

- Home
- Journal Rankings
- Journal Search
- Country Rankings
- Country Search
- Compare
- Map Generator
- Help
- About Us

Journal Search

Search query

in Journal Title

Exact phrase

International Journal of Earth Sciences and Engineering

Country: India

Subject Area: Earth and Planetary Sciences | Engineering | Environmental Science

Subject Category:

Category	Quartile (Q1 means highest values and Q4 lowest values)															
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Building and Construction													Q4	Q4	Q4	Q4
Civil and Structural Engineering													Q4	Q4	Q4	Q4
Earth and Planetary Sciences (miscellaneous)													Q4	Q3	Q3	Q3
Environmental Engineering													Q4	Q4	Q4	Q4
Ocean Engineering													Q4	Q3	Q3	Q3

Publisher: Cafet-Innova Technical Society, **Publication type:** Journals. **ISSN:** 09745904

Coverage: 2010-2014

H Index: 4

[Charts](#) [Data](#)

Show this information in your own website



Display journal title

Just copy the code below and paste within your html page:

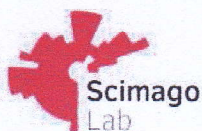
SJR indicator vs. Cites per Doc (2y)

Related product



@scimago

SJR is developed by:



Powered by
Scopus

The SJR indicator measures the scientific influence of the average article in a journal, it expresses how central to the global scientific discussion an average article of the journal is. Cites per Doc. (2y) measures the scientific impact of an average article published in the journal, it is computed using the same formula that journal impact factor™ (Thomson Reuters).

Citation vs. Self-Citation

June 2016

Volume 09 SPL No 03

ISSN 0974-5904

INTERNATIONAL JOURNAL OF EARTH SCIENCES AND ENGINEERING

Indexed in: Scopus Compendex and Geobase (products hosted on Engineering Village)
Elsevier, Amsterdam, Netherlands, Geo-Ref Information Services-USA, List B of Scientific
Journals in Poland, Directory of Research Journals

SJR: 0.17 (2014); H-index: 6 (2015);
CSIR-NISCAIR, INDIA Impact Factor 0.042 (2011)

EARTH SCIENCE FOR EVERYONE

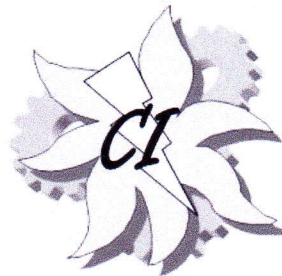
Special Issue of
**3rd International Conference on Earth Sciences and Engineering
(ICEE 2016)**

17th-18th June, 2016

<http://icee.cafetinnova.org/>

Jointly Organized by

**Department of Civil Engineering,
Nehru Institute of Technology, Coimbatore, India &
Cafet Innova Technical Society, Hyderabad, India**



Published by

**CAFET-INNOVA Technical Society
Hyderabad, INDIA**

<http://cafetinnova.org/>

CAFET-INNOVA Technical Society

1-2-18/103, Mohini Mansion, Gagan Mahal Road, Domalguda
Hyderabad – 500 029, Andhra Pradesh, INDIA

Website: <http://www.cafetinnova.org>

Mobile: +91-7411311091

Registered by Government of Andhra Pradesh

Under the AP Societies Act., 2001

Regd. No.: 1575

The papers published in this journal have been peer reviewed by experts. The authors are solely responsible for the content of the papers published in the journal.

Each volume, published in six bi-monthly issues, begins with February and ends with December issue. Annual subscription is on the calendar year basis and begins with the February issue every year.

Note: Limited copies of back issues are available.

Copyright © 2015 CAFET-INNOVA Technical Society

All rights reserved with CAFET-INNOVA Technical Society. No part of this journal should be translated or reproduced in any form, Electronic, Mechanical, Photocopy, Recording or any information storage and retrieval system without prior permission in writing, from CAFET-INNOVA Technical Society.

INTERNATIONAL JOURNAL OF EARTH SCIENCES AND ENGINEERING

The International Journal of Earth Sciences and Engineering (IJEE) focus on Earth sciences and Engineering with emphasis on earth sciences and engineering. Applications of interdisciplinary topics such as engineering geology, geo-instrumentation, geotechnical and geo-environmental engineering, mining engineering, rock engineering, blasting engineering, petroleum engineering, off shore and marine geo-technology, geothermal energy, resource engineering, water resources and engineering, groundwater, geochemical engineering, environmental engineering, atmospheric Sciences, Climate Change, and oceanography. Specific topics covered include earth sciences and engineering applications, RS, GIS, GPS applications in earth sciences and engineering, geo-hazards such as earthquakes, landslides, tsunami, debris flows and subsidence, rock/soil improvements and development of models validations using field, laboratory measurements.

Professors / Academicians / Engineers / Researchers / Students can send their papers directly to: chiefeditor_ijee@yahoo.com

CONTACT:

For all editorial queries:

D. Venkat Reddy (Editor-in-Chief)
Professor, Department of Civil Engg.
NIT-Karnataka, Surathkal, INDIA
☎ +91-9739536078
✉ dvr1952@gmail.com

All other enquiries:

Hafeez Basha. R (Managing Editor)
☎ +91-9866587053
✉ hafeezbasha@gmail.com
Raju Aedla (Editor)
☎ +91-7411311091
✉ rajucits@gmail.com

