

- 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

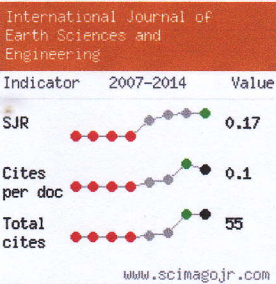
Coverage: 2010-2014

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:

```
<a href="http://www.scimagojr.com"
```

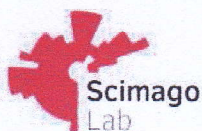
SJR indicator vs. Cites per Doc (2y)

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

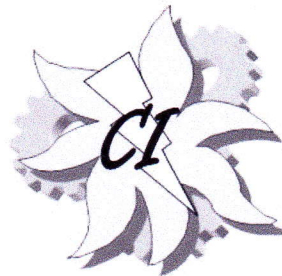
Special Issue of
**3rd International Conference on Earth Sciences and Engineering
(ICEE 2016)**

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 Gwangu
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- Tiruchirapalli,
Tamil Nadu, INDIA

N Ganesan

NIT- Calicut, Kerala
Kerala, INDIA

Linhua Sun

Suzhou University
CHINA

Pradeep Kumar R

IIIT- 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 BURAGOHAJIN, 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



Parents Perception toward Road Safety Related to the Potential of Cycling to School in Urban Area

BAYU MARTANTO ADJI^{1,2}, MOHAMED REHAN KARIM², BAMBANG ISTIJONO¹ AND TAUFIKA OPHIYANDRI¹

¹Center for Transportation Research, Faculty of Engineering, University of Malaya, Kuala Lumpur, Malaysia

²GriTrans, Civil Engineering, Faculty of Engineering, Andalas University, West of Sumatera, Indonesia

Email: bayumartantoadji@gmail.com; rehan@um.edu.my; bistijono1452@yahoo.co.id; ophiyandri@ft.unand.ac.id

Abstract: This study focuses on parents' perception on road safety with regards to potentially consider cycling to school as a mode of transportation in Taman Medan, within the Petaling Jaya Municipal area in Selangor, Malaysia. The data was obtained from a set of questionnaires, from two hundred and fifty five (n = 255) respondents whom participated in this study. The parents' concerns on road safety as are the reason why most parents do not allow their children to cycle to school. Road safety concerns are also explored with regards to the cycling facilities along the route to schools that was suggested, the majority of parents suggested on the exclusive bike path facilities for their children cycling to school. Finally, parents will only allow their children to cycle to school if the distance is within 500 meters.

Keywords: road safety, cycling to school, physical activity, active transport, encouraging factor for cycling

1. Introduction

Doing physical activity regularly for children and youth is very important for their health (Buliung et al., 2009). According to Chriqui et al. (2012), ideally 60 minutes of physical activity should be spent every day. In their researches, Tudor-Locke et al. (2001); Cooper et al. (2003); Timperio et al. (2004); Boarnet et al. (2005); Timperio et al. (2006); Faulkner et al. (2009) and Buliung et al. (2009) stated that for youth, cycling as one of the active mode of transport to school could increase physical activity for the children.

Parents are actually aware that cycling as a physical activity is essential for health of their children. It can be the beginning of realization of willingness to allow their children to cycle to school. But it must be supported with some convincing factors such as a friendly neighborhood to carry out activities outside the residence, a safe and friendly environment away from potential accidents and crime when cycling to school.

The willingness of the children to cycle to go to school is high enough. But unfortunately only a few children can do it, because parents do not allow their children to cycle to school. Gatersleben et al. (2001) conducted a survey among parents of primary school children, the result of willingness to cycle to school is 30% but only 1% of them can make this a realization.

Parents have an influencing role in the lowering the chances of bicycles used as a means of transportation for children to go to school. They are really concerned of their child's safety along the travelling routes to school. They are concerned on the safety from other

traffic users and crime. The availability of adequate and environmental friendly cycling route will also be a consideration. According to Soole et al. (2011), child-related risks, children's safety as pedestrians and cyclists was also compromised by the behaviour of drivers, especially those exceeding the speed limit in residential environments, and in addition their research stated that young children are typically still developing their ability to make sound and accurate judgments when interacting with the road environments. The number of accidents involving children are also consideration for their parents before allowing their children to cycled to school, María de Lourdes Martínez (2010) suggested that more than 50 % of children less than < 15 years old are involved in transport-related injuries in Nicaragua.

Parents are also concerned on the availability of an officer at intersections to help their children cross the road safely. If the requirement mentioned above is not met, then they would rather let their children to use other transportation, such as; school buses, public transport or the parents themselves drop and pick up their children from school by car and motorcycle.

2. The Survey

This study focuses on parents perception regarding road safety for cycling to school within Taman Medan areas, within the Petaling Jaya Municipal area in Selangor, Malaysia. A field survey was undertaken. A set of questionnaires was prepared and distributed to parent as respondents in this area. The questionnaire covers sociodemographic data, mode share for travelling to school and the road safety perception for cycling to school.

