International Refereed Journal of Engineering and Science (IRJES)
ISSN (Online) 2319-183X, (Print) 2319-1821
Volume 6, Issue 9 (September 2017), PP.54-62

Logistics and Freight Transport Policy in Urban Areas: A Case Study of SARBAGITA Metropolitan

[*]Nyoman Budiartha Raka Mandi
Civil Engineering, Engineering Faculty, Udayana University, Kampus Bukit Jimbaran, Indonesia
Corresponding Author:

Abstract :- SARBAGITA is an abbreviation of Denpasar, Badung, Gianyar and Tabanan which are the district and city in Bali. The integration of logistics and transport infrastructure, in particular urban freight transport, with metropolitan urban planning SARBAGITA is a complex problem. The complexity lies in the dynamics and the components uncertainties from the parameter of existing system. The objective of this study is to evaluate existing transportation and logistics system policies, with the aim of integrating ground, water / sea and air transport modes, both intra and inter-modal. The evaluation on effectiveness of the coordination of freight transport, in terms of delivery methods, operators, network design services, freight forwarding and consolidation of goods, finds that there is no integration on both intra and inter-modal modes of transport in areas served by land, water / sea and air transport. The results of this study inform policy in this area, and enable tools development to support decision makers in urban transport infrastructure planning by taking time and cost constraints into consideration.

Keywords :- Logistic, freight transport policy, Sarbagita Metropolitan.

I. INTRODUCTION

Denpasar, Badung, Gianyar and Tabanan are the core metropolitan areas of Sarbagita with more than one million inhabitants, there are major ports, International Airport and the most tourist destinations and most in demand by both domestic and foreign tourists. Hotels, and shopping malls that creates the most important economic area in southern Bali. Positive changes in the economic environment increase the demand for transportation services, a challenge to existing policies and more effective solutions are demanded. There is a growing awareness of impact from transportation on urban environments along with a high growth in vehicle ownership ratio. At the same time, the city center seeks to fully utilize the location potential to benefit from large chain retailers expanding their networks. With the increased participation of the people, the city government is faced with higher expectations from its citizen.

In most cities that are included in this SARBAGITA area, the problem is very similar to the following characteristics: congestion; lack of place to load and adequate parking space for freight vehicles; fragmented goods flow increase the traffic; tourist destinations with narrow streets and other obstacles; ignoring the problem of freight transport in the city in traffic planning; environmental impacts on freight transport; lack of awareness and information on urban transport issues.

The movement of goods distribution in Bali province was built based on economic development of each zone or district and city in Bali. Differences in the level of regional economic development or zone is based on the level of GDP or input-output area that occurs based on supply and demand for commodity goods. The goods distribution network system of road freight transport is grouped based on the basic geographic physical condition of Bali province based on the route track group, based on the role, road class and function in Bali province. The Metropolitan area of SARBAGITA is located on the main freight transportation road, because almost every national roads and provincial roads in Bali are oriented towards SARBAGITA, and are located on a traffic road connecting Java and Nusa Tenggara.

The biggest support of Bali's economic growth is the tourism sector. The urban freight transport in Bali have a crucial part of the tourism trade. In this tourism business, every part must be done professionally because the aim of this business is how we can treat tourist with the best service. As such, urban freight transport should also have excellent services.

The unexplored potential for urban freight planning looks different from the more advanced and sustainable steps in the field of public transport. This is the main reason to verify how SARBAGITA can continue its urban transport planning given its potential and limitations. As the city has launched its revised strategic document, planners and decision makers should pay special attention to urban transport and develop practical tools to align goods-related activities with the city's strategic objectives.

In urban transport, there are many segments involved in the production and distribution chain: producers, wholesalers, transport operators, retailers and consumers. Each has its own advantages. As a result, there are many decision makers and their information is distributed among spatially dispersed individuals. Therefore, the distribution of urban transport often has high transaction costs and asymmetric information.