EDITORIAL COMMITTEE**D. Venkat Reddy***NITK, Surathkal, Karnataka, INDIA*

EDITOR-IN-CHIEF

Trilok N. Singh*IIT-Bombay, Powai, INDIA*

EXECUTIVE EDITOR

P. Ramachandra Reddy*Scientist G (Retd.), NGRI, INDIA*

EXECUTIVE EDITOR

R. Pavanaguru*Professor (Retd.), OU, INDIA*

EXECUTIVE EDITOR

Joanna Maria Dulinska*Cracow University of Tech., Poland*

EXECUTIVE EDITOR

Hafeez Basha R*CAFET-INNOVA Technical Society*

MANAGING EDITOR

Raju Aedla*CAFET-INNOVA Technical Society*

EDITOR

INTERNATIONAL EDITORIAL ADVISORY BOARD**Zhuping Sheng***Texas A&M University System
USA***Choonam Sunwoo***Korea Inst. of Geo-Sci & Mineral
SOUTH KOREA***Hsin-Yu Shan***National Chio Tung University
TAIWAN***Hyun Sik Yang***Chonnam National Univ Gwangju
SOUTH KOREA***Krishna R. Reddy***University of Illinois, Chicago
USA***L G Gwalani***NiPlats Australia Limited
AUSTRALIA***Abdullah MS Al-Amri***King Saud University, Riyadh
SAUDI ARABIA***Suzana Gueiros***Dra Engenharia de Produção
BRAZIL***Shuichi TORII***Kumamoto University, Kumamoto
JAPAN***Luigia Binda***DIS, Politecnico di Milano, Milan
ITALY***Gonzalo M. Aiassa***Cordoba Universidad Nacional
ARGENTINA***Nguyen Tan Phong***Ho Chi Minh City University of
Technology, VIETNAM***Ganesh R. Joshi***University of the Rykyus, Okinawa
JAPAN***Kyriakos G. Stathopoulos***DOMI S.A. Consulting Engineers Athens,
GREECE***U Johnson Alengaram***University of Malaya, Kuala Lumpur,
MALAYSIA***Robert Jankowski***Gdansk University of Technology
POLAND***Paloma Pineda***University of de Sevilla, Seville
SPAIN***Vahid Nourani***Tabriz University
IRAN***Anil Cherian***United Arab Emirates
DUBAI***P Hollis Watts***WASM School of Mines
Curtin University, AUSTRALIA***Nicola Tarque***Department of Engineering
Catholic University of Peru***S Neelamani***Kuwait Institute for Scientific
Research, SAFAT, KUWAIT***Jaya naithani***Université catholique de Louvain
Louvain-la-Neuve, BELGIUM***Mani Ram Saharan***National Geotechnical Facility
DST, Dehradun, INDIA***G S Dwarakish***NITK- Surathkal
Karnataka, INDIA***Subhasish Das***IIT- Kharagpur, Kharagpur
West Bengal, INDIA***S Viswanathan***IIT- Bombay, Powai, Mumbai
Maharashtra, INDIA***K U Maheshwar Rao***IIT- Kharagpur, Kharagpur
West Bengal, INDIA***Ramana G V***IIT- Delhi, Hauz Khas
New Delhi, INDIA***Usha Natesan***Centre for Water Resources
Anna University, Chennai, INDIA***M R Madhav***JNTU- Kukatpally, Hyderabad
Andhra Pradesh, INDIA***Kalachand Sain***National Geophysical Research Institute,
Hyderabad, INDIA***R Sundaravadivelu***IIT- Madras
Tamil Nadu, INDIA***M K Nagaraj***NITK- Surathkal
Karnataka, INDIA***Arash Ebrahimabadi***Azad University, Qaemshahr
IRAN***S M Ramasamy***Gandhigram Rural University
Tamil Nadu, INDIA***Gholamreza Ghodrati Amiri***Iran University of Sci. & Tech.
Narmak, Tehran, IRAN***Chachadi A G***Goa University, Taleigao Plateau
Goa, INDIA***Girish Gopinath***Geomatics Division
CWRDM, Kerala, INDIA***Shamsher B. Singh***BITS- Pilani, Rajasthan
Rajasthan, INDIA***C Natarajan***NIT- Tiruchirappalli,
Tamil Nadu, INDIA***N Ganesan***NIT- Calicut, Kerala
Kerala, INDIA***Linhua Sun***Suzhou University
CHINA***Pradeep Kumar R***IIT- Gachibowli, Hyderabad
Andhra Pradesh, INDIA***Vladimir e Vigdergauz***ICEMR RAS, Moscow
RUSSIA*

D P Tripathy National Institute of Technology Rourkela, INDIA	E Saibaba Reddy JNTU- Kukatpally, Hyderabad Andhra Pradesh, INDIA	Chowdhury Quamruzzaman Dhaka University Dhaka, BANGLADESH
Parekh Anant kumar B Indian Institute of Tropical Meteorology, Pune, INDIA	Datta Shivane Central Ground Water Board Hyderabad, INDIA	Gopal Krishan National Institute of Hydrology Roorkee, INDIA
Karra Ram Chandar NITK- Surathkal Karnataka, INDIA	Prasoon Kumar Singh Indian School of Mines, Dhanbad Jharkhand, INDIA	A G S Reddy Central Ground Water Board, Pune, Maharashtra, INDIA
Rajendra Kumar Dubey Indian School of Mines, Dhanbad Jharkhand, INDIA	Subhasis Sen Retired Scientist CSIR-Nagpur, INDIA	M V Ramanamurthy Geological Survey of India Bangalore, INDIA
A Nallapa Reddy Chief Geologist (Retd.) ONGC Ltd., INDIA	Bijay Singh Ranchi University, Ranchi Jharkhand, INDIA	S Suresh Babu Adhiyamaan college of Engineering Tamil Nadu, INDIA
C Sivapragasam Kalasalingam University, Tamil Nadu, INDIA	Xiang Lian Zhou ShangHai JiaoTong University ShangHai, CHINA	Debadatta Swain National Remote Sensing Centre Hyderabad, INDIA
Kripamoy Sarkar Assam University Silchar, INDIA	Ranjith Pathegama Gamage Monash University, Clayton AUSTRALIA	B M Ravindra Dept. of Mines & Geology, Govt. of Karnataka, Mangalore, INDIA
Nandipati Subba Rao Andhra University, Visakhapatnam Andhra Pradesh, INDIA	M Suresh Gandhi University of Madras, Tamil Nadu, INDIA	Autar Krishen Raina CSIR-CIMFR, Maharashtra, INDIA
H K Sahoo Utkal University, Bhubaneswar Odissa, INDIA	R N Tiwari Govt. P G Science College, Rewa Madhya Pradesh, INDIA	Nuh Bilgin Istanbul Technical University Maslak, ISTANBUL
M V Ramana CSIR NIO Goa, INDIA	N Rajeshwara Rao University of Madras Tamil Nadu, INDIA	Manish Kumar Tezpur University Sonitpur, Assam, INDIA
Salih Muhammad Awadh College of Science University of Baghdad, IRAQ	Sonali Pati Eastern Academy of Science and Technology, Bhubaneswar, INDIA	Safdar Ali Shirazi University of the Punjab, Quaid-i-Azam Campus, PAKISTAN
Naveed Ahmad University of Engg. & Technology, Peshawar, PAKISTAN	Raj Reddy Kallu University of Nevada 1665 N Virginia St, RENO	Glenn T Thong Nagaland University Meriema, Kohima, INDIA
Raju Sarkar Delhi Technological University Delhi, INDIA	Hanumantha Rao B School of Infrastructure IIT Bhubaneswar, INDIA	Samir Kumar Bera Birbal sahani institute of palaeobotany, Lucknow, INDIA
C N V Satyanarayana Reddy Andhra University Visakhapatnam, INDIA	S M Hussain University of Madras Tamil Nadu, INDIA	Vladimir Vigdergauz ICEMR, Russian Academy of Sciences Moscow, RUSSIA
T J Renuka Prasad Bangalore University Karnataka, INDIA	Deva Pratap National Institute of Technology Warangal, INDIA	K. Subramanian Coimbatore Institute of Technology Tamil Nadu, INDIA
Mohammed Sharif Jamia University New Delhi, INDIA	A M Vasumathi K.L.N. College of Inf. Tech. Pottapalayam, Tamil Nadu, INDIA	Deepak T J INTI International University Kuala Lumpur, MALAYSIA
C J Kumanan Bharathidasan University Tamil Nadu, INDIA	B R Manjunatha Mangalore University Karnataka, INDIA	Sivaraja M N.S.N College of Engg. & Technology Tamilnadu, INDIA
Ch. S. N. Murthy NITK- Surathkal Karnataka, INDIA	Jitendra Virmani Jaypee Uni. of Information Tech. Himachal Pradesh, INDIA	K Elangovan PSG College of Technology Coimbatore, INDIA
Vikram Vishal Department of Earth Sciences IIT Roorkee, INDIA	A K Verma Indian School of Mines Dhanbad, Jharkhand, INDIA	Saeed Khorram Eastern Mediterranean University Famagusta, CYPRUS

