



International Conference on
**Innovative Research
in Engineering and Science**

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Schedule

Committees

About Conference

Author Index

Title Index

Paper Id Index

Asian Institute of Technology Conference Center,
Thailand

International Conference on Innovative Research in Engineering and Science

16-17 June 2017

Asian Institute of Technology Conference Center
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International Conference on Innovative Research in Engineering and Science

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TITLE INDEX

PAPER ID	TITLE
NISMIET.1	A CASE STUDY ON CPE (COMMUNICATION PROTOCOL ERROR) ALARM IN NOKIA DXC
131	A COLLECTIVE STUDY ON POPULAR NATURE INSPIRED OPTIMIZATION
342	A HYBRID MEDICAL IMAGE DENOISING APPROACH USING GABOR, NN AND MDA
64	A NEW APPROACH BASED ON VARIABLE SCALING HYBRID DIFFERENTIAL EVOLUTION FOR UNIT COMMITMENT PROBLEM
256	A NEW DESIGN OF A VOLTAGE SOURCE MLI AND ANALYSIS OF ITS APPLICABILITY FOR MEDIUM POWER REQUIREMENTS
177	A NOVEL CLOUD BASED INDUSTRIAL INTERNET OF THINGS (IIOT) ARCHITECTURE FOR HEALTHCARE APPLICATIONS
11	A NOVEL OBJECT TRACKING METHOD USING BINARY BAT ALGORITHM
327	A PATH-SET BASED APPROACH FOR TWO-TERMINAL RELIABILITY COMPUTATION OF INTERCONNECTION NETWORKS
107	A REVIEW PAPER ON MOBILE TECHNOLOGY FOR ACTIVITY RECOGNITION



- 138 A SEMI SUPERVISED HYBRID PROTECTION FOR NETWORK AND HOST BASED ATTACKS
- 122 A STAND ALONE PV SYSTEM FOR WATER-PUMPING APPLICATION
- 121 A STUDY ON BAMBOO REINFORCED CONCRETE BEAM USING NUMERICAL MODELING AND COMPARISON WITH THE EXPERIMENTAL DATA
- 69 A STUDY ON STATE OF THE ART IN SECURITY AND PRIVACY ISSUES ON CLOUD COMPUTING
- ASCISE 5 AADHAR CARD BASED DOUBLE IDENTITY VERIFICATION SYSTEM FOR RAILWAY
- 82 AES BASED SYMMETRIC-BIOMETRIC CRYPTO SYSTEM USING USER PASSWORD.
- 66 AN AMENDED RSA ALGORITHM FOR SECURE COMMUNICATION
- 283 AN ANALYSIS FOR REPOWERING PREDICTION OF JAMGODARANI WIND FARM USING MATLAB
- 16 AN APPROACH TO DETECT PATTERNS IN A SOCIAL ATTRIBUTED GRAPH USING GRAPH MINING TECHNIQUES
- 38 AN EFFICIENT METHOD FOR EARLY STAGE DETECTION OF DIABETIC RETINOPATHY
- 124 AN IMPLEMENTATION OF HONEYPOTS IN A CLOUD ENVIRONMENT FOR ANALYZING ATTACKS ON WEBSITES
- STNGCR 9 AN INTELLECTUAL TRAFFIC ORGANISM FOR VANET



- 129 AN OVERVIEW OF SOFTWARE PROCESS IMPROVEMENT INITIATIVES PROMOTING TO THE GROWTH OF AN ORGANIZATION
- 60 ANALYSIS OF COMPOSITE LAMINATE UNDER BALLISTIC IMPACT BY BULLETS OF DIFFERENT TYPES
- 347 ANALYSIS OF DIFFERENT SECURITY AND VULNERABILITY IN CELLULAR NETWORKS
- 136 ANALYSIS OF TIME-SERIES METHOD FOR DEMAND FORECASTING
- STNGCR 6 ANTI -TRAIN COLLISION IMPLEMENTATION SYSTEM WITH VECTOR POINTS
- 125 APPLICATION OF LEAN MANAGEMENT FOR IMPROVING PRODUCTIVITY OF HOUSEKEEPING STAFF IN HEALTH CARE INDUSTRY: A CASE STUDY
- 171 APPRAISAL OF NONLINEAR DYNAMIC SOIL-STRUCTURE INTERACTION MODEL OF PILE FOUNDATION SUPPORTED STRUCTURE: A PROBABILISTIC APPROACH
- 168 AUGMENTED REALITY IN ACADEMIA – CHANGING LANDSCAPE OF EDUCATION
- 133 AUTOMATIC RATING FOR SERVICES OF TOURISM INDUSTRY BY USING OPINION MINING
- 128 BITCOIN: THE FUTURE OF MONEY
- ETCEB 110 BLACKBOARD USAGE: AN INVESTIGATIVE STUDY AMONG CCSE FEMALE FACULTY AND STUDENTS AT UNIVERSITY OF HAIL
- 65 BLOOD GLUCOSE LEVEL MONITORING BY NONINVASIVE METHOD USING NEAR INFRA RED SENSOR



STNGCR 4	COGNITIVE SPECTRUM FRAMEWORK ON COOPERATIVE ENVIRONMENT: A STUDY
STNGCR 20	COMPARISON OF SUPPORT VECTOR MACHINE (SVM) AND BACK PROPAGATION NETWORK (BPN) METHODS IN PREDICTING THE PROTEIN VIRULENCE FACTORS
176	CONTACT IMPEDANCE MEASUREMENTS USING COMPOUND ELECTRODES FROM ELECTRICAL IMPEDANCE SPECTROSCOPY (EIS) STUDY DURING BANANA RIPENING
47	CONTEMPLATE ON IDENTIFYING THE BEST WAVELET FILTER AND FILTER ORDER FOR MEDICAL IMAGE COMPRESSION
325	CONTENT CENTRIC FRAMEWORK FOR WIRELESS SENSOR NETWORKS
172	CONVERGENCE ANALYSIS OF THE TERNARY CROSSOVER OPERATOR
ASCISE 103	DATA EXTRACTION IN SEMANTIC WEB: LITERATURE REVIEW
98	DECISION OF AN OPTIMUM CUTTING CONDITION BY NEURAL NETWORK
101	DESIGN AND ANALYSIS OF MULTI-INPUT BIDIRECTIONAL BUCK-BOOST CONVERTER FOR HYBRID ELECTRIC VEHICLES
314	DESIGN AND EVALUATION OF OFDM BASED OPTICAL COMMUNICATION NETWORK
ETCEB-101	DESIGN AND IMPLEMENTATION OF MULTILINGUAL FILE TRANSLATOR
116	DESIGN AND PERFORMANCE ANALYSIS OF GRAVITY ASSISTED POWER (GAP) GENERATING SYSTEM FOR HARVESTING ELECTRICAL ENERGY



- 294 DESIGN OF A MOSFET BASED PORTABLE AND COMPATIBLE DIMMER ADAPTOR FOR LED BULBS
- 155 DESIGNING AND DEVELOPING ENERGY INFORMATION SYSTEM FOR ACADEMIC INSTITUTES
- STNGCR 2 DETECTING MALICIOUS DATA INJECTION IN EVENT DETECTION USING EADA SCHEME
- 345 DEVELOPMENT OF LAND TRANSPORTATION TOWARDS EMPOWERED TOURISM SECTOR FOR BETTERMENT OF SOCIAL WELFARE
- STNGCR 3 DIGITAL SIGNATURE APPROACH FOR TRUST BASED COMMUNICATION OVER SELFISH NODE ATTACK IN VANET
- STNGCR 13 DYNAMIC RESOURCE ALLOCATION IN CLOUD USING QUEUING MODEL
- STNGCR 15 EANKBB: NEIGHBOR DESIGNATING METHOD FOR BROADCASTING IN MOBILE ADHOC NETWORK
- 166 EFFECT OF SOCIOECONOMIC AND LATENT VARIABLES IN VEHICLE OWNERSHIP: A CASE STUDY OF AGARTALA CITY, INDIA
- 118 EFFICIENT AUTHENTICATION SCHEME AND SECURE COMMUNICATION FOR MOBILE IP NETWORKS UNDER VARYING MOBILITY SPEED
- 346 EFFICIENT IMPROVED WEAKLY SECURE NETWORK SEGMENTATION USING DKE
- STNGCR 8 EFFICIENT IRIS RECOGNITION USING GLCM AND SVM CLASSIFIER
- 119 ELECTRIC DISCHARGE COATING ON ALUMINIUM-6351 ALLOY WITH GREEN COMPACT SILICON CARBIDE AND COPPER TOOL USING EDM OIL AS DIELECTRIC



- 106 ENERGY ASSESSMENT OVER A SOLAR CLADDING BY USING GEOGRAPHIC INFORMATION SYSTEM
- 220 ENERGY EFFICIENT CONTENT DISSEMINATION ARCHITECTURE FOR CONTENT CENTRIC NETWORK
- 100 ENERGY-EFFICIENT CLOUD COMPUTING WITH TASK CONSOLIDATION
- 193 ENHANCING FUZZY C-MEANS BY GRID-DENSITY CLUSTERING FOR DISTRIBUTED WSN DATA STREAM
- 264 EXPERIMENTAL COMPUTATIONS TO ASSESS SURFACE WEAR IN ROLLER BEARING USING INTEGRATED APPROACH OF VIBRATION ANALYSIS AND SPECTROSCOPIC TECHNIQUES
- STNGCR 17 EXTENDED MEDIUM DOMINATION NUMBER OF A JAHANGIR GRAPH
- ETCEB 104 FACTORS AFFECTING THE INDEPENDENCE OF EXTERNAL AUDITORS: A STUDY OF LOCAL AUDIT FIRMS IN SAUDI ARABIA
- STNGCR 10 FISSURE DETECTION IN LUNG CT IMAGES USING BACK PROPAGATION NEURAL NETWORKS
- 77 FRACTAL STRUCTURE RING RESONATOR BASED CHANNEL DROP FILTER FOR OPTICAL NETWORKS USING INP DIELECTRIC MATERIAL
- STNGCR 19 FUNCTION BASED PREDICTIONS OF PROTEIN FOLD RECOGNITION USING GO-TERM
- 348 FUTURE PERSPECTIVES IN ELASTIC OPTICAL NETWORKS
- 80 GENERATION OF RANDOM NUMBER IN TIME DEPENDENT COLOR CAPTCHA FOR ENABLING WEB SECURITY ACCESS



45	GREECE DEBT CRISIS
STNGCR 14	HEURISTIC METHOD FOR CLOUD RESOURCE CONSOLIDATION USING ECRC (ENHANCED CLOUD RESOURCE CONSOLIDATING)
255	HIGHLY EFFICIENT AND ROBUST AUDIO IDENTIFICATION AND ANALYTICS SYSTEM TO SECURE ROYALTY PAYMENTS FOR SONG ARTISTS
68	HPL ALGORITHM FOR SEMANTIC INFORMATION RETRIEVAL WITH RDF AND SPARQL
RISMT 1	HYBRID CONVERTER WITH SIMULTANEOUS AC AND DC OUTPUT FOR NANO-GRID APPLICATIONS WITH RESIDENTIAL SYSTEM
156	HYBRID GA-PSO BASED PITCH CONTROLLER DESIGN FOR AIRCRAFT CONTROL SYSTEM
352	HYBRIDIZATION OF GENETIC ALGORITHM & VARIABLE NEIGHBORHOOD SEARCH (VNGA) APPROACH TO CRACK THE FLEXIBLE JOB SHOP SCHEDULING PROBLEM: A FRAMEWORK
142	IMPLEMENTATION OF LOW AREA FIR FILTERS USING VEDIC MULTIPLICATION ALGORITHMS
132	IMPLEMENTATION OF RANDOM FOREST MACHINE LEARNING ALGORITHM
81	IMPLEMENTATION OF VARIOUS EDGE DETECTION FILTERS USING DIFFERENT THREAD DISTRIBUTIONS
114	IMPROVEMENT OF ANDROID BANKING APPLICATION INTEGRITY USING DYNAMIC KEY VALUE
285	INVESTIGATION ON MICRO STRUCTURAL, MECHANICAL AND TRIBOLOGICAL PROPERTIES OF ALUMINIUM NITRIDE (ALN) COATING DEPOSITED BY RF MAGNETRON SPUTTERING



- 23 IN-VITRO ANTIPROLIFERATIVE EFFECT, CYTOTOXICITY AND APOPTOSIS STUDY OF BIOGENIC SILVER NANOPARTICLES SYNTHESIZED USING STERCULIA QUADRIFIDA LEAF EXTRACT
- 160 IOT AND WIRELESS TERMINAL SECURITY TECHNIQUE
- ASCISE 7 IRIS CONTROLLED WHEEL CHAIR IN REAL TIME
- 157 LANDSLIDE PREDICTION USING CLASSIFIER MODELS
- NIESMT 2 LEXICON BASED SENTIMENT ANALYSIS ON FACEBOOK PAGE
- 304 LOCATION-BASED DEPRESSION ANALYSIS AMONG THE VARIOUS CITIES OF INDIA
- 351 MAPREDUCE BASED CLASSIFICATION OF LEGAL DOCUMENTS
- 137 MICROSTRUCTURES AND MECHANICAL PROPERTIES STUDIES OF THE DIRECTIONAL SOLIDIFIED DEVELOPED EX-SITU AL-4.5%CU-SICP METAL-MATRIX COMPOSITES.
- 167 MINING THE WEB: A SURVEY
- 242 MITIGATION AND PERFORMANCE ANALYSIS OF ROUTING PROTOCOLS UNDER BLACK-HOLE ATTACK IN VANET
- 278 MITIGATION OF HARMONICS IN MULTILEVEL INVERTER USING MSPWM & SVM TECHNIQUES
- 149 MODULATION DIVERSITY FOR DIFFERENTIAL AMPLITUDE AND PHASE SHIFT KEYING TECHNIQUE



- 164 MOVING OBJECT AWARE VIDEO COMPRESSION
- 27 NONINVASIVE HEMOGLOBIN LEVEL AND HEART RATE SENSOR SYSTEM FOR AUTOMATIC TREADMILL SPEED CONTROL
- 126 OPTIMIZING THE NETWORK FLOW IN CLOUD SUPPLY CHAIN MANAGEMENT
- ETCEB 108 PAPER TITLE: OBJECT-ORIENTED AND RELATIONAL APPROACHES IN DATABASE MANAGEMENT SYSTEMS (DBMS): DESIGN, IMPLEMENTATION AND INDUSTRIAL MARKETS
- 127 PARALLELIZING BINARY SEARCH USING CUDA- A CONCEPTUAL IDEA
- 48 PARAMETRIC STUDY OF FLYASH BASED GEOPOLYMER CONCRETE
- 88 PENETRATION TESTING: VULNERABILITY ANALYSIS IN A VIRTUAL ENVIRONMENT
- 251 PERFORMANCE ANALYSIS AND ROBUST CONTROL OF A BALL AND BEAM SYSTEM
- 105 PERFORMANCE ANALYSIS OF LINEAR FRESNEL REFLECTOR CONCENTRATING SOLAR SYSTEM WITH HORIZONTAL AND VERTICAL ABSORBER WITH VARYING WIDTH OF REFLECTOR
- 201 PERFORMANCE COMPARISON OF OPTIMAL PID CONTROLLER DESIGN FOR TITO SYSTEM
- 205 PERFORMANCE ENHANCEMENT BY TRAFFIC RE-SCHEDULING OF NETWORK NODES
- 343 PERFORMANCE EVALUATION OF PARALLEL APPLICATIONS USING SVM AND PVM THROUGH MATRIX MULTIPLICATIONS



67	PLC BASED FUZZY CONTROLLED ETHANOL-WATER SEPARATION SYSTEM
85	POTHOLE DETECTION AND ANALYSIS SYSTEM (PODAS) FOR REAL TIME DATA USING SENSOR NETWORKS
123	POWER FLOW MANAGING IN A STAND-ALONE HYBRID POWER SYSTEM
STNGCR 22	PROPERTYEDIA- A TWITTER DATA ANALYSIS AND RECOMMENDATION BASED ANDROID APPLICATION FOR REAL ESTATE USERS
329	QUALITY BASED DRIP DRAG MATCH DATA COLLECTION IN WIRELESS SENSOR NETWORK
276	RAPID PROTOTYPING OF LIGHTING CONTROL SYSTEM USING RECONFIGURABLE DEVICE
RTMEIR 2	REDUCED TAIL EMISSIONS BY OPTIMUM USAGE OF CAR AIR CONDITIONERS
STNGCR 1	RESCUING AND REHOMING PETS FROM INJURIES AND ORPHANING FOR INDIAN SCENARIO- AN ANDROID BASED APPLICATION
STNGCR 12	RESOURCEFUL AND PROFICIENT EXPLOITATION OF MDYMO IN MOBILE ADHOC NETWORKS
295	ROLE OF EXTRA-CURRICULAR ACTIVITIES IN HIGHER EDUCATIONAL INSTITUTES FOR QUALITY IMPROVEMENT
STNGCR 21	ROUTE MAX - A UNIQUE ENERGY EFFICIENT ROUTING ALGORITHM IN WIRELESS SENSOR NETWORK
178	SECURE PASSWORD SCHEME USING CRYPTOGRAPHY, STEGANOGRAPHY AND TOP-K RETRIEVAL CONCEPT



- 298 SECURITY AWARE VULNERABILITY AVOIDANCE IN CLOUD COMPUTING USING NATURE INSPIRED APPROACH
- 277 SENTIMENT ANALYSIS OF SOCIAL MEDIA TREND FOR POLITICAL OPINION
- 99 SMALL HYDROPOWER IN INDIA AND SILT EROSION IN HYDRO TURBINES - A REVIEW
- STNGCR 18 SOME CHARACTERIZATION OF COMPLEMENTARY TRIPLE CONNECTED DOMINATION NUMBER OF 3 – REGULAR GRAPHS
- 222 STEPS TOWARDS GRID CONNECTED PV SYSTEM TO IMPROVE THE EFFICIENCY, CONTROLLABILITY AND RELIABILITY
- 273 STUDY AND ANALYSIS OF SOLAR WATER PUMPING PROGRAM FOR AGRICULTURE IN INDIA
- 161 SYMMETRIC KEY GENERATION USING INTEGRATED SYSTEM OF MULTIMODAL BIOMETRICS AND USER-PASSWORD
- 7 TERMINAL SYNERGETIC CONTROL OF CRANE SYSTEM
- 26 TEXT AND IMAGE HIDING WITHIN AN IMAGE USING DWT TRANSFORMATION FOR SECURED WATERMARKING
- 72 THE ANALYSES OF EFFICIENCY AND PERFORMANCE ON CLOUD-BASED VERSUS TRADITIONAL INFRASTRUCTURE
- ETCEB105 THE IMPLEMENTING AND IMPACT OF SPEECH RECOGNITION TECHNOLOGY IN CLINICAL DOCUMENTATION
- 275 THE RESEARCH PAPER ON “INFORMATION AUDIT AND INFORMATION SECURITY MEASURES FOR HIGHER EDUCATION IN INDIA”- A CONCEPTUAL STUDY.