Analyses were conducted using descriptive procedures from SPSS version 17. Chi-square tests are conducted to explore the influence of socio-demographic characteristic corresponding to road safety perception. To seek the most encouraging factor on the parents permitting cycling to school, The Analytical Hierarchy Process (AHP) was conducted.

Socio-demographic data of respondents are summarized in Table 1, two hundred and fifty five (n = 255) parents participated in this study. There was 61.3% males and 38.7% females (Table 1). Respondent's ages are placed in 4 groups. As presented in Table 1, the majority age of respondents is between 30 and 40 years old (43.8%), followed by 40-50 years old (29.7%), more than 50 years old (21.9%) and under 30 years old (4.5%). Moreover the majority of respondent is married (90.2%). Regarding occupation of respondents, there are five categories of respondent's occupation in this study, namely under the trading (23.0%), private (31.9%), housewife (7.0%), government employee (27.7%) and retired (3.1%).

As shown in Table 1, the majority of respondent have an income at the level between 326 USD and 978 USD (44.9%), followed by 978-1630 USD (22.3%), less than 326 USD (12.9%), and more than 1630 USD (19.9%). Most of the respondents only have one car (55.9%) followed by two cars (22.3%), don't have a car (16.0%) and More than 3 cars (2.0%).

Table 1: Socio-demographic data of respondents

Demographic characteristic	N	Percentages
Gender		
Mother	156	61.30%
Father	99	38.70%
Marriage status		
Married	248	97.30%
Divorced	8	3.10%
Occupation		
Government employee	71	27.70%
Trading	59	23.00%
Private	100	39.10%
Housewife	18	7.00%
Retired	8	3.10%
Age		
< 30 years old	12	4.70%
30 – 40 years old	112	43.80%
40 – 50 years old	76	29.70%
> 50 years old	56	21.90%
Income		
< 326 USD	33	12.90%
326 – 978 USD	114	44.90%
978 – 1630 USD	57	22.30%
> 1630 USD	51	19.90%
Car ownership		
None	41	16.00%
1	143	55.90%
2	57	22.30%
3	10	3.90%
> 3	5	2.00%

3. Parents Perception on the Safety of Neighborhood Surroundings

Timperio et al. (2006) and Isler et al. (2008) argued that physical neighborhood environment and social aspects are among aspects that could influence children to go to school by cycling and walking. It was also stated that many children in neighborhood environment would give higher opportunities for cycling and walking together with other children to school. Regarding safety of neighborhoods surrounding for physical activities alone, the parental concerns where about road safety and 'stranger danger'. Both of them are major causes that becomes are parent's concern to restrict their children's outdoor play and active transport (Carver et al., 2008).

Regarding neighbourhood surrounding safety for children doing physical activity alone outside their home, in Table 2 it can be seen that, most parents slightly suggested that the neighbourhood surroundings was not safe for doing physical activities, only 48.4% of parents stated that their neighbourhood surrounding is safe for their children. In this study, there is a different viewpoint among fathers, mothers and single parents regarding their neighborhood surroundings' safety for physical activities. Most fathers stated that their neighbourhood environment is safe (60.2%), while the majority of mothers and single parents stated that their neighbourhood environment is not safe (58.0% and 56.0%). The percentage of fathers who answered safe, is was higher than mother. Based on Chi-square test, there is a significant influence of the position of the family corresponding to the perception of neighbourhood surroundings safety, $\chi^2_{(2)} = 7.498 > \chi^2_{0.05(2)} = 5.991$.

Table 2: The perception of neighbourhood environment safety

Socio-demographic characteristic	Safe	Not Safe
All respondents	48.4%	51.6%
Mother	42.0%	58.0%
Father	60.2%	39.8%
Single parent	44.0%	56.0%
≤ 326 USD	69.7%	30.3%
326 – 978 USD	50.4%	49.6%
978 – 1630 USD	49.1%	50.9%
≥ 1630 USD	29.4%	70.6%

Table 2 also presents the correlation among group of parent's level of income againts the perception of the neighbourhood surroundings safety for their children to do physical activity outside. There is a consistent pattern of the respondents' income level corresponding to the perception of the neighbourhood surroundings safety perception for doing activities outside their home. The parents who stated that the neighbourhood environment is "safe" decreased as the

income level increased. The percentage of parents who earned an income below 978 USD who stated neighborhood surroundings is are “safe” are higher than the percentage of the parents who earned an income more than 978 USD. Chi square test is also conducted to explore the difference between parent’s income less than 978 USD with the income 978 USD above, the result is the significant difference occurs between those income regarding the perception of the neighborhood environment safety , $\chi^2_0 = 5.561 > \chi^2_{0.05(1)} = 3.841$.

4. The Transportation Mode used to School

It was reported that there was a decrease of active transport in several countries. USA, Germany, Austria and United Kingdom has been reported the decrease of active travel to school (ATS), (Van der Ploeg et al., 2008; Metcalf et al., 2004; Scherer, 2006 and Chriqui, 2012). Cole et al. (2010) said that in a majority of countries in the late 20th century have observed that active transports were significant decreased.