INDEX

Volume 09

June 2016

No.03

RESEARCH PAPERS

- Analysis of Effect of Reinforcement on Stability of Slopes** 01-06
By AKSHAY KUMAR JHA, MADHAV MADHIRA AND G V N REDDY
- Influence of Operational Parameters on the Efficiency of Rod Mill: A Design of Experiments Approach** 07-13
By K RAM CHANDAR, ASHWIN J BALIGA, B S S RAO AND R K BISEN
- Transformation of Chennai City as Nucleus of Regional Development through the Emergence of Sub-CBD's** 14-20
By D KARTHIGEYAN
- Mechanical Properties of High Calcium Flyash Geopolymer Concrete** 21-25
By V C PRABHA AND V REVATHI
- Assessment of Wave Energy Potential along South Maharashtra Coast** 26-31
By JUSTIN THOMAS T, K H BARVE, L R RANGANATH AND G S DWARAKISH
- Experimental Investigation on Strength Aspects of Glass Fiber-Reinforced Fine Grained Soil** 32-39
By SUCHIT KUMAR PATEL AND BALESHWAR SINGH
- Role of Time Buffer on Project Monitoring and Forecasting of Steel Structures – A New Approach to Structural Planning** 40-45
By VISHNU S PILLAI AND C RAJASEKARAN
- Utilization of Ground Granulated Blast Furnace Slag and Pulverized Fly ash in the Manufacture of Stabilized Mud Blocks** 46-53
By VENKATALAKSHMIYARLAGADDA AND BEULAH M
- Characteristics of Concrete Containing Waste Foundry Sand and Slag Sand** 54-59
By JOJU JOSE AND NABIL HOSSINEY
- Numerical Analysis of Bucket Foundations under Eccentric Lateral Loading in Medium Dense Sand** 60-65
By TANMOY KUMAR DEB AND BALESHWAR SINGH
- A Short Review of Anaerobic Co-Digestion and Feasibility of Anaerobic Co-Digestion of Sewage and Food Waste for Sustainable Waste Management** 66-70
By DIWAKAR SOMANI, HARSHITA SRIVASTAVA, SABUMON P C AND ANJALI G
- Eco-efficient Fiber Reinforced Self Compacting Concrete for Replacements of Cement and Natural Sand with Waste Materials** 71-77
By PRASAD M L V, PRASENJIT SAHA, ABHILASHA S AND MD FAISAL KARIM
- Psychological Effects of Travel Time Use** 78-83
By YOSRITZAL
- RS - GIS based Operational Monitoring of Indian Maritime and Environs** 84-92
By P KESAVA RAO, J K KISHORE, L J VJAYA KUMAR AND MURTHY REMILLA

Simulation of Damage of Waterfront Structure of Port of Kobe during Hyogo-ken Nanbu Earthquake by Using Three-Dimensional Non-linear Parallel Finite Element Analysis <i>By JAFRIL TANJUNG AND MAKOTO KAWAMURA</i>	93-99
Feasibility Study of Powdered Curry Leaf and Amla Fruit as Potential Filter Media for Treating Contaminated Lake Water <i>By N NATARAJAN, D HEMANTH KUMAR, K SAI SARAN NAVEEN, K AKHIL, K A GANESH BABU, A JYOTHSNA LAXMI AND M VASUDEVAN</i>	100-104
Using QSWAT for Simulating Streamflow in a Highland Catchment of Humid Tropics <i>By CELINE GEORGE AND ASWATHY MOHAN</i>	105-108
A Critical Review of Multi Criteria Decision Making Methods for Infrastructure Planning and Sustainability Assessment of Infrastructure Projects <i>By B SURESH, ERINJERY JOSEPH JAMES AND JEGATHAMBAL P</i>	109-123
Soil Structure Interaction in Indian Seismic code: Recommendations for Inclusion of Potential Factors <i>By RAVI KANT MITTAL, ADITI AND SANKET RAWAT</i>	124-130
Estimation of PMP and Precipitations of Various Return Periods Using Statistical Approach—A Case Study for Gunderipallam Dam, Tamil Nadu, India <i>By S DIRAVIA BALAN AND M KRISHNAVENI</i>	131-136
Integrated River Basin Plan for Achencoil River in Kerala State, India <i>By LINDA P JAMES AND A B ANITHA</i>	137-143
Optimum Configuration of Rigid Barriers to Mitigate Avalanche Hazard <i>By VINAY CHAUDHARY, R K VARMA AND MAN MOHAN SINGH</i>	144-148
Properties of Bitumen Containing Powdered Gondorukem Rubber Additives <i>By ELSA EKA PUTRI AND PUJA PERDANA</i>	149-153
Analysis of Historical Strong Earthquake Impacts on Landslides at the Gansu Segment in the Bailongjiang River Basin, China <i>By SHOUYUN LIANG, WANJIONG WU, RUI SHOU BA AND YUTIAN KE</i>	154-160
Development of Subsurface Profile Using Geophysical Test Data <i>By SHIVAMANTH ANGADI, MAYANK K DESAI AND GOUDAPPA R DODAGOUDAR</i>	161-164
Quality Control of Cationic Emulsion Modified Cold Mix in Flexible Pavement <i>By M S RANADIVE AND ANUP KUMAWAT</i>	165-169
Investigation of Influence of Terrain on Rainfall for Vembanad Basin, Kerala, India <i>By RAKTIM HALDAR AND RAKESH KHOSA</i>	170-174
Influence of Zinc Oxide Nanoparticle on Strength and Durability of Cement Mortar <i>By D NIVETHITHA AND S DHARMAR</i>	175-181
A Review on Seismic Performance of Reinforced Masonry Structures <i>By UMADEVI R, A S ARUN KUMAR AND B V RAVI SHANKAR</i>	182-187
Effect of Waste Paper Sludge Ash on Engineering Behaviors of Black Cotton Soils <i>By R BARANI DHARAN</i>	188-191
Effectiveness of Bamboo Fiber as a Strength Enhancer in Concrete <i>By KAVITHA S AND T FELIX KALA</i>	192-196