Unfortunately, the problem of urban freight transportation in Bali is very rarely discussed in social problems in Bali. Not much is known on how to solve the problem. The purpose of this research is to find a method to map the city based on its node and its logistics flow. Urban transport studies concentrate on the distribution of inter and intra-urban goods and vice versa (recycling and return of damaged goods) flowing in urban areas. Includes other logistics functions such as loading and unloading, consolidation, and goods terminals that function in the node between long haul transport and city distribution. This study also addresses the issue of freight transport in Bali, to provide an overview of logistic modeling patterns of nodes and flows. This study area as shown in Fig. 1

Figure 1 Study area

II. LITERATURE REVIEW AND OBJECTIVE OF THIS STUDY

Logistics and Freight Transport

Logistics is defined as the management of material information and information related to the cash flow along the supply chain consisting of several companies (suppliers of raw materials, producers, wholesalers, retailers and logistic service providers) and the last customer, which may include individuals, public authorities, or other organizations. Logistics consists of different processes and components, such as: strategic processes, supply and demand processes and supply chain processes. Urban logistics deals with logistics processes and operations in urban areas, taking into account operational characteristics, markets, infrastructure and urban regulation. Urban logistics is an integral part of the inner-city and international logistics chain

Freight Transport, is basically a means to move goods from one place to another. In contrast to people's travel, goods are generally transported for longer distances, fewer and more diverse customers (Warpani, 1990). In addition, various types of goods have varying volume and weight ratio as well as various characteristics that require special transport. Because of these certain demands, there were various modes of freight transport.

Transport modes include trucking, trains, water transport, pipelines, air transport, both domestically and internationally. In the calculation of transportation costs it also includes the use of facilities and logistics services at ports, stations, and terminals

The basic principle in calculating the logistics costs as the components of transport costs is the use of resources in every transportation activity, which includes all modes of transport, infrastructure and transport facilities. Each company or supply chain is different in its supply chain process, therefore it is necessary to identify the process of supply chain activity of each commodity, company, industry, and economic sector, in order to calculate the logistics cost accurately, completely and comprehensively.

In the calculation of logistics costs, the components of transport costs include the cost of primary transportation and secondary transportation costs.

Primary transport is the transportation for the movement of finished products from factories and suppliers to warehouses. The cost of primary transportation includes the cost of moving goods from factories or distribution centers to other factories or distribution centers, or inbound transport of goods purchased from factories or distributors for resale.

While secondary transport is the distribution or delivery of finished products to final consumers. Secondary transportation costs include pickup fees, distribution costs, unloading and loading operations, and distribution administration costs.

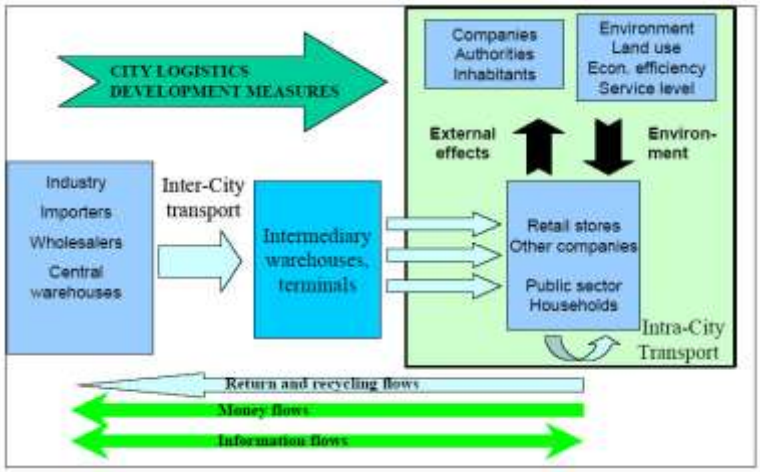
Transportation costs include all transportation costs of each mode of transportation used for goods movement activities in a series of supply chain and distribution channels processes.

City freight, city distribution, city logistics, urban freight transport, urban freight distribution and freight transport are different terms for the same subject. In this report, we will use ***'freight transport in urban area'***..

