INTERNATIONAL CONFERENCE

The Second International Conference on Engineering and Technology Development

2nd ICETD 2013

27, 28, 29 August 2013, Bandar Lampung, Indonesia

PROCEEDINGS

Hosted by:
Faculty of Engineering and Faculty of Computer Science,
Bandar Lampung University (UBL), Indonesia
2nd ICETD 2013
The Second International Conference
On Engineering And Technology Development

28-30 January 2013
Bandar Lampung University (UBL)
Lampung, Indonesia

PROCEEDINGS

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Bandar Lampung University (UBL)
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PREFACE

The Activities of the International Conference is in line and very appropriate with the vision and mission of Bandar Lampung University (UBL) to promote training and education as well as research in these areas.

On behalf of the Second International Conference on Engineering and Technology Development (2nd ICETD 2013) organizing committee, we are very pleased with the very good response especially from the keynote speaker and from the participants. It is noteworthy to point out that about 80 technical papers were received for this conference.

The participants of the conference come from many well known universities, among others: University Kebangsaan Malaysia – Malaysia, APTIKOM – Indonesia, Institut Teknologi sepuhul November – Indonesia, Surya Institute – Indonesia, International Islamic University – Malaysia, STMIK Mitra Lampung – Lampung, Bandung Institut of Technology – Bandung, Lecture of The Malahayati University, B2TP – BPPT Researcher – lampung, Starch Technology Center – lampung, Universitas Islam Indonesia – Indonesia, Politeknik Negeri Malang – Malang, University of Kitakyushu – Japan, Gadjah Mada University – Indonesia, Universitas Malahayati – Lampung, Lampung University – lampung, Starch Technology Center – Lampung, Universitas Riau – Riau, Hasanuddin University – Indonesia, Diponegoro University – Indonesia, King Abdulaziz University – Saudi Arabia, Parahyangan Catholic University – Indonesia, National Taiwan University– Taiwan, Surakarta Christian University – Indonesia, Sugijapranata Catholic University – Indonesia, Semarang University – Indonesia, University of Brawijaya – Indonesia, PPKIA Tarakanita Rahmawati – Indonesia, Kyushu University, Fukuoka – Japan, Science and Technology Beijing – China, Institut Teknologi Sepuluh Nopember – Surabaya, Researcher of Starch Technology Center, Universitas Muhammadiyah Metro – Metro, National University of Malaysia – Malaysia.

I would like to express my deepest gratitude to the International Advisory Board members, sponsor and also to all keynote speakers and all participants. I am also grateful to all organizing committee and all of the reviewers who contribute to the high standard of the conference. Also I would like to express my deepest gratitude to the Rector of Bandar Lampung University (UBL) who give us endless support to these activities, so that the conference can be administrated on time.

Bandar Lampung, 29 August 2013-08-26

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# Table Of Content

Organizing Committee

Table Of Content

Keynote Speaker

1. Recent Advances in Biofuel Cell and Emerging Hybrid System  
   **Abdul Aziz Ahmad and Raihan Othman** .......................................................... 1

2. Waste Utilization Study Tailing Gold Mine in Way Linggo-Lampung, as Fine Aggregate Materials for Producing Mortar Materials based on concept of Green Technology  
   **Lilies Widojoko & Susilawati** ........................................................................ 8

3. Infrastructure Health Monitoring System (SHM) Development, a Necessity for Maintenance and Investigation  
   **Prof. Dr. Priyo Suprobo, Faimun, Arie Febry** ................................................. 17

4. Four Phases Quality Function Deployment (Qfd) By Considering Kano Concept, Time And Manufacturing Cost  
   **Prof. Dr. Moses L Singgih, Dyah L. Trenggonowati, Putu D. Karningsih** .... 22
Speaker

1. Comparative Analysis for The Multi Period Degree Minimum Spanning Tree Problem
   Wamiliana, Amanto, and Mustofa Usman................................................................. 39

2. Choosing The Right Software In Supporting The Successful of Enterprise ERP Implementation
   Yodhie Yuniarthe, Idris Amsuni............................................................. 44

3. Climate Adaptive Technology In Maintaining Vernacularism Of Urban Kampong
   Case study: KampungAdat (Indiginous) Mahmud, Bandung District,West Java
   Marcus Gartiwa................................................................. 50

4. The Prospect Of Diesohol In Facing Fossil Fuel Crissis
   M.C. Tri Atmodjo.................................................................................. 63