Use of Gold Mine Tailings in Production of Concrete-A Feasibility Study <i>By B M RAMALINGA REDDY, K S SATYANARAYANAN, H N JAGANNATHA REDDY AND N PARTHASARATHI</i>	197-202
Experimental Investigation on the Behaviour of Bagasse Ash Reinforced Concrete Structural Members <i>By S AISHWARYA, K DAKSHAYINI AND P GAJALAKSHMI</i>	203-207
Generation of Synthetic Ground Motion for a Hard Rock Site in Intra Plate Region <i>By A RAVI KIRAN, S BANDOPADHYAY, M K AGRAWAL AND G R REDDY</i>	208-214
Modeling and Controlling of an Coordinated Power Control Grid Connected Hybrid System with Wind, PV and Fuel Cell Sources <i>By N S SRAMAKRISHNA, D N GAONKAR AND G S BHARATHI</i>	215-220
An Advanced GIS based Storm Water Drainage Networking Design for Bhimrad Area of Surat City (India) <i>By MANISHA DESAI AND JAYANTILAL N PATEL</i>	221-228
The Performance of the Accessibility to BRT Stop: A Case Study on Transpadang Metro Bus <i>By BAMBANG ISTIJONO, BAYU MARTANTO ADJI, TAUFIKA OPHIYANDRI, JOVI SATRIOS AND YOSRITZAL</i>	229-234
Parents Perception toward Road Safety Related to the Potential of Cycling to School in Urban Area <i>By BAYU MARTANTO ADJI, MOHAMED REHAN KARIM, BAMBANG ISTIJONO AND TAUFIKA OPHIYANDRI</i>	235-243
Linkages between Catchment Landscape Dynamics and the Natural Flow Regime <i>By VINAY S, BHARATH H A, SUBASH CHANDRAN M D, SHASHISHANKAR A AND RAMACHANDRA T V</i>	244-251
Impact Study on Ferrocement Slabs with Different Types of Mortar Matrices <i>By SEERAM APOORVA, M SAIHARAN, M ARAVINTHAN, H THAMIM ANSARI AND M NEELAMEGAM</i>	252-257
Flexural Behaviour of Cold Formed Steel Hat Shaped Beams <i>By ASHOK M, JAYABALAN P AND JAYA PRABHAKAR K</i>	258-263
Observation of Earthquake Precursors - A Study on OLR Scenario Prior to the Earthquakes of Indian and Neighboring Region Occurred in 2016 <i>By N VENKATANATHAN, V HAREESH AND W S VENKATESH</i>	264-268
Stability Assessment of a Hill Slope-An Analytical and Numerical Approach <i>By B BURAGOHAIN, J KUNDU, K SARKAR AND T N SINGH</i>	269-273
Predictions of Vulnerability Flood and Flood Prone Areas in Watershed West Sumatra Province using Arc-GIS and Category Value <i>By DARWIZAL DAOED, BUJANG RUSMAN, BAMBANG ISTIJONO AND ABDUL HAKAM</i>	274-279
Economic Design of Reinforced Concrete Columns under Direct Load and Uniaxial Moments <i>By SONIA CHUTANI AND JAGBIR SINGH</i>	280-284
Investigation on Partial Replacement of Coarse Aggregate using E-Waste in Concrete <i>By BALASUBRAMANIAN B, GOPALA KRISHNA GVT AND SARASWATHY V</i>	285-288

West Sumatra Landslide During in 2012 to 2015 <i>By ABDUL HAKAM AND BAMBANG ISTIJONO</i>	289-293
Performance on the Study of Nano Materials for the Development of Sustainable Concrete <i>By S SANJU, S SHARADHA AND J REVATHY</i>	294-300
Assessment of Flood Induced Area using Geo-Spatial Technique <i>By AJEET SINGH CHHABRA, SNIGDHADIP GHOSH AND VIJAY KUMAR DWIVEDI</i>	301-304
Deformational Behaviour of Coal Measure Rocks <i>By ASHUTOSH TRIPATHY, BANKIM MAHANTA AND TN SINGH</i>	305-309
Analysis and Design of Transmission Tower Using STAAD.PRO <i>By SAI AVINASH P, RAJASEKHAR P, SIDDHARDHA R, HARINARAYANAN R, CHAMANDEEP AND YASHDEEP</i>	310-313
Strength Properties of Roller Compacted Concrete Pavements Containing Fly ash and Triangular Polyester Fiber <i>By PRAMOD KESHAV KOLASE AND ATUL K DESAI</i>	314-322
Study on the Structural Behavior of Concrete Encased Steel Composite Members <i>By U ELAKEYA, A BHUVANESH SRE AND P GAJALAKSHMI</i>	323-329
Hot Pixel Identification using Satellite Hyper-spectral Data <i>By PIYUSH KUMAR GAURAV, VIVEK KUMAR GAUTAM, P MURUGAN AND M ANNADURAI</i>	330-334
Experimental Study on the Structural Performance of Composite Beam with J-hook Connectors <i>By SARATHKUMAR S, SIVACHIDAMBARAM M AND REVATHY J</i>	335-340
Influence of Fly Ash on Durability and Performance of Concrete <i>By V SESHASAYEE, B H BHARATKUMAR AND P GAJALAKSHMI</i>	341-346
Performance Comparison of Band Ratio and Derivative Ratio Algorithms in Chlorophyll-A Estimation using Hyperspectral Data <i>By P MURUGAN, R SIVAKUMAR, R PANDIYAN AND M ANNADURAI</i>	347-352
Structural Response of FRP Strengthened PSC Beams <i>By VIGNESH C K, SIVARANJAN D AND REVATHY J</i>	353-359
Strength and Setting Times of F-Type Fly Ash-Based Geopolymer Mortar <i>By KOLLI RAMUJEE</i>	360-365
Groundwater Prospects Mapping in Korapuzha River basin, Kerala, India - An Integrated Approach using Multicriteria Decision Making and GIS Techniques <i>By AMAL P SIVADAS, JESIYA N P AND GIRISH GOPINATH</i>	366-372
Optimum Position of Multi Outrigger Belt Truss in Tall Buildings Subjected to Earthquake and Wind Load <i>By A S JAGADHEESWARI AND C FREEDA CHRISTY</i>	373-377
Study on Reduction in Delay due to Road Accidents using Variable Message Sign <i>By GANGHA G, ARUNIMA JAYAKUMAR AND NIRMAL KUMAR P</i>	378-382
Spatial and Temporal Variation in Groundwater Quality and Impact of Sea Water in the Cauvery Delta, South India <i>By ASWIN KOKKAT, P JEGATHAMBAL AND E J JAMES</i>	383-392