Parents often preferred to drop and pick up their children to school rather than encouraging their children to walk, cycle or use public transport as the result of that knowing other families are no longer encouraging those active transport (Carver et al. 2008). Due to concern about road safety and crime, many children are dropped and picked up after their activities at the school in order to protect them. Moreover, ‘chauffeur’ of children to school were an attempt by parents to avoid from risk and injury to their children (Timperio et al. 2004). In line with the findings Hillman et al. (1990) and Carver et al. (2008), it was stated that parents put the restriction on their children's physical activity due to concerns about possibility of child injury. Temperio et al. (2004) stated regarding the issues of safe active transport conditions, the parental perceptions have had negative correlation with 10 - 12-year-old children’s active transport to their destination. The parents' protections for their children safety along the journey to the school are likely contributing factors as to why active commuting is at low levels. The parents' safety concern was mostly related to dangers from traffic (Isler et al. 2008).

The study by Hillman et al., (1990) and Carver et al., (2008) suggested that parent’ concerns about road safety resulted in the restriction of their children in travelling alone from school to their home. Parental concern on traffic and pedestrian safety may not be unfound, as the cause of pedestrian and cyclists injured, fatality and hospitalization in Australian children (Timperio et al., 2004). Further research is needed to objectively measure neighborhood road safety by analyzing road characteristics and traffic calming measures in detail, and to examine its influence on children’s physical activity and active transport, Carver et al., (2008).

As presented in Table 3, with regards to the means of transportation for their children from home to school, most parents (55.8%) would drop and pick them up at school by private vehicle (by motorcycle, 29.2% and by car, 26.6%), followed by letting their child take a bus school (36.9%). Only 4.2% of parents would allow them to take public transport and 3.6% allowed them to walk to and from school. Furthermore, most mothers and fathers also drop and pick them up at school by private vehicle (56.1% and 57.8%). Based on Chi-square test, there is no significant influence of the position in household towards the transportation mode of choice for the children to go use to go to school, $\chi^2_0 = 15.438 < \chi^2_{0.05(8)} = 15.507$.

Table 3: Transportation mode used for the children to go to school

Socio-demographic	You take them by car	You take them by motor cycle	School bus	Walking	Public transport
All respondents	26.6%	29.2%	36.5%	3.6%	4.2%
Mother	26.3%	29.8%	40.4%	1.8%	1.8%
Father	26.8%	31.0%	26.8%	7.0%	8.5%
Single parent	28.6%	-	71.4%	-	-
≤ 326 USD	8.0%	72.0%	4.0%	12.0%	4.0%
326 – 978 USD	15.7%	33.7%	41.6%	4.5%	4.5%
978 – 1630 USD	33.3%	16.7%	45.2%	-	4.8%
≥ 1630 USD	58.3%	2.8%	36.1%	-	2.8%

Based on Chi-square test, there is a significant influence of the income level towards the Transportation mode for the children to go to school, $\chi^2_0 = 65.564 > \chi^2_{0.05(12)} = 21.026$. As presented in Table 3, most parents earned income less than 326 USD uses a motorcycle to drop at and take their children from school (72.0%), while the parents who earned an income of 326 – 978 USD (41.6%) and 978 – 1630 USD (45.2%) would allow their children to take the school bus and parents who earned an income more than 1630 USD would drop at and take their children from school by car (58.3%).

The consistent pattern occurs among income levels towards car and motorcycle usage as transportation mode to the school. The car user increased as the income level increased. However, as the income levels increased motorcycle users decreased. No parents earned an income of 978 – 1630 USD and more than 1630 USD would let their child walk to school. In several countries, social-economic status (SES) influenced active travel to school for children.

In Rotterdam the adolescent with at least one parent without a paying job were more likely to be a non-active commuter while travelling by either walking

and cycling seems to be a most commonly prominent transportation mode among adolescents of two working parents (Bere et al., 2008). In the areas of low SES, the neighborhood provides the opportunities for inexpensive forms of physical activity, such as walking and cycling (Carver et al, 2008).

There was a contrary phenomenon seen happening in the USA and Portugal, adolescents from higher socioeconomic status were not more likely to walk or cycling to school (McDonald, 2007; Mota et al. 2007; Bere et al, 2008). McMilan (2012) in her research stated that both socio-demographic variables showed significant influence for active transport probability to school: as household income increased the probability of the active transport to school increased, the likelihood of the decreasing of non-motorized school travel was seen as the increasing of number of children in the household (KIDS), so did the likelihood of active transport to school.

5. The Parent whom permitted the Children to Cycle to School

Figure 1 summarizes the bicycle ownership of the children, the results in Figure 1 reflect the parents slightly that more of them do not allow their children to own a bicycle (54.3% compared to 45.7%). Most mothers do not allow their children to have their own bike (40.8%), while the majority of fathers allow (52.9%). Based on Chi-square test, there is no significant influence of the position in household towards the permission of having their own bike, $\chi^2_0 = 3.206 < \chi^2_{0.05(1)} = 3.841$.