Interrelations

The integration between logistics and transportation infrastructure, especially urban freight transportation, with urban planning is a complex problem. The complexity lies in the dynamics and uncertainties of the components of the parameters in the existing system. The entire system consists of various actors (transport providers, transport receivers, authorities, residents, visitors) interacting according to their own interests, influence and their existence were influenced by urban environments such as land use, economy, environmental issues, safety issues, infrastructure and the role of transportation.

It is a very dynamic, integrated and complex process that ultimately generates flows (goods, waste, remittances, money, information between different groups of actors, generating general economic efficiency and new land use patterns but also causing conflicts and problems in urban areas. This study concentrate on the distribution, collection and delivery of inter and intra-urban goods reverse (recycling and return of damaged goods) flows in urban areas.This also takes into account other logistics functions such as loading and unloading functions, consolidation, and node terminal functions between long haul transport and city distribution. These Inter- and intra urban freight distribution as shown in Fig 2 [9]



Source: Stratec S.A. (BE) (2005)
Figure 2 Inter- and intra urban freight distribution

In Bali, the evaluation of the effectiveness of the coordination of freight transport, in terms of delivery methods, operators, network design services, freight transport and consolidation of goods, found that it is lacking on integration of both intra and inter-modal modes of transport in areas served by land, water / sea , and air transport.

Stakeholders

In the distribution of urban goods there are a number of actors / stakeholders involved. One way to classify them is by looking at the actors in the chain of transport and the actors in the city. Actors in the metropolitan community SARBAGITA can be divided into (residents, visitors, tourists, employees), companies (catering industry, retail outlets, service providers, builders) and authorities (departments: economy, land use, transportation, infrastructure, safety, environment, etc.). The existence of all groups of actors is dependent on the receipt of the goods. All these perpetrators demand goods and therefore initiate the goods inflow to the city.

Perpetrators in the transport chain may be referred to as one hand who is the sender of goods (company, public, construction location) that demand goods and on the other hand the goods / shippers supplying goods and transportation companies / logistic service providers who deliver the goods. The main interests of the actors in the distribution of urban goods are the benefits oriented as listed in Table 1 below

Table 1 Main interest of actors in urban freight distribution [9]

Actor	Interest
Shipper:	the lowest possible cost while still meeting the needs of their customers
Consignee (collector of goods):	products are delivered at a short lead time at low transport costs;
Transport company:	low cost but a high level of operational transport efficiency, satisfaction of the interest of the shipper and receiver
Public (resident, visitor, tourist):	minimum hindrance caused by goods transport and availability of high variety goods
Local authorities:	attractive city for residents and visitors (minimum hindrance), strong economic development for local business and an effective and efficient transport operation;
National authorities:	minimum external effects by transport, maximum overall economic situation.

Source: (Stratec S.A. (BE) 2005)

Each actor, in its own role, tries to optimize its functioning, according to its own interests, deferring from the interest of its neighbour. This generates a lot of problems and conflicts.

Objectives

As for the problems, objectives depend on the actors and can be defined in general, two sets of objectives can be distinguished: private and public objectives.

Private objectives are often related to turnover levels: sales levels; customer levels; costs levels; service levels; competition.

Public objectives, which are often related to the wellbeing of all actors in a certain geographical area, for instance: quality of life; safety (accidents, crime level, atmosphere); environment (noise, emission, nuisance etc.); facilities (recreational facilities: parks, hotel and catering facilities etc.); economic vitality (mix of economic activities that serve the public needs in terms of offering goods and services and employment and income); accessibility (time needed to travel to, within and from the city for different modalities and for both freight and persons)

Local governments are faced with the problems of all actors in the city as well as external factors such as national government regulations, legislation, direction and the like. Besides that, it should also look at the problems of private transport users and non-urban transport problems as significant internal factors that can (and usually do) outpace transport of goods as a priority

All problems relate to losses incurred on one actor or obstacles experienced by one of the actors. Losses can be economic losses (stock damage, transportation costs, product damage, material damage, damage to economic efficiency, customer / sales damage), physical damage to people, products, buildings or infrastructure (health, accident, damage to infrastructure, products, materials / equipment) or psychological damage (burn out).