5. The Potential Of Agriculture And Forestry Biomass Wastes As Source Of Bioenergy
   Hardoyo...................................................................................................... 66

6. The Importance of Education Facility as Sustainable Urban Generation Tool
   Fritz Akhmad Nuzir, Haris Murwadi and Bart Julien Dewancker ......... 71

7. The implementation of Secton Method for Solving Systems of Non Linear Equations
   Nur Rokhman............................................................................................ 80

8. Quality Control Analysis Into Decrease The Level Defects On Coffee Product
   Heri Wibowo, Sulastri and Emy Khikmawati ........................................ 85

9. Public Transportion Crisis In Bandar Lampung
   Ida Bagus Ilham Malik ........................................................................ 89

10. Geospatial Analysis of Land Use Change in Way Kuripan Watershed, Bandar Lampung City
    Candra Hakim Van Raflil., Dyah Indriana Kusumastuti2., Dwi Jokowinarno................................................................. 99

11. Material Utilization Technology Of Agriculture And Forestry Waste
    Hardoyo...................................................................................................... 105

12. The Supply Chain System Of Cassava On The Tapioca Industry
    Hardoyo...................................................................................................... 108

13. Glass Technology In Natural Light Glasses On Aperture Element In The Architecture World
    Muhammad Rija & MT Pedia Aldy ........................................................ 113
Firdaus Chairuddin, Wihardi Tjaronge, Muhammad Ramli, Johannes Patanduk

15. Coordination Of Architectural Concepts And Construction Systems  
Eddy Hermanto

16. Seismic Assessment of RC Building Using Pushover Analysis  
Riza Ainul Hakim

17. Viscosity and Liquidity Index Relation for Elucidating Mudflow Behavior  
Budijanto Widjaja and Shannon Hsien-Heng Lee

18. The Use of Pozzolanic Material for Improving Quality of Strontium Liquid Waste Cementation in Saline Environment during Nuclear Waste Immobilization Process  
Muhammad Yusuf, HayuTyasUtami, Tri SulistiyoHariNugroho, SusetyoHarioPutero

19. Geospatial Analysis Of Land Use And Land Cover Changes For Discharge At Way Kualagaruntang Watershed In Bandar Lampung  
Fieni Yuniarti, Dyah Indriana K, Dwi Joko Winarno

20. Wifi Network Design For High Performance  
Heru Nurwarsito, KasyfulAmron, BektiWidyaningsih

Yasser, Herman Parung, M. Wihardi Tjaronge, Rudy Djamaluddin

22. The Research Of Slow Release Nitrogen Fertilizer Applied In Sugarcane (Saccharum Officinarum) For Green Energy Bioethanol  
M.C. Tri Atmodjo, Agus Eko T. Nurul Rusdi, Sigit Setiadi, and Rina

23. Energy Utilization Technology Of Agriculture And Forestry Waste  
Hardoyo

24. Implementation Of Fuzzy Inference System With Tsukamoto Method For Study Programme Selection  
Fenty Ariani and Robby Yuli Endra

25. The Analysis of Video Conference With ITU Standardization (International Telecommunication Union) That Joining in Inherent At Bandar Lampung University  
Maria Shusanti F, Happy Reksa
26. The E-internal audit iso 9001:2008 based on accreditation form assessment matrix in study program for effectiveness of monitoring accreditation
   Marzuki, Maria Shusanti F. ................................................................. 207

27. The Developing Of e-Consultations For Effectiveness of Mentoring Academy
   Ahmad Cucus, Endang K ................................................................. 214

28. The Evaluation of information system performance in higher education case study with EUCS model at bandar lampung university
   Reni Nursyanti, Erlangga ................................................................. 221

29. The Analysis Of History Collection System Based On AndroidSmartphone With Qr Code Using Qr Code Case Study: Museum Lampung
   Usman Rizal, Wiwin Susanty, Sutrisno ............................................ 230

30. Application of Complaint Handling by Approach Model of ISO 10002 : 2004 to Increase Complaint Services
   Agus Sukoco and Yuthsi Aprilinda .................................................. 235

31. Towards Indonesian Cloud Campus
   Taqwan Thamrin, Ing Lukman, Dina Ika Wahyuningsih .......................... 252

32. Bridging Router to ADSL Modem for Stability Network Connection
   Arnes Yuli Vandika and Ruri Koesliandana ....................................... 257

