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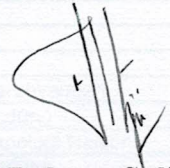
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DEVELOPMENT OF RAILWAYS SYSTEM IN LAMPUNG

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Abstract

Determination of railway networks as a whole in Lampung (Comprehensive Railway Network) with regard to the study of the regional development. In general, it developed to accommodate passenger and freight transport as result of potential products in this province. The main problem is the damage of road pavements caused by overloaded such as coal. In addition, the railway network in Lampung has not connected well with other modes. This study is aimed to analyze the potential for the transport of goods in Lampung Province and rail network development plans to accommodate the movement of people and goods in this province. One of this analyze is the expansion of such entire railway network connected with the location in the coal unloading dock. The results obtained from this study that the railway development plan in Lampung can accommodate the demand for passenger and freight services and Trans Sumatra Railway Master plans.

Key Words: Railway Network, Freight Transport, Expansion

INTRODUCTION

Background

Accordance with the basis that the potential Lampung province as "Agriculture area", the development of Lampung province by increasing the potential advantages of regional infrastructure, transportation infrastructure needed to ensure distribution of passengers and goods.

Especially for freight transportation, train is a major infrastructure to ensure good distribution of resources towards commodities processing, marketing the area as well as other modes of transfer points such as airports, port terminals and piers. Scale flagship product marketing of Lampung province such as cocoa, rubber, palm oil, shrimp, fish, resin, coal, petroleum potential, geothermal, renewable energy and tourism sectors that have international scale requires the development of the railway system that can support the excellent potential.

The development of urban economic mobility is also necessary for the provision of passenger rail infrastructure. This is to anticipate the mobility from buffer area to the city center because the roads are very congested in urban areas. The existing railway line to the port of coal still crosses the city center (Bandar Lampung). Rate of accidents caused by crossings especially in dense urban areas increased vehicle traffic, besides congestion due to road and railway crossings are getting worse.

This is references for problems related to deterioration of road pavement due to overloading and its trend in the future. We realize that overloading causes the damage of road pavement at exponential rate of average power fourth. 10% overloaded truck can damage road pavement greater than 40% comparing to the same load limited truck. In this case especially coal truck which is through Lampung Road Network.

Utilization of railway networks in Sumatra diverse, but tend to be low:

- a total of railway networks in Sumatra, approximately 1860 km railway line in Sumatra is only about 1348 km (72.47%) are operational;
- The railway in South Sumatra are mostly used to transport coal to 8-10 million tons of cargo / year is one of Indonesia's most populous path and this path became the main source of income for the PT. KAI (Persero)
- rail traffic on the railway in Sumatra (except in South Sumatra) generally only use about 10-30% of installed capacity;
- The role of the railway mode in Sumatra for passenger transportation is still very minimal, which is only about 1.71% and for goods is only about 0.62%.

Particularly in Lampung province, only one railways system existing, namely Bandar Lampung-Palembang majors are also a legacy of Dutch colonizers 62 years ago. This track is not much developed until recently, was part of a network of railway lines in South Sumatra, which crosses one city and five districts in Lampung province. Average volume of passenger transport services over the last five years to reach 354,898 people / year, and the transportation of goods to reach 581,203 tons/ year. Especially for coal transport, cargo volume averaged 6.5-7 million tons / year, which is still far from the target of 12 million tons / year. It is caused due to the existing railway line is still a single lane and take turns with a passenger.

Aimed Study

This study is intended to draw up railway system in the short, medium and long-term, development plans in the province of Lampung which include the development of railway infrastructure and train service opportunities. Preparation of planning frameworks rail system is integrated with other transport systems such as the mode of road transport, sea freight and air freight, synergistic and integrated with the framework of national and regional transportation system.

ECONOMIC POTENTIAL OF LAMPUNG PROVINCE

Lampung focus on the development of land for large plantations such as palm oil, rubber, rice, cassava, cocoa, black pepper, coffee, corn, sugar cane, etc.. And in some coastal areas, fisheries such as shrimp farm commodities more prominent, even for the national and international level. In addition to agricultural produce, Lampung is also a port city, because the southern gate to the other area of Sumatra. Many industries area such as coastal length, in Natar, Tanjung Bintang and Bandar Jaya. This province is rich with natural resources potential, both renewable and non-renewable (mining and minerals).