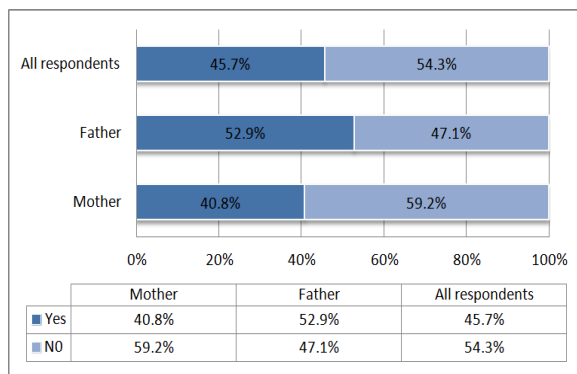


Figure 1 Bicycle ownership

In Figure 2 it can be seen that, the main reason why parents do not allow their children to own their own bicycle was due to road safety (50.7%), followed by the fact that the neighborhood was not safe for cycling (37.7%) and they argue that is not necessary for children to have their own bike (11.6%). Most fathers' and mothers' concerns were about road safety (61.0%; 45.9%). Based on Chi-square test, there is no significant influence of the position in household towards the reason parents do not allow their children to own a bike, $\chi^2_0 = 5.145 < \chi^2_{0.05(4)} = 9.488$.

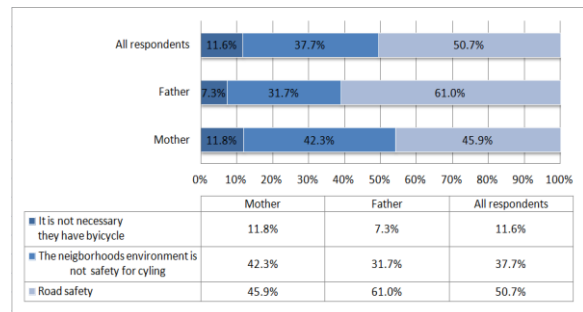


Figure 2 The reason why parents do not allow their children to have their own bicycle

Cycling to school is not an easy task: one needs to keep a steady rhythm and remain on the cycle track. One also needs to stop and cross the streets with care (Kullman and Palludan, 2011). Owen et al., (2004); Mokhtarian et al., (2001); Saelens et al., (2003); Carver et al, (2008); Cole et al, (2010) stated that the decreasing of cycling to school was because the 'chauffeur' of children to school increased. They also have found that environmental factors and demographic factors to be associated with the decreasing need of walking and cycling.

As presented in Table 4, most parents do not allow their children to cycle to school (76.8%). The percentage of fathers who allow cycling is higher than mothers (26.7% compares to 19.6%). Based on Chi-square test, there is no significant influence of the position in household towards the permission to cycle to school, $\chi^2_0 = 0.803 < \chi^2_{0.05(2)} = 5.991$.

Table 4: The permitted for cycling to school

Socio-demographic characteristic	Allow	Do not allow
All respondents	23.2%	76.8%
Mother	19.6%	80.4%
Father	26.7%	73.3%
Single parent	27.3%	72.7%
≤ 326 USD	64.7%	35.3%
326 – 978 USD	28.6%	71.4%
978 – 1630 USD	3.4%	96.6%
≥ 1630 USD	-	100.0%

Table 4 also shows the correlation of parent's level income towards the permission to cycle to school. There is a consistent pattern between the parent's income levels towards the permission for cycling to school. The permission decreased as the income level increased. The interesting result is that for parents who earned an income of ≤ 326 USD, most of them allow their children to cycle to school, while parents who earned > 326 USD do not allow. Moreover not one of the parents who earned an income > 1630 USD allowed their children cycling to cycle to school. Based on Chi-square test, there is the significant influence of the parent's income level corresponding to the cycling permission to school, $\chi^2_0 = 28.703 > \chi^2_{0.05(3)} = 7.815$.

6. The Factor Concerned Regarding the Permissions to Cycle to School

The distances, road traffic, the weather conditions, hilly routes, the safety, busy intersections for crossing, bad access to pedestrian crossings, and many things to carry are among commonly cited barriers for children when active transport to school is considered (Dellinger, 2002; DiGuiseppi et al., 1998; Timperio et al., 2004, 2006; Cole et al, 2010). Barriers for allowing children to cycle and walk to school is the fact that cycling and walking to, parents and caregivers have common concerns about their child's safety and distance to school (Ahlport et al., 2008; Di Guiseppi et al., 1998; Faulkner et al., 2010; Kerr et al., 2006; Martin and Carlson, 2005; Timperio et al., 2006; Chriquí et al, 2012).

As stated in the Muller research in 2005, respectively, the weather condition or seasons have a strong impact on student transport mode preference for students for travelling to school. Furthermore, linked with costs, the distance is recognized as the most important factor for discrimination between transport modes (public transport and car/motorcycle) and those with lower travel costs (walking and cycling). In Timperio et al, 2006 it was suggested that the present study found that some factors, such as the travel distance to school, hilly routes, the dangerous high traffic volume for crossing, and less accessibility and infrastructure for crossing were negatively associated with walking/cycling to school, those all factors mentioned have an important influence for the improvement of safer active transport environments and child-friendly urban design.