33. The Effect of Use Styrofoam for Flexural Characteristics of Reinforced Concrete Beams
   Yasser, Herman Parung, M. Wihardi Tjaronge, Rudy Djamaluddin .......... 261

34. The Estimation Of Bioethanol Yield From Some Cassava Variety
   M.C. Tri Atmodjo ................................................................. 273

35. Effect of Superficial Velocity of Pressure Difference on The Separation of Oil And Water by Using The T-Pipe Junction
   Kms. Ridhuan and Indarto ................................................................. 277

36. The use of CRM for Customer Management at Cellular Telecommunications Industry
   Ayu Kartika Puspa ................................................................. 293

37. Indonesian Puslit (Centre Of IT Solution) Website Analysis Using Webqual For Measuring Website Quality
   Maria Shusanti Febrianti and Nurhayati ............................................ 297

38. The E-internal audit iso 9001:2008 based on accreditation form assessment matrix in study program for effectiveness of monitoring accreditation
   Marzuki, Maria Shusanti F. ................................................................. 307
Agus Sukoco ........................................................................................................ 320

40. Value Analysis Of Passenger Car Equivalent Motorcycle (Case Study Kartini Road Bandar Lampung)  
Juniardi, Aflah Efendi .......................................................................................... 337

41. Alternative Analysis Of Flood Control Downstream Of Way Sekampung River  
Sugito, Maulana Febramsyah. ............................................................................ 347

42. Analysis Of Fitness Facilities And Effective Use Of Crossing Road  
Juniardi, Edi Haryanto. ........................................................................................ 353

43. Study On Regional Development Work Environment Panjang Port Lands In Support Bandar Lampung City As A Service And Trade  
Ir. A. Karim Iksan, MT, Yohn Ferry. .................................................................... 359

44. Analytical And Experimental Study Bamboo Beam Concrete  
Hery Riyanto, Sugito, Juli ................................................................................... 370

45. Comparative Analysis Of Load Factor Method Static And Dynamic Method (Case Study Akdp Bus Route Rajabasa - Bakauheni)  
A. Ikhsan Karim, MT., Ahmad Zulkily. ............................................................... 378

46. Optimization Utilization Of Water Resourcesdam Batutegi Using Method Of Linear Program  
Aprizal, Hery Fitriyansyah .................................................................................. 386

47. Characteristics Generation Traffic Patterns And Movement In Residential Area (Case Study Way Kandis Residential Bandar Lampung)  
Fery Hendi Jaya, Juniardi, .................................................................................. 392

48. Use Study On Slight Beam Reinforced Concrete Floor Platein Lieu Of Scondary Beam  
Hery Riyanto, Sugito, Lilies Widodjoko, Sjamsu Iskandar ................................. 399

49. Observation Of The Effect Of Static Magnetic Field 0.1 Mr On A-Amylase Activity In Legume Germination  
Rochmah Agustrina, Tundjung T. Handayani, and Sumardi. .............................. 405

50. Effectiveness Analysis Of Applications Netsupport School 10 Based Iso / Iec 9126-4 Metrics Effectiveness  
Ahmad Cucus, Nelcy Novelia ............................................................................. 413

51. Omparative Performance Analysis Of Banking For Implementing Internet Banking  
Reza Kurniawan .................................................................................................. 418
COMPARATIVE ANALYSIS OF LOAD FACTOR
METHOD STATIC AND DYNAMIC METHOD
(CASE STUDY AKDP BUS ROUTE RAJABASA - BAKAUHENI)