Obstacles can be categorized as physical barriers (eg roadblocks), optical barriers (roads full of freight vehicles do not provide attractive images), noise (unloading vehicles at night), disturbance (gas odor emissions), psychological barriers (stress , frustration)

Logistics costs either the costs of an enterprise, industry, or logistics costs of a country in aggregate has always been an interesting discussion. Not only the calculation of logistics costs, comparisons of logistics costs between companies, industries, countries, logistics costing methodologies, but also the ratio of logistic costs of a country to the country's Gross Domestic Product (GDP).

Logistics and GDP Costs

From the calculation of the logistics costs of each commodity, company, industry, and sector will then resulted in the total logistical costs or aggregate logistics costs of a country. Then, this aggregate logistics cost is compared in proportion to total GDP.

As we know, that GDP is calculated based on 2 approaches. Income approach and expenditure approach. In the income approach, GDP is calculated from the income contribution of each sector of a country's economy. While the expenditure approach, GDP is calculated on the basis of expenditure from each sector of the economy.

Based on the comparison of aggregate logistics cost to total GDP then will be obtained a measurement of efficiency and competitiveness of a country from aspects of logistics performance indicators.

A comparison of aggregate logistics costs to total GDP, will provide important information from two perspectives.

First, from a cost efficiency perspective. The smaller the proportion of total logistics costs to GDP indicates the more efficient management of logistics in the country. Government and policy makers of a country's logistic will seek to lower total logistics costs on GDP.

Second, the perspective of the contribution of the logistics sector. Aggregate logistics costs can be viewed as "the contribution of the logistics service provider sector" to GDP. The logistics sector includes freight transportation companies, warehouse providers and managers, port logistics service providers, terminals, stations, and others. The greater the cost of aggregate logistics on GDP shows the productivity and contribution of the logistics sector to a country's GDP.From these two perspectives it seems to contradict each other. Logistics costs offer burden while contributing. It depends on how our viewpoint at it.Is aggregate logistics cost of 24% to GDP is inefficient? In the context of comparison with logistic costs of other countries Yes, because in countries with advanced logistics performance such as China, Japan, Korea, the United States, the total logistics cost is not less than 15% of GDP.

However, in the context of the contribution of the logistics sector to GDP, the figure shows a considerable contribution. The problem is, until now there has been no standard how much the total cost of logistics to GDP to reach maximum efficiency and optimal.

One thing to be concerned about is whether the logistics cost is a cost that really adds value to the performance of logistics services, or our logistics costs are still a waste of costs due to high cost economy such as costs due to illegal levies, poor infrastructure and logistics facilities , taxes and retributions that are less supportive of logistics performance, and poor quality of bureaucratic logistics services? [2]

III. RESEARCH METHOD

Qualitative research with multi-respondent stakeholders at government, industry, and enterprise levels. This study used a combination of secondary and primary data. Primary data were collected through surveys by way of contact / involvement with relevant stakeholders / authorities / companies from the urban transport industry on the island of Bali. By learning and understanding the urban transportation logistics system, which includes interviewing and collecting relevant data. Secondary data will include such as: Economic factors: land prices, availability of land, supporting infrastructure and utilities, transportation costs, operating costs, labor costs, and other relevant costs. Social and environmental factors: traffic flow, rules and regulations.

Characteristic of freight transportation was obtained through a roadside interview survey. The survey is conducted by asking directly to the driver of freight transport and the data characteristic of freight transport includes the type of vehicle used, the type and volume of freight transported, the origin and destination zone, the speed of the vehicle, the travel time, and mileage.

IV. LOGISTCS AND FREIGHT TRANSPORT IN SARBAGITA METROPOLITAN

Examination of Policy Objectives and Related Measures

To facilitate the evaluation of freight transport policies in the metropolitan city of SARBAGITA by attempting to elaborate logistic issues / issues by categorize them based on Networks Enabling Transport Services (NETS) (Tiffin and Kissling, 2007) which includes: 1) Fixed Facility Networks; 2) Mobile Subject Networks; 3) Auxiliary Networks; 4) Communication Networks; 5) Regulatory Networks; and 6) Skill Networks.