Waste Water Treatment by Phyto-Remediation Technique <i>By ADITYA VIKRAM CHOPRA, UMANG K SHAH AND J S SUDARSAN</i>	393-399
An Experimental Investigation on Effect of Hybrid Fiber on High Strength Self Compacting Concrete and Vibrated Concrete <i>By K J N SAI NITESH AND S VENKATESWARA RAO</i>	400-403
Viscosity Graded Approach for Quality Control of Bitumen <i>By M S RANADIVE AND VINAYAK BOBADE</i>	404-410
Effects of Domestic Rawsewage on Mechanical Properties of Concrete Incorporating GGBS (Ground Granulated Blast Furnace Slag) <i>By SHILPA S RATNOJI, PRAVEEN S MALLAPUR, SHASHANK KANAVALLI AND K B PRAKASH</i>	411-414
Experimental Investigation on Modulus of Elasticity of Recycled Aggregate Concrete <i>By P S KULKARNI, A GHATGE, O KANK, A NAIR AND R ASWAR</i>	415-419
Geotechnical Characteristics of Volcanic Soils in and around Taiz City, Yemen <i>By JANARDHANA M R AND ABDUL-ALEAM AHMED A D AL-QADHI</i>	420-425
Experimental Studies on the Effect of Bagasse Ash and M-Sand on Mechanical Behaviour of Concrete <i>By BHUVANESHWARI M AND TAMILARASAN S</i>	426-431
Factors Contributing to the Success of a Resettlement Project: A Case Study on Batanghari Dam Project, Indonesia <i>By TAUFIKA OPHIYANDRI, UYUNG GATOT S DINATA, TAFDIL HUSNI, BAMBANG ISTIJONO AND ADI PUTRA</i>	432-435
An Immediate Review of Flood Characteristics on Delta Lowland Sumatra using D8 Model Spatial Analysis <i>By NURHAMIDAH, AHMAD JUNAIDI AND LIBRINA ANGGRAINI</i>	436-442



The Performance of the Accessibility to BRT Stop: A Case Study on Transpadang Metro Bus

BAMBANG ISTIJONO¹, BAYU MARTANTO ADJI¹, TAUFIKA OPHIYANDRI¹, JOVI SATRIOS² AND YOSRITZAL¹

¹GriTrans, Civil Engineering, Faculty of Engineering, Andalas University, West of Sumatera, Indonesia

²Department of Transportation of Padang City, West of Sumatera, Indonesia

Email: bistijono1452@ahoo.co.id; bayumartantoadji@ymail.com; ophiyandri@ft.unand.ac.id; yosritzal@ft.unand.ac.id

Abstract: In this study were conducted the assessment of the accessibility performance to mass transit facilities before and after BRT (Trans Padang Metro Bus) operated. This study focuses on the accessibility of the bus transit stops in an urban area, a case study in Padang City, West of Sumatra, Indonesia. A total of 600 questionnaires were analyzed, multivariate analysis were used. Regarding the performance, parameters which were observed namely; 'the access distance', 'the protection from the weather', 'the time delays', 'the convenient to access the bus stops facility', 'the protection from traffic accidents', 'the road pavement condition', 'the facilities for the disability' and 'the safety from crimes'. As the result, the performance of 'protection from the weather', 'the protection from other traffic', 'the facilities for the disability', 'the safety from crimes' increased. While, the performance of 'the access distance', 'the time delays', 'the convenient to access the bus stops facility', 'the road pavement condition' decreased.

Keywords: transit system performance, accessibility, access distance, Transpadang Metro Bus, BRT.

1. Introduction

The rapid growth of urbanization in developing countries has often been accompanied with the increasing of urban travel needs. As the economic activity levels increased, private vehicle ownership increased, the quantity and the travel distance of the trips made also increased, (Roza et al., 2013). Especially private car, the dependency for this means of transportation is very high, Dickinson et al, (2003) stated that the uses of private car as a means of transportation in urban city is widely utilized, the majority travelling for work trip purposes uses this mode of transportation. The flexibility, time saving, comfort and safety concerned are among the advantages of private cars. Hagman (2003), he argued that the important advantage of private car use is the flexibility of accessibility and time, that means that if they use a private vehicle, there will be more convenient for people to go to anywhere at any time they desire without having to wait for public transport at the bus stop. Safety and comfort are also one of the advantages of using private vehicles. The other advantage that private car is more preferable for people is the convenience to bring their belongings along with them (Cullinane et al, 2003). Transportation planners must concern this condition because in transportation planning, there are two basic objectives: to provide sufficient mobility to access jobs, goods, and services and to provide mobility which have the minimum negative environmental impact trip (Salon and Aligula, 2012).

There must be an extensive effort to decrease the dependence of private car. One of the policies that are often suggested to attract people to leave away their private car is by improving the public transport policy (Cullinane, 2002). Bergstrom and Magnusson in 2003 argued that the number of cars in traffic could be decreased, especially in urban regions, by promoting active transportation (public transport, cycling and walking) as a means of travel. Many research attempted have been devoted into seeking how to promote active transport modes as part of a transportation system, e.g. Gatersleben and Appleton (2007), Wardman et al. (2007) and Akar and Clifton (2009). Encouraging public transport used, car ownership and usage hold seem to be the solution of transportation issues in urban cities.

Padang City is the largest city on the west Coast of Sumatra Island once the capital of the province of West Sumatra, Indonesia. The city has an area of 694.96 km² which is bordered by the geography of the sea but has a hilly terrain which height reaches 1,853 mdpl (Figure 1). Based on the data in Padang in Numbers in 2013, a number Padang City population is 871,534.