- 170 THE SHARP EYE: A VISION FOR THE PEOPLE WHO LOST THIS GIFT
- 152 TOWARDS ENERGY SAVING WITH SMARTER MULTI QUEUE JOB SCHEDULING ALGORITHM IN CLOUD COMPUTING
- 221 UAGNI – AN INTELLIGENT WILDFIRE MONITORING AND ASSESSMENT SYSTEM
- 344 VOLTAGE STABILITY IMPROVEMENT OF MULTI MACHINE POWER SYSTEM USING TCSC WITH REDUCED CONGESTION
- 154 WEB USER BEHAVIOR MODELING DISCOVERING BEHAVIOR PATTERNS AND ANALYSIS ON PATTERN ACCURACY
- 120 WEBSITE FORGERY/FALSIFICATION DETECTION SYSTEM USING LINK INFORMATION AND IMAGES

International Conference on Innovative Research in Engineering and Science

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PAPER-ID INDEX

PAPER ID	TITLE	AUTHORS
7	TERMINAL SYNERGETIC CONTROL OF CRANE SYSTEM	DJAMILA ZEHAR, KHIER BENMAHAMMED, KHALISSA BEHIH AND AIDA CHERIF
11	A NOVEL OBJECT TRACKING METHOD USING BINARY BAT ALGORITHM	NENAVATH HATHIRAM AND DR. RAVI KUMAR JATOTH
16	AN APPROACH TO DETECT PATTERNS IN A SOCIAL ATTRIBUTED GRAPH USING GRAPH MINING TECHNIQUES	BAPUJI RAO, SAROJANANDA MISHRA AND T KARTIK KUMAR
23	IN-VITRO ANTIPROLIFERATIVE EFFECT, CYTOTOXICITY AND APOPTOSIS STUDY OF BIOGENIC SILVER NANOPARTICLES SYNTHESIZED USING STERCULIA QUADRIFIDA LEAF EXTRACT	VISHNU RAJENDRAN
26	TEXT AND IMAGE HIDING WITHIN AN IMAGE USING DWT TRANSFORMATION FOR SECURED WATERMARKING	HIMANI BHARDWAJ, SUNITA CHAUDHARY, MEENU DAVE, NEHA GOSWAMI AND AMIT SANGHI
27	NONINVASIVE HEMOGLOBIN LEVEL AND HEART RATE SENSOR SYSTEM FOR AUTOMATIC TREADMILL SPEED CONTROL	KAVITHAMANI ASHOK AND MANIKANDAN VENUGOPAL
38	AN EFFICIENT METHOD FOR EARLY STAGE DETECTION OF DIABETIC RETINOPATHY	S.D. SHIRBAHADURKAR, V.M. MANE AND D.V. JADHAV
45	GREECE DEBT CRISIS	ITIKA MAJUMDER
47	CONTEMPLATE ON IDENTIFYING THE BEST WAVELET FILTER AND FILTER ORDER FOR MEDICAL IMAGE COMPRESSION	D. RAVICHANDRAN, PRASHANT SAHAI SAXENA, RAMESH NIMMATOORI AND M. R ASHWIN DHIVAKAR
48	PARAMETRIC STUDY OF FLYASH BASED GEOPOLYMER CONCRETE	SOURAV KUMAR DAS
60	ANALYSIS OF COMPOSITE LAMINATE UNDER BALLISTIC IMPACT BY BULLETS OF DIFFERENT TYPES	S.L. GOMBI AND CHANDAN INAMDAR



64	A NEW APPROACH BASED ON VARIABLE SCALING HYBRID DIFFERENTIAL EVOLUTION FOR UNIT COMMITMENT PROBLEM	RAMU MUTYALA, RAVI SRINIVAS AND TARA KALYANI S
65	BLOOD GLUCOSE LEVEL MONITORING BY NONINVASIVE METHOD USING NEAR INFRA RED SENSOR	KAVITHAMANI ASHOK AND DAARANI PAPPANAN
66	AN AMENDED RSA ALGORITHM FOR SECURE COMMUNICATION	NISHA SHETTY, ARJUN CV AND POOJA S
67	PLC BASED FUZZY CONTROLLED ETHANOL-WATER SEPARATION SYSTEM	SHAHZEB ANSARI, AYAZ AHMED, SARANG KARIM, DEEPAK DODEJA AND YAHYA KHAN BROHI
68	HPL ALGORITHM FOR SEMANTIC INFORMATION RETRIEVAL WITH RDF AND SPARQL	PRATHYUSHA KANAKAM, S MAHABOOB HUSSAIN AND D SURYANARAYANA
69	A STUDY ON STATE OF THE ART IN SECURITY AND PRIVACY ISSUES ON CLOUD COMPUTING	ABDULAZIZ ALDAEJ, D. RAVICHANDRAN, MOHAMMED GULAM AHAMAD AND M. R ASHWIN DHIVAKAR
72	THE ANALYSES OF EFFICIENCY AND PERFORMANCE ON CLOUD-BASED VERSUS TRADITIONAL INFRASTRUCTURE	HUA YI LIN, MENG-YEN HSIEH AND KUAN-CHING LI
77	FRACTAL STRUCTURE RING RESONATOR BASED CHANNEL DROP FILTER FOR OPTICAL NETWORKS USING INP DIELECTRIC MATERIAL	MAYUR KUMAR CHHIPA, D. SAI PRIYA, MASSOUDI RADHOUENE, B SUTHAR AND K SRIMANNARAYANA
80	GENERATION OF RANDOM NUMBER IN TIME DEPENDENT COLOR CAPTCHA FOR ENABLING WEB SECURITY ACCESS	PRADEEP KUMAR S AND RAMACHANDARAN R
81	IMPLEMENTATION OF VARIOUS EDGE DETECTION FILTERS USING DIFFERENT THREAD DISTRIBUTIONS	POOJA S, HEZIL DSOUZA AND JAYASHREE BALLAL
82	AES BASED SYMMETRIC-BIOMETRIC CRYPTO SYSTEM USING USER PASSWORD.	DISHA AGARWAL, AMODINI VARDHAN AND POOJA S
85	POTHOLE DETECTION AND ANALYSIS SYSTEM (PODAS) FOR REAL TIME DATA USING SENSOR NETWORKS	JINESH MEHTA, VINAYAK MATHUR, DHRUV AGARWAL, ATISH SHARMA AND KRISHNA PRAKASH



88	PENETRATION TESTING: VULNERABILITY ANALYSIS IN A VIRTUAL ENVIRONMENT	ARJUN C V
98	DECISION OF AN OPTIMUM CUTTING CONDITION BY NEURAL NETWORK	HYUNCHUL KIM AND DUONGTHANH HUNG
99	SMALL HYDROPOWER IN INDIA AND SILT EROSION IN HYDRO TURBINES - A REVIEW	ROBIN THAKUR, SOURABH KHURANA AND MUNEESH SETHI
100	ENERGY-EFFICIENT CLOUD COMPUTING WITH TASK CONSOLIDATION	PARTHASARATHI PATTNAYAK AND PAMELA PAL
101	DESIGN AND ANALYSIS OF MULTI-INPUT BIDIRECTIONAL BUCK-BOOST CONVERTER FOR HYBRID ELECTRIC VEHICLES	MUDALA DHANANJAYA AND SWAPNAJIT PATNAIK
105	PERFORMANCE ANALYSIS OF LINEAR FRESNEL REFLECTOR CONCENTRATING SOLAR SYSTEM WITH HORIZONTAL AND VERTICAL ABSORBER WITH VARYING WIDTH OF REFLECTOR	BABU M AND HARIHARAN S
106	ENERGY ASSESSMENT OVER A SOLAR CLADDING BY USING GEOGRAPHIC INFORMATION SYSTEM	SARAVANAN R AND SALAIMANIMAGUDAM M.P
107	A REVIEW PAPER ON MOBILE TECHNOLOGY FOR ACTIVITY RECOGNITION	NEELABH SAO
114	IMPROVEMENT OF ANDROID BANKING APPLICATION INTEGRITY USING DYNAMIC KEY VALUE	JIHO CHO, CHUNG-HYUN LIM, HYO-JUNG AHN AND LEE GEUK
116	DESIGN AND PERFORMANCE ANALYSIS OF GRAVITY ASSISTED POWER (GAP) GENERATING SYSTEM FOR HARVESTING ELECTRICAL ENERGY	ARPUTHA VIJAYA SELVI J AND DEVAYANI S
118	EFFICIENT AUTHENTICATION SCHEME AND SECURE COMMUNICATION FOR MOBILE IP NETWORKS UNDER VARYING MOBILITY SPEED	ABDURAHM EL ATMAN IGRAIR AND RAGHAV YADAV
119	ELECTRIC DISCHARGE COATING ON ALUMINIUM-6351 ALLOY WITH GREEN COMPACT SILICON CARBIDE AND COPPER TOOL USING EDM OIL AS DIELECTRIC	SUJOY CHAKRABORTY, VIDYUT DEY, SUBRATA KR. GHOSH AND PROMOD PAUL
120	WEBSITE FORGERY/FALSIFICATION DETECTION SYSTEM USING LINK INFORMATION AND IMAGES	JIHO CHO, CHUNG-HYUN LIM, HYO-JUNG AHN AND LEE GEUK
121	A STUDY ON BAMBOO REINFORCED CONCRETE BEAM USING NUMERICAL MODELING AND COMPARISON WITH THE EXPERIMENTAL DATA	RANENDRA NATH BHOWMIK, JOYANTA PAL AND PARTHA PRATIM SARKAR



122	A STAND ALONE PV SYSTEM FOR WATER-PUMPING APPLICATION	SWAPNAJIT PATNNAIK AND INAVELLI CHANDRA MOULI
123	POWER FLOW MANAGING IN A STAND-ALONE HYBRID POWER SYSTEM	MODEM NARAYANA AND SOUMYA RANJAN MOHANTY
124	AN IMPLEMENTATION OF HONEYPOTS IN A CLOUD ENVIRONMENT FOR ANALYZING ATTACKS ON WEBSITES	VISHAL SURYA, SARTHAK CHAUHAN AND KRISHNA PRAKASHA K
125	APPLICATION OF LEAN MANAGEMENT FOR IMPROVING PRODUCTIVITY OF HOUSEKEEPING STAFF IN HEALTH CARE INDUSTRY: A CASE STUDY	SACHIN LAL, NAVEEN KUMAR AND HARISH TIWARI
126	OPTIMIZING THE NETWORK FLOW IN CLOUD SUPPLY CHAIN MANAGEMENT	PARTHASARATHI PATTNAYAK, JAYRAM PRADHAN AND SUDHANSHU SHEKHAR PATRA
127	PARALLELIZING PINCER SEARCH USING CUDA- A CONCEPTUAL IDEA	ANCHIT BHATIA, DIVYANSHU SHARMA AND CHETHAN S
128	BITCOIN: THE FUTURE OF MONEY	SHIVAM BHATIA AND CHETHAN S
129	AN OVERVIEW OF SOFTWARE PROCESS IMPROVEMENT INITIATIVES PROMOTING TO THE GROWTH OF AN ORGANIZATION	SMITHA ANU THOMAS AND BINDU V. R
131	A COLLECTIVE STUDY ON POPULAR NATURE INSPIRED OPTIMIZATION	SOMYA SNEH, SRIKAR KOMPELLA AND CHETHAN S
132	IMPLEMENTATION OF RANDOM FOREST MACHINE LEARNING ALGORITHM	ROSHEN SARMA R, RAJATH R JOSHI, SYED WAJAHATH, PRASHANTH R AND SHARMILA CHIDARAVALLI
133	AUTOMATIC RATING FOR SERVICES OF TOURISM INDUSTRY BY USING OPINION MINING	RUPESH KUMAR MISHRA, MEGHANA R BHARADWAJ, A.K AWASTHI, RAFAEL BERLANGA LLAVORI AND KANNAN SRINATHAN
136	ANALYSIS OF TIME-SERIES METHOD FOR DEMAND FORECASTING	AAYUSHI VERMA, AISHWARYA KARAN, AAROH MATHUR AND CHETHAN S



137	MICROSTRUCTURES AND MECHANICAL PROPERTIES STUDIES OF THE DIRECTIONAL SOLIDIFIED DEVELOPED EX-SITU AL-4.5%CU-SICP METAL-MATRIX COMPOSITES.	SHANTANU DEBNATH, VIKASH SWAMI AND RAM NARESH RAI
138	A SEMI SUPERVISED HYBRID PROTECTION FOR NETWORK AND HOST BASED ATTACKS	JASPREET KAUR
142	IMPLEMENTATION OF LOW AREA FIR FILTERS USING VEDIC MULTIPLICATION ALGORITHMS	DEEPA R, ELANGO S AND SHANMUGAM A
149	MODULATION DIVERSITY FOR DIFFERENTIAL AMPLITUDE AND PHASE SHIFT KEYING TECHNIQUE	KANTHIMATHI M, AMUTHA R AND ANUSHA S
152	TOWARDS ENERGY SAVING WITH SMARTER MULTI QUEUE JOB SCHEDULING ALGORITHM IN CLOUD COMPUTING	JASPREET SINGH AND DEEPALI GUPTA
154	WEB USER BEHAVIOR MODELING DISCOVERING BEHAVIOR PATTERNS AND ANALYSIS ON PATTERN ACCURACY	ABHIRAMI KANNABIRAN AND KAVITHA DEVI M.K
155	DESIGNING AND DEVELOPING ENERGY INFORMATION SYSTEM FOR ACADEMIC INSTITUTES	PRAVEEN KANT PANDEY AND MANEESHA PACHORI
156	HYBRID GA-PSO BASED PITCH CONTROLLER DESIGN FOR AIRCRAFT CONTROL SYSTEM	VAIBHAV SINGH RAJPUT, BODA BHASKER, NAGU BHOOKYA AND RAVI KUMAR JATOTH
157	LANDSLIDE PREDICTION USING CLASSIFIER MODELS	SUKRITI PAUL, ARPIT GARG AND CHETHAN S
160	IOT AND WIRELESS TERMINAL SECURITY TECHNIQUE	WONSEOK KIM, EUNSIK BAK AND EUJIN CHOI
161	SYMMETRIC KEY GENERATION USING INTEGRATED SYSTEM OF MULTIMODAL BIOMETRICS AND USER-PASSWORD	SREENIVAS REDDY CHITLA, POOJA S AND MAYANK SHUKLA
164	MOVING OBJECT AWARE VIDEO COMPRESSION	LE ANH VU
166	EFFECT OF SOCIOECONOMIC AND LATENT VARIABLES IN VEHICLE OWNERSHIP: A CASE STUDY OF AGARTALA CITY, INDIA	AMITABHA ACHARJEE, PARTHA PRATIM SARKAR AND JOYANTA PAL
167	MINING THE WEB: A SURVEY	SALEH MOWLA, ISHITA BEDI AND NISHA SHETTY
168	AUGMENTED REALITY IN ACADEMIA – CHANGING LANDSCAPE OF EDUCATION	DIVYANSHU SHARMA, ANCHIT BHATIA AND CHETHAN S