Table 5 shows reasons why parents do not allow their children to cycle to school. The parents concerned about the road safety as the reason. Most of the parents do not allow due concerns o road accidents (43.7%), followed by crime (32.2%), inadequate cycling facility on the road (17.2%), and the distance is too far (6.9%). This result is in line with researches before. As presented in Isler et al., 2008; Carver at al., 2008; Kerr et al., 2006; McDonald, 2007; Nelson, 2008; Sjolie and Thuen, 2002; Timperio et al., 2006; Bere et al, 2008 research, different reasons have been suggested for low and decreasing levels of active commuting such as safety concerns, traffic, road crossing, crime, convenience to drop children off on the way to work and environmental factors such as the ability to be able to walk and distance to school.

Table 5: The main reason why parents do not allow for cycling to school

Socio-demographic characteristic	The distance	Road accident concerned	Adequate cycling facility	Concerned about the crime
All respondents	6.9%	43.7%	17.2%	32.2%
Mother	8.9%	48.9%	17.8%	24.4%

Father	6.1%	36.4%	18.2%	39.4%
Single parent	-	44.4%	11.1%	44.4%
≤ 326 USD	20.0%	40.0%	33.3%	6.7%
326 – 978 USD	5.6%	44.4%	8.3%	41.7%
978 – 1630 USD	4.3%	47.8%	17.4%	30.4%
≥ 1630 USD	-	38.5%	23.1%	38.5%

Mothers more concerned about road accidents (48.9 %) while fathers are more concerned about the crimes (39.4%). Based on Chi-square test, there is no significant influence of respondent's position in household toward the Transportation mode for the children to go to school, $\chi^2_0 = 5.161 < \chi^2_{0.05 (6)} = 12.592$.

In Table 5 can be seen that the reason why the parents do not allow their children to cycle to school is based on income level. Based on income level, most of the parents do not grant permission due to concerns on road accident. Except the reason of distance, there is no consistent pattern amongst income level towards the reason. Based on Chi-square test, there is the significant influence of respondent income level towards the Transportation mode for the children to go to school, $\chi^2_0 = 14.155 > \chi^2_{0.05 (6)} = 12.592$.

7. The Encouraging Factors for Cycling to School

In this research the parents were asked regarding factors that could encourage them to allow their children to cycle to school.

The data analysis was conducted by using the Analytical Hierarchy Process (AHP). Consistency Ratio for the AHP analysis (All respondents, father and mother respondents) are 6.9 %; 6.8 %; 7.4 %. According Saaty in 1984, the Consistency Ratio value is not more than 10%.

The result can be seen in Table 6 the main factor that could encourage the parents to allow their children to cycle to school was the distance. Parents ranked the adequacy and safety route in second place and the safety of the neighborhood environment in third place. Children's physical activity can be impacted by road safety, Petch and Henson (2000); Carver et al., (2008) stated that it is now realized that road accidents involving children could be happening due to the various factors including the driver's attitude and/or the children and the physical/social environment conditions

Table 6: Encouraging factors for cycling to school

	All respondents	Father	Mother
Adequate and safe cycling facilities along the route to school	2	2	2
Need bicycle	7	7	8

facilities (bicycle parking area)			
Need helmet for your children	6	6	6
Need separate path for cycling	4	3	4
Safety neighbourhood environment for children	3	4	3
Speed zones along the cycling route	8	8	7
The crossing guard along the cycling route	5	5	5
The distance from your house to school is not far	1	1	1

Fathers and mothers have equal view point for first rank until sixth rank regarding the encouraging factors for cycling to school. In the seventh rank fathers consider the bicycle facilities (bicycle parking area) more while mothers consider more about speed zones along the cycling route.

8. The Permitted Distance for Cycling to School

As stated in Carver et al research in 2008, safety is identified as a potential influence for active transport. Timperio et al., (2006) suggested that the attention on school location related to areas of residence and traffic routes. This is an important factor in planning for new communities and when the policy of school zone is made.

Children whom have shorter distance are likely have more opportunity to commute by active transport to school (McDonald, 2007; Merom et al., 2006; Nelson et al., 2008; Børrestad et al 2011). The Netherlands have a tradition of cycling for a long time; they a better built environment for cycling, which has the result the good infrastructure which is more safe and comfortable for cycling than in other countries (Bere et al, 2008).

In line with Dellinger (2005); Ewing et al., (2004); Timperio et al., (2006); Merom et al., (2005); Isler et al., (2008) research, suggested that travel distance to school and high volume of traffic were significantly associated with non-active transport commuting. While as stated in Buliung et al, 2009 research, the migration from elementary schools to larger secondary schools could change the type of transport.

From the school authorities, road traffic, distance from the residence to school, lack of sidewalks and cycling paths, lack of guards for crossing, bad weather and the crimes reported are considered as barrier for active transport to school (Chriqui et al, 2012).

As stated in Boarnet et al., (2005) research, the improvement of pedestrian and bicycle facilities such

as improvement of sidewalks and traffic control system can impact the preference of children for active transport to school. Isler et al., (2008) stated in Payerne urban area, the concerned about safety, there are more student to be accompanied by their parents

Figure 3 shows that most of the parents only allow their children cycling to school within 1 km (75%).