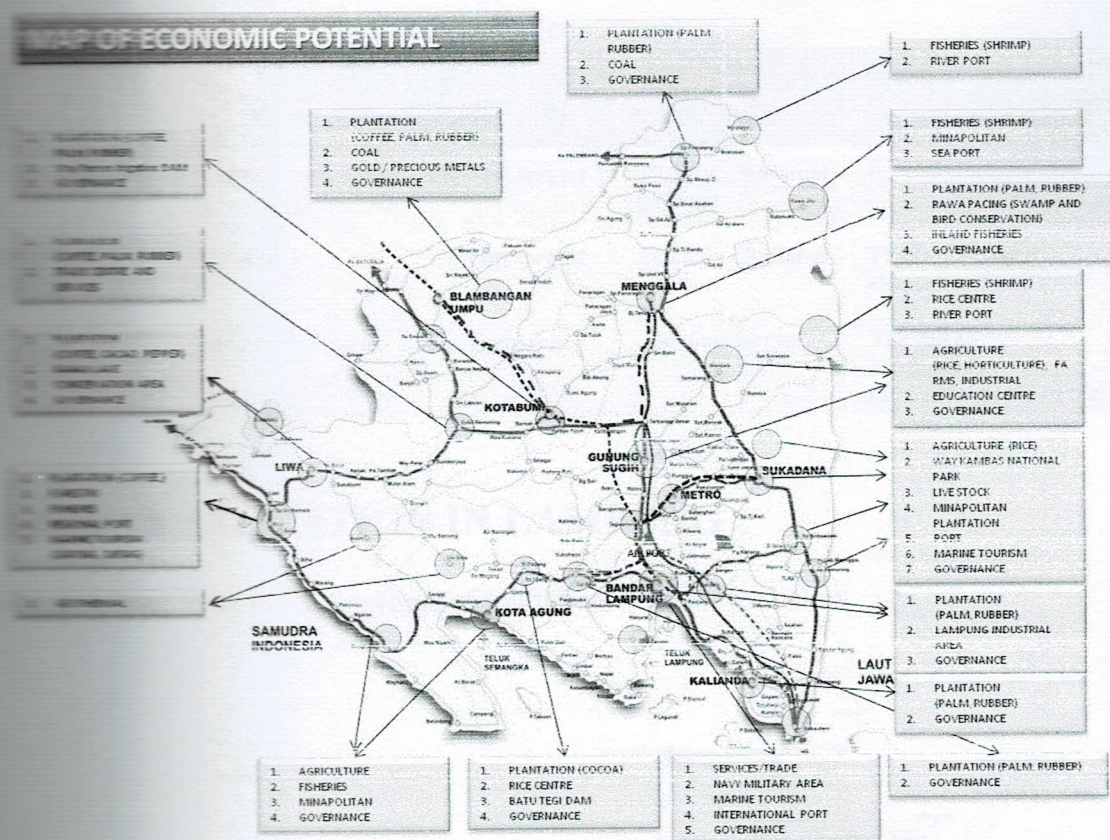


Figure 1. Map of Economic Potential

Lampung Provincial Government's efforts to maintain its status as one of the barns in Indonesia showed satisfactory results. Some commodities as an indicator of the success of the development of the production sector showed a growth trend continues to rise.

Table 1. Potential Commodities in Lampung

COMMODITIES	PRODUCTION (TON)	SUMATERA	NATIONAL	INTER NATIONAL
RICE	2,976,933	The second largest	The seventh largest	-
COCA	1,921,326	The first largest	The third largest	-
CRAB	9,017,137	The first largest	The first largest	The first largest
SHRIMP	44,167	The first largest	The second largest	Largest export to America
CATTLE	712,428	Largest supplier of Sumatra and Jabotabek	13,981,477	-
SUGAR CANE	991,880	The first largest	37% National product	-

Table 1. Potential Commodities in Lampung (continous)