170	THE SHARP EYE: A VISION FOR THE PEOPLE WHO LOST THIS GIFT	MRINAL MATHUR, PRANSHU DIXIT AND CHETHAN S
171	APPRAISAL OF NONLINEAR DYNAMIC SOIL-STRUCTURE INTERACTION MODEL OF PILE FOUNDATION SUPPORTED STRUCTURE: A PROBABILISTIC APPROACH	RAJIB SAHA AND ABHINAVA PAL
172	CONVERGENCE ANALYSIS OF THE TERNARY Crossover OPERATOR	APOORVA MISHRA, PRANAV ANAND AND ANUPAM SHUKLA
176	CONTACT IMPEDANCE MEASUREMENTS USING COMPOUND ELECTRODES FROM ELECTRICAL IMPEDANCE SPECTROSCOPY (EIS) STUDY DURING BANANA RIPENING	ATANU CHOWDHURY, TUSHAR KANTI BERA, DIBYENDU GHOSHAL AND BADAL CHAKRABORTY
177	A NOVEL CLOUD BASED INDUSTRIAL INTERNET OF THINGS (IIOT) ARCHITECTURE FOR HEALTHCARE APPLICATIONS	KAUSHIK SEKARAN, SRIJAN SINGH, NIMMADI BHARANI PRASAD, REVATHI SARAVANAN AND FABIAN GALLEGOS GUTIERREC
178	SECURE PASSWORD SCHEME USING CRYPTOGRAPHY, STEGANOGRAPHY AND TOP-K RETRIEVAL CONCEPT	VASUDEVAN BADIADKA AND POOJA S
193	ENHANCING FUZZY C-MEANS BY GRID-DENSITY CLUSTERING FOR DISTRIBUTED WSN DATA STREAM	YASSMEEN ALGHAMDI AND MANAL ABDULLAH
201	PERFORMANCE COMPARISON OF OPTIMAL PID CONTROLLER DESIGN FOR TITO SYSTEM	JAILSINGH BHOOKYA AND RAVI KUMAR JATOTH
205	PERFORMANCE ENHANCEMENT BY TRAFFIC RE-SCHEDULING OF NETWORK NODES	MOU DASGUPTA, GOSTA BISWAS AND SANGRAM RAY
220	ENERGY EFFICIENT CONTENT DISSEMINATION ARCHITECTURE FOR CONTENT CENTRIC NETWORK	PRASANTA KUMAR ROY, SANGRAM RAY AND MOU DASGUPTA
221	UAGNI – AN INTELLIGENT WILDFIRE MONITORING AND ASSESSMENT SYSTEM	NITIN JAIN, S N PANDA AND SANJAY SINGLA
222	STEPS TOWARDS GRID CONNECTED PV SYSTEM TO IMPROVE THE EFFICIENCY, CONTROLLABILITY AND RELIABILITY	AMBIKA PATHY, GAJENDRA SINGH AND PRABHAKAR TIWARI
242	MITIGATION AND PERFORMANCE ANALYSIS OF ROUTING PROTOCOLS UNDER BLACK-HOLE ATTACK IN VANET	KAMLESH CHANDRA PUROHIT, SUSHIL CHANDRA DIMRI AND SANJAY JASOLA



251	PERFORMANCE ANALYSIS AND ROBUST CONTROL OF A BALL AND BEAM SYSTEM	DR. V. I. GEORGE, MANU VARGHESE AND DR. CIJI PEARL KURIAN
255	HIGHLY EFFICIENT AND ROBUST AUDIO IDENTIFICATION AND ANALYTICS SYSTEM TO SECURE ROYALTY PAYMENTS FOR SONG ARTISTS	THARIKA MADURAPPERUMA, GOTHAMI ABAYAWICKRAMA, NESARA DISSANAYAKE, VIRAJ BRIAN WIJESURIYA AND LAKSHMAN JAYARATNE
256	A NEW DESIGN OF A VOLTAGE SOURCE MLI AND ANALYSIS OF ITS APPLICABILITY FOR MEDIUM POWER REQUIREMENTS	VARSHA SINGH, SHUBHRATA GUPTA AND SWAPNAJIT PATTNAIK
264	EXPERIMENTAL COMPUTATIONS TO ASSESS SURFACE WEAR IN ROLLER BEARING USING INTEGRATED APPROACH OF VIBRATION ANALYSIS AND SPECTROSCOPIC TECHNIQUES	NIRANJAN HIREMATH AND D.MALLIKARJUNA REDDY
273	STUDY AND ANALYSIS OF SOLAR WATER PUMPING PROGRAM FOR AGRICULTURE IN INDIA	SURENDRA BAJPAI AND V.K. SETHI
275	THE RESEARCH PAPER ON “INFORMATION AUDIT AND INFORMATION SECURITY MEASURES FOR HIGHER EDUCATION IN INDIA”- A CONCEPTUAL STUDY.	HINDURAO SANKPAL AND ANIL GAIKWAD
276	RAPID PROTOTYPING OF LIGHTING CONTROL SYSTEM USING RECONFIGURABLE DEVICE	SUSAN VARGHESE. G., CIJI PEARL KURIAN AND GEORGE V.I
277	SENTIMENT ANALYSIS OF SOCIAL MEDIA TREND FOR POLITICAL OPINION	SEEULEE UPADHYAYA, SOURAV PANIGRAHI AND AKSHAY MJ
278	MITIGATION OF HARMONICS IN MULTILEVEL INVERTER USING MSPWM & SVM TECHNIQUES	S SIVAKUMAR AND S SOWMIYA
283	AN ANALYSIS FOR REPOWERING PREDICTION OF JAMGODARANI WIND FARM USING MATLAB	MANOJ VERMA, SIRAJ AHMED AND J.L. BHAGORIA
285	INVESTIGATION ON MICRO STRUCTURAL, MECHANICAL AND TRIBOLOGICAL PROPERTIES OF ALUMINIUM NITRIDE (ALN) COATING DEPOSITED BY RF MAGNETRON SPUTTERING	HARIHARAN R AND RAJA R
294	DESIGN OF A MOSFET BASED PORTABLE AND COMPATIBLE DIMMER ADAPTOR FOR LED BULBS	ANUBHUTI SHARMA AND ANSHUL SINGH



295	ROLE OF EXTRA-CURRICULAR ACTIVITIES IN HIGHER EDUCATIONAL INSTITUTES FOR QUALITY IMPROVEMENT	DINKAR PATIL
298	SECURITY AWARE VULNERABILITY AVOIDANCE IN CLOUD COMPUTING USING NATURE INSPIRED APPROACH	SACHIN GUPTA, DR. SANJAY SINGLA AND DR.S.N. PANDA
304	LOCATION-BASED DEPRESSION ANALYSIS AMONG THE VARIOUS CITIES OF INDIA	KASHAF KHAN, SHAILJA AGARWAL, VIJAY SINGH AND BHASKER PANT
314	DESIGN AND EVALUATION OF OFDM BASED OPTICAL COMMUNICATION NETWORK	DEEPAK SHARMA AND SURESH KUMAR
325	CONTENT CENTRIC FRAMEWORK FOR WIRELESS SENSOR NETWORKS	RABINDRA DALEI, AJIT KUMAR NAYAK, PRADYUMNA KUMAR TRIPATHY AND SATYANANDA CHAMPATI RAI
327	A PATH-SET BASED APPROACH FOR TWO-TERMINAL RELIABILITY COMPUTATION OF INTERCONNECTION NETWORKS	PRADYUMNA KUMAR TRIPATHY, RANJAN KUMAR DASH, RABINDRA KUMAR DALEI AND CHITTA RANJAN TRIPATHY
329	QUALITY BASED DRIP DRAG MATCH DATA COLLECTION IN WIRELESS SENSOR NETWORK	V JAYARAJ AND S ALONSHIA
342	A HYBRID MEDICAL IMAGE DENOISING APPROACH USING GABOR, NN AND MDA	SHANT KAUSHIK AND SURENDER JANGRA
343	PERFORMANCE EVALUATION OF PARALLEL APPLICATIONS USING SVM AND PVM THROUGH MATRIX MULTIPLICATIONS	MEHZABEEN KAUR AND SURENDER JANGRA
344	VOLTAGE STABILITY IMPROVEMENT OF MULTI MACHINE POWER SYSTEM USING TCSC WITH REDUCED CONGESTION	KALAIMANI P AND MOHANA SUNDARAM K
345	DEVELOPMENT OF LAND TRANSPORTATION TOWARDS EMPOWERED TOURISM SECTOR FOR BETTERMENT OF SOCIAL WELFARE	ENDY MARLINA
346	EFFICIENT IMPROVED WEAKLY SECURE NETWORK SEGMENTATION USING DKE	KIRTI WALIA, SURYA NARYAN PANDA AND ASHOK KUMAR
347	ANALYSIS OF DIFFERENT SECURITY AND VULNERABILITY IN CELLULAR NETWORKS	ANU AHLAWAT AND SURESH KUMAR



348	FUTURE PERSPECTIVES IN ELASTIC OPTICAL NETWORKS	DEEPAK SHARMA AND SURESH KUMAR
351	MAPREDUCE BASED CLASSIFICATION OF LEGAL DOCUMENTS	NIHARIKA SING, LAXMI AHUJA, SUNIL KUMAR KHATRI
352	HYBRIDIZATION OF GENETIC ALGORITHM & VARIABLE NEIGHBORHOOD SEARCH (VNGA) APPROACH TO CRACK THE FLEXIBLE JOB SHOP SCHEDULING PROBLEM: A FRAMEWORK	RAJAN GARG AND VINEET KUMAR
ASCISE 103	DATA EXTRACTION IN SEMANTIC WEB: LITERATURE REVIEW	RISHABH BHANDARI, VIKAS DEEP
ASCISE 5	AADHAR CARD BASED DOUBLE IDENTITY VERIFICATION SYSTEM FOR RAILWAY	KSHAMA, JASPREET SINGH, NAVEEN GARG, VIKAS DEEP
ASCISE 7	IRIS CONTROLLED WHEEL CHAIR IN REAL TIME	KSHAMA CHAUDHARY, NAVEEN AGARWAL, NAVEEN GARG
ETCEB 104	FACTORS AFFECTING THE INDEPENDENCE OF EXTERNAL AUDITORS: A STUDY OF LOCAL AUDIT FIRMS IN SAUDI ARABIA	DR. NABIL AHMAD SENAN & DR. R. B. SHARMA
ETCEB 108	PAPER TITLE: OBJECT-Oriented AND RELATIONAL APPROACHES IN DATABASE MANAGEMENT SYSTEMS (DBMS): DESIGN, IMPLEMENTATION AND INDUSTRIAL MARKETS	REEM MANSOUR ALRASHDI
ETCEB 110	BLACKBOARD USAGE: AN INVESTIGATIVE STUDY AMONG CCSE FEMALE FACULTY AND STUDENTS AT UNIVERSITY OF HAIL	IKLEEL OSMAN
ETCEB-101	DESIGN AND IMPLEMENTATION OF MULTILINGUAL FILE TRANSLATOR	DR. J. VIJIPRIA, SAMINA AND ZAHIDA
ETCEB105	THE IMPLEMENTING AND IMPACT OF SPEECH RECOGNITION TECHNOLOGY IN CLINICAL DOCUMENTATION	DR. ANJALI CHAUDHARY RUAA HAFIZ
NIESMT 2	LEXICON BASED SENTIMENT ANALYSIS ON FACEBOOK PAGE	MOHAMMAD ARIF
NISMIET.1	A CASE STUDY ON CPE (COMMUNICATION PROTOCOL ERROR) ALARM IN NOKIA DXC	RUPINDER KAUR
RISMT 1	HYBRID CONVERTER WITH SIMULTANEOUS AC AND DC OUTPUT FOR NANO-GRID APPLICATIONS WITH RESIDENTIAL SYSTEM	B. KAVYA SANTHOSHI, DR. K. MOHANA SUNDARAM



RTMEIR 2	REDUCED TAIL EMISSIONS BY OPTIMUM USAGE OF CAR AIR CONDITIONERS	SANCHITA ABROL , KUNAL RANA, ANKIT DHIR
STNGCR 1	RESCUING AND REHOMING PETS FROM INJURIES AND ORPHANING FOR INDIAN SCENARIO- AN ANDROID BASED APPLICATION	SWETHA SRIDHARAN, R.DHAYA, BUMIJA SRIRAMAN, ANJANA PREMKUMAR
STNGCR 10	FISSURE DETECTION IN LUNG CT IMAGES USING BACK PROPAGATION NEURAL NETWORKS	K.DEVAKI, R.AKILA DEVI, P.VIDHUPRIYA
STNGCR 12	RESOURCEFUL AND PROFICIENT EXPLOITATION OF MDYMO IN MOBILE ADHOC NETWORKS	R DHAYA, R.KANTHAVEL, T. NIRMAL RAJHEN, SUDHARSUN M, SOORAJ SUNIL
STNGCR 13	DYNAMIC RESOURCE ALLOCATION IN CLOUD USING QUEUING MODEL	S. VETHA, K. VIMALA DEVI
STNGCR 14	HEURISTIC METHOD FOR CLOUD RESOURCE CONSOLIDATION USING ECRC (ENHANCED CLOUD RESOURCE CONSOLIDATING)	G.SONIYAPRIYATHARSINI, N.MALARVIZHI
STNGCR 15	EANKBB: NEIGHBOR DESIGNATING METHOD FOR BROADCASTING IN MOBILE ADHOC NETWORK	R.KANTHAVEL, J.BANUMATHI, V.MERIN SHOBI
STNGCR 17	EXTENDED MEDIUM DOMINATION NUMBER OF A JAHANGIR GRAPH	G. MAHADEVAN, V. VIJAYALAKSHMI, C.SIVAGNANAM
STNGCR 18	SOME CHARACTERIZATION OF COMPLEMENTARY TRIPLE CONNECTED DOMINATION NUMBER OF 3 – REGULAR GRAPHS	G.MAHADEVAN, A.IRAVITHUL BASIRA, C.SIVAGNANAM
STNGCR 19	FUNCTION BASED PREDICTIONS OF PROTEIN FOLD RECOGNITION USING GO-TERM	E. LOGANATHAN, K.DINAKARAN, S.GNANENDRA, P.VALARMATHI
STNGCR 2	DETECTING MALICIOUS DATA INJECTION IN EVENT DETECTION USING EADA SCHEME	M.USHA, P.PRITTOPAUL, R.VIJAYALAKSHMI, T.SHANMUGA PRIYA
STNGCR 20	COMPARISON OF SUPPORT VECTOR MACHINE (SVM) AND BACK PROPAGATION NETWORK (BPN) METHODS IN PREDICTING THE PROTEIN VIRULENCE FACTORS	THIRUNAVUKKARASU M, DINAKARAN K, SATHISHKUMAR E N, GNANENDRA S
STNGCR 21	ROUTE MAX - A UNIQUE ENERGY EFFICIENT ROUTING ALGORITHM IN WIRELESS SENSOR NETWORK	SRINIVASAN.R, E. KANNAN



STNGCR
22

PROPERTYEDIA- A TWITTER DATA ANALYSIS AND
RECOMMENDATION BASED ANDROID APPLICATION FOR
REAL ESTATE USERS

SWETHA SRIDHARAN, S
SHREERAM

STNGCR 3

DIGITAL SIGNATURE APPROACH FOR TRUST BASED
COMMUNICATION OVER SELFISH NODE ATTACK IN
VANET

P.PRITTOPAUL, M.USHA,,
VIGNESH CS, ESWARAN VA

STNGCR 4

COGNITIVE SPECTRUM FRAMEWORK ON COOPERATIVE
ENVIRONMENT: A STUDY

C AMBHIKA, R DHAYA, R
KANTHAHEL

STNGCR 6

ANTI -TRAIN COLLISION IMPLEMENTATION SYSTEM
WITH VECTOR POINTS

ANJANA DEVI J, ATHITHYA J, A
MOHAMAD IMRAN, RESHMA M
K

STNGCR 8

EFFICIENT IRIS RECOGNITION USING GLCM AND SVM
CLASSIFIER

G.TAMILMANI, M. KAVITHA,
K.RAJATHI

STNGCR 9

AN INTELLECTUAL TRAFFIC ORGANISM FOR VANET

R.DHAYA,
R.AMIRTHAVALLI,N.RAGHAVI,
K.ELAKKIYA , B.KAMALI

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

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Abstract- This research reveals that overall the performance of transportation infrastructure network in terms of tourism development of Sulawesi Island is found to be quite good despite some improvements to make especially in terms of accessibility, punctuality, and comfort. It unveils that facility and infrastructure provision in many areas still needs improvements. Internal and external integration between each mode of transportation are badly low. This is mostly due to lack of transportation facility to exchange the modes, disorganized schedule for transportation service, limited number of vehicles for the vital internal and external mode of transportation service, and limited number of networks of infrastructure and service connecting between areas. It is possible to say that there is deprivation of integrated transportation of internal modes. Hence, this research also recommends the way to develop land transportation in a subtle detail to enhance its role in supporting the development of tourism in Sulawesi Island.

This study aims particularly at taking a hard look at the relation between type of tourism, mode of transportation especially land transportation, and development of tourism in Sulawesi. It is expected that knowing the relationship between each of these components will lead us to a formulation of potentials and role of land transportation to develop tourism. This research was conducted in several analytical stages namely: 1) Spatial scope analysis, 2) prediction of travel demand analysis, 3) Transportation and spatial scope analysis, and 3) Analysis on the potentials and role of land transportation to develop tourism. On the account of this study, it is revealed that there is a greater need for organizing types and quality of transportation network to support tourism, that is by providing nodal transportation, sufficient transportation network, public transportation, and travel service/ travel agent, and program to enhance the quality of transportation management system which should be integrated, reliable, safe, comfortable, informing the system of tourism transportation, and road service for tourism.