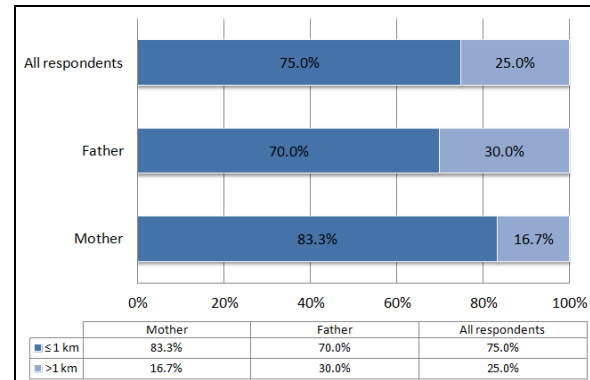


Figure 3 The permitted distance for cycling to school

Figure 3 also shows fathers that allow their children to cycle further than the mothers. The percentage of fathers that allowed their children to cycle to school with the distance more than 1 km is higher than mothers.

9. The Cycling Facilities Suggested to Cycle to School

The road safety concerned was shown by parents on the cycling facilities suggested. The parents concern on dangers from other traffic on the road is very high. As the result in Figure 4, regarding cycling facilities, the majority of parents suggested the exclusive bike path for their children to go to school (64.1%). A few parents suggest on the existing road but it must be provide a cycling lane to separate the cyclist from other traffic. No one would let their children ride their bicycle on a road mix with other traffic, most of them proposed an exclusive bike path for their children.

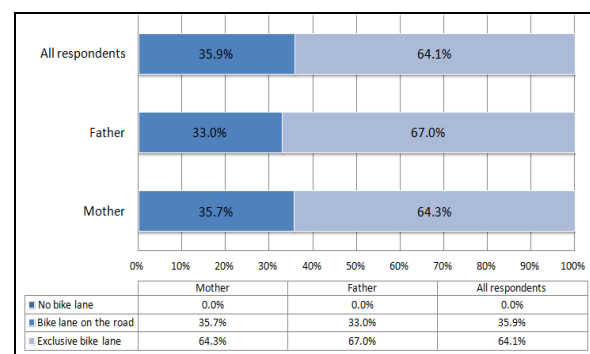


Figure 4 Cycling facilities suggested

Based on Chi-square test, there is no significant influence of respondent's position in household toward the cycling facilities suggested, $\chi^2_0 = 1.295 < \chi^2_{0.05 (6)} = 12.592$.

10. Conclusion

Regarding neighborhood surroundings safety for their children doing physical activity, the majority of parents stated that their neighborhood surrounding are not safe for their children to do physical activity alone outside the home. Most fathers argue that the neighbourhood surrounding is safe while most mothers and single parents stated that their neighbourhood environment is not safe. There is significant influence of the position in the family towards the perception. The consistent pattern occurs on the respondents' income level corresponding to the perception of the surrounding neighbourhood safety. Parents who stated neighbourhood environment is 'safe' decreases as the income level increases. There is significant influence of the position in the income level towards the perception of the neighborhood environment safety.

Regarding the means of transportation for their children from home to school, most of the parents would let their children take a school bus. Even though the dependence on private vehicle is high enough, almost 50% of the parents drop and pick them up from school. Fathers are higher than mothers on private vehicle dependence, but the difference is not significant. The consistent pattern occurs among income levels toward cars and motorcycles used as transportation mode to school. The car used increases as the income level increases. While as the income level increases motorcycle usage decrease. There aren't parents who earned income more than 978 USD that would let their children walking to school. There is significant influence of the income level towards Transportation mode for the children to go to school.

Most parents do not allow their children to cycle to school. The percentage of fathers who allow cycling is higher than mothers. There is no significant influence of the position in household toward the permission for cycling to school. The consistent pattern is between the parent's income level toward the permission for cycling to school. The permitted decrease can be seen as the increasing of income level. There is the significant influence of parents' income levels towards the permission to cycle to school. The interesting result is for parents who earned an income ≤ 326 USD, most of them allow their children to cycle to school, while parents > 326 USD do not allow.

As the reason for permitting their children to cycle to school, most parents do not allow this due to concerns of road accidents. The mothers are more concerned on road accidents while fathers more concerned about crimes. There is no significant influence of respondent's position in household towards the transportation mode for the children to go to school. Based on income level, most parents do not allow due to concerns of road accidents. Except that the reason of the distance, no consistent pattern amongst income

level toward the reason. There is no significant influence of respondent income level towards the transportation mode for the children to go to school.

The road safety concerned was shown by parents by the cycling facilities suggested. The parents concerns about the dangers from other traffic on the road are very high. Regarding cycling facilities, a majority of parents suggested exclusive bike path for their children to go to school. A few parents suggested this on the existing road but that this must be provided by a cycling lane to separate the cyclist from other traffic. No one would let their children ride their bicycle on the road which is mixed with other traffic, most of them proposed exclusive bike path for their children.

Parents would like to allow their children to cycle to school if there is a safe bicycle path along the route to school, they also stated that the friendly neighborhoods for cycling is important for children to cycle to school. Fathers expect the friendly neighborhood for active transport in order to encourage them to allow their children to cycle to school, followed by the presence of a guard to help their children across the street. While mothers more concern about the availability of safe cycling path.