COMMODITIES	PRODUCTION (TON)	SUMATERA	NATIONAL	INTER NATIONAL
BLACK PEPPER	21,905	The first largest	27.58% National product	-
ROBUSTA COFFEE	150,424	The first largest	26.15% National product	The third largest eksporter
CANNED MANGOSTINE	265,000 ton/year	The first largest	The first largest	The third Eksporter (26 % the world needs)

RAILWAY CONDITION IN LAMPUNG

Existing railway lines in the province of Lampung is as shown below

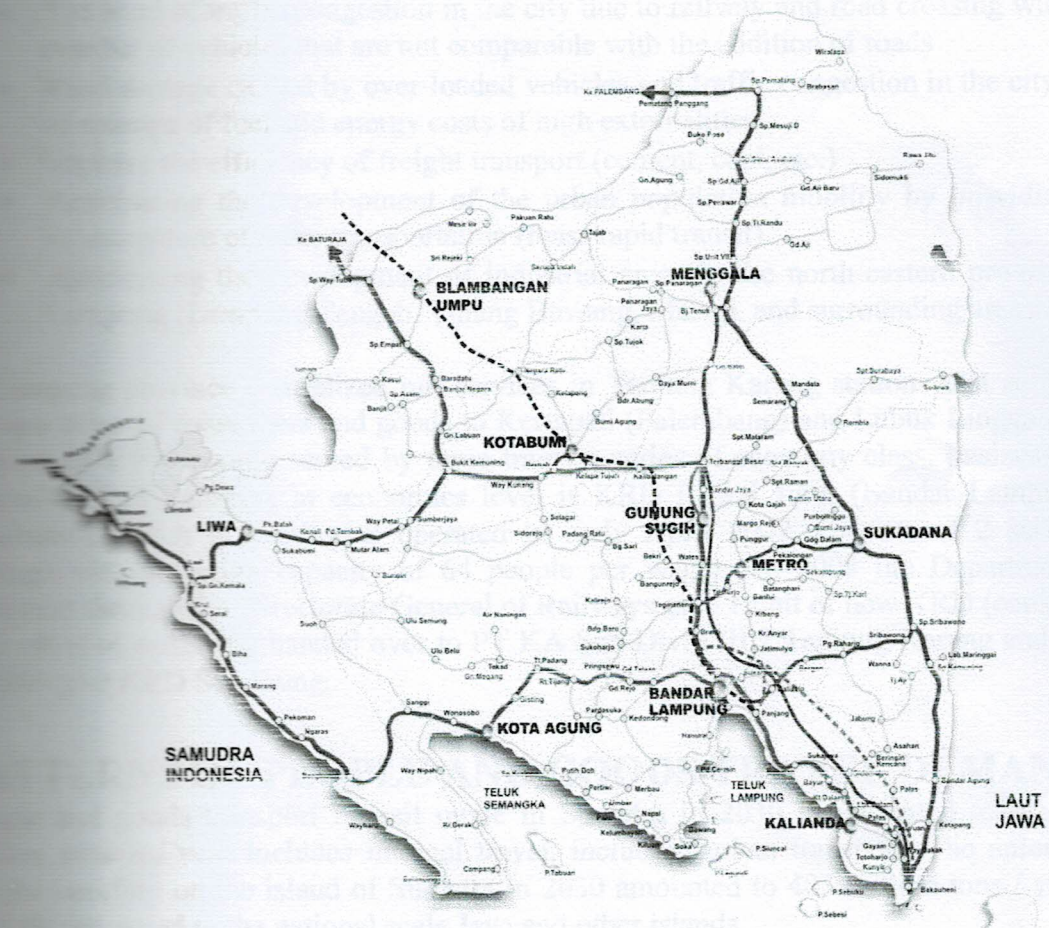


Figure 2. Railway existing in Lampung

Railway system in Lampung as a part of South Sumatra equipped with some tracks from the western area of Palembang and South Sumatra to the port in Lampung. Some of the many types of goods transported include coal, cement, fuel oil, wood pulp, paper products and some other products. The main railway system by the construction of a single track consists of passenger and freight transport, but the system in place is dominated by the transport of coal from Tanjung Enim (PTBA) to Tarahan (shipping facilities from rail to sea port) along 412 km. Freight traffic flows is an essential part of a series of coal and power energy for Java.