Fixed Facility Networks; which constitute the physical infrastructure of urban logistics systems, such as port infrastructure, airport infrastructure and land transportation infrastructure (eg issues relating to warehouses, roads, terminal goods, etc.)

Benoa Harbor is located in South Denpasar, precisely in Benoa Bay. Benoa Harbor was built in 1924 and is divided into three zones of East, South and West. East side for both domestic and international passenger terminal, container terminal, and Makin. The South side used for LNG terminal. As for the western side is used for fishery dock and fishing industry.

Delivery of goods by sea is the best solution for the distribution of goods in large quantities for an outer island destination. The effectiveness of non-urgent delivery of goods makes the sea cargo service the only option to deliver the goods at the cheapest cost.

But the delivery of goods, by sea, at the port of Benoa is not much in demand by the customer because Benoa port still not been able to accommodate the delivery perfectly. The perfection includes easy delivery procedures and requirements, goods security assurance, timely delivery, and reimbursement or repair warranties if the goods are damaged in transit (insurance). Only 1,091,528 tons or only 12.98% through the port of Benoa. As shown in Table 1.[1]

Currently, loading and unloading facilities with forklift with a capacity of three tons, *reach stacket* with a capacity of 45 tons, *head truck* plus *chassis* as many as 12 units are used. While a 14,000 square meter container field with a capacity of 1,000 containers measuring 20 feet (TEUs).

Table 1. Port activity in Bali Province [1]

Sea Port	Number of goods (t=Ton)	
	Unloading	Loading
Benoa	1,091,528	29,611
Padangbai	957,833	1,174,154
Celukan Bawang	775,280	1,025
Gilimanuk	5,583,600	3,180,225
Amount	**8,406,161**	**4,385,015**

As shown in Table 1 indicates that 66.43 percent of goods entering Bali by land mean that the use of land transportation mode in Bali becomes burden to the road and unpredictable congestion especially in the main road connecting Denpasar and Gilimanuk, to reduce the traffic pressure caused by this freight transport, Denpasar city government has built a freight terminal located on the road Mount Galunggung, West Denpasar district.Consolidation activities in freight terminal goes like what is called Urban Distribution Center (UDC). Large vehicles from afar with various modes unload their cargo. The loads are then sequenced and consolidated into smaller vehicles for their final destination.

Growth of freight transport through Ngurah Rai International Airport continues to increase, this is not apart from the increasing quality of cargo services at managed airports such as increased cargo warehousing capacity that can accommodate an increase in transaction volume. Growth in cargo volume is also driven by the increasing number of airlines using large-bodied aircraft (widebody), especially those that landed at I Gusti Ngurah Rai Bali Airport. Five countries which are the main destinations for the departure of Ngurah Rai international aircraft in July 2016 are Australia, Singapore, China, Malaysia and Hongkong. Compared to the prior month, the five countries experienced an increase of 8.25 percent, 1.95 percent, 66.19 percent and 9.45 percent respecitively. Baggage and goods shipments from the five major destinations of Australia, Singapore, China, Malaysia and Hong Kong compared to the previous month showed that Australia, Singapore and China grew by 23.47 percent, 1.26 percent and 13 , 35 percent respectively. In contrast, Malaysia and Hongkong decreased by 0.59 percent and 8.52 percent. Meanwhile, the departure of domestic aircraft from Ngurah Rai airport in July 2016 reached 3,578 units of flight, or up 14.13 percent compared to the previous month which reached 3,135 units of flight. The five main destination are Jakarta / Soekarno-Hatta airport consists of 1,226 flight units, Surabaya 482 flight units, 271 units of Lombok Praya flight, Jogyakarta 259 flight units and Labuan Bajo 194 flight units. The number of baggage and goods transportation in general also increased by 35.47 percent. Meanwhile, when compared with the same month of the previous year, seen overall baggage and goods amount increased by 38.10 percent.

The cumulative development of the number of international aircraft in the January-July 2016 showed as many as 16,810 units, up 12.86 percent compared to the same situation in January-July 2015 which reached 14,895 units. As for the number of baggage and goods, following the number of aircraft that has increased by 13.62 percent from 39,518 Ton to 44,899 Ton.

