill by supply, but must be looking for balancing in harmony between demand and supply.

Accoding to basic pricipal that transportation is derived demand, so that importance moving is passenger and freight, not vehycle, with the adequate quality of services.

Success on applying policy and steps which have choice depend on the readiness of human resources. This human resources direct relate to all process: determining policy, planning, and implementing. In the transfer of technology, for example, the readiness of human resources has to deleloped in sustainability, cause the depending of the undeveloped country, including Indonesia, to developed countries is very big. Step by step the role of human resources hope to improve local content and technology which will uses and at once reduce the dependency to other countries.

3. Technical Operational Dimension

Every steps will be done insist a integrated planning. Integration an urban transportation system at least looked from policy, plan and programme sides, funding, and services. Integration of that system directed to improve accessibility of the people as user, improving efficiency on resources uses, improving interaction among area, improving public participation including private role, and reducing environment polution, and accident level. All stakeholder need to do an effective coordination to reach that condition. Planning, programming, and activating do appropriate with that institution responsibility. In funding matter, even fund resources and allocation for each programme, made in transparent and accountable at all process. Also must get attent is that steps what we have discussed at the above have to support by research in every related field. Applying research products which have developed by others countries can be done in order apropriate with climate condition, geographic etc. Various knowledge disciplines insist to give positive contribution in the framework to fit up each others. In this context, research institution, higher education, and industrial have together responsibility to answer that various chalenge in systimatically and sustainability.

IV. CONCLUSION AND RECOMENDATION

From the above discussion can be gave some notification for rural-urban development in the shape of sustainable land transportation in Indonesia, as like:
1. Policy in handling of rural-urban transportation problem must be approached as well from supply side and demand side. Nothing 'panacea' which by one action can be resolve all of transportation problem, but need some integrated and sustainable action. Transportation demand management is a practical action which need to sought more intensive in order to optimize the resources uses.

2. That methodes which are proven effective at developed country not necessarily give same result if applied at Indonesia remember citizen condition. Because that implementation policy which taken in Indonesia have to appropriateness with the existing condition.
3. The sustainable development issues and especially sustainable ttransportation has become global issue which every countries insist to show their responsiblity appropriate with problem and locally demand.
4. Indonesia as apart of global community immidiately must show response to sustainable challenges. Anticipation steps realized by readiness what needed in institutional aspect, social culture, regulation and law enforce, and tecnical operational aspect especially related with the development of human resources which all arranged through integrated planning framework.
5. Looking from economic indicator for sustainable land tranportation by DPSIR, the effort to increase mass public transport uses in rural-urban area absulutely have to push to decrease HC, Nox, CO gases etc, and reducing burden of develope cost and road maintenance.
6. Uses of vehycle with fosile fuel have to substarct, change with non fosile fuel vehycle and renewable (as like hybrid vehycle, electric vehycle, etc) as well for freight and passanger transport.
7. Mainly the spatial approach as like optimalization rural-urban space to increase the density of road infrastructure, in order to reduce: travel length, cost of road network developement, cost of people transportation, etc, which very related with sustainable land transportation.
8. Adding and improving road network in good condition, including the completeness of sign and road markers, law enforce on safety and traffic security to push level of traffic accident which increasing trend in line with economic increase.

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APPENDIX

Annex Table 2 The Full List of Transport Sustainability Indicators Extracted from European and International Indicator Initiatives

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
ECONOMIC											
Volume of transport relative to GDP		+	+	+	+						
Road transport (passenger and freight)		+	+	+	+	+	+	+	+	+	
Railway transport (passenger and freight)	Transport demand and intensity	+	+	+	+	+	+	+	+	+	
Maritime transport (passenger and freight)		+	+	+	+	+	+	+	+	+	
Inland waterways transport (passenger and freight)		+	+	+	+	+		+	+	+	
Air transport (passenger and freight)		+	+	+	+	+	+	+		+	
Intermodal transport			+						+		
Total transport expenditures (vehicle parking, roads and transit services)	Transport costs and prices		+					+		+	
Motor vehicle fuel prices and taxes (gasoline and gas/diesel)			+	+		+		+			
Direct user cost by mode (passenger transport)			+			+		+			
External costs of transport activities (congestion, emission costs, safety cost) by transport mode (freight and passenger)		+	+	+						+	

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
Internalisation of costs (implementation of economic policy tools with a direct link with the marginal external costs of the use of different transport modes)				+							
Subsidies to transport				+		+					
Taxation of vehicles and vehicle use						+		+		+	
Investment in transport infrastructure by mode		+		+		+		+			
Road quality – paved roads, fair/good condition	Infrastructure			+			+	+			
Total length of roads by mode			+	+	+	+	+	+	+		
Density of infrastructure				+		+		+			
SOCIAL											
Average passenger journey time			+	+				+		+	
Average passenger journey length per mode	Accessibility and mobility		+	+				+			
Quality of transport for disadvantaged people (disabled, low incomes, children)										+	
Personal mobility (daily or annual person-miles and expenditure on trips by income group)				+						+	
Volume of passengers			+		+						
Persons killed in traffic accidents	Risk and safety	+	+	+	+	+	+	+	+	+	
Traffic accidents involving personal injury			+	+						+	

11

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
Exposure to traffic noise, by noise category and by mode associated with health and other effects	Health impacts			+		+	+			+	
Cases of chronic respiratory illness, cancer, headaches. Respiratory restricted activity days and premature deaths due to motor vehicle pollution							+			+	
Private car ownership	Affordability					+	+	+			
Affordability (portion of households income devoted to transport)										+	
Contribution of transport sector (by mode) to employment growth	Employment					+			+		

ENVIRONMENTAL

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
Emissions of air pollutants. NOx, VOCs, PM_{10}, $PM_{2.5}$, SOx. CH, ozone precursors	Transport emissions	+	+	+	+	+	+			+	
Greenhouse gas emissions (CO_2 and N_2O)		+	+	+	+	+	+			+	
Energy consumption by transport mode	Energy efficiency	+	+	+		+			+	+	
Fuel consumption							+				+

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
Habitat and ecosystem disruption	Impacts on environmental resources		+	+			+			+	
Land take by transport infrastructure mode				+		+	+			+	
Polluting accidents (land, air and water)	Environmental risks and damage			+			+				
Hazardous materials transported by mode			+			+	+				
Use of renewable fuels (alternative-fuelled vehicles) – use of biofuels	Renewables			+						+	+

TECHNICAL AND OPERATIONAL

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
Occupancy rate of passenger vehicles	Occupancy of transport			+							
Load capacity of freight transport (LDV, HDV)			+	+					+		
Average age of vehicle fleet	Technology Status		+	+					+		
Size of vehicle fleet			+	+	+				+		
Proportion of vehicle fleet meeting certain air emission standards (Euro IV, Euro V, etc.)				+							

INDICATORS	Themes	EC SDS	EC ETIS	EC-EEA TERM	Eurostat	OECD	US EPA	World Bank	UNECE	VTPI	W-to-W
INSTITUTIONAL											
R &D expenditure on "eco-vehicles" and clean transport fuels	Measures to improve Transport Sustainability					+					
Total expenditure on pollution prevention and clean-up						+					
Measures taken to improve public transport										+	
Uptake of strategic environmental assessment in the transport sector	Institutional Development			+				+			

13