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Abstract-Along with the increasing mobility of the population, then the users are demanding the availability of inter-city transportation are eligible smoothness, comfort and safety. It is also worth noting that the operator provides services angkutan. Operator certainly will not be able to serve well if not achieving the target of economic benefits. This is closely connected with the passenger load factor on a given route. To get a load factor (load factor) are known methods of static and dynamic methods. Each of these methods have shortcomings and kelebihannya.Trayek Rajabasa - Bakauheni AKDP bus served an important tool in making the transportation of passengers from Sumatra towards Java. So for performance that will be investigated how the operator is indicated by factors muatnya. Penelitian intends to see bus load factors, by comparing the static method with dynamic survey methods on the route that serve transportation between cities in the province that connects the city of Bandar Lampung in the South Lampung is also the gateway to the island Jawa. Dari analysis and calculations obtained by the method of static load factor LF values obtained Sunday morning at 45.33%, while the evening LF obtained a value of 24.44%. LF Monday morning at 39.11%, while the LF night obtained a value of 35.11%. From the analysis and calculation of Dynamic Methods for directions Rajabasa - Bakauheni obtained Load Factor on Sunday morning at 57.09%, while the evening LF obtained a value of 31.70%. LF Monday morning at 55.98%, while the LF night obtained a value of 46.98%. For directions Bakauheni - Rajabasa obtained Load Factor on Sunday morning at 63.31%, while the evening LF obtained a value of 36.35%. LF Monday morning at 61.50%, while the LF night obtained a value of 53.95%. Regression analysis of the results obtained equations that represent relationships Static and Dynamic Load Factor direction Rajabasa - Bakauheni is: \[ y = -3.859 + 3.955 x x^2 - 0.422 \], the value of coefficient of determination, \( R^2 = 0.972 \). As for the direction of Bakauheni - Rajabasa equation: \[ y = -4.677 + 4.585 x x^2 - 0.479 \], with a value of \( R^2 = 0.988 \)

Keywords: Bus AKDP, Survey Static, Dynamic Survey (Survey on the bus)
INTRODUCTION

In the human history of the development of the city we can see that people are always eager to travel from one place to another in order to obtain the required purposes. In this case the people need of a means of transport is called transportation mode.

The need for transportation from time to time increased due to the increasing number of activities that require the services traffic thus so does the intensity of inter-city traffic movement.

Performance of the public transport services can be viewed from an operation effectiveness and efficiency of public transport. Effective assessment criteria are usually given to efficient transport modes, while the criteria given to passengers aspects. In terms of effectiveness can be seen with the indicator of accessibility (ease of users to achieve these vehicles), density (number of vehicles or the length of the route), average travel speed, average frequency and headway. In terms of efficiency seen from indicators of affordability, feasibility, utility, operating rate, load factor and the age of the vehicle.

Along with the increasing mobility of the population, then the users are demanding the availability of inter-city transportation are eligible smoothness, comfort and safety. It is also worth noting that the operators provide transport services. Operator certainly will not be able to serve well if not achieving the target of economic benefits. This is closely connected with the passenger load factor on a given route.

LITERATURE REVIEW

1. Transportation systems

Transportation system consisting of transit cargo (freight) and transportation management to manage (Salim, 1993: 8).

a. Freight transportation

The system used to transport goods by using certain conveyances called modes of transportation. In the use of transportation consists of 3 (three) modes that can be used, namely:

1. Transportation through the land (rail, bus, truck, ferry, etc.);
2. Transportation through the water (sea ship, boat, etc.);
3. Transportation by air (plane).

b. Management of transportation system consists of 2 (two) categories, namely:

1. Marketing and Sales Management Freight;
2. Marketing Management is responsible for the operation and exploitation in the field of transport, and as part of the company's attempt to seek subscriptions for the progress of the company as much as possible.
3. Traffic and Transport Management. Freight traffic management is responsible for managing the provision of transport services that
transport cargo, conveyance, and the costs of operating a vehicle (Salim, 1993: 8).

2. Definition of Traffic and Transportation

Traffic is passing activity or movement of vehicles, people, or animals on the streets (Warpani, 1990). Problems encountered in peralalulintasan is a balance between the capacity of the road network with the number of vehicles and people passing by using the road. If the capacity of the road network is almost saturated, let alone exceeded, then there is a traffic jam. Transport (transport) are the activities of the movement of people and goods from one place (origin) to another (destination) by means of (vehicle) (Warpani, 1990).

2. Definition of Public Transport

Public transport passengers are transit passengers carried on a lease or pay (Ahmad Munawar, 2001). Transportation generally divided into three categories play, namely the Inter-City Transport, Urban Transport and Rural Transport.

Inter-city transport is divided into two, namely Transport Inter City Inter Province (AKAP), the public transportation service between cities that transcend provincial administrative boundaries, and the Inter-City Transport in the province (Descending), the public transportation service between cities in the administrative area of the province. Mass public transport in cities in Indonesia are generally serviced by buses and small buses, while large buses serve only public transportation in major cities; remaining, large buses serve intercity transportation between provinces. Of the 10 metropolitan areas only 7 cities that use large capacity vehicle (big bus and medium bus), while the remainder is dominated by small-capacity vehicles.