The network of immovable facilities (airport, harbor, freight terminal) that becomes the physical infrastructure of the urban logistics system in Metropolitan SARBAGITA as shown in Figure 3

Mobile Subject Networks; The movement of goods transport in metropolitan SARBAGITA as shown in Figure 3. Where the movement of each node creates a dynamic network associated with freight transport and movement route.

Auxiliary Networks; Network support services for other networks such as gas stations, restaurants is sufficient. but the rest area network in the freight trajectory area is not available at SARBAGITA area, whereas for the smoothness and safety of the goods transport this network must be available.

Communication Networks; An information network system that ensures the entire network can operate well such as information technology such as transport management system (TMS), warehouse management system (WMS), fleet management system (FMS), order management system (OMS) and others.

Regulatory Networks; System settings and regulations that ensure the system is running well. Public authorities have a set of policy themes that they use to achieve this goal: land use policy; transportation and infrastructure policies; economic policy; environmental and safety policies.

Private actors (usually the transport and automotive industry) have also developed several 'initiatives' to address the growing problems they are experiencing, and policies, regulations and arrangements that they face in cities in various ways, including: vehicle design (to overcome size limitations and vehicle weight); low noise technique; initiative of cooperation between competitors to achieve consolidation of goods etc,

Policies related to scheduling and access to freight transport in SARBAGITA metropolitan, the regulation must be addressed by removing obstacles such as local regulations, the elimination of unregulated tariff rates such as illegal levies which remains a major issue of goods distribution and trading activities.

Skill networks; Network system expertise or skills required by both private and public, in this case the government until today has not been so intensively conducted it. As for example with regard to driver capability, standardized delivery service quality**.**

Figure 3 Fixed Facility Networks (Benoa Harbor, Ngurah Rai Airport, Freight terminal)

Rationalizing Indonesian Urban Freight Through Integrated Urban Development of Sarbagita Metropolitan

The general principles of integration in urban freight strategies include (May et al., 2006): Integration between policy instruments involving different modes; Integration of policy instruments involving infrastructure provision, management, information and pricing; Integration between transport measures and land use planning measures; Integration with other policy areas.

To address the problems identified in the previous section, private and public actors have developed many initiatives, often separated from each other. Due to the complexity of linkages in the distribution of urban transport, it is not always effective to implement public and private initiatives without coordinating them. This paragraph uses a strategy in rationalizing urban freight transport in the SARBAGITA metropolitan i.e. short-term strategy, medium term strategy and long strategy.

Short-term strategy; by doing optimization and regulation with a number of general solutions more or less can be identified that is; restrictions on access to the city and parking restrictions; out-of-hours delivery; increase road capacity; and expand the number of loading and unloading areas.

Medium term strategy; With the concept of Urban Distribution Center (UDC) with various technical solutions. This is an interesting example for the analysis of differential impacts on the transport flow and emissions of green pollutants and gases in cities and inland areas.

Without UDC, the flow of goods enters the city through many different routes ending in highly dispersed destinations in urban areas. Medium-sized vehicles would be found everywhere in the city.