Keywords –network, mode, tourism, role, land transportation

I. INTRODUCTION

It is widely recognized that tourism can play a very important role in the economy of a developing country. Besides improvement in the balance of payments, it generates many other socio-economic benefits including the expansion of economic activities and employment opportunities [1]. Tourism in Indonesia is an important component of the Indonesian economy as well as a significant source of its foreign exchange revenues. In 2014, the tourism sector contributes 7.33 billion US \$ or ranks fourth to Indonesia's foreign exchange after oil and gas, coal, and palm oil. By 2023, the potential contribution of tourism to the region's economy is projected to reach US \$ 480 billion with an average growth of 5.8% per year, while investment growth is around 6.8% per year [2]. The contribution of the tourism sector needs to be continuously improved to accelerate Indonesia's economic growth. The development of the tourism sector is a must considering its existing high potential. The vast country of a plethora of sprawling archipelago has much to offer expanding from its natural beauty, its historical heritage to its cultural diversity.

In the masterplan of Indonesia's national tourism development, the government planned 88 National Tourism Strategic Area (KSPN). Meanwhile, in the range of 2015-2017, there are 16 priority areas to develop, three of which are in Sulawesi Island, namely: Toraja (South Sulawesi), Bunaken (North Sulawesi), and Wakatobi (Southeast Sulawesi). Toraja is directed as a cultural tourism area, while Bunaken and Wakatobi are projected to be marine tourism areas [3]. Tourism development in Sulawesi is directed to enhance tourism promotion and develop tourist destinations, marketing and tourism. To maximize the development of tourism sector in Sulawesi, one thing to conduct is to be supported by the development of transportation, especially land transportation. As part of the national transportation system, land transportation should develop its potential and role in the attempt to achieve security, prosperity, traffic order and road transport to support tourism development.

Transportation is a benchmark in inter-regional spatial interactions and has a very important role in supporting the development of a region. The success of development is strongly influenced by the role of transportation as the lifeblood of political, economic, socio-cultural, and defense of security, including the tourism sector. In the National Tourism Development Master Plan [4], in the range of 2010-2025 the development of national tourism is programmed to include tourism destination aspect in the form of National Tourism Destination (DPN), tourism marketing, tourism industry, and tourism institution. Transportation as an infrastructure is one part of the development of tourist destinations, one of which is the development of land transportation. This is in accordance with the study conducted by Culpan [5] on the international scope, which states that tourism is an open system consisting of four essential components of demand, marketing, transportation, and accommodation. It examines each component and its relationship to the system.

II. METHOD

Tourism is a complex sector, which also involves classic industries, such as handicrafts and souvenirs, as well as lodging and transportation [6]. Tourism development has three functions, namely [7]: 1) promoting the economy, 2) maintaining the nation's personality and preserving the function and quality of the environment, and 3) fostering the love of the country and the nation. To run these three functions, it is necessary to develop tourist objects and tourist attraction, to improve and develop promotion and marketing, and to improve tourism education and training. In line with this, Pedit [8] argues that tourism can generate economic growth, as it can provide employment, stimulate various sectors of production, and contribute directly to advances in the efforts to manufacture and repair ports, roads, and encourage the implementation of hygiene and health programs, cultural public center projects, and environmental conservation that can provide benefits and fun to both local communities and tourists from abroad. Tourism development is highly correlated with the following factors [9]: 1) Scarcity factors: the nature of tourist objects / performances which cannot be found elsewhere, including natural scarcity or scarcity of man-made buildings; 2) Naturalism factor, namely: the nature of the tourism object which remain unchanged because of human behavior; 3) The uniqueness factor that is the nature of the object / tour show that has a comparative advantage compared with other objects around it; 4) Community Empowerment Factors (community empowerment), so that people have a sense of belonging to create hospitality for visiting tourists; 5) Land optimization factor (area optimization) by considering conservation, preservation and protection; 6) The equity factor, that is, it should be arranged in such a way as to produce the greatest benefit for the community; and 7) Transportation along road facilities must be available and be qualified so as to accommodate movement of people, goods and services from the area of origin to the tourist destination [10].

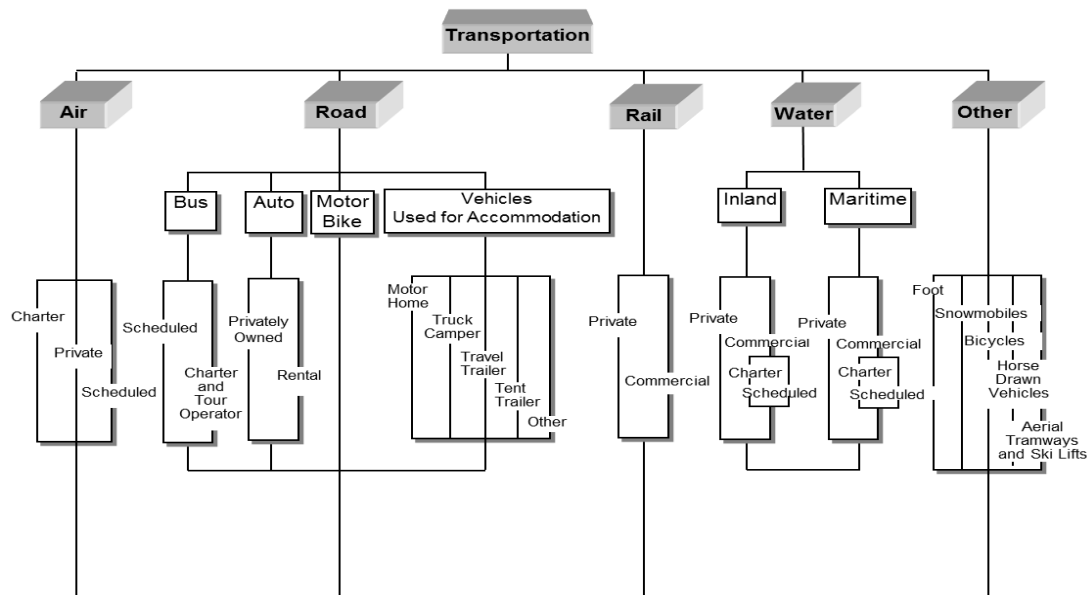


Figure 1. Passenger's mode of transportation [11]

Transportation in its simple meaning is to carry passengers from one point to another. In tourism frame, transportation simply refers to carrying tourists from their place of living to the place where the touristic products

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

are introduced to them [12]. The travel and tourism experience of tourists and the ideas about tourism products start and end up with transportation. It is impossible to consider tourism without transportation. The development of transportation, transportation vehicles, infrastructure and using new technologies in this will sector speed up the development of tourism. In general, the mode of transportation can be categorized as in Figure 1.

Transportation is an integral part of the tourism industry. This is mainly because the increasing role of transportation can expand the development of tourism. Modes of transportation and management is an essential component of the tourism system [13]. The integration between air, sea and land modes of transportation is essential to support tourism activities. It also needs to be supported by the availability of services such as fuel stations, vehicle repairs, hotels, and rest facilities for road trips.

In contrast, the escalating traffic due to the growth of world tourism puts pressure on transport facilities and can have the following negative effects [14]: 1) Congestion - means delays which leads to waste of time and energy. Serious congestion may have a negative effect on transportation modes, especially on airports and roads during peak times, 2) Safety and security - making sure that the transportation mode is safe and secure is a basic and important requirement for tourism; 4) Seasonality - seasonal patterns of travel demand create overcrowding at certain times. Adversely, low occupancy and load factors will occur at other periods.

Automobile transportation comes forward regarding other modes of transportation. The automobile transportation makes it easy to see local culture and nations. It presents great flexibility in contrast to other modes of transportation [15]. Enriching the travel experience of travelers highly depends on the mode of transportation and frequency of use. Factors influencing the effectiveness of the selection of modes of transportation are [16]: time limits, distance, status, convenience, security, benefits, price, geographic position, and competition. This mode of transportation is highly important in tourism. Regarding the high fares of air transportation, this mode of transportation is mostly selected by tourists because it offers lower prices. However, other main factors affecting choice are time and distance. When noticed further, tourists are generally people who have a lot of time, money and are excited to travel [17]. For long distance travel, using the mode of land transportation means consuming a lot of energy and valuable time. However, in return, with the use of land mode of transportation, tourists will be allowed to see many places and have plenty of opportunities to enjoy the trip [18].

In addition, the other mode of transportation that significantly affects tourism is railway transportation. This type of transportation is considered as the oldest one. In the 19th century the railways were frequently used. To date, in many countries, however, the railways are used mainly for transporting loads. This is mainly because tourists prefer air or automobile transportation than train. Nonetheless, there exists such railroads that have been included to touristic packages.

As aforementioned, the tourist's travel starts and ends with transportation. In this sense, in order that countries achieve sustainable development of tourism sector, they must take heed of transportation sector, reduce monopoly in this sector, and provide sound competition opportunities for the companies. To sum up, in order to develop and increase the role of transportation in tourism, the countries should pay attention to the following points: 1) keeping the transportation costs at competitive level, 3) making the passengers be attracted to sea and railway modes of transportation, 4) establishing new embarkation port in order to develop cruise travel, 5) establishing and new fast trains lines, 6) bringing new coaches to the country, 8) putting new technologically advanced aircraft into airlines, 9) training the personnel, and 10) allocating financial support for the development of transportation.

Developing Sulawesi as one of the major islands in Indonesia is very important in supporting the improvement of national development performance. The Sulawesi region has great potential as a growth hub in eastern Indonesia and ASEAN sub regions. To implement economic transformation in Indonesia there is a greater need to involve the role of Sulawesi region as compared to previous years. This economic transformation was developed through the concept of acceleration and expansion of Indonesia's economic development and poured into Indonesia's economic corridor, including the Sulawesi Corridor whose development spans the tourism sector.

In support of the tourism sector, on the island of Sulawesi there are two entrances between the nine national entrances of Sam Ratulangi and Makassar. Data from the Director General of Immigration and Central Bureau of Statistics re-processed by the Ministry of Tourism and Creative Economy based on the number of foreign tourists in 2014 reveal that as many as 19.3% of foreign tourists come into Indonesia through the entrance of Sam Ratulangi airport and that as much as 17.5% entered the country through the entrance of Makassar [19]. This is because countless tourism potentials are located on the island of Sulawesi. Referring to the categorization of Spillane [20], attractions on the island of Sulawesi can be grouped as follows: 1) Tourism for trip enjoyment (Pleasure Tourism), 2) Tourism for recreation (Recreation Tourism), 3) Tourism for culture (Cultural Tourism) 4) Tourism for sports (Sports Tourism), 5) Tourism for business affairs (Business Tourism), and 6) Tourism for Convention (Convention Tourism), which can be seen in Figure 2. The distribution of tourism object categorization in every province in Sulawesi Island can be seen in Figure 3.

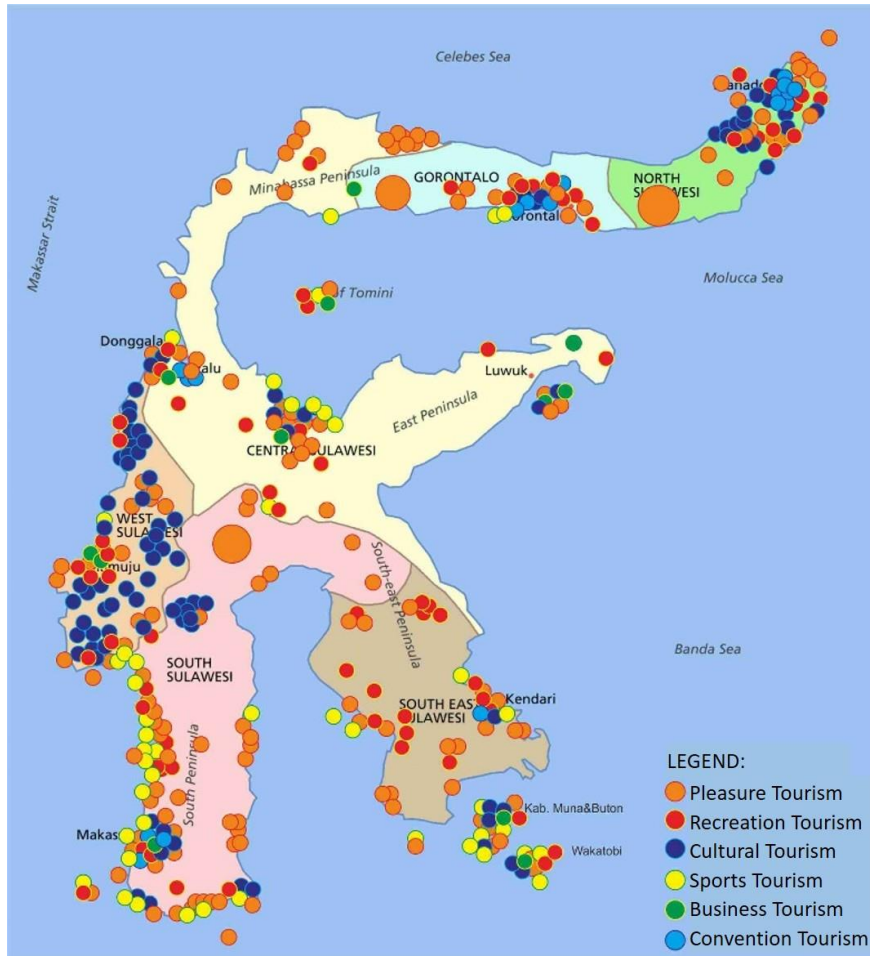
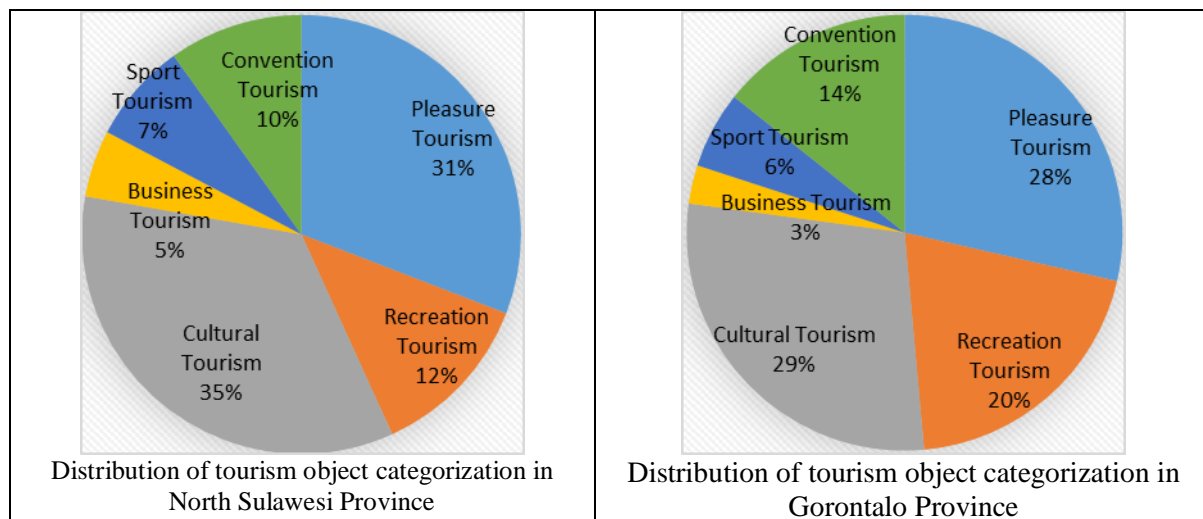


Figure 2. Distribution of Tourism Potential on Sulawesi Island [21]

Tourism activity highly depends on transportation and communication. Distance and time factors also greatly affect the desire of people to travel. The advancement of transportation facilities leads to the advancement of tourism and on the contrary the expansion occurring within the tourism industry can create demand for transportation that can meet the needs of tourists [22].



Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

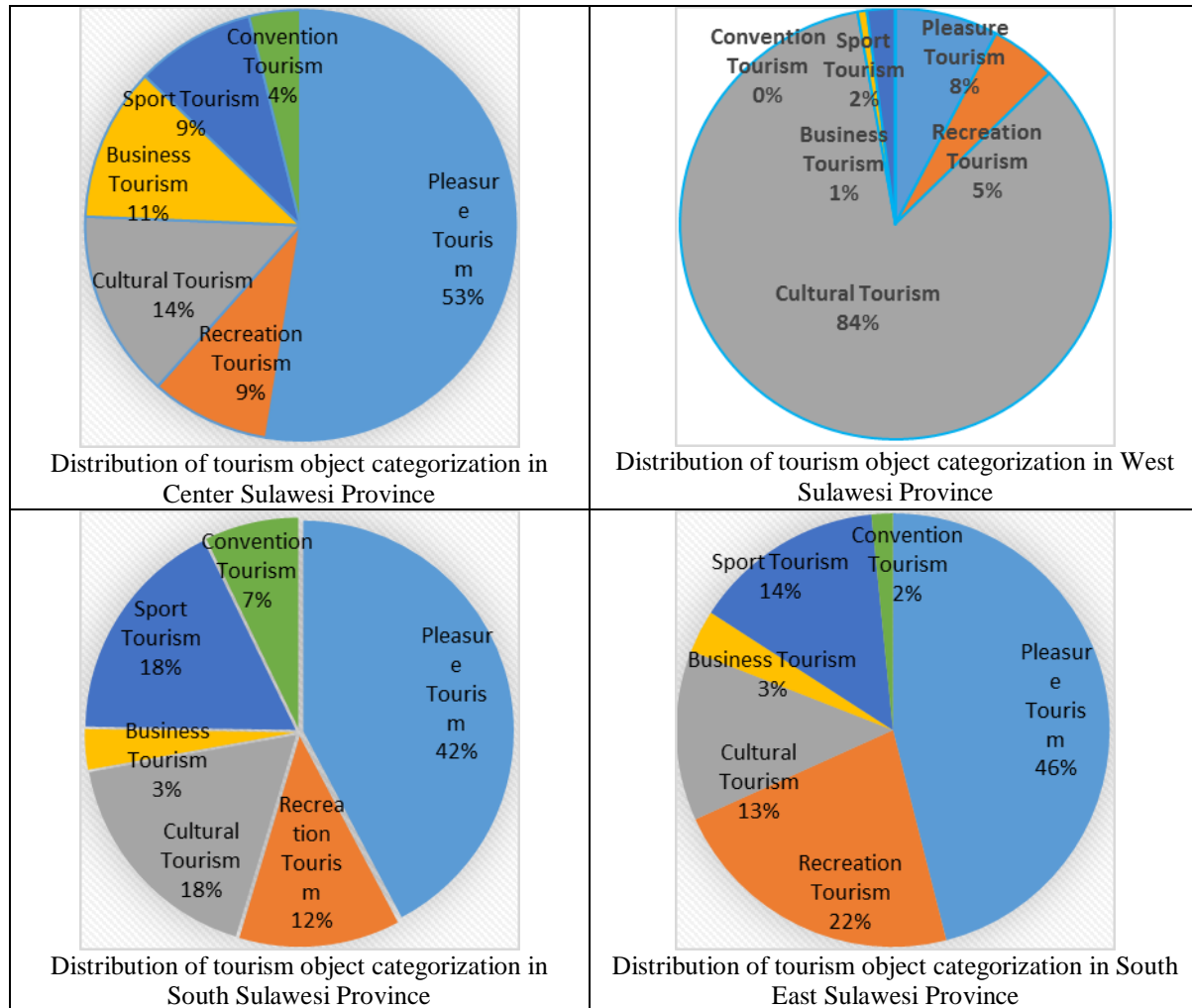


Figure 3. Distribution of tourism object categorization in every province in Sulawesi Island [23]

This study examines the links between types of tourism, transportation modes, especially land transportation, and tourism development in Sulawesi Island. The relationship between the various components which is formulated in the form of potential and the role of land transportation in the development of tourism is conducted through several stages of analysis, namely:

1. Spatial analysis, covering the following activities:
 - a. Identifying centers of tourism activities
 - b. Identification of important transport nodes
 - c. Identifying the location of origin/destination of tourism
2. The prediction analysis of travel demand includes the following activities:
 - a. Driving and pulling factor of tourism
3. Analysis of transportation and layout includes the following activities:
 - a. Analysis of network and related strategic Spatial nodes
 - b. Analysis of potential development of transportation related to spatial planning
 - c. Role sharing and cooperation between modes of transportation
4. Analysis of the potential and role of land transportation in tourism development covers the following activities:
 - a. Analysis of tourism potential of spatial-based region
 - b. Analysis of development of land transportation for tourism development and demand movement

III. DISCUSSION AND RESULT

3.1. Discussion

Sulawesi Island is in the north-eastern part of Indonesia, with Borneo Island in its west side, Halmahera Island in the east, and the Philippines in the north. Sulawesi Island is a unified land territory which has the longest coastline in comparison with other islands in Indonesia. It also has many small islands in it and in its surrounding.

Sulawesi consists of six provinces and has settlement centers designated as National Activity Centers namely Manado - Bitung, Gorontalo, Palu, Metropolitan Maminasata (Makassar - Maros - Sangguminasa - Takalar) and Kendari [24]. The existence of these activity centers affects the numbers of transportation. The arrangement of the transportation system on Sulawesi Island is based on the Regulation of Minister of Transportation No. KM 49 of 2005 on the National Transportation System mandating the implementation of effective and efficient transportation.

The movement pattern of passengers and goods in Sulawesi uses the modes of roads, air plane, river/lake transportation and ferry transports, as well as ocean transport. In the mode of road transportation, the development of Sulawesi Island is directed at optimizing urban areas of Maminasata and Manado-Bitung as Primary Service Center and encouraging the development of the city of Gorontalo, Palu and Kendari as Secondary Service Center. Meanwhile, the freeway network is divided into the east, west, and central freeway, as shown in Figure 4. The length of eastern freeway network is 1207,8 km, the west 2179,32 km and the central is 2187,14 km [25].



Figure 4. Road network system in Sulawesi [26]

The role and development of transportation modes per provinces in Sulawesi indicates that role and development which are good and rapid are in air and road transportation modes, especially in the provinces of South and North Sulawesi, while the mode of river/lake transportation still does not develop well. The integration of transportation is a goal that is expected in transportation sector it becomes and an objective in the National Transportation System in realizing the implementation of effective and efficient transportation, in the sense that the public burden is low and the utility is high in one unity of transportation network [27].

There are several things determined in the integration of transportation as a part of the performance of transportation operation systems, such as [28]: 1) The morphology of territory in transportation service, 2) The availability of transportation facilities suitable with the types of modes being utilized, 3) The availability of adequate transportation

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

modes, and 4) The movement pattern of passengers and goods. The integration of inter-river transportation on Sulawesi Island has not been well carried out and it is still limited to a few locations which have river transportation. The means of transportation which are generally used are traditional boats with a very limited load capacity, found in low transportation facility intensity, with a relatively low coverage. The available supporting facility is generally in the form of docks that are built by the local community.

The integration of transportation infrastructure and service network on Sulawesi Island has generally been achieved, for example at the hub of bus stations, ports, and airports. Road transportation services through the route of Inter-City in Province (AKDP) and Inter-City Inter-Province (AKAP) in each province has been well operating with the hub on bus station type A and B. Similarly, river, lake, and sea ports and ferry transports can be well integrated with road network and road transportation modes. Meanwhile, airports are supported by road transportation modes with fixed routes and not fixed ones (taxi). Nevertheless, the score of the network integrity of infrastructure and services on Sulawesi Island is general not good, so it still requires improvement to support the development of other sectors. In case of the service network of goods, inter-mode integration with the highest score is the transportation modes of roads and ferry transports. This is because the goods transported are integrated with cars/trucks transporting the goods and it is supported by the availability of road facilities connecting ferry ports, as its function is to connect the end of the national / provincial road of a freeway. The integrity scores of ferry transports and road are already good. This condition is possible since several ports provide the service of loading and unloading with container system. Associated with its role as a supporting facility of the development of tourism, transportation conditions particularly land transportation in Sulawesi can be explained as follows.

3.1.1 Relation Between Land Transportation and Tourism in Provinces in Sulawesi

A. North Sulawesi Province

The tourism in North Sulawesi Province is dominated by Pleasure Tourism, with a site distribution which tends to be in the north-east part of the province. Many of the tourist sites in North Sulawesi Province are in South Minahasa Regency, Minahasa, Tomohon City, Manado City, North Minahasa Regency, and some parts of Bitung City. The Cultural Tourism is mostly found in Tomohon and Manado City. The Sport Tourism and Recreation Tourism are dominantly found at the beach / sea.

Seen from its accessibility, almost all tourist sites in North Sulawesi Province are already reachable by road transportation (arterial, collector and local) especially on the big island of Sulawesi, and they are quite close to airports and seaports. The locations of Samratulangi Airport and Bitung Port can be used as a tourism entrance from the outside of the region / overseas and the trip can continue to tourist sites by using land transportation.

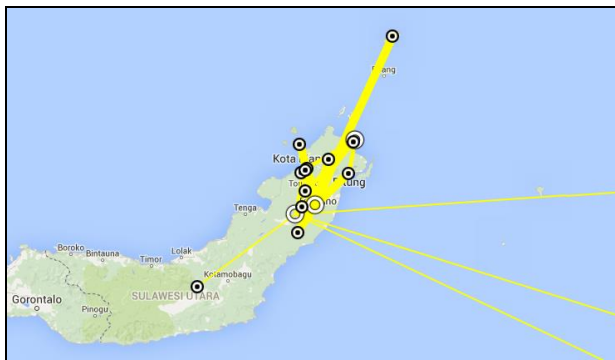


Figure 5. Desireline to 3 leading tourist destinations in North Sulawesi Province

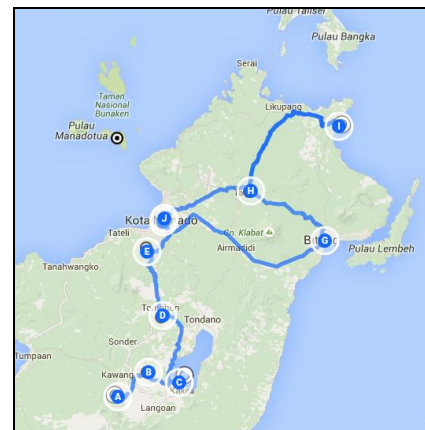


Figure 6. Routes linking tourist destinations with the origin of each tourist in North Sulawesi Province

The identification result of the sample of tourists in three main tourist destinations (Bukit Kasih Kanonang, Tondano Lake, and Marinsow Beach) in North Sulawesi Province reveals the origins of the tourists. The originals of the tourists and the proportion of the number of tourists from each tourist destination are drawn up in the form of desire lines as shown in Figure 5.

The results of route analysis show that the distance connecting the origin and tourist destinations in North Sulawesi Province is approximately 221 km, as shown in Figure 6. Seeing the survey results of origins and route analysis,

there are some potential that could be carried out by the Directorate General of Land Transportation to support the development of tourism in the province of North Sulawesi, namely:

1. It is necessary to make the system of traffic signs to reach each tourist site, according to the results of the interviews with visiting tourists. If there is one signpost in the distance of 10 km, it means there will be 22 signposts to tourist destinations.
2. It is necessary to make public transportation routes that pass by those tourist areas, especially from the downtown of Manado.
3. It is necessary to build public transportation hubs in the main tourist destinations.
4. It is necessary to make information of public transportation routes which pass by the main tourist destinations.

B. Gorontalo Province

The tourism in Gorontalo Province is dominated by Pleasure Tourism, Cultural Tourism, and some Recreation Tourism, with a site distribution which tends to be to the center of the province and around the coastal line of Gorontalo. The access of land transportation to tourism objects in Gorontalo Province is relatively smooth because several tourist attractions in this province is in the route of Trans Sulawesi bus connecting the provinces in Sulawesi. In general, the inter-city and regency transportation is by bus. Almost all the locations in Gorontalo Province can be reached by land transportation (arterial, collector and local), they are close enough to airports and seaports. Djalaludin Airport and Gorontalo Port can be used as a tourism entrance from the outside of the region / overseas and the trip can continue to tourist sites by using land transportation.

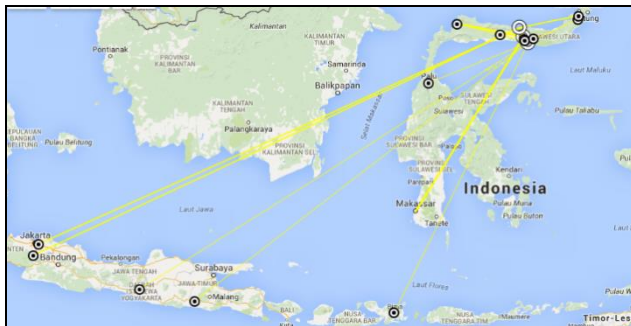


Figure 7. Desireline to three leading sites in Gorontalo Province

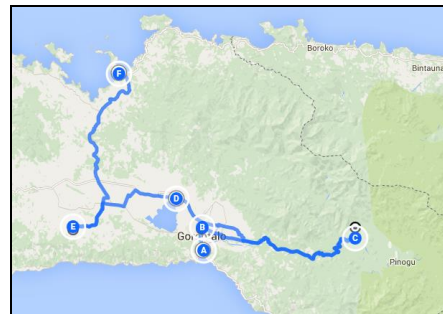


Figure 8. Routes linking tourist destinations with the origins of each tourists in Gorontalo Province

Three leading tourist destinations in Gorontalo which became the object of this study are Olele Beach, Pentadio Resort and Saronde Island. The survey result of the origins and destinations of the respondents in each of the tourist sites results in a desire lines map as shown by Figure 7. The map shows that there are some tourists coming from the outside of Gorontalo Province and Sulawesi Island. From the route analysis by if the shortest route was used to travel from the origin to the tourist sites, it was obtained that the length of the route often used to reach the tourist sites in Gorontalo Province is approximately 185 km as shown in Figure 8. It is also necessary to consider the tourists coming from the outside of Gorontalo Province.

From the survey results of origin and route analysis, there are some potential that could be carried out by the land transportation agency to support the development of tourism, namely:

1. It is necessary to make the system of traffic signs to reach each tourist site. If there is one signpost in the distance of 10 km, it means there will be 18 signposts to tourist destinations.
2. It is necessary to make public transportation routes that pass by those tourist areas, especially from the downtown of Gorontalo.
3. It is necessary to build public transportation hubs in each tourist destination to support the performance of public transportation.
4. It is necessary to make information of public transportation routes which pass by the main tourist destinations.

C. Central Sulawesi Province

The tourism in Central Sulawesi Province is dominated by Nature / Pleasure Tourism, with a site distribution which tends to be in the coastal areas. Central Sulawesi Province can be reached by domestic flights that fly directly from Jakarta, Bali, Surabaya, Makasar and Balikpapan. Central Sulawesi can also be reached by bus from Toraja, South Sulawesi for 14 hours and 18 hours by using buses from Bunaken, North Sulawesi. The access of land transportation

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

to the tourist attractions in this province is relatively smooth, since some tourist attractions in this province is in the route which Trans Sulawesi buses connecting the provinces in Sulawesi. Almost all the tourist destinations in Central Sulawesi Province can be reached by land transportation (arterial, collector and local), they are close enough to airports and seaports. Airport and seaport can be used as a tourism entrance from the outside of the region / overseas and the trip can continue to tourist sites by using land transportation.



Figure 9. Desire line of 3 main tourist destinations in Central Sulawesi Province

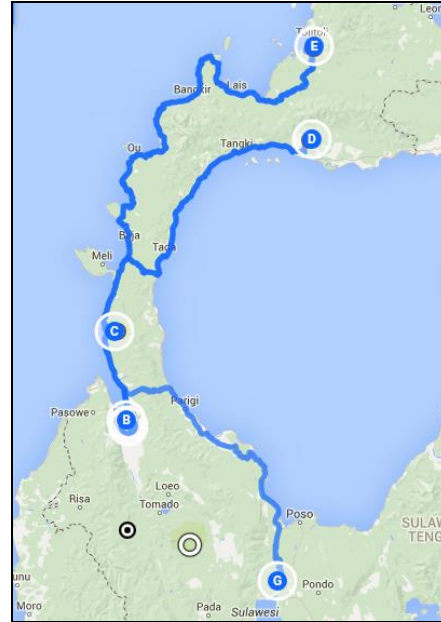


Figure 10. Routes linking tourist destinations with the origin of each tourist in Central Sulawesi Province

The main tourist destinations in the province of Central Sulawesi tend to be around the city of Palu, namely Tanjung Karang, Talise Beach, and Lore Lindu National Park, a tourism potential in the eastern part of this province. Some tourists were identified to be come from a far enough origin such as Tolitoli, and some tourists were from the outside of the province such as West Sulawesi and Gorontalo Province. The origin-destination of tourists from the interview results can be seen in a desire lines map as shown in Figure 9. The map depicts some tourists whose origin is far since the distance is more than 300 km from the tourist sites. The results of route analysis of each origin to tourist destinations show several routes that can be used as shown in Figure 10. It is estimated that the route length is more than 1,500 km.

From the survey results of origin and route analysis, there are some potential that could be carried out by the land transportation agency to support the development of tourism, namely:

1. It is necessary to make the system of traffic signs to reach each tourist site. If there is one signpost in the distance of 10 km, it means there will be 150 signposts to tourist destinations.
2. It is necessary to make public transportation routes that pass by those tourist areas, especially from the downtown of Palu.
3. It is necessary to build public transportation hubs in three main tourist destinations.
4. It is necessary to build public transportation hubs (bus station) in tourist destinations

It is necessary to make information systems for public transportation routes that pass by tourist destinations.

D. West Sulawesi

Tourism in West Sulawesi is dominated by Cultural Tourism, Sports Tourism and Recreation Tourism, with a distribution of these in the coastal line of this province and several cities, such as Mamuju, Polewali Mamasa, and Majene. West Sulawesi can be reached through several alternative roads or ways, including:

1. Air lines, the entrance is through Tampa Padang Airport which is in Kalukku District; the flight volume is currently done every day and it serves the round-trip route of Makassar-Mamuju.
2. Sea lines can be reached through Simboro Port located in Mamuju Regency which is strategic because it is adjacent Makassar Strait which is a shipping traffic to the island of Borneo, Java, and Bali. This ferry port which is in Simboro District serves both passenger and goods transportation for Mamuju-Balikpapan route

handled by two (2) transportation companies. There is also Port of Belang-Belang Ocean located in Belang-Belang Village, Kalukku District which is about 40 km from Mamuju City.

3. The development of land transportation for passengers, goods, as well as agricultural and plantation crops from various regions in South Sulawesi has grown quite rapidly. This is because the road condition in West Sulawesi Province, which becomes a part of Trans Sulawesi bus route, improves. The support of 1631.62 km long road network consists of: state road with the length of 372 km, provincial road 150.6 km, and regency road connecting cities in one province or different provinces 1109.09 km. Land transportation facilities such as passenger and goods cars adequately support the smooth flow of passengers and goods. Such means connect the cities in West Sulawesi, South Sulawesi and Central Sulawesi Province. Supporting infrastructure in the form of main bus station has also been available. Local bus stations are also available in several districts in Mamuju Regency.