It is estimated by 2020 there will be 15 cities in Indonesia with a population of over 1,000,000 inhabitants. In addition, a change in society's values and behaviors that improve mobility, which in turn requires transportation service with a level of safety, security, speed, smoothness, and greater comfort, greater variety, and larger capacity. The essence of the forecast city of more than one soul we can manage transportation. Population growth in the region / province will take effect on the amount of the required transportation services (trade, agriculture, industry). As a means of transportation and infrastructure to meet the needs of transport services should be coupled with the development of programs to meet those needs.

Urban areas with a population of one million or more already should have a public passenger transport service or mass transportation. Urban management needs to improve efficiency in the use of urban infrastructure that relies on the existence of public transport mobility. They are people who have no choice but to use public transport. Operation of the mass transit system is one way to accommodate the interests of the mobility of the population, especially in urban areas or cities with a population over one million.

The existence of public transport, especially the nature of mass, mean reduction in the number of vehicles passing on the road. It is very important pertaining to traffic control. The need for increased transport infrastructure development without coupled loads resulted planned arterial
and collector roads become increasingly accommodated. Because of its mass, then the passenger should have similarities in many ways the origin, destination, track, and time. The similarities in turn raises a question of balance between supply and demand. Public transport services will run properly if it can create a balance between supply and demand. An effort is difficult (perhaps even less likely) the criterion is met if the demand during busy or peak periods. The uncertainty caused by the movement patterns of uneven population over time, such as during peak hours of high demand, and when the off peak hours of low demand. In this connection it should government intervene with the aim, among others:

a. Ensure a safe operating system for the benefit of the user community transport services, freight management officers, and businessmen freight services;
b. Directed that the environment is not too bothered by transport activities;
c. Assist the development of national and regional development and to improve the transportation service;
d. Ensure equitable distribution of transport services so that there is no injured party;
e. Control the operation of transport services

Service Type Public Transportation
Road Transportation of people with common road vehicle is done by using a bus or passenger car. Transport of persons served by public transportation:
1. Fixed routes and regular; transport service that is performed in a route network with a regular fixed schedule or not scheduled for the transportation service by public transport and in certain fixed routes, carried out in the route network
2. Non fix routes; transporting people with no public transport in the route consists of:
   a. Transportation by taxi.
   b. Transport by way of lease.
   c. Transport for tourist purposes.

For the transportation service by public transport in fixed routes and regular, set in route network. Route network include:

a. Route inter-city inter-provincial routes, through which more than one region of the Province, has the characteristics of services as follows:
   1) Have a fixed schedule.
   2) The service is fast.
   3) Served by public bus car.
   4) Availability at type A passenger terminal, in the early departure.
   5) Infrastructure of the courses comply with the class.
b. Route between cities in the province through the inter-regional routes, Level II in the territory of the Province, held by an unlikely candidate for the following services:
   1) Have a fixed schedule.
   2) The service is fast and / or slow.
   3) Car serviced by public bus.
   4) Availability of terminal type B at least, at the beginning of departure, transit and destination terminals
   5) Of the road infrastructure to comply with the class.
c. City routes is entirely within one municipality Regional Level II or routes in Jakarta Capital Region Otority.
Network of public services in urban roads stretch are classified into four kinds, namely:

1. direct route
   Route directly held by the characteristics of service as follows:
   a. Have a fixed schedule.
   b. Serve the transportation between regions that are mass regularly and directly.
   c. Served by public bus.
   d. Fast service.
   e. Short distances.
   f. Through the places assigned only to raise and lower the passenger.

2. The main route
   The main route was organized with the characteristics of service as follows:
   a. Have a fixed schedule.
   b. Serve the transportation between major regions, between regions and supporting the main characteristics of the shuttle to travel regularly to the nature of mass transportation.
   c. Car serviced by public bus.
   d. The service is fast and / or slow.
   e. Short distances.
   f. Through the places that have been established to raise and lower the passenger.

3. route branch
   Route branch was organized with the characteristics of service as follows:
   a. Have a fixed schedule.
   b. Serve inter-regional transit advocates, supporters and the area between residential areas.
   c. Served by public bus car.
   d. The service is fast and / or slow.
   e. Short distances.
   f. Through the places that have been established to raise and lower the passenger.