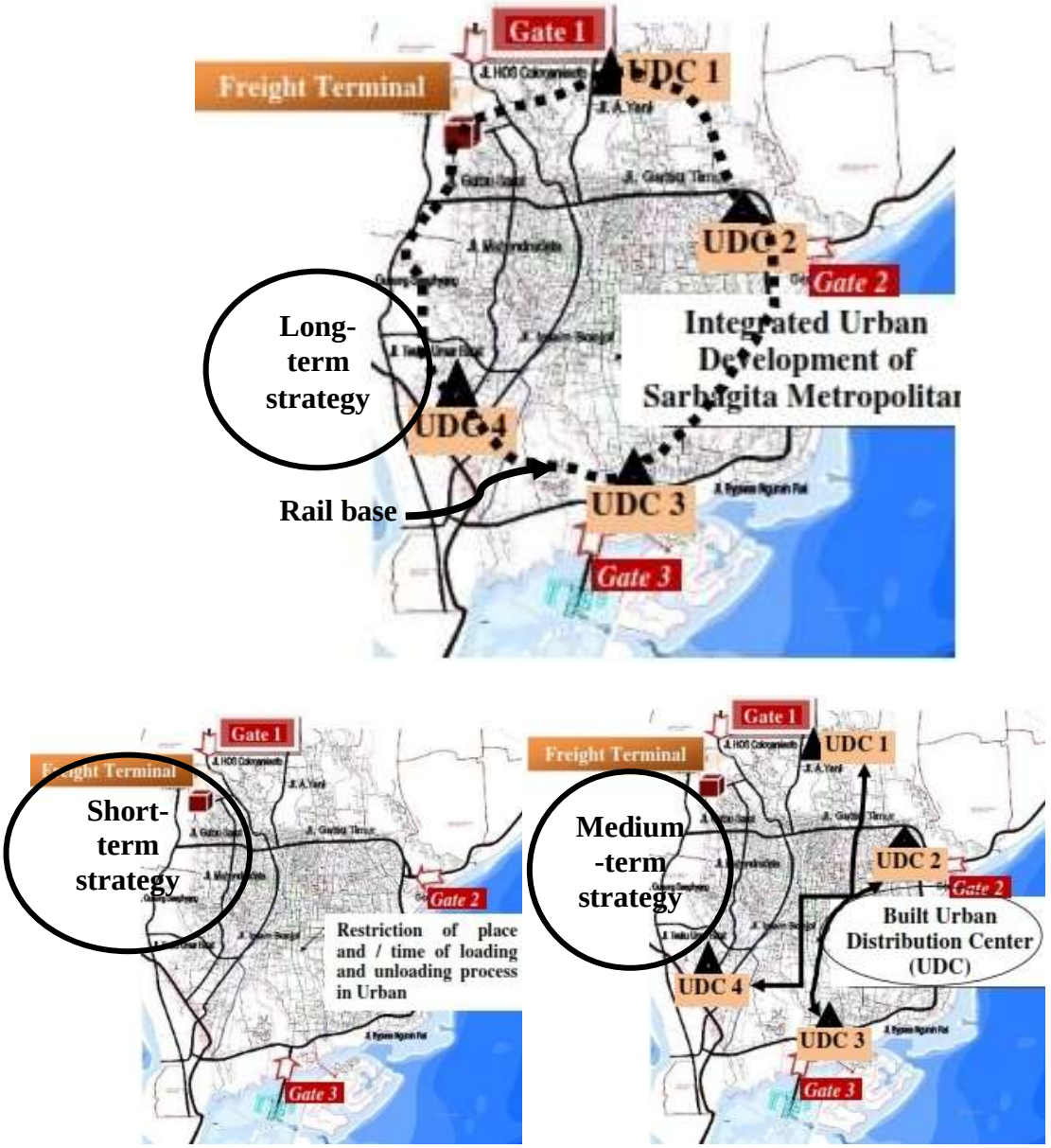
With UDC, the flow of goods entering the city will be concentrated only on one destination point in urban areas - UDC creates an opportunity to use heavier vehicles upstream from this point and improve the efficiency of the inter-city transport system. The possibility is to see the impact of the balance on the vehicle per tonne transported and on pollutant emissions and green gases to be positive in the urban areas.

UDC location is of course important. Due to the fact that most of the work and activities are concentrated in the heart of the city (Central Business District / CBD, some industrial estates) that make up the peak density of work, preferably UDC approach that peak, to minimize the length of light vehicle routes. Conversely, placing UDCs on the outskirts of the city often increases the length of this route and of course total emissions. The spatial distribution of activities changes over time, the advantages and disadvantages of being in some locations will also change.

Long-term strategy; Rail Base, In contrast, downstream, the transfer of goods from heavy vehicles to light vehicles causes a rise in the flow of light vehicles because goods must be sent from one point to all end destinations in the city. The number of miles per tonne transported will increase, as do the amount of pollutant emissions and green gas. The impact balance will be very negative, and congestion and obstacles will remain the same in the city.