Most of the parents only allow their children to cycle to school within 1 km. Fathers allow their children to cycle further than mothers. The percentage of fathers that allowed their children to cycle to school with the distance more than 1 km meters is higher than mothers.

11. Acknowledgements

The authors would like to acknowledge the Faculty of Engineering, Andalas University, Padang West of Sumatera, *Indonesia* (No. Kontrak 044/UN.16.PL/AKS/2015) and the University of Malaya, Kuala Lumpur for partly funding of this work under the Flagship Project (FL020-2012) : Sustainable Transportation.

References

- [1] Buliung, R. N., Mitra, R., & Faulkner, G., "Active school transportation in the Greater Toronto Area, Canada: An exploration of trends in space and time (1986–2006)". *Preventive Medicine*, 48(6), pp. 507-512., 2009.
- [2] Chriqui, J. F., Taber, D. R., Slater, S. J., Turner, L., Lowrey, K. M., & Chaloupka, F. J. "The impact of state safe routes to school-related laws on active travel to school policies and practices in U.S. elementary schools". *Health & Place*, 18(1), pp. 8-15, 2012.
- [3] Tudor-Locke, C., Ainsworth, B.E., Popkin, B.M. (2001), "Active commuting to school an overlooked source of children's physical activity?", *Sports Medicine*, 3, pp. 309–313, 2001.
- [4] Cooper, A. R., Page, A. S., Foster, L. J., & Qahwaji, D., "Commuting to school: Are children

- who walk more physically active?”, *American Journal of Preventive Medicine*, 25(4), pp. 273-276, 2003.
- [5] Timperio, A., Crawford, D., Telford, A., & Salmon, J., “Perceptions about the local neighborhood and walking and cycling among children”, *Preventive Medicine*, 38(1), pp. 39-47, 2004.
- [6] Boarnet, M. G., Anderson, C. L., Day, K., McMillan, T., & Alfonzo, M., “Evaluation of the California Safe Routes to School legislation: Urban form changes and children’s active transportation to school”, *American Journal of Preventive Medicine*, 28(2, Supplement 2), pp. 134-140, 2005..
- [7] Timperio, A., Ball, K., Salmon, J., Roberts, R., Giles-Corti, B., Simmons, D., Crawford, D., ‘Personal, Family, Social, and Environmental Correlates of Active Commuting to School’, *American Journal of Preventive Medicine*, 30(1), pp. 45-51, 2006.
- [8] Faulkner, G. E. J., Buliung, R. N., Flora, P. K., & Fusco, C., “Active school transport, physical activity levels and body weight of children and youth: A systematic review”, *Preventive Medicine*, 48(1), pp. 3-8, 2009.
- [9] Gatersleben, B., Leach, R., Uzzell, D., “Travel to school: studying and promoting walking and cycling to school in four junior schools and one secondary school in Ash, Guildford”, University of Surrey, Guildford, UK, 2001
- [10] Soole, D.W., Alexia Lennon, A., Haworth, N., “Parental beliefs about supervising children when crossing roads and cycling”, *International Journal of Injury Control and Safety Promotion*, 18(1), pp. 29–36, 2011.
- [11] María de Lourdes Martínez T., Julio Rocha C., Carne Clavel-Arcas, C., Mack, K.A., “Nonfatal unintentional injuries in children aged <15 years in Nicaragua”, *International Journal of Injury Control and Safety Promotion*, 17(1), pp. 3–11, 2010
- [12] Isler, B. B., Leticia Grize, L., Mäder, U., Ruch, N., Sennhauser, F.H., Braun-Fahrländer, C., “Personal and environmental factors associated with active commuting to school in Switzerland”, *Preventive Medicine*, 46, pp. 67 – 73, 2009.
- [13] Carver, A., Timperio, A., & Crawford, D., “Playing it safe: The influence of neighbourhood safety on children's physical activity—A review”, *Health & Place*, 14(2), pp. 217-227, 2008.
- [14] Van der Ploeg, H. P., Merom, D., Corpuz, G., & Bauman, A. E., “Trends in Australian children traveling to school 1971–2003: Burning petrol or carbo hydrates?”, *Preventive Medicine*, 46(1), pp. 60-62, 2008.
- [15] Metcalf, B., Voss, J., Jeffery, A., Perkins, J., Wilkin, T., “Physical activity cost of the school run impact on schoolchildren of being driven to school (EarlyBird 22)”, *BMJ*, 329, pp. 832–833, 2004.
- [16] Scherer, K., Mausner-Dorsch, H., Kemény, P., “Surveillance-based injury epidemiology in schools in Germany”, *International Journal of Injury Control and Safety Promotion*, 13(3), pp. 159 – 169, 2006.
- [17] Cole, R., Burke, M., Leslie, E., Donald, M., & Owen, N., “Perceptions of representatives of public, private, and community sector institutions of the barriers and enablers for physically active transport”, *Transport Policy*, 17(6), pp. 496-504, 2010.
- [18] Hillman, J., Adams, J., Whitelegg, “*One False Move: A Study of Children's Independent Mobility*”, PSI Publishing, London, 1990.
- [19] Bere, E., van der Horst, K., Oenema, A., Prins, R., & Brug, J., “Socio-demographic factors as correlates of active commuting to school in Rotterdam, the Netherlands”, *Preventive Medicine*, 47(4), pp. 412-416, 2008.
- [20] McDonald, N. C., “Active transportation to school: trends among U.S. schoolchildren, 1969-2001”, *American Journal of Preventive Medicine*, 32(6), pp. 509-516, 2007.
- [21] Mota, J., Gomes, H., Almeida, M., Ribeiro, J., Carvalho, J., Santos, M., “Active versus passive transportation to school-differences in screen time, socio- economic position and perceived environmental characteristics in adolescent girls”, *Annals of Human Biology*, 34, pp. 273–282, 2007.
- [22] McMillan, T., “The relative influence of urban form on a child’s travel mode to school”, *Transportation Research Part A*, 41, pp. 69–79, 2007.
- [23] Kullman, K., Palludan, C., “Rhythmanalytical sketches: agencies, school journeys, temporalities”, *Children's Geographies*, 9, pp. 347–359, 2011.
- [24] Owen, N., Humpel, N., Leslie, E., Bauman, A., & Sallis, J. F., “Understanding environmental influences on walking: Review and research agenda”, *American Journal of Preventive Medicine*, 27(1), pp. 67-76, 2004.
- [25] Mokhtarian, P.L., Salomon, I., Redmond, L., “Understanding the demand for travel: it's not purely “derived”. *Innovation: The European Journal of Social Science Research*, 14 (4), pp. 355–380, 2001.
- [26] Saelens, B.E., Sallis, J.F., Black, J.B., Chen, D., “Neighborhood-based differences in physical activity: an environment scale evaluation”, *Am J Public Health*, 93, pp. 1552–1558, 2003.
- [27] Cole, R., Burke, M., Leslie, E., Donald, M., & Owen, N., “Perceptions of representatives of public, private, and community sector institutions of the barriers and enablers for physically active transport”, *Transport Policy*, 17(6), pp. 496-504, 2010.
- [28] Dellinger A.M., Staunton C.E., “Barriers to children walking and bicycling to school—United States, 1999”, *Morbidity & Mortality Weekly Report*, 51 (32), pp. 701–704, 2002.
- [29] DiGiuseppi, C., Roberts, I., Li, L., Allen, D., “Determinants of car travel on daily journeys to school: cross sectional survey of primary school children”, *British Medical Journal*, 316 (7142), pp. 1426–1428, 1998.