Rail transport is one answer to meet the needs of mass transit of passengers and goods. Some of the things that underlie the need for rail transport infrastructure developed are:

- Anticipation of the Sunda Strait Bridge Construction and Highways
- Anticipation of Sumatera's rapid economic growth and preparation for the free market (Asean-China (ACFTA 2010), Asia - Pacific etc)
- Support the realization of the Trans ASEAN Railways & Sumatra Rail Ways
- Existing railway lines connecting coal port still through city center (Bandar Lampung)
- The level of traffic congestion in the city due to railway and road crossing with the number of vehicles that are not comparable with the addition of roads
- Road damage caused by over-loaded vehicles and traffic congestion in the city lead to wastage of fuel and energy costs of high externalities
- Improve the efficiency of freight transport (cement, coal, etc.)
- Anticipating the development of the urban population mobility by providing an infrastructure of mass transportation (mass rapid transit)
- Anticipating the development of industrial areas in the north-eastern province of Lampung (Lampung Tengah, Tulang Bawang, Mesuji, and surrounding areas)

In Lampung province centralized rail services in Tanjung Karang stations that serve the transportation of passengers and goods to Kertapati (Palembang) and Lubuk Linggau. The purpose of \pm 970 people served by three trains a series of economy class, business, and executive. Rail transport in economics level is KRD Ruwai Jurai (Bandar Lampung – Kertapati), which is starting to operated in early April 2007, consists of 2 series of carriage with a seating capacity of 64 people per wagon. In 2008 the Department of Transport through the Directorate General of Railways give 1 unit of new KRD (consisting of 2 series of carriages) handed over to PT KA Sub Divre III.2 Tanjung Karang and next, in 2009 give KRD Seminung.

PATTERNS OF PEOPLE AND GOODS TRAVEL DEMAND

People and goods transport by rail mode in Sumatra in 2030 is estimated to reach 48 million persons/ year includes internal travel, including urban transport. The amount of freight traveling on the island of Sumatra in 2030 amounted to 403 million tons / year or 48.50% compared to the national scale Java and other islands.

Estimate patterns of both passengers and goods movement on the island of Sumatra in 2030 can be seen that the trip generation is quite high in Lampung Province.

Table 2 Passenger Origin-Destination Matrix in 2030

	Medan	Samar	Sukab	Pem	Jambi	Semarang	Bengkulu	Lampung	Batub	Kepri	0
Medan	27.000	238.000	6.000	25.000	8.000	39.000	1.000	25.000	9.000	1.000	814.000
Samar	9.000	593.000	64.000	139.000	21.000	108.000	25.000	99.000	14.000	9.000	1.290.000
Sukab	65.000	19.000	229.000	105.000	34.000	9.000	40.000	90.000	1.000	25.000	775.000
Pem	135.000	2799.000	2391.000	1039.000	312.000	907.000	379.000	430.000	75.000	333.000	9.344.000
Jambi	42.000	59.000	774.000	352.000	27.000	1297.000	82.000	512.000	23.000	13.000	4.471.000
Semarang	19.000	2203.000	143.000	542.000	92.000	3322.000	752.000	2037.000	87.000	204.000	15.522.000
Bengkulu	347.000	484.000	71.000	339.000	14.000	837.000	244.000	69.000	77.000	6.000	3.629.000
Lampung	121.000	1431.000	94.000	374.000	109.000	2465.000	493.000	2.103.000	220.000	20.000	9.254.000
Batub	9.000	69.000	90.000	57.000	59.000	69.000	69.000	69.000	44.000	2.000	1.292.000
Kepri	24.000	335.000	409.000	59.000	82.000	219.000	49.000	14.000	22.000	37.000	1.745.000
0	1.514.000	8.632.000	7.092.000	2.319.000	2.897.000	1.819.000	2.245.000	6.261.000	1.041.000	992.000	48.000.000