Wide negative effects of car as a transportation mode, namely ; traffic congestion, pollution, road accidents, and the lack of space for road and parking facilities were the problems that must be faced in Padang City. It caused by the dependency of private car and insufficient of public transportation services. Padang city covered a regular bus and "Angkot" (a public transport which has the capacity 12 passengers) as

public public transportation. To increase the service, transportation authority provide a new public transportation system, namely Trans Padang Metro Bus (BRT).

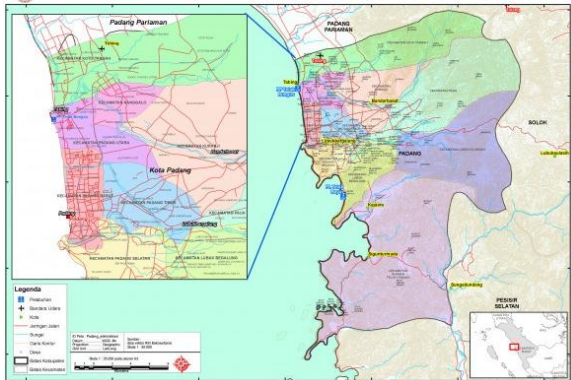


Figure 1 Map of Padang City

Government planned five corridors for Trans Padang Metro Bus (Figure 2), namely “LubukBuaya– Pasar Raya”, “Indarung - Pasar Raya”, “TelukBayur- Air Pacah”, “TelukBayur - Pasar Raya” and “BIM (International Airport) – Teluk Bayur”. The operation of this system has been planned since 2007, but continues to be delayed by various factors.



Figure 2 The planned corridors of Trans Padang

Fist corridor operated in January 2014, corridor is “LubukBuaya - Pasar Raya”. The Length of the route is 20.6 km. The average travel time is 1 hour and 25 minutes. BRT Trans PADANG Metro Bus scheduled departure begins early in the morning at 06.00 am till 20.00 pm, every day at a ticket tariff of IDR 3,500 (USD 0.29) for general users and IDR 1,500 (USD 0.12) for students. The capacity of the bus is 20 passenger’s seats and 20 standing passengers. This system operates 10 buses. There are 66 stops along the corridor 1 “LubukBuaya - Pasar Raya” (Figure 3).

Figure 4 shows one of the bus stop facility along the corridor of Trans Padang Merto Bus which is equipped with road markings, traffic signs, protection from the weather and the seats for the users who are waiting for the bus.

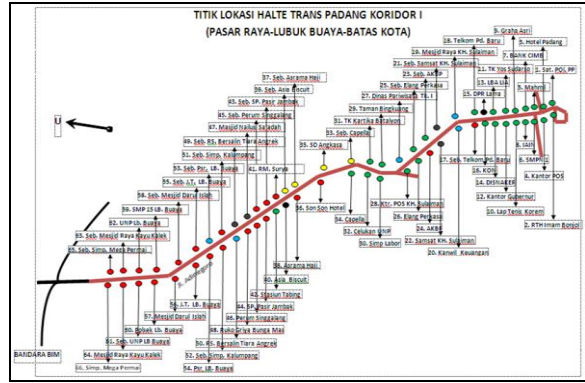


Figure 3 Fist corridor of Trans Padang Metro Bus (Lubuk Buaya-Pasar Raya)



Figure 4 Trans Padang Metro Bus Stop facility

Before BRT operates within Padang city, public transport systems operate with a stop based on user requests (Flag stop). With this system the user could stop the public transport anywhere, even at the street junction. Public transport operator could load and unload at any place. It is very disturbing the other traffic flow, due to the old bus did not have an exclusive line. It is also very dangerous because public transport will be stopped suddenly when the driver saw there were passengers on the edge of the road who wants to use public transport or any passengers getting off. To overcome these problems, the government operates the Trans Padang Metro Bus (BRT) to replace the old system. The operation of public transport becomes “Set stop”. BRT only stop at bus stops and operates on the left side of the road. The were advantages and disadvantages after Trans Padang Metro Bus operated., mainly accesibility to bus stop facility. This research attempted to find out the performance the accesibility.

2. Survey Results

Field surveys were undertaken in this study. A set of questionnaire was prepared and distributed to the respondents in along the Trans Padang route. The questionnaire covers public transit users. However, in this study the sample size is 600. Table 1 summarizes the socio-demographic data of respondents. The data consists of Trans Padang users. The percentages of females are higher than males. The survey recorded 59.3% females and 40.7% males in the study.

Table 1: The socio-economic characteristic of the sample

Characteristics	Statistic
Gender	Male (40.7%), Female (59.3%)
Age	0-15(13.3%), 15-25(50.0%), 25-50 (20%), > 50 (16.7%)
Occupation	Student (64.0%), employee (16.0%), self-employee (17.7%), housewife (3.3%), unemployed (3.0%)
Income	< USD 82.6 (50%), USD 82.6-165.1 (23.3), USD 165.1-412.8 (14.0%), > 412.8(12.7%)
Marriage status	Married (28.7%), not married (71.3%)
Private vehicle ownership	Private car (8.7%), walking (54.7%), Ojek (21.0%), private car (15.0%), Angkot (15.6%)

As the result in Table 1, majority of public transit users are respondents aged between 15-25 years old (most of which are student). The consistent pattern does not occur between respondent's ages towards the usage of mass transit for commuting. The highest numbers of public transit users are students, followed self-employee (17.7%). The view of public transit users is from low income group was explored in this research. Based on income level, the highest public transit user respondent earned an income less than 82.6 USD (50%), this result is in accordance with Sanchez in 2002, and his research also stated the relevance of low income and public transit users. He also indicated that this phenomenon can be considered for land public transit authority in decision-making of public transit system and policy such as the subsidies travel cost expenses for the public transit users. The majority of mass transit users walked to bus stops (54.7%), a total of 21 % of respondent used "Ojek", "Ojek" is the public transport by using the motorcycle. The operation of the "Ojek" is equal to a taxi. Respondent also used "Angkot" in accessing public transit (15.5%). "Angkot is defined as the public transport which has 12 capacity of passenger.

3. Result of the Study

As mentioned before, this study investigates the performance of the accessibility to Transpadang Metro bus stops. There are eight parameters were observed namely; 'the access distance', 'the protection from the weather', 'the travel time', 'the convenient to access the bus stops facility', 'the protection from traffic accidents', 'the road pavement condition', 'the facilities for the disability' and 'the safety from crimes'.