When dealing with urban freight issues, authorities should keep an eye on the long term and on future challenges. They should avoid letting their most pressing concerns hide the hard realities yet to come. A long term perspective is needed, especially because SARBAGITA metropolitan freight distribution involves land use planning and infrastructure planning

By rationalizing of the existing transport and logistics system, with the aim to integrate land, water/sea and air transport modes, both intra and inter-modal, in order to develop useful transportation and planning interventions to enhance urban freight transport.



Source: Processed from (8)

Figure 4 Strategy of Rationalizing Indonesian Urban Freight Through Integrated Urban Development of Sarbagita Metropolitan

V. CONCLUSION

The aim of the evaluation study is to assess freight transport patterns and trends in SARBAGITA metropolitan. An analysis of a survey of deliveries to the SARBAGITA led to the examination of two specific freight delivery management strategies: the use of a UDC and a strategy relating to rationalizing urban freight through integrated urban development of Sarbagita Metropolitan

The main finding and conclusions from the survey analysis are the following:

- 66.43% of deliveries to the Sarbagita metropolitan were made in land transport
- 60 % of deliveries to the Sarbagita metropolitan were made vans, while light trucks accounted for 35% of the total
- Peak hour for deliveries was found to occur between 10:00 and 12:00
- The highest delivery generating zones were located in the north west (gate 1) of the city
- 72% of deliveries used on-street parking for unloading goods. It was also observed that 60% of trucks parked on street for deliveries especially on Mahendrata street. This is a finding that has repercussion for city accessibility and further highlights the need for delivery management strategies.
- The distribution center also assists in the process of backhauling which further reduces unnecessary truck trips

REFERENCES

[1] BPS Provinsi Bali (2017). Bali dalam Angka 2015.

[2] I Gusti Suparsa, T. I. (2016). "Analisis dan Kebijakan Pengoperasian Angkutan Barang di Kota Denpasar." Jurnal Teknik Sipil - Fakultas Teknik - Universitas Udayana - Bali **20**(1): 47-57.

[3] I Nyoman Budiartha RM (2015). Strategi Pembangunan Sistem Transportasi Multimoda di Dalam RPJM 2015-2019: Studi Kasus Pulau Bali. *Prosiding Konferensi Nasional Teknik Sipil 9 (KoNTekS 9).* Makassar 7- 8 Oktober 2013, Komda VI BMPTTSSI: 47-54.

[4] I Nyoman Budiartha, R. M. (2013). Perencanaan dan Evaluasi Sistem Transportasi Logistik Kota Denpasar yang Ramah Lingkungan. Konferensi Nasional Teknik Sipil 7 (KoNTekS 7), Prosiding. Universitas Sebelas Maret (UNS) - Surakarta 24-26 Oktober 2013**:** T-147 - T-156.

[5] Kaszubowski, D. (2016). "Recommendations for urban freight policy development in Gdynia." Transport Research Procedia **12**: 886-899.

[6] Nyoman Budiartha R.M. (2011). EKONOMI TRANSPORTASI Model Penentuan Lokasi Pelabuhan Berbasis Sektor Pariwisata. Denpasar, Udayana University Press.

[7] Nyoman Budiartha, R. M. (2017). "Development of Ferry Port as a Complement of "Tol Laut": Case Study on Ferry Port of Ketapang." International Refered Journal of Engineering and Science (IRJES) **6**(3): 31-37.

[8] Pemerintah Kota Denpasar (2011). Peraturan Daerah Kota Denpasar No. 27 Tahun 2011 tentang Rencana Tata Ruang Wilayah Kota Denpasar Tahun 2011 – 2031.

[9] Stratec S.A. (BE) (2005). CITY FRIGHT Inter - and Intra - City Freight Distribution Networks, European Commission Fifth Framework Programe. **Final Report**.

*Nyoman Budiartha Raka Mandi. "Logistics and Freight Transport Policy in Urban Areas: A Case Study of SARBAGITA Metropolitan ." International Refereed Journal of Engineering and Science (IRJES), vol. 06, no. 09, 2017, pp. 54–62.