Table 3 Freight Origin-Destination Matrix in 2030

	Medan	Samar	Sukab	Pem	Jambi	Semarang	Bengkulu	Lampung	Batub	Kepri	0
Medan	0	47.450.000	9.99.000	1929.000	997.000	3739.000	923.000	2239.000	69.000	99.000	63.914.000
Samar	9.997.000	0	9.997.000	9.974.000	179.000	9.904.000	1979.000	3.997.000	219.000	109.000	59.120.000
Sukab	339.000	9.919.000	0	9.990.000	1979.000	2199.000	237.000	1.999.000	140.000	139.000	34.499.000
Pem	294.000	9.742.000	3039.000	0	174.000	3.14.000	2294.000	1729.000	194.000	3.093.000	79.193.000
Jambi	179.000	479.000	9290.000	1994.000	0	1.990.000	1.97.000	2.900.000	99.000	947.000	20.593.000
Semarang	294.000	9.143.000	9.923.000	2.100.000	9.954.000	0	3979.000	9.903.000	1399.000	7.9.000	49.709.000
Bengkulu	140.000	179.000	2279.000	71.000	34.000	1.999.000	0	103.000	75.000	99.000	9.399.000
Lampung	999.000	1.999.000	9.99.000	2.792.000	3.939.000	20.900.000	9.121.000	0	997.000	992.000	95.919.000
Batub	99.000	1.000.000	990.000	29.000	299.000	3.999.000	379.000	999.000	0	74.000	7.939.000
Kepri	997.000	2.939.000	3.939.000	279.000	90.000	90.000	399.000	499.000	40.000	0	12.149.000
0	29.199.000	29.629.000	79.992.000	31.399.000	17.547.000	55.901.000	17.794.000	23.217.000	3.370.000	9.492.000	409.000.000

Passenger trip generation of the Lampung province to the other provinces in Sumatra Island was 9.254 million people / year, while the other provinces of Lampung to the total of 6.261 million people / year. Trip generation of freight transportation from the provinces of Lampung to the other provinces in Sumatra Island is 65.818 million tons / year and from other provinces towards Lampung totaled 23.217 million tons / year.

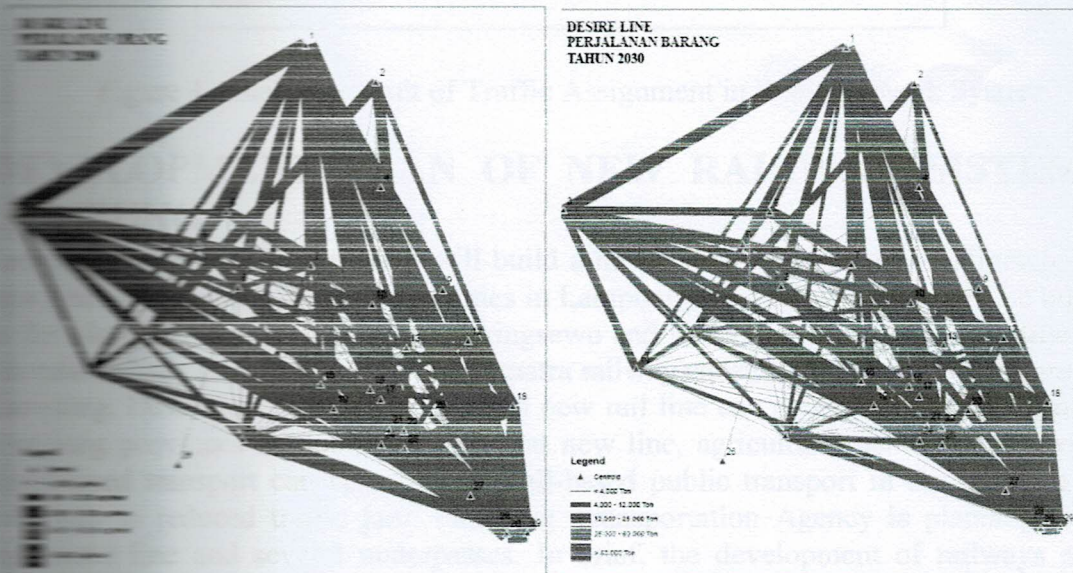


Figure 3. Passenger and Freight Distribution per Year in Lampung 2030

Passenger movement patterns showed a pattern of significant movement of people from the provinces of Bengkulu - Java, and the movement from South Sumatra - Java. This shows the amount of movement is a through traffic, while the inter-zone movement has not been so great. The movement of the external zone to the internal zone is of considerable South Sumatra, Bengkulu and Java to the center of Bandar Lampung. Movement between internal zones are also large enough is Liwa- Mesuji, Bakauheni-Sukadana and Labuan Maringgai - Bakauheni. The average movement from all internal zone - Bakauheni is also quite large.