Regarding the assessment, there were 1 until 5 scales of performance assessment namely, "1" denoted 'extremely not satisfied', "2" denoted 'not importance', "3" denoted 'moderately satisfied', "4" denoted 'satisfied', "5" denoted 'extremely satisfied'.

The assessment was conducted on the condition before and after Trans Padang operated.



Figure 5 The comparison of the interior and exterior the previous bus (left) with BRT (right)

3.1 The Travel Time and the Interior Condition of the Bus

The operation of Trans Padang was actually not make the travel time were shorter than the initial bus. The travel time average of the earlier bus is 65 minutes. Compared to BRT travel time average is 1 hour and 25 minutes. This happens because the former bus driver operates city bus with high speed. The city bus has 60 km/hour of maximum speed, while BRT has only 45 km/hour. The operation of BRT is more to provide the comfort and save of mass transportation. In figure 5 shows the comparison of the interior and exterior of the previous bus and. In addition, the operation of the BRT is intended to make the public transport stop at stops bus only. In order to obtain that purpose, this BRT had a physical barrier, which is has the entrance door higher than the previous bus, i.e 80 cm. To adjust the height of the entrance door, the bus stops infrastructure also made higher.

3.2 Access Distance

Transit used is associated with walking behavior and the result of TOD initiatives (Lachapelle and Noland, 2012). They also It was suggested that transit systems often cover the major central business district (CBD) with the high of walking activity. The transit system as a part of TOD must provide a good access to infrastructures for walking and pedestrian infrastructure. Public transit should provide the feeder service to serve the transit users who resides outside the acceptable walking distance area. Lachapelle and Noland, 2012 suggested that the catchment area of transit station (bus service) in business area is should be 500 meters. While Krygsman et al. (2004); Ben-Akiva and Morikawa (2002), the walking distance to access a subway system, light rail, or express bus service is 800–1000 m.

Moreover, the others other researches highlighting on access distance to public transit are well documented;

296 meters in Chicago (Levinson, 1974); 369 meters in Toronto (Schoppert and Herald, 1978); 523 meters in New York (Seneviratne, 1985); 512 meters in West Germany, Hamburg (Koushki, 1988); 859 meters in Saudi Arabia, Riyadh (Koushki, 1993); (400 meters in Indonesia (Soegijoko and Horthy, 1991); 263-493 meters in Hongkong (Lam et al., 1995) and 910 meters in Mumbai, India (Rastogi and Rao, 2003).

In this study, the public transport user is also given the question regarding the perception of distance access after BRT was operated. As the result is, a total of 28.3 % from 600 respondents stated that the access distance increased, 15% of respondents stated the access distance decreased and 56.7 % mentioned there were not any changes of the access distance.

Table 2 presents the trip distances from the respondent's residence to the nearest bus stop before and after Transpadang Metro Bus operated. In this table, the data of bus users indicated that, before Transpadang Metro Bus operated, the highest range of access distance is < 200 meters (48.08%), followed by between 500 – 1000 meters (30.0%), 200 – 500 meters (17.0%) and more than 1000 meters (5.0 %). After Transpadang Metro Bus operated, the respondents with the access distance < 200 meters and 200 – 500 meters decreased to 24.0 % and 15.67%. while the respondents with the access distance 500-1000 meters and > 1000 meters increased to 52.83 % and 7.50%.

Table 2 The access distance to bus stop before and after BRT operated

Access distance (m)	Before	After
	Percentage	Percentage
< 200	48.00%	24.00%
200-500	17.00%	15.67%
500-1000	30.00%	52.83%
> 1000	5.00%	7.50%

Regarding the performance of the access distance to the bus stop before and after BRT operated, before Transpadang Metro Bus operated, respondents stated that the average performance was 3.34 STDEV 0.88, while after Transpadang Metro bus operated the average performance decreased to 2.71 STDEV 0.80. At 0.05 level of significant, the decline of the performance was significant (p value = 0.13).

3.3 The Protection from the Weather along the Access Route

Regarding the protection from the weather in accessing bus stops, it is defined as protection from the hot weather and the rain along the route of access. Padang City is a tropical area, which has a high rainfall intensity and has the high enough of the temperature. The range of the air temperature is between 23 ° C - 32 ° C, during the day and 22 ° C - 28 ° C, at night. The humidity ranged between 78 % - 81 %. The intensity of rainfall in Padang City reached

an average of 405.58 mm per month, which has an average of 17 days of rain days per month. It could be an obstacle in encouraging people to use of public mass transit. In this study conducted an assessment of performance regarding 'the protection from the weather' before and after the BRT operated.

Multivariate test was conducted to observe the performance. As the result, after Transpadang Metro bus operated, the performance increased, (Average performance = 2.36, STDEV 1.05 to 3.75, STDEV 1.03), a significant increasing of the performance occurred at the level of 0.05 significant (p value = 0.18).

3.4 The Travel Time to Access Bus Stop

The travel time to access the bus have the correlation with the access distance. Table 3 shows the increasing of travel time to access the bus stop after transpadang Metro bus operated. In the table, after BRT operated, at all of access distance range, the travel time increased. The highest increasing of travel time is for the range of the access distance 500-1000 meters, namely 3.78 minutes.

Table 3 The travel time to access the bus stop after transpadang Metro bus operated

Access distance (meters)	The increasing of travel time (minutes)
< 200	1.20
200-500	2.60
500-1000	3.78
> 1000	2.21

With regards to this performance of the travel time, after BRT operated, the performance of this parameter also decline, (Average Assessment = 3.20, STDEV 0.91 to 2.81, STDEV 0.89), the decline was significant at 0.05 level (p value = 0.07).

3.5 The Convenient to Access the Bus Stops facility

As mentioned before, one of the purposes of the new bus system is the bus only stop at the bus stop (set stop). Physical constrain was assigned to obtain the purpose. If the old bus the high of the entrance door from road surface is only about 30 cm, while the entrance door of bus Trans Padang, the high is 80 cm. The infrastructure bus stops should be built based on the high of bus entrance door. This condition influence the convenient in accessing BRT. The respondents were asked regarding the performance of this parameter after BRT operated.

As a result, the performance of this parameter also decline (Average Assessment = 3.03, STDEV 0.79 to 2.84, STDEV 0.35), the decline was significant at 0.05 level (p value = 0.095).