- [30] Ahlport, K. N., Linnan, L., Vaughn, A., Evenson, K. R., & Ward, D. S., "Barriers to and Facilitators of Walking and Bicycling to School: Formative Results From the Non-Motorized Travel Study", *Health Education & Behavior*, 35(2), pp. 221-244., 2006.
- [31] Faulkner, G.E., Richichi, V., Buliung, R.N., Fusco, C., Moola, F., "What's "quickest and easiest?": parental decision making about school trip mode", *International Journal of Behavioral Nutrition and Physical Activity*, 7, p. 62, 2010.
- [32] Kerr, J., Rosenberg, D., Sallis, J.F. (2006). Active commuting to school: associations with environment and parental concerns. *Med Sci Sports Exerc*, 38 , pp. 787–794.
- [33] Martin, S., Carlson, S. (2005). Barriers to children walking to or from school—United States, *Morbidity & Mortality Weekly Report*, 54 (38), pp. 949–952.
- [34] Nelson, J. D., Saleh, W., & Prileszky, I., "Ownership and control in the bus industry: the case of Hungary", *Journal of Transport Geography*, 5(2), pp. 137-146, 1997
- [35] Sjolie A.N., Thuen, F., "School journeys and leisure activities in rural and urban adolescents in Norway", *Health Promotion International*, 7 , pp. 21–30, 2002.
- [36] Saaty, T.L., "Analytical Hierarchy Process, Planing, Priority Setting", Resource Allocation, Mc Graw- Hill Company, USA, 1980.
- [37] Petch, R.O., Henson, R.R., (2000). Child road safety in the urban environment", *J. Transport Geogr.*, 8, pp.197–211, 2000.
- [38] Merom, D., Tudor- Locke, C., Bauman, A., & Rissel, C., "Active commuting to school among NSW primary school children: implications for public health", *Health & Place*, 12(4), pp. 678-687, 2006.
- [39] Børrestad, L. A. B., Andersen, L. B., & Bere, E., "Seasonal and socio-demographic determinants of school commuting", *Preventive Medicine*, 52(2), pp. 133-135, 2011.
- [40] Ewing, R., Schroeder, W., Greene, W., "School location and student travel: analysis of factors affecting mode choice", *Transportation Research Record: Journal of the Transportation Research Board*, 1985, pp. 55–63, 2004.
- [41] Merom, D., Rissel, C., Mahmic, A., Bauman, A., "Process evaluation of the New South Wales 'Walk-Safely to-School-Day' (WSTSD)", *Health Promotion Journal of Australia*, 16, pp. 100–106, 2005.