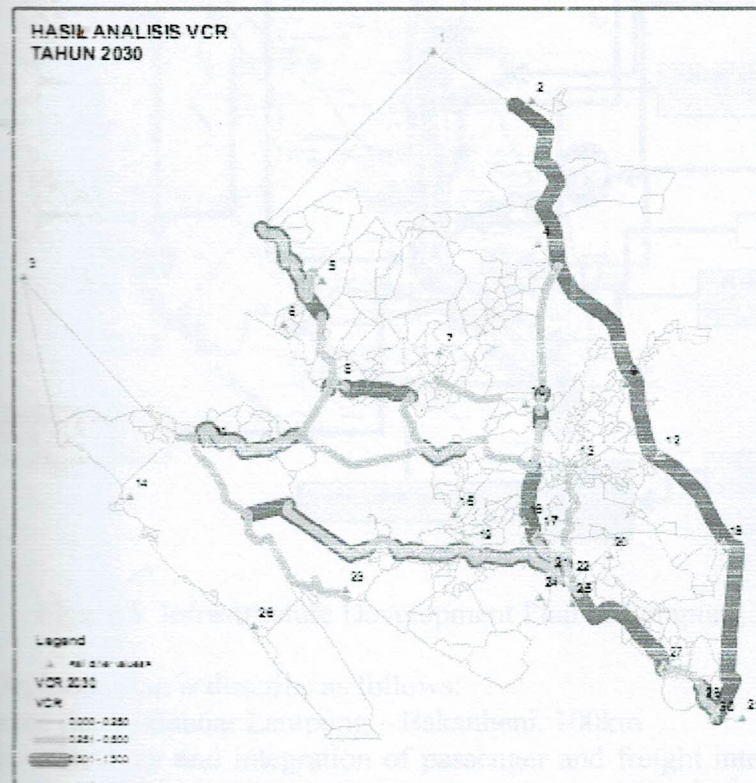


Figure 4. Analysis Result of Traffic Assignment in Road Network System

DEVELOPMENT PLAN OF NEW RAILWAY SISTEM IN LAMPUNG

Lampung Provincial Government will build a new railway line along 62 kilometers. The new lines will connect a number of cities in Lampung. New railway lines will be built that is the Metro-Terbanggi, Tegineneng-Pringsewu and Kotabumi-Menggala. Construction of the new railway project is part of the Sumatra railway construction along 200 kilometers in Lampung. Development construction of a new rail line can generate economic growth of Lampung provinces in Sumatra. With that new line, agricultural centers that have been constrained transport can be resolved. Rail-based public transport in the city is a major solutions to reduced traffic jam. Lampung Transportation Agency is planning to build commuter line and several underpasses. In brief, the development of railways system, infrastructure and regional planning in the province of Lampung is as follows