3.6 The Protection from Other Traffic

In Padang City, The people concern with regards to the lack of pedestrian facilities, pedestrians should

move in an area, which mixed with other traffic flows. The risk of accidents in accessing the bus stop will always be threatened. It can also be a barrier in encouraging using mass transit in Padang City. In this study was also carried out observations about the risk of accidents before and after BRT operated. As the result of the user, the performance of this parameter increased (Average Assessment = 2.03, STDEV 0.67 to 3.04, STDEV 0.99), the increasing was significant at 0.05 level (p value = 0.25).

3.7 Road Pavement Condition

As mentioned before, in accessing bus stops, the majority of mass transit users were walking. The condition of road pavement along the route must be concerned. The respondents were asking regarding the condition of pavement road along the route. As the result is the performance of this parameter also decline (Average Assessment = 3.03, STDEV 1.019 to 2.84, STDEV 0.94), the decline was significant at 0.05 level (p value = 0.087).

3.8 The Facilities for the Disability

In public transportation it must be concerned regarding the lack of facilities for the disability. In this study the investigation of facilities for persons with Disabilities. As the result is the performance of this parameter increased (Average Assessment = 1.13, STDEV 0.41 to 2.74, STDEV 0.72), the increasing was significant at 0.05 level (p value = 0.17).

3.9 The Safety from the Crimes during the Trip

Regarding this parameter, the performance also increased (Average Assessment = 1.53, STDEV 0.31 to 2.14, STDEV 0.54), the increasing was significant at 0.05 level (p value = 0.25).

4. Conclusion

Compared to the previous public transit, the BRT operation does not reduce the travel time of public transport users. The results obtained, the travel time is 20 minutes longer compared to the bus earlier. But as a new public transit system, BRT is more secure, because it only stops at the bus stop only (Set Stop). BRT operates only on the left side of the road, which do not interfere with the flow of other traffic. In visual, there is an increasing of the interior quality compared to the previous bus.

As the result, the performance of 'protection from the weather', 'the protection from other traffic', 'the facilities for the disability', 'the safety from crimes during the trip' increased. While, the performance of 'the access distance', 'the travel time to access bus stop', 'the convenient to access the bus stops facility', 'the road pavement condition' decreased.

In improving the public transportation service, accessibility to the bus stop is an essential parameter. The results of this research should be concerned by

the authorities in order to increase the performance of the public transport service.

5. Acknowledgements

The authors would like to acknowledge the Faculty of Engineering, Andalas University, Padang West of Sumatera, *Indonesia*, for the funding of this research and publication.

References

- [1] Roza, A., Ibrahim, N.I., Adji, B.M., Karim, M.R., Study On Parking Characteristic: Case Study In Petaling Jaya City Council (MBPJ), Malaysia, Journal of Society for Transportation and Traffic Studies (JSTS), Vol.4 No.1, 2013.
- [2] Dickinson, J.E., Kingham, S., Copsey, S., Pearlman, D., Employer travel plans, cycling and gender: will travel plan measures improve the outlook for cycling to work in the UK?, *Transportation Research Part D* 8, pp. 53–67, 2003.
- [3] Hagman, O., Mobilizing meanings of mobility: car user's constructions of the goods and bads of car use, *Transportation Research Part D* 8, pp. 1–9, 2003.
- [4] Cullinane, S., Cullinane, K. Car dependence in a public transport dominated city: evidence from Hong Kong. *Transportation Research Part D* 8: pp.129–138, 2003.
- [5] Salon, D., Aligula, E.M., Urban travel in Nairobi, Kenya: analysis, insights, and opportunities, *Journal of Transport Geography* 22, pp.65-76, 2012.
- [6] Cullinane, S., The relationship between car ownership and public transport provision: a case study of Hong Kong. *Transport Policy* 9, pp. 29–39, 2002.
- [7] Bergstrom, A., Magnusson, R, Potential of transferring car trips to bicycle during winter. *Transportation Research Part A* 37, pp. 649–666, 2003.
- [8] Gatersleben, B., Appleton, K., Contemplating cycling to work: Attitudes and perceptions in different stages of change. *Transportation Research Part A* 41, pp. 302–312, 2007.
- [9] Wardman M, Tight M, Page, M. 2007. Factors influencing the propensity to cycle to work, *Transportation Research Part A* 41: 339–350.
- [10] Akar, G., Clifton, K., The influence of individual perceptions and bicycle infrastructure on the decision to bike. *Transportation Research Record* 2140, pp. 165–172, 2009.
- [11] Lachapelle, U., Noland, R.B., Does the commute mode affect the frequency of walking behavior? The public transit link, *Transport Policy* 21, pp. 26-36, 2012
- [12] Krygsman, S., Dijst, M., Arentze, T., Multimodal public transport: an analysis of travel time elements and the inter connectivity ratio. *Transport Policy* 11, pp. 265–275, 2004.

- [13] Ben-Akiva, M., Benjamin, J., Lauprete, G., Polydoropolou, A., 1996. Impact of advanced public transportation systems on travel by dial-a-ride, *Transportation Research Record 1557*, pp. 73–79, 1996.
- [14] Levinson, H.S., Planning and pedestrian environment. *Proc., Seminar on Bicycle/Pedestrian Planning and Design, ASCE, Reston, Va.*, pp. 37–75, 1974.
- [15] Schoppert, D. W., Herald, W.S., Pedestrian range as related to transit stations and their immediate surroundings.” *ITE J 48*, pp. 13–18, 1978.
- [16] Seneviratne, P.N., Acceptable walking distances in central areas.” *J. Transp. Eng.*, 111(4), pp. 365–376, 1985.
- [17] Koushki, P.A., Walking characteristics in Central Riyadh, Saudi Arabia. *J. Transp. Eng.*, 114(6), pp. 735–744, 1988.
- [18] Koushki, P.A., Ali, S.Y., Pedestrian characteristics and the promotion of walking in Kuwait City Center. *Transp. Res. Rec. 1396, Transportation Research Board, Washington, D.C.*, pp. 30–33, 1993.
- [19] Soegijoko, S.T.B., Horth, y S.I., Role of nonmotorized transport modes in Indonesian cities, *Transp. Res. Rec. 1294, Transportation Research Board, Washington, D.C.*, pp. 16–25, 1991
- [20] Lam, W.H.K., Morrall, J. F., Ho, H., Pedestrian flow characteristics in Hong Kong, *Transp. Res. Rec. 1487, Transportation Research Board, Washington, D.C.*, pp. 56–61, 1995.
- [21] Rastogi, R., Rao, K.V.K., Travel Characteristics of Commuters Accessing Transit: Case Study. *Journal of Transportation Engineering 6*, pp. 684–694, 2003.