Airports and ports can be used as a tourism entrance from the outside of the region/overseas, roads and ferry transports.

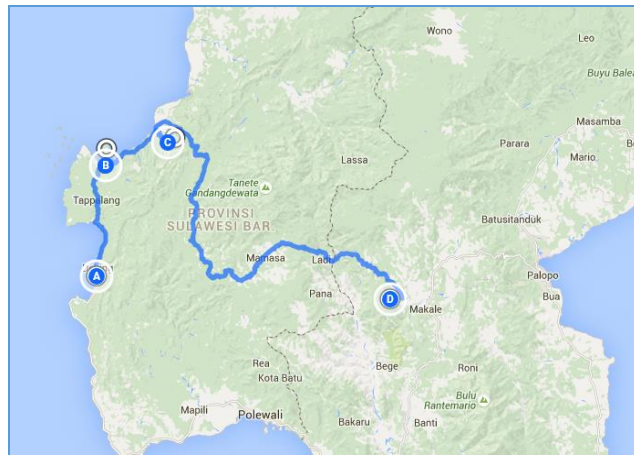


Figure 11. Routes linking tourist destinations with tourists' origins in West Sulawesi Province

The result of the survey interview concerning the origin and destination in 3 main tourist locations in West Sulawesi (Bukit Jati Gentungan, Lombang-Lombang Beach and Karampuang Island) shows the most of the tourists is from Mamuju. Further, the analysis of the route to the locations, whose result is shown in Figure 11, shows that the total length of the route to tourist sites is approximately 295 km.

From the survey results of origin and route analysis, there are some potential that could be carried out by the land transportation agency to support the development of tourism, namely:

1. It is necessary to make the system of traffic signs to reach each tourist site. If there is one signpost in the distance of 10 km, it means there will be 30 signposts to tourist destinations.
2. It is necessary to make public transportation routes that pass by those tourist areas, especially from the downtown of Mamuju.
3. It is necessary to build public transportation hubs in three main tourist destinations.

E. South Sulawesi Province

The types and categories of the tourism in South Sulawesi are very varied, but, it is dominated by Pleasure Tourism, Cultural Tourism, and Sports Tourism. The tourism distribution in this province is quite good, especially those on the coast, small islands and several cities. Most of the tourist attractions in South Sulawesi have been accessible by road transportation with the entrance through Hasanudin Main Airport and some sea ports and ferry ports, except for marine tourism in small islands which needs to be reached by using local sea transportation.

South Sulawesi Province is one of the provinces on Sulawesi Island which has a lot of tourism potential, both natural and artificial. Of the many tourist sites, three tourist sites are set as the main tourism destinations of this study: Bira Beach, Bantimurung National Park and Fort Rotterdam. The average visitors to those three sites are local tourists. The result of the origin-destination survey is shown as desireline map in Figure 12. The route analysis can be seen in Figure 13.

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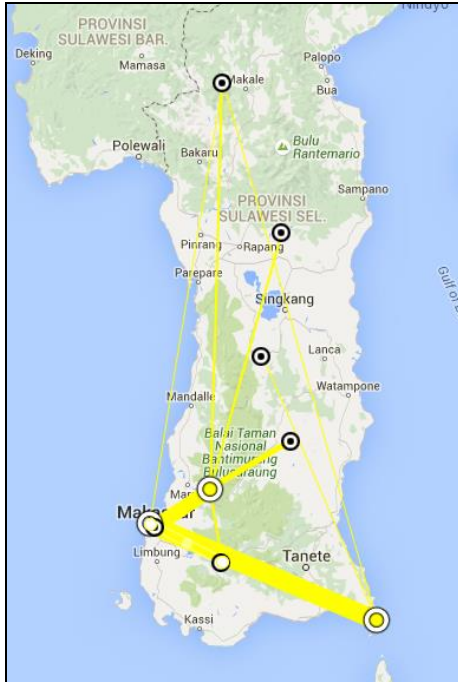


Figure 12. Desire line to 3 main tourist destinations in South Sulawesi Province

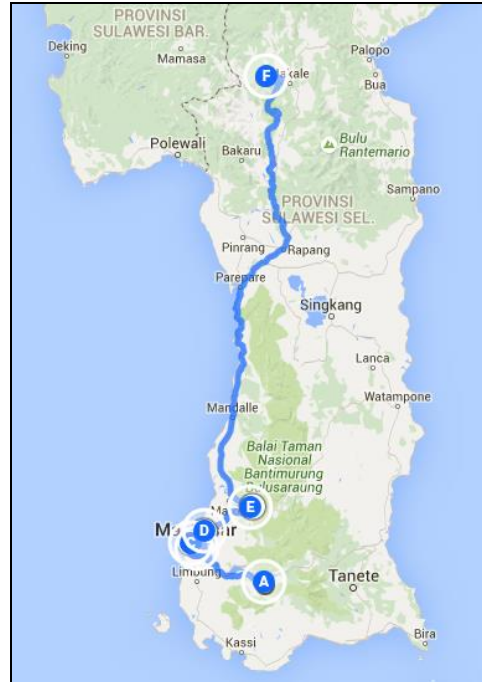


Figure 13. Routes linking tourist destinations with tourists' origins in South Sulawesi Province

From the survey results of origin and route analysis, there are some potential that could be carried out by the land transportation agency to support the development of tourism, namely:

1. It is necessary to make the system of traffic signs to reach each tourist site. If there is one signpost in the distance of 10 km and the route length to tourist destination is 285 km, it means there will be 29 signposts to tourist destinations.
2. It is necessary to make public transportation routes that pass by those tourist areas, especially from the downtown of Makassar.
3. It is necessary to build public transportation hubs in the three main tourist destinations.

F. Southeast Sulawesi Province

The types and categories of tourism in Southeast Sulawesi Province is dominated by Pleasure Tourism, Sports Tourism and Recreation Tourism, with the tourism distribution which tends to the southeastern part of the province, namely in Kendari City, Konawe Regency, and on small islands like Bau-Bau and Wakatobi. Most of the tourism objects in Southeast Sulawesi Province are in small islands, making the access by road is difficult. To reach the destinations requires access by sea and air transportation. The tourism entrance can be through Kendari Main Airport and some sea ports and ferry ports.

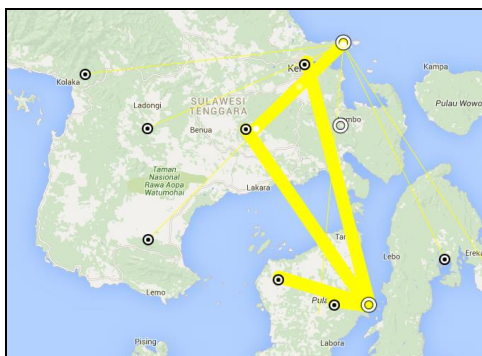


Figure 14. Desireline to 3 main tourist destinations in Southeast Sulawesi Province

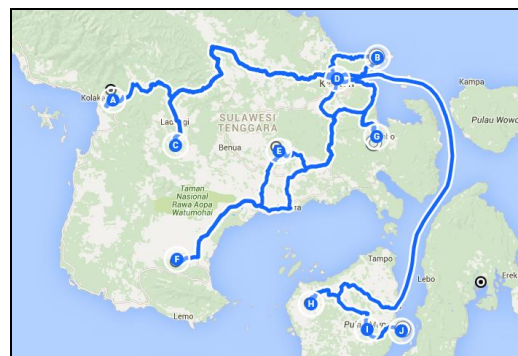


Figure 15. Routes commonly used by tourists to reach 3 main tourist destinations in Southeast Sulawesi Province

The results of the interviews with attraction visitors as the respondents in Southeast Sulawesi Province show the proportion of the number of visitors to the three main tourist destinations in Southeast Sulawesi Province (Napabale Beach, Toronipa Beach, and Moramo Waterfall) as well as the origins of the visitors, which are then drawn into a desireline map as shown in Figure 14. Further, from the data of origin-destination, the analysis result of route to reach the tourist destinations from the visitors' origins is shown in Figure 15.

The land route which tourists most frequently pass by to reach some tourist destinations in Southeast Sulawesi has the length of approximately 1,093 km, including the ferry ports to small islands. From the survey results of origin and route analysis, there are some potential that could be carried out by the land transportation agency to support the development of tourism, namely:

1. It is necessary to make the system of traffic signs to reach each tourist site. If there is one signpost in the distance of 10 km, it means there will be 100 signposts to tourist destinations.
2. It is necessary to make public transportation routes that pass by those tourist areas, especially from the downtown of Kendari.
3. It is necessary to build public transportation hubs in the three main tourist destinations.

3.1.2 Type-Variety and Quality of Transportation Network to Support Tourism

Transportation hubs such as airports, seaports, and the bus stations are the first entrance for both international and local tourists to reach an area that has tourism destinations. The completeness of this transportation hub is one accessibility indicator of an area [29]. The more complete the transportation hub that a region has, the easier a region or a tourism destination to be achieved.

The role of a transportation hub on tourist arrivals can be seen by looking at the correlation between the presence of a transportation hub with the arrival of tourists, shown by the number of visitors staying at hotels in each province. Figure 16 shows the number of each transportation hub in each province and the number of visitors of Indonesia in the hotels in Sulawesi. In 2013, the highest level of hotel visits was in South Sulawesi Province (2,919 persons / day), followed by Southeast Sulawesi Province (1,210 persons / day) and Central Sulawesi Province (1,148 persons / day), and the lowest one was in Gorontalo Province (289 persons / day) [30]. The graph in Figure 17 does not show any significant correlation between the number of transportation hub with the number of visitor arrivals Indonesia to hotels in Sulawesi. The tendency of visitor arrivals to Sulawesi seems to be influenced by factors of the location proximity, for example South Sulawesi and Southeast Sulawesi Province whose locations are closer to some places, particularly to Java.

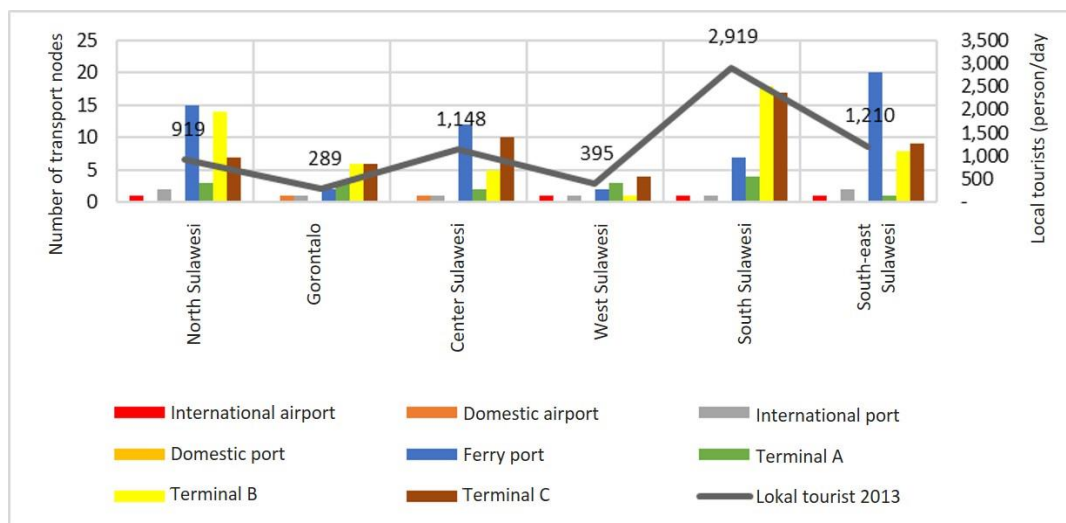


Figure 16. Correlation between the number of transportation hub with the number of Indonesian guest visits to hotel in Sulawesi [31]

Unlike Indonesian guests, international guests tend to come to South Sulawesi Province (54,764 persons / year) and North Sulawesi Province (22,757 persons / year), as shown in Figure 17 [32]. This is possibly because the international airports in those two provinces are already good enough and both provinces have tourism potential which is internationally well-known, e.g. Bunaken in North Sulawesi, Bantimurung and Toraja in South Sulawesi). The function of transportation hub as an entrance to an area is certainly not only in terms of the number but must also be seen from the spatial location and distribution of the destinations to be visited.

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

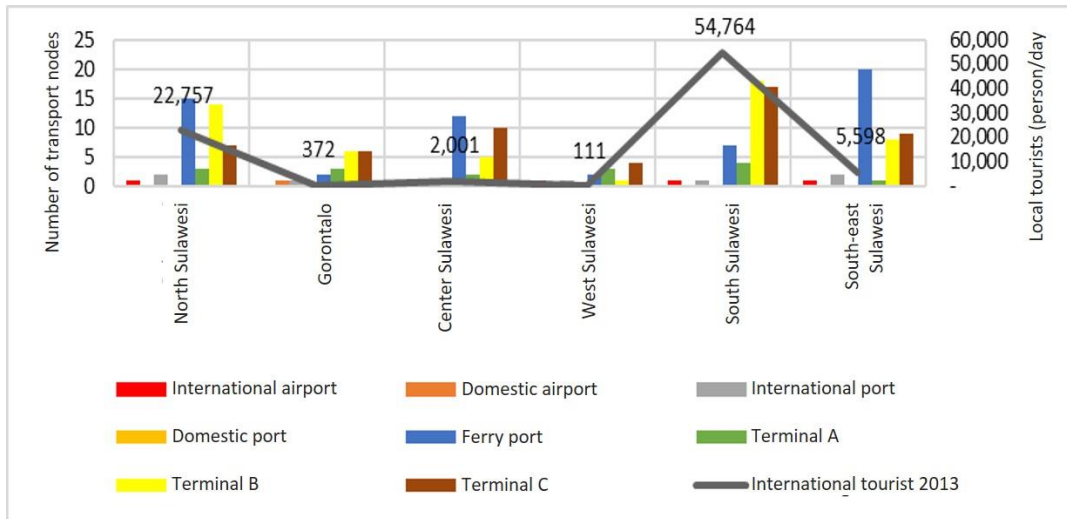


Figure 17. Correlation between the number of transportation hub with the number of visits of international guests to hotels in Sulawesi [33]

The correlation can be explained as follows.

A. Transportation hub in North Sulawesi

Figure 18 shows the position of transportation hubs (especially Samratulangi International Airport and the Port of Bitung) towards tourist destinations based on their types in North Sulawesi Province. The locations of the tourist destinations in North Sulawesi Province are mostly spread around the city of Manado, Tomohon, and Tondano, and dominated by pleasure and cultural tourism.

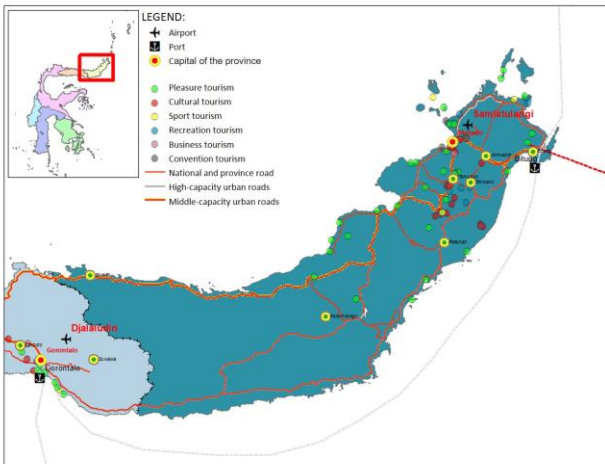


Figure 18. Tourist destinations based on type and position of transportation hub in North Sulawesi [34]

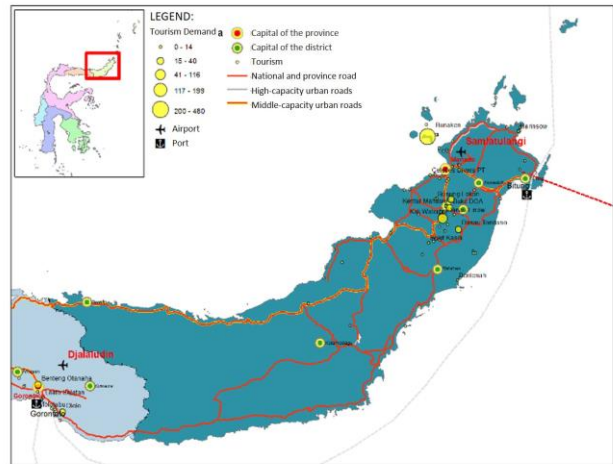


Figure 19. Tourism demand and transportation hub position in North Sulawesi [35]

Tourist locations with high demand (Figure 19) tend to gather around the city of Manado which is close to the airport (an entrance to North Sulawesi). The potential of demand is obtained from the tendency of trend in search sites, with the assumption that the more often a location is searched, the bigger the opportunity to be visited.

In North Sulawesi Province, the highest demand of tourist visits is in Bunaken and several tourist sites around the city of Manado. There is a possibility that the size of this demand is the influence of the position of the existing transportation hub, especially international airports and seaports. Spatially, the tourist sites near the hub has a high demand.

The transportation hubs available in North Sulawesi Province are: 1) Airport: Samratulangi International Airport as an entrance access to North Sulawesi, 2) Sea Port, which are Bitung and Ulu Siau-Sitar international ports, 3) Ferry Ports: there are 15 ferry ports, 4) Bus station; there are passenger terminals: 3 terminals A, 14 terminals B and 7 terminals C, 5) Train station: there has not been any train station (KA) in the region.