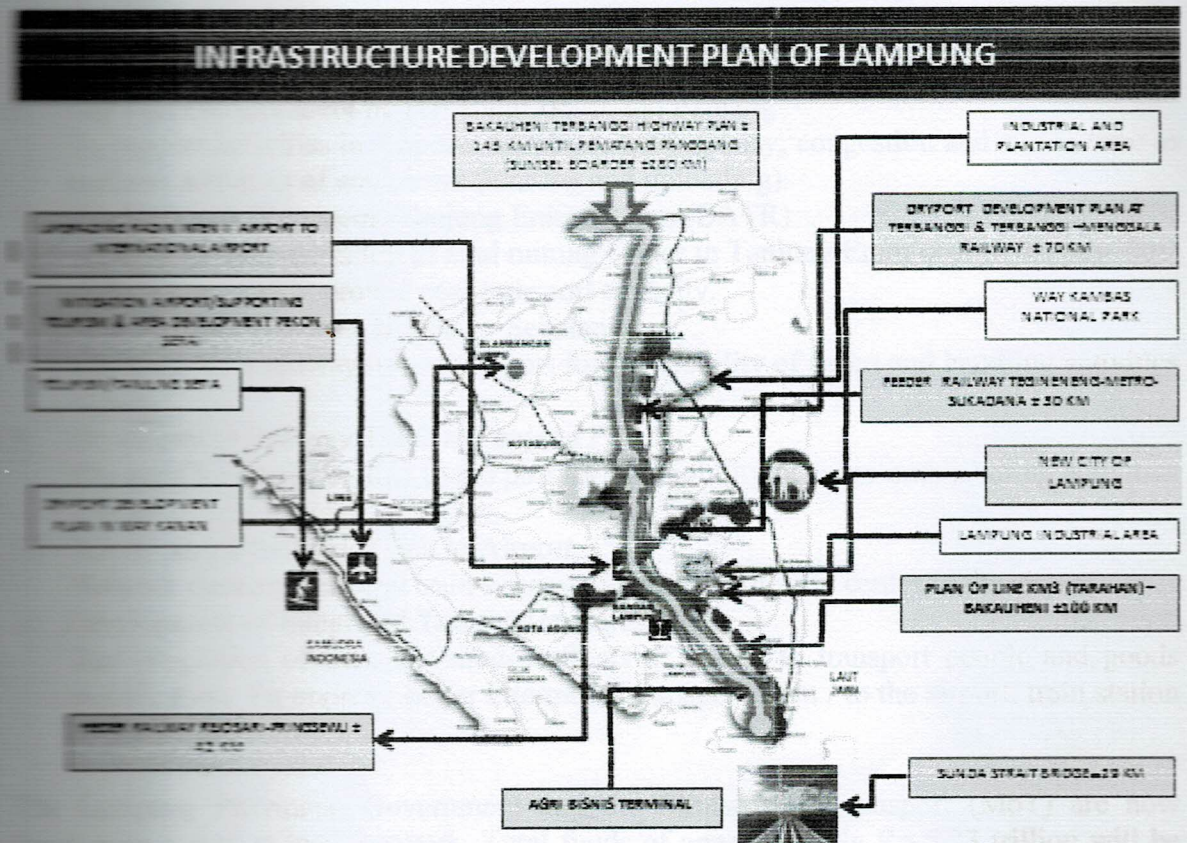


Figure 5. Infrastructure Development Plan of Lampung

Railways Development Plan is describe as follows:

1. Tarahan Trace (km3) Bandar Lampung – Bakauheni, 100km
Improve the efficiency and integration of passenger and freight intermodal transport by land, sea, and railway system. This project is very potential for passenger and freight services and respond of Trans Sumatra Railway Master plans and development plans of Sunda Strait Bridge
2. Tegineneng – Metro Trace (next to Sukadana) 18km
The development of economic mobility of Metro is necessary for the development of passenger rail infrastructure (commuter line). It is important to stretching the economic level of Metro and hinterland areas in Lampung.
3. Pringsewu – Rejosari – Tj. Karang Trace, 42 km
Connecting Pringsewu district to downtown because the highway is very crowded, and Pringsewu is a district which is rapid economic growth and supported by a hinterland region such as Tanggamus and Pesawaran.
4. Rejosari – Tarahan Shortcut, 26 km
The aim of this project is to reduce the rate of accidents caused by crossings and reduce congestion, also to improve the efficiency of coal transportation.
5. Feeder Terbanggi Besar – Unit 2 Menggala, 76 km
To improve the efficiency of freight transport both in the mining sector, agriculture, plantation and other sectors. Potential of Lampung, especially Northern Central part is

very large but has not been supported by adequate infrastructure. It is important to reduce road damage caused by overload.