4. Route sub branch was organized with the following characteristics:
   a. Serving transport in residential areas.
   b. Served by public bus car and / or public transportation.
   c. Slow service.
   d. Short distances.

5. Rural stretch that stretch, all located in one area of The District, held by the characteristics of the following services:
   a. Have a fixed schedule and / or non-scheduled.
   b. Slow service.
   c. Dilayanioleh public bus car and / or public transportation.
   d. The availability of the passenger terminal at least type C, in early pemberngkatan and destination terminals.
   e. Of the road infrastructure to comply with the class.

6. Stretch across national borders that stretch through the state border, has the characteristics of services as follows:
   a. Have a fixed time tables.
   b. Fast service.
   c. Served by public car.
   d. The availability of the passenger terminal type A, at the beginning of departure, transit and destination terminals.
   e. Of the road infrastructure to comply with the class.

RESEARCH METHODOLOGY

1. Data Collection
   Data will be collected at the place where the survey was conducted. Data - the data consists of:
   • Primary Data
data obtained directly by observing and recording in the field as well as interviews with the certain parties to be able to support the accuracy of the results of this analysis.

• Secondary Data
This data is obtained indirectly through the document. For example, data obtained from the Organda and DLLAJ associated with this analysis.

2. Data Analysis
Further primary data and secondary data that have been obtained will be analyzed by comparing the data from static and dynamic survey using a formula - the formula contained in the literature until the obtained values - values or parameters are defined as presented in tabular form. Value - the value or parameter is included in the conclusions of this research by comparing with the existing standard.

DATA AND ANALYSIS

1. Average number of Trips Per day
Based on data obtained from the Department of Transportation Lampung Province, in 1 (one) day average passenger transport needs can be catered for 21.14 trips during the day (at 8:00 a.m. to 18:00) and 7.9 trips at night, ie between the hours of 18:00 up to 08:00. For the average trips per day for 24 hours is equal to 8.43 rit. This calculation can be seen in Table 1.

Table 1. Average number of Rit Per day

<table>
<thead>
<tr>
<th>HARI</th>
<th>JUMLAH RIT</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pagi (8.30 - 18.00)</td>
</tr>
<tr>
<td>Senin</td>
<td>20</td>
</tr>
<tr>
<td>Selasa</td>
<td>20</td>
</tr>
</tbody>
</table>

From the data obtained, Sunday and Monday had the highest number of trips, so the Sunday and Monday were sampled to analyze the load factor.

2. Load Factor Analysis
Passenger load factor shows comfort in traveling. Here is the definition of load factor load factor, if we conduct a review of public transport between cities. In a study of public transport between cities where passenger numbers are fixed along the route, then the definition of load factor is the number of passengers carried in one rit divided by payload capacity.

3. Statics Survey Method
Static survey conducted within the terminal, in order to obtain performance data transport bus that includes the amount of vehicles that operate in a single day. Data were successfully obtained a police bus number, bus name, type of service (AC / Economics), time of departure and number of passengers carried when leaving from the terminal, either from Rajabasa terminal, or from a terminal Bakauheni.

CONCLUSION
Obtained from the analysis and calculation methods of static load factor with values obtained LF Sunday morning at 45.33%, while the evening LF obtained a value of 24.44%. LF Monday morning at 39.11%, while the LF night obtained a value of 35.11%.
From the analysis and calculation of Dynamic Methods for directions Rajabasa - Bakauheni obtained Load Factor on Sunday morning at 57.09%, while the evening LF obtained a value of 31.70%. LF Monday morning at 55.98%, while the LF night obtained a value of 46.98%.

For directions Bakauheni - Rajabasa obtained Load Factor on Sunday morning at 63.31%, while the evening LF obtained a value of 36.35%. LF Monday morning at 61.50%, while the LF night obtained a value of 53.95%

Dynamic Load Factor remained above the value of Static Load Factor. This is due to the static method can not be calculated passengers up or down beyond the point of showing the results pengamatan serta Load Factor value is always higher in the morning which is above the value of Load Factor night.

Regression analysis of the results obtained from the equation that represents the relationship Static and Dynamic Load Factor direction Rajabasa - Bakauheni is: \( y = -3.859 + 3.955 \times x - 0.422 \), the value of coefficient of determination, \( R^2 = 0.972 \). As for the direction of Bakauheni - Rajabasa equation: \( y = -4.677 + 4.585 \times x - 0.479 \), with a value of \( R^2 = 0.988 \)

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