B. Transportation hub in Gorontalo

In the province of Gorontalo, the locations of many tourist destinations are spread around the city of Gorontalo, Lomboto, Tlamuta, and Marise. There are also several tourist sites which are located along the coast line of the south part of Gorontalo Province as shown in Figure 20. The tourism in this region is dominated by pleasure and cultural tourism.

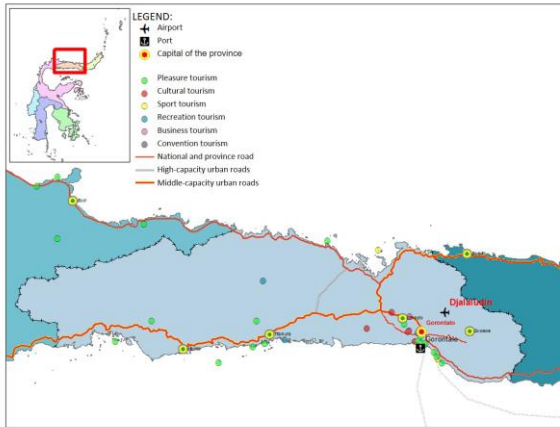


Figure 20. Tourist locations based on types and positions of transportation hub in Gorontalo [36]

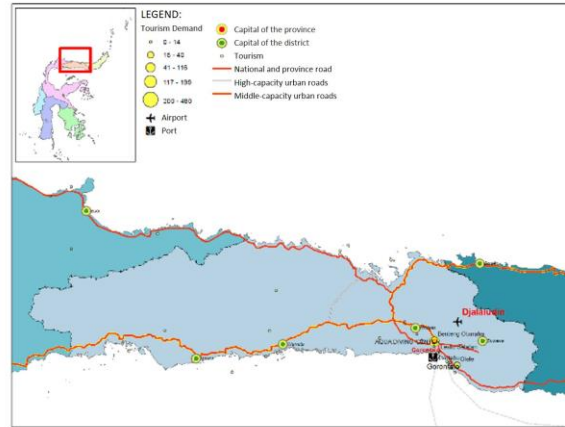


Figure 21. Tourism demand and positions of transportation hub in Gorontalo [37]

From the inventory results of the search of tourism trend in Gorontalo Province in tourist sites, this region seems to receive lack of interest from tourists; the demand is only around Gorontalo City (Figure 21). There is no tourist destination with lots of visitors. This might probably be due to the lack of transportation hub as a supporting facility. The transportation hubs in Gorontalo Province are: 1) Airport: it is planned to conduct development of the domestic airport to become an international airport as an entrance to Gorontalo, namely Jalaludin Airport, 2) Seaport: there is one international seaport, namely Gorontalo, 3) Ferry Ports: there are two ferry ports, namely Gorontalo and Marisa), 4) Bus Stations: passenger terminals are available, namely 3 terminals A, 6 terminals B and 6 terminals C, 5) Train station: there has not been any train station yet.

C. Transportation hubs in Central Sulawesi

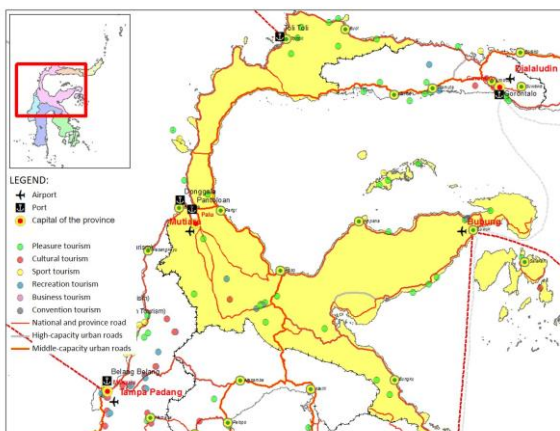


Figure 22. Tourist locations based on types and positions of transportation hub in Central Sulawesi [38]

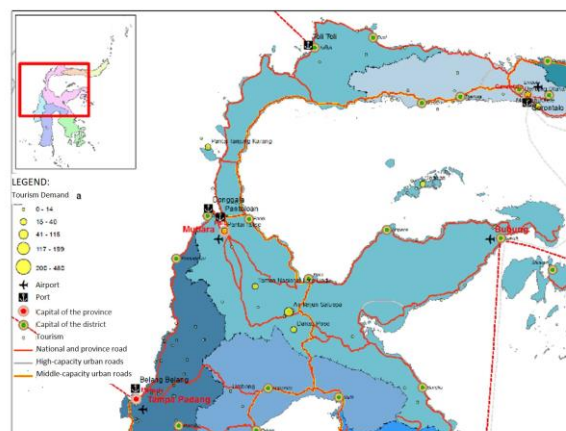


Figure 23. Tourism demand and positions of transportation hub in Central Sulawesi [39]

The tourist sites in Central Sulawesi Province which are successfully recorded are mostly located in the central part of the province, such as Lore Rindu National Park, Poso Lake and Saluopa Waterfall (Figure 22).

Figure 23 shows that the tourist destinations, whose areas are large, such as Lore Rindu National Park, Poso Lake and Saluopa Waterfall, are far enough from the entrances such as airports and seaports.

The demand of natural tourism destination in this province is high even though the transportation hub is still lacking. The transportation hubs in this province are: 1) Airport: there is no international airport; Mutiara Sis Aljufrie

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

domestic airport is now being prepared to become an international airport, 2) Seaport: there is one international seaport namely Pantoloan Palu Port, 3) Ferry Ports: there are already 12 ferry ports, 4) Bus stations: passenger terminals are available, namely 2 terminals A, 5 terminals B, 10 terminals C, 5) Train station: there is no train station.

D. Transportation hubs in West Sulawesi

This province is the smallest province in Sulawesi. Some transportation hubs which are already available and are adequate are: 1) Airport: international airport is available, namely Tampo Padang Airport, 2) Seaport: there is one international seaport namely Belang-Belang Mamuju Seaport, 3) Ferry Ports: there are 2 ferry ports namely Mamuju and Dermaga Sungai Sampaga, 4) Train station: there is no train station, 5) Bus stations: the existing passenger terminals are 3 terminals A, 1 terminal B, 4 terminals C.

There have not been many attractions in West Sulawesi which could attract both local and international tourists. The highest tourism demand is on the tourism object whose location is the closest to the entrance into Sulawesi (Tampo Padang Airport), namely Tana Toraja (located in South Sulawesi Province), as shown in figure 24, so the access in the form of a transportation hub in West Sulawesi Province can also support other provinces especially South Sulawesi.

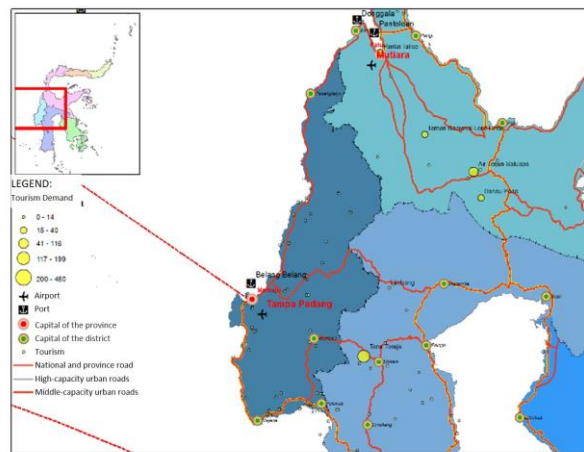


Figure 24. Tourism demand and transportation hub position in West Sulawesi [40]

E. Transportation hub in South Sulawesi

This province is the most developed province in Sulawesi. Some transportation hubs which are available and adequate are: 1) Airport: there is one international airport, namely Sultan Hassanudin International Airport, 2) Seaport: there is one international seaport, namely Makassar Port, 3) Ferry Ports: there are seven ferry ports, 4) train station: there is no train station, 5) Bus stations: the existing passenger terminals are 4 terminals A, 18 terminals B, 17 terminals C.

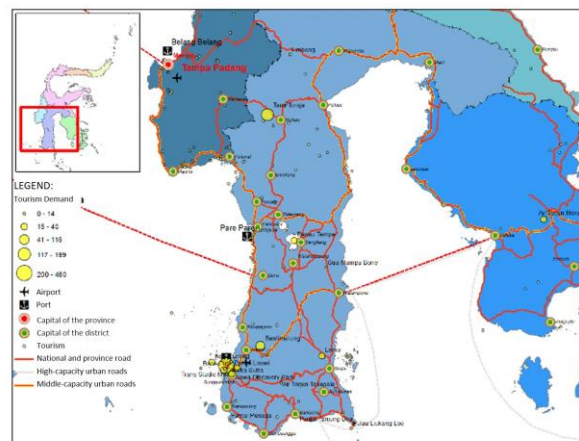


Figure 25. Tourism demand and transportation hub position in South Sulawesi [41]

The tourism in this province is also growing with a high demand in almost all types of tourism although the demand is concentrated in tourism objects which are close to the transportation hubs such as Bantimuring and Losari Beach. There is one tourism object which is far from the airport in this province, but it is close to the airport of other province, namely Tana Toraja, as shown in Figure 25.

F. Transportation hub in Southeast Sulawesi

This province is a province that is developing well in Sulawesi. Some transportation hub infrastructures which are very adequate are: 1) Airport: there is an international airport, namely Haluoleo Airport, 2) Seaport: there are two international seaports, namely Kendari and Bau-Bau Seaport, 3) Ferry Ports: there are 20 ferry ports, 4) Train station: there is no train station, 5) Bus station: There are passenger terminals, namely one terminal A, 8 terminals B, 9 terminals C.

Although there is quite a lot of transportation hub, the tourism demand in this province is not yet high enough. This may be due to the entrance access which is not adequate regarding the fact that the shape or character of the area has many small islands as shown in Figure 26.

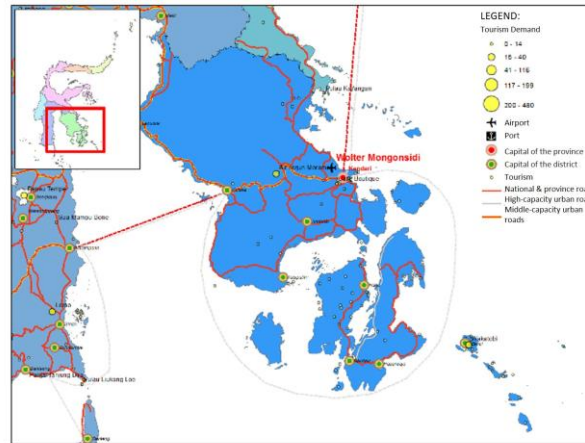


Figure 26. Tourism demand and transportation hub position in Southeast Sulawesi [42]

3.1.3 Availability of Transportation Network

Network availability is also an accessibility indicator of a region [43]. In the context of tourism, of course, there is a strong relationship between this accessibility factor and the number of tourist visits. Figure 27 shows the relationship between the number of tourist visits and the congestion of the network in each province in Sulawesi. The figure depicts that the provinces with relatively high congestion of network also have high tourist visits, namely South Sulawesi and North Sulawesi.

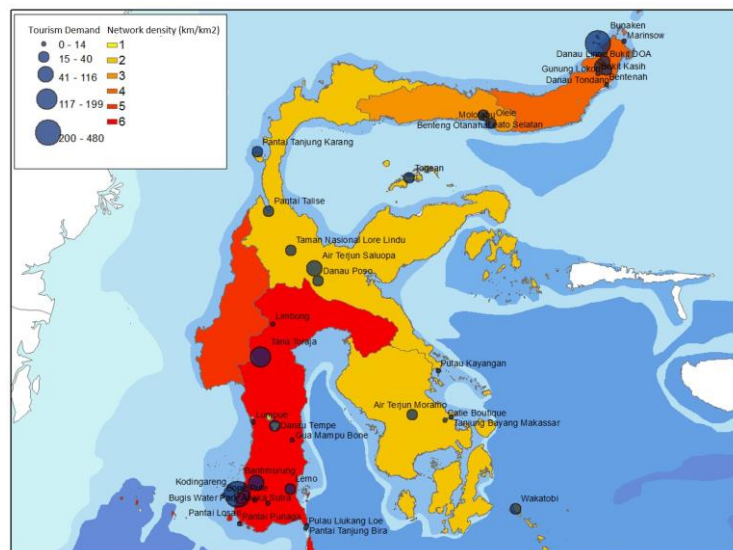


Figure 27. Network congestion of road transportation associated with number of visits or trend of tourist visits [44]

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

From the identification that has been done, it is necessary to conduct some development of transportation networks to foster the growth of tourism such as: 1) Development of road network for the access to tourist sites or road network which is integrated with tourist destinations, 2) Development of rail network which is well integrated with tourist destinations, and 3) Development of pedestrian facilities to the tourist attractions or in the tourist attractions (e.g. pedestrian ways from the downtown to the beaches in Manado).

3.1.4 Types-Varieties and Quality of Transportation Modes

Public transportation system is an important service for tourists, especially in big cities such as Makasar, Manado, Palu and Gorontalo. Public transportation needed is a public bus, metro and train system. In cities that are congested by weak public transportation, the influx of tourists is an additional pressure on transportation demand. Ultimately, tourists compete with residents to travel on the limited road network in urban areas. This situation can lead to negative impacts such as congestion that would affect the next tourist visits. Therefore, the availability of public transportation is very important to support the tourism system in an area.

Some indications related to the public transportation in Sulawesi are:

North Sulawesi	Gorontalo	Central Sulawesi
<ul style="list-style-type: none"> Public transportation modes to tourist locations are still very limited. AKAP: there is inter-city inter-provincial transportation (5 routes from and to Manado) AKDP: inter-city transportation within a province is only available in the evenings. (8 routes to and from Manado). Urban Transportation: it is available but not developing well; it is only at level I city (11 routes in Manado). Rural transportation: it is available but not developing and not well organized. Travel: it provides inter-city service, both inter-province and in a province and non-route, and some of this travel transportation are still black plate. Transportation Rental: car rental is Rp.400.000-500.000 / day, but it is not yet well organized. Taxi: it is available in level I city of Manado. (BlueBird Taxi Trust Taxi, Celebrity Taxi, Kokapura Taxi, Dian Taxi, Langowan Taxi) Ferry transportation: it is available and is used to reach small islands such as Bunaken (Ferry). Ferry transportation rental: it is available and is used to reach small islands such as Bunaken (Ferry). 	<ul style="list-style-type: none"> Public transportation modes are quite complete and some have been connected to tourist sites. AKAP: inter-city inter-provincial transportation is only available in the evenings. (8 routes to and from Gorontalo) AKDP: inter-city transportation within a province is available. (57 routes to and from Gorontalo). Urban Transportation is in the form of <i>Bentor</i> (Motor Pedicab) (population 12,000-15,000). Rural transportation: I is in the form of <i>Bentor</i> (Motor Pedicab) (population > 200,000). Travel: it provides inter-city service, both inter-province and in a province and non-route, and some of this travel transportation are still black plate. Transportation Rental: car rental is Rp.400.000-500.000 / day, but it is not yet well organized. TAXI: it is available in level I city of Gorontalo (airport taxi) Ferry transportation: it is available and is used to reach small islands and other provinces (Ferry). Ferry transportation rental: it is available and is used to reach small islands such as Saronde Island, Iluta Dock). 	<ul style="list-style-type: none"> Public transportation modes to tourist locations are still very limited. AKAP: inter-city inter-provincial transportation is available. (the number of routes is not recorded; there are 133 fleets) AKDP: inter-city transportation within a province is not well organized. (the number of routes is not recorded; there are 300 fleets). Urban Transportation: No, but less developed only at the city level I and do not follow the route that has been set (not recorded, the data does not exist). Rural transportation: it is available but not developing and not well organized. Travel: it provides inter-city service, both inter-province and in a province and non-route, and some of this travel transportation are still black plate. Transportation Rental: car rental is Rp.400.000-500.000 / day, but it is not yet well organized. Taxi: it is available in level I city of Pali. (Mutiara Taxi and Utama Taxi) Ferry transportation: it is available and is used to reach small islands such as Togean (Ferry). Ferry transportation rental: it is available and is used to reach small islands (such as Togean).
West Sulawesi	South Sulawesi	Southeast Sulawesi
<ul style="list-style-type: none"> Public transportation modes to tourist locations are still very limited. 	<ul style="list-style-type: none"> Public transportation modes to tourist locations are still very limited. 	<ul style="list-style-type: none"> Public transportation modes to tourist locations are still very limited.