6. Dry Port Development in Terbanggi Besar and Panjang
To support activities in seaports which are getting busy, congestion and a long time to perform activities of containers (loading and unloading).
7. Double Track Srengsem -Tanjung Enim 300km (BATR)
To improve transportation of coal mining center in Tanjung Enim coal to the new Port of Srengsem and improved coal transport capacity.
8. Double Track Bandar Lampung – Sebalang
The need for a railway line to the port for the mobility of cargo and handling activities at port
9. Development Railway Track to Panjang Port
The need for a railway line to the port for the mobility of cargo and handling activities at port
10. Development Railway Track to Airport
Network development and train services connecting the city center to the airport
11. Development of Integrated Terminal at Rejosari
The integration of transport modes affects of access to transport people and goods mobilization. To improve better intermodal transport from / to the airport, train station or port.

The Lampung Provincial Government and the Ministry of Transport (MoT) are now developing a new railway network. Total funds of approximately Rp 5.23 trillion will be needed to build this network, which will cover 191 km. the network development includes the Rejosari-Lampung Airport-Bakauheni rail line (100 km) as part of the Sumatra railway program. It also includes the development of an outer loop Rejosari-Tanah railway freight line covering 26 km, the Tembaga Besar-Unit 2 Menggala-Sp Pematang Mesuji railway freight line (100 km), and an urban commuter rail line (65 km).

Stepping up the development of railways in Lampung is sorely needed. Moreover, the service quality of the roads as a means of transport continues to decline due to the very large number of vehicles, which has not been matched by an increase in the capacity of the roads. The funds needed for the railway development could reach Rp 30-40 billion per km of railway. Meanwhile, in 2012 total budget for the MoT's Directorate General of Railways is Rp 8.7 trillion.

In addition to the government, a private investor is also developing a railway line in Lampung. In November 2012, China Development Bank (CDB) signed a framework agreement to arrange the financing scheme to fund a coal railway project from Tanjung Enim in South Sumatra to Bandar Lampung. This Chinese bank has become the coordinator for the bank financing and is prepared to fund the project in the amount of US\$ 1.3 billion (Rp 11.69 trillion).

The coal rail line will cover 300 km and will travel across eight districts and one municipality in two provinces on the island of Sumatra. They're ready to start the railway project to the tune of US\$ 1.3 billion, with a debt-to-equity ratio of 70:30. China Railway Group and PT BA have formed a joint venture named BATR to work on the project. The

project is now at the land acquisition stage. The railway construction is part of the PT Bukit Asam Banko coal mine project, which is a joint venture between PT BA and PT Rajawali Asia Resources. The signing of the framework agreement provides certainty over the funding sources for this railway infrastructure project. This project is part of the Masterplan for the Acceleration and Expansion of Economic Development in Indonesia (MP3EI). The project will integrate coal mining, railway transport infrastructure, and port logistics. The railway and port infrastructure will be built and operated by BATR.

Table 4. MP3EI Railway Projects Open to Private Sector

No.	Project Name	Value (Rp trillions)
1	Tanjung Enim-Tanjung Carat Railway 270 km	17.00
2	Tanjung Enim-Lampung Railway 300 km	15.30
3	MRT East-West	30.00
4	Semarang-Bojonegoro-Surabaya Double Track Railway and facilities	9.50
5	Soekarno-Hatta Airport Railway	2.27
6	Pekalongan-Semarang Double Track Railway 87.9 km	1.80
7	Puruk Cahu-Tanjung Isuy Railway 203 km	20.30
8	Puruk Cahu-Bangkuang Railway 185 km	15.00
	Total	111.11

CONCLUSION

Lampung province has potential in agriculture, plantations and mining that requires a more efficient mode [of transport]. Railway development is also needed to anticipate plans to construct the Sunda Strait Bridge (JSS), toll roads, new towns, and to develop industrial zones in Lampung. For a special purpose railway to be established between a point of production (for example, a mine) and a point on the public railway system, and for the trains operated on the special purpose railway to continue along the public railway to a port or other destination. The MP3EI project has identified a number of projects open to the private sector. In fact, the main spirit of the Law No. 23/2007 on the Railways is to eliminate the monopoly of PT KAI. Efforts to eliminate this monopoly are expected to give birth to a healthy climate of competition. If there is competition among several operators in enhancing railway transport services, the community will likely benefit from it.

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