West Sulawesi	South Sulawesi	Southeast Sulawesi
<ul style="list-style-type: none"> • AKAP: inter-city inter-provincial transportation is only available in the evenings. (Mamuju - Makasar, Palu, Parepare, Sengkang Wajo, Palopo, Toraja) • AKDP: inter-city transportation within a province is not yet well organized. (13 routes). • Urban Transportation: it is available but not developing well; it is only at level I city. There is <i>ojek</i> (not recorded, data are not available). • Rural transportation: it is available but not developing well and is not well recorded. • Travel: it provides inter-city service, both inter-province and in a province and non-route, and some of this travel transportation are still black plate. • Transportation Rental: car rental is Rp.400.000-500.000 / day, but it is not yet well organized. • Taxis: it is available in level I city of Mamuju but it is only very few. (Tasha Taxi) • Ferry transportation: it is available and is used to reach Kalimantan Island (Ferry). • Ferry transportation rental: It is available and is called Sea Taxi with 15 passengers (only in the district of Binuang Polewali Mandar). 	<ul style="list-style-type: none"> • AKAP: inter-city inter-provincial transportation is only available in the evenings. (the routes are not recorder; there are 300 fleets) • AKDP: inter-city transportation within a province is quite well organized. (Not recorded, there are 1.164 fleets). • Urban Transportation: it is available but not developing well; it is only at level I city. • Rural transportation: it is available but not developing well and is not well recorded. • Travel: it provides inter-city service, both inter-province and in a province and non-route, and some of this travel transportation are still black plate. • Transportation Rental: car rental is Rp.400.000-500.000 / day, but it is not yet well organized. • Taxi: it is available in level I city of Makassar. (There are 13 taxi companies, with 1.434 fleets) • Ferry transportation: it is available and is used to reach small islands and other provinces (Ferry). • Ferry transportation rental: no data. 	<ul style="list-style-type: none"> • AKAP: inter-city inter-provincial transportation is only available in the evenings. (not recorded) • AKDP: inter-city transportation within a province is quite well organized. (57 routes) • Urban Transportation: it is available but not developing well; it is only at level I city (1.874 urban transportation). • Rural transportation: it is available but not developing well and is not well recorded. • Travel: it provides inter-city service, both inter-province and in a province and non-route, and some of this travel transportation are still black plate. • Transportation Rental: car rental is Rp.400.000-500.000 / day, but it is not yet well organized. • Taxi: it is available in level I city of Kendari. (Dactraco Taxi, Ade Taxi, Agung Taxi, Mery Taxi) • Ferry transportation: it is available and is used to reach small islands and other provinces (Ferry). • Ferry transportation rental: It is available, especially to Wakatobi.

From the identification described above, several possible development potentials, especially on public transportation are: 1) Development of the route network of public transportation that passes by tourist destinations and in the tourist destinations (AKAP, AKDP, Urban Transportation, Rural Transportation), 2) Development of the utilization of Motor Pedicab to reach tourism destinations in a short distance, 3) Public transportation among tourist attractions (sightseeing public transportation), 4) Coordination / control of transportation rental services, 5) Provision of tourism transport, that is transportation by using public buses which are equipped with distinct signs for tourism purposes or other purposes such as for family and social purposes, except for transportation services in common routes, 6) Transportation rental is transportation service by using public transportation that provides door to door service, with or without drivers, with unlimited area of operations. In other countries, it is known as car rentals like Avis, Budget. Such transportation often has a representative at airports.

3.1.5 Availability of Transportation / Tourism Tour Services

In each province on Sulawesi Island, there has been plenty of availability of transportation or tourism tour services but it is still not well organized.

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

3.1.6 Quality of Transportation System Management (Integration, Security-Safety)

Inter-mode integration eases tourists in traveling to several locations using public transportation, like the example in Figure 28 [45]. The identification results of the role of road transportation, particularly mode interconnection, can already be found in some provinces in Sulawesi:

1. North Sulawesi: It has inter-mode integration to support the accessibility of the tourist objects, but it is not yet comprehensive. Mode integrator transportation (DAMRI) from and to Samratulangi Airport has 5 Routes (Samratulangi Airport– Tomohon, Samratulangi Airport– Kotamobagu, Samratulangi Airport - Amurang, Samratulangi Airport – Boulevard, Samratulangi Airport – Bitung).
2. Gorontalo: Inter-mode integration is not yet available in several locations to support the accessibility of the area attractions. Mode integrator is only available to provide the service for Jallaluddin Airport - Ferry Port.
3. South Sulawesi: It has inter-mode integration to support the accessibility of the tourist objects, but it is not too many. There is one route of mode integrator (DAMRI) from and to the airport (Sultan Hasanuddin Airport - Karebosi).
4. Other provinces have not had any inter-mode integration.

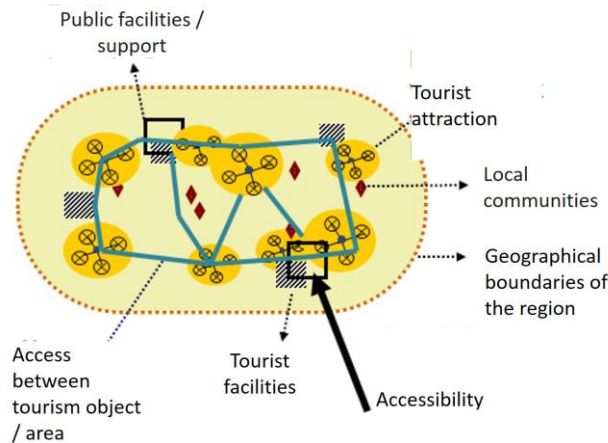


Figure 28. Model of public transportation interconnection [46]

From the identification of the role that has been done, some potentials that could be developed are: 1) Development of inter-mode integration to support the accessibility of tourist areas and tourism entrance, 2) Development of inter-mode integration to support accessibility among tourist destinations, and 3) Development of inter-mode integration to support accessibility in tourism destination (intra-tourist destination), which can be achieved by the development of tourist clusters.

In detail, the quality of transportation system management in Sulawesi is as follows [47].

1. Reliability

Of all the provinces identified, the reliability of the public transportation system does not exist. One very important service performance in meeting the expectation of passengers is the reliability of public transportation, so it is necessary to make public transportation scheduling model integrated with tourism destinations (especially during the peak season).

2. Security and Safety

There are no standards on safety and security systems for tourism transportation, so it needs to be developed and it can be in the form of Norms, Standards, Regulations, and Manual (NSPM).

3. Comfort

There are no minimum service standards of comfort for tourism transportation, so it needs to be developed and it can be in the form of Norms, Standards, Regulations, and Manual (NSPM).

4. Tourism Transportation Information System

Based on the identification, there is no information system related to transportation and tourism in Sulawesi. Thus, it is necessary to develop a tourism information system that also includes information on transportation system that supports.

5. Road Service / Traffic Signs / Signposts for Tourism

Traffic signs and signposts to tourist attractions are not yet complete. Good system of traffic signs to reach tourism attraction needs to be developed. Tourist signs are traffic signs whose purpose is to direct visitors to

tourist destinations, such as historical buildings, tourist areas, camp sites, picnic areas, sports facilities or museum.

3.1.7 Analysis on Issues Based on Tourists' Perception

The analysis of primary data shows that in average, the visitors of tourism attractions use the means of motorcycles, private transportation and rental in their trip to the tourist attractions. In North Sulawesi, many of the tourists (42,95%) use private vehicles to get to the tourist destinations, meaning that they are possibly local tourists. Vehicle rental is the second largest percentage after private vehicles (32,89%), and it is followed using motorcycles (17,45%). The rest is other types of modes. In Gorontalo, the tourists using motorcycles have the percentage of 32,19%, private vehicles 30,14%, public transportation 19,86% and vehicle rental 16,44%. The pattern of the use of transportation modes in West Sulawesi is almost the same as in the one in Gorontalo: the majority uses motorcycle (38,26%) and private vehicles (38,26%); the next is vehicle rentals (15,44%) and public transportation (6,71%).

Of the three provinces where questionnaire survey to tourism visitors was conducted, it can be concluded that most the visitors use private vehicles (four- and two-wheel vehicles) to travel to the tourist attractions. This might be due to a lack of public transportation or comfort in travelling to the tourist attractions. To know the answer to such question, a question was raised regarding the accessibility of getting public transportation.

In North Sulawesi some respondents said that it was very difficult (41.91%) and difficult (37.50%) in getting public transportation. In Gorontalo, those who said it was difficult (44.20%) and easy (47.10%) were almost equal. In West Sulawesi, the majority thought it was easy (45.32%). In Central Sulawesi, Southeast Sulawesi and South Sulawesi, many respondents said it was easy and very easy in getting public transportation to reach tourist destinations.

3.2. Result

Currently, the growing mode of transportation on the island of Sulawesi includes air, sea and land transportation. Land transportation is the most dominant mode used in supporting tourism activities in Sulawesi Island. The utilization of this type of transportation is more prominent than air transport, especially when compared to the aspect of price. This is because most tourists on the island of Sulawesi are domestic tourists. In addition, land transportation also enriches the travel experience of travelers which highly depends on the utilization frequency. The higher the frequency, the more experience they will gain. Related to the frequency of this usage, there are several factors that influence the effectiveness of the selection of tourist modes of transportation in Sulawesi Island, namely: price, geographical position, distance, time limit, convenience, security, benefit, and competition.

Transport planning needs to be done to meet existing demand with adequate levels and quality and with limited funds. This plan includes the formulation of policies and strategic plans, transportation operational planning, and design of transportation elements. In this case, the development of transportation is closely related to economic, geographical, political, military, technological, competition, and urbanization considerations. That is, in the development of transportation, various disciplines will be involved.

In support of tourism development in Sulawesi Island, the development of transportation system includes the development of tourism activities system, network system, and movement system. The development of tourism activity system is closely related to the development of Sulawesi Island space in general. The direction of tourism development policy in Sulawesi refers to the policy of developing national tourism which is in every province referred to in the following provincial space development policy.

1. The policy of tourism development in North Sulawesi Province is directed at [48]: a) Making cultural development and various local natural resources as part of world heritage; b) Creating the North Sulawesi Province as the Gateway of Indonesia to East Asia and the Pacific, and c) Increasing number of tourist arrivals to North Sulawesi and Northern Eastern Indonesia.
2. The policy of tourism development in Gorontalo Province is directed to [49]: a) Supporting conservation and cultural development activities as a tourist attraction in the light of local philosophical custom *adat bersendi syara, syara bersendi kitabullah Payu Limo Totalu Lipu Pei Hulalu* and strengthening the development structure of Gorontalo Province to make it more advanced and independent, b) Conserving and protecting the nature and culture of Gorontalo as tourism identity of Gorontalo, c) Optimizing unique natural resource potential as a support for the creation of environmentally sound tourism, d) Maintaining the competitiveness of Gorontalo's tourism at national and international level through the planning and management of sustainable natural and cultural tourism to become a flagship, e) Increasing participation and role of the community both as subject and object in sustainable and environmentally friendly tourism development and f) Creating an

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

independent, responsible and competitive society to support the achievement of tourism as a leading tourism destination.

3. The policy of tourism development in West Sulawesi Province is directed to [50]: a) Increasing the construction of road and bridge networks in all areas; b) Increasing the development of road infrastructure to production centers; c) Accelerating development of Tampa Padang and Sumarorong Airport, d) Increasing infrastructure development for maritime potential development, e) Improving the development of economic facilities and infrastructure, f) Improving the distribution of inter-regional transport services both between provinces and districts; g) Rehabilitating and maintaining traffic infrastructure according to the standard of service, h) Improving the network of land and sea transportation, and i) Developing and promoting tourist destinations.
4. The policy of tourism development in Central Sulawesi Province is directed at Achieving creative economic progress for the people of Central Sulawesi [51].
5. The policy of tourism development in Southeast Sulawesi Province is directed to [52]: a) Increasing tourism promotion and marketing so as to create a conducive climate for ODTW development in Southeast Sulawesi Province, b) Attracting tourists, c) Creating conditions that can encourage community participation in tourism, d) Promoting the development of cultural values so as to create a conducive climate for the development of arts and culture, e) Improving the management of regional cultural wealth, f) Improving the management of cultural diversity and art in the region, and g) Increasing harmonious cooperation in the management of cultural wealth.
6. Tourism development policy in South Sulawesi Province is directed to [53]: a) Realizing safe, comfortable, attractive, accessible, environmentally friendly tourism destination and contributing to the welfare of society, b) Realizing effective tourism marketing to increase the number of domestic and foreign tourists visit, c) Creating a partnership of tourism management that encourages the development of a competitive tourism industry and responsible for the natural environment and community life, d) Developing cultural richness and cultural diversity and revitalizing the maritime culture as a characteristic South Sulawesi entities, and e) Encouraging creative economy of media-based, design and science and technology as well as developing the creative economy based on art and culture.

The development of land transportation includes accessibility aspects, mobility, and transportation system management. This study formulates general recommendations on the development of land transportation to support the development of tourism on the island of Sulawesi as follows:

1. The development of land transportation network to support tourism (accessibility) which includes the following recommendations:
 - a. It is necessary to develop public transport node integrated with tourism object. These nodes include terminals, airports, and ports. In particular, it is necessary to develop the Mutiara Sis Aljufrie Airport into an international airport to attract foreign tourists to natural tourism destinations in Central Sulawesi. In addition, the south side of the Central Sulawesi Province also needs to be developed as a domestic airport to reach tourism in the south and facilitate tourism activities to the northern province of Southeast Sulawesi. It is primarily aimed at attracting foreign tourists to natural tourist destinations like Kayangan Island at the southern tip of Central Sulawesi.
Another recommendation is the development of Tampa Padang Airport to attract foreign tourists to natural tourism destinations in West and Southeast Sulawesi Provinces such as Toraja, due to its closer attainment to Mamuju (capital of West Sulawesi province) rather than from Makasar (capital of South Sulawesi province).
In Southeast Sulawesi province, it is necessary to develop domestic airport on the north side to reach the northern region and to Central Sulawesi province and to attract foreign tourists to natural tourism destinations like Kayangan Island in Central Sulawesi.
In South Sulawesi province, it is necessary to develop domestic airport on the north side to reach the north and to West Sulawesi province to attract foreign tourists to natural and cultural tourism destinations such as Toraja.
 - b. It is necessary to develop an environmentally sound transport node on small island destinations. This is to support tourism activities in small islands such as Bunaken, Togeian, and Wakatobi).

- c. It is necessary to develop a road network for access to tourist sites or to make it integrated with tourist destinations.
 - d. It is necessary to develop an integrated rail network as well as tourism destinations.
 - e. There is a need to develop pedestrian facilities to tourist attractions or within tourist attractions, for example: from the city center to the coastal tourist area of Manado, within/from the city center to the coastal tourist area of Gorontalo, the urban area of Palu and Talise beaches, the urban area of Mamuju, the urban area of Kendari, the Wakatobi Islands, and the urban area of Makassar).
2. Development of modes of transportation (mobility) includes the following recommendations:
- a. It is necessary to develop a network of public transport routes passing tourist destinations and within tourist destinations, including Inter-City Inter-Provincial transport route, Inter-City Inside the Province transport route, Urban Transport, and Village Transport.
 - b. It is necessary to develop public transportation between tourism objects (sightseeing public transport). In Gorontalo Province, it is recommended to develop the utilization of motor pedicab for tourist destination with short distance.
 - c. It is necessary to coordinate / control the service of motor vehicle rental.
 - d. It is necessary to develop an affordable model of travel services, such as the use of motorcycles, or other affordable modes.
 - e. It is necessary to develop local tourism services of Sulawesi.
3. The development of transportation management system quality includes aspects of integration between modes of transportation, reliability, security and safety, convenience, tourist transport information system, and road service. The recommendations are as follows:
- a. On the aspect of integration between modes of transport, it is necessary to develop inter-modal integration to support the accessibility of tourist areas and tourist entrances.
 - b. On the aspect of reliability, it is necessary to create a model of public transportation scheduling related to tourism, especially during peak tourism.
 - c. In terms of security and safety, it is necessary to develop Minimum Service Standards (SPM) for security and safety of public transport.
 - d. In the aspect of convenience, it is necessary to develop Minimum Service Standards (SPM) for the convenience of public transport.
 - e. In the aspect of tourist transport information system, it is necessary to develop a tourist information system that is managed by the government in cooperation with existing tourist information system.
 - f. In the aspect of road service, there is a need to complete the signs that can lead to the tourist destination.

IV. CONCLUSION

In general, the performance of the transportation infrastructure network on Sulawesi Island is quite good although not optimal, especially the performance of accessibility, punctuality, and convenience which is still not good enough. This indicates that the provision of transportation infrastructure in many regions needs improvement. The integration of intra- and inter-modes of transportation is generally still lacking / low because the availability of transportation facilities to perform change in the modes of transportation is inadequate, the number of vehicles in the service hubs of the intra- and inter-modes of transportation is limited, and the network and service infrastructure connecting one region to the others is also limited. Besides, the integration of intra-modes of transportation is still not optimal. Intra-mode interaction generally occurs in airports and ports, especially ferry ports. The intra-mode interaction road transportation terminal has not demonstrated any integration and vehicles generally only pass by the terminals, except the regional terminal of Makassar (South Sulawesi) which has started to be well organized.

Based on the analysis of the conditions and opportunities for future development of land transportation, and in general, to support tourism development on Sulawesi Island, some conclusions can be drawn as follows:

1. It is necessary to have planning of the type-variety and quality of the transportation network to support tourism, including the provision of transportation hubs, provision of adequate transportation network, provision of public transportation, and provision of services of transportation / tourism tour.

Development of Land Transportation Towards Empowered Tourism Sector for Betterment of Social Welfare

2. It is necessary to improve the quality of transportation system management in the form of integration, reliability, security-safety, comfort, tourism transportation information systems, and road service / traffic signs / signposts for tourism.

In general, it is necessary to have coordination of planning across provinces, across sectors in the construction and development of land transportation in the form of macro planning of land transportation on Sulawesi Island which can be developed at regional and local level, which is integrated vertically and horizontally to create synergy in providing transportation services to communities. Besides, consistency in spatial planning is also needed, at the level of national, island, province, regency, and city.

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