

# Introduction to the Speakers and Presentations Abstracts

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# Theme 1: Transport and Climate Change

## Paper 1: Implication of Transport Improvement Projects on Land Use: Some examples from Karachi

**Dr. Noman Ahmed, Professor and Chairman Department of Architecture, NED University Karachi**

Professor Dr Noman Ahmed is an architect and planner by profession. He obtained his Bachelor of Architecture degree from Dawood College/NED University, Karachi and a Masters degree in city planning from the Middle East Technical University, Ankara, Turkey. He also obtained postgraduate training in Urban and Regional Planning from the United Nations Centre for Regional Development (UNCRD), Nagoya, Japan and Centre for Housing and Urban Development Studies, Harvard University, Cambridge, USA. Noman obtained his Ph.D. from Loughborough University, UK. He is also a graduate of the 88th National Management Course offered by National School of Public Policy, Lahore, Pakistan. Noman has taught in the leading architecture and planning institutions in Karachi and also supervised post graduate research in the same disciplines. Noman worked as a Faculty Member and Coordinator, Urban Design Graduate Programme at the Dawood College of Engineering and Technology, Karachi from 1989 to 2000. Thereafter he founded an Architecture and Planning Department at the NED University of Engineering and Technology, Karachi in 2000. He is currently working as its Professor and Chairman. He has undertaken several self-motivated research studies on developmental issues including infrastructural planning and management and has been a consultant to many NGOs, CBOs and government organizations in Pakistan and abroad. He has also published several reports, monographs and papers on different relevant topics and subjects. He regularly writes on developmental issues in the leading newspapers in Pakistan and has contributed over 600 articles in DAWN and THE NEWS since 1988.



### **Abstract:**

Initiatives in urban transportation are generally undertaken to facilitate movement of people, enhance efficiency of various systems and modes, connect people with destinations as well as support options for a healthy and convenient life style for all. Many experts on the subject are of the opinion that mobility is a basic human right. Researches and observations have established the fact that transportation is directly linked to land use. A change in one parameter has a direct impact on the other. Whenever scientifically valid and socially acceptable process of transportation planning and consequent project formulation and implementation is done in cities, it normally produces positive impacts on the land use situation. During the recent past, many transportation improvement projects were undertaken in Karachi. An appraisal of these initiatives showed that these projects had a mixed impact on the adjoining land use situation. This paper presents the study of some of these projects and examines corresponding impacts on land use scenario of the connected locations in particular and the city in general.

## Paper 2: Environmental Aspects of Sustainable Transportation

### Mr. Shahid Lutfi, Environmental Expert, STC, World Bank Group

Shahid Lutfi is a qualified and well experience professional Environmental Engineer. He earned Masters of Engineering degree in Environmental Engineering from Georgia Tech, Atlanta, USA and Bachelors of Civil Engineering from NED UET, Karachi. Mr. Lutfi possess over 20 years of experience in environmental planning and sustainable development. His core areas of interest and expertise relates to environmental legislation; impact assessments; environmental audits; occupational health, safety and environmental management systems; and climate change policies and response initiatives.



Mr. Lutfi has served as a senior officer in Environmental Protection Agency of Sindh for over 8 years. Presently, he is engaged with World Bank Group as environmental consultant for projects mostly in infrastructure, manufacturing, hydropower and wind farms. Passion for research and education has kept him attached as honorary faculty with the Community Health Department of Aga Khan University to share his expertise in environmental and occupation health. He is also a visiting faculty and member of Board of Studies at Environmental Engineering Department of NED University of Engineering & Technology. Mr. Lutfi is a fellow of LEAD Pakistan and member of Provincial Climate Change Policy Implementation Committee of Sindh.

#### **Abstract:**

Pakistan has over 8,000 km of railway network and 250,000 km of roads network including around 140,000 km of surfaced road, rest unsurfaced. The surfaced road increased by 265% in 2000 over the year 1980, whereas total road length increased by 166%. Statistics further reflect increase in year 2000 of motor cars, buses, motorcycle and trucks by 365%, 255%, 612% and 366% respectively over the year 1980. The higher rate of increase in fleet compared with road network growth is an indicative of stress on overall transportation system of the country. Growth rate statistics for major cities elucidates even higher stresses --- persistent peak-hours congestions and suffocating ambient air quality are a few practical evidences that trickles down sours evenly to all tiers of populace.

Transportation does not conclude on mobility of vehicles; it rather extends to provision of access, but safe, to people. Aspects need to be closely looked while planning sustainable transportation would include, but not limited to, fleet management, traffic management, resilient infrastructure, health & safety, air emissions control. Sustainable transportation planning needs to focus on service to community rather unidirectional judgment for brisk vehicles transport. Intervention for mainstreaming transportation planning in sustainable development process would requires appropriate linkages of policies related to environment, climate change and transportation. This would be merely the seedling. However, to enjoy the fruits this process has to go all the way to institutional reforms to capacity building to implementation of action plans to rigorous monitoring to unprejudiced prosecution and penalization.

## Paper 3: Importance of Non-Motorized Transport for Climate Resilient Urban Transport in Pakistan

### Mr. Arif Pervaiz, Independent Consultant

Mr. Arif Pervaiz has been working in the environment and social development sector for over 16 years. His experience spans: water, sanitation, and hygiene; urban mobility and air quality; community development; and climate change mitigation and adaptation. He is currently working as a climate change resilience specialist for an Asian Development Bank (ADB) pre-feasibility project, and has in the past worked for USAID, IUCN, William J. Clinton Foundation, WaterAid, a World Bank and Government of Sindh project development initiative amongst others. He completed his MSc. in Environmental Management from National University of Singapore (NUS), MSc. in Management of NGOs from the London School of Economics (LSE) and B.A. in Political Science and History from Rutgers University, NJ, U.S.A.



### **Abstract:**

Non-motorised transport (NMT) is often a key element in successful shift towards cleaner urban transport. It can be a very attractive mode of transport for relatively short distances, which make up the largest share of trips in most cities in Pakistan and around the world. However, our cities are designed for private vehicle use and a disproportionately high percentage of public expenditure is expended on building ever bigger and better roads. This has enormous (and often negative) implications for land use and associated socio-economic dimensions of quality of city life. The key to reversing the trend towards more private vehicle use is to make walking and cycling attractive, together with improving public transport. This would require investment in a range of activities including construction of sidewalks and bike lanes, bike sharing programmes, urban planning, pedestrian-oriented development, and awareness raising. NMT is a highly cost-effective strategy for urban mobility that can bring about large health, economic and social co-benefits, particularly for the urban poor. The main barriers to NMT are its perceived low status, and the current focus on car-oriented planning.

## Paper 4: Maintaining Sustainable Transport in Pakistan through Global Climate Finance

### Mr. Khizer F. Omer, Independent Consultant

With Masters in Engineering (MENG) Transportation, Carleton University, Ottawa, and Bachelors of Science, City and Regional Planning (CRP), University of Engineering and Technology, Lahore, Mr. Omer has over 25 years of work experience with Multi-lateral and Bi-lateral donors (such as WB, UNDP, UNESCO, UNESCAP, JICA, CIDA, RNE, SDC, NORAD etc.), governments (Federal and Provincial) (such as Canada, Ontario, Pakistan, the Punjab) non-government and civil society organizations such as AKDN, IUCN, and the Private Sector. Mr. Omer is involved in the specialized fields of integrated social development, urban and rural planning, infrastructure planning and design, Climate and energy, environmental management, rehabilitation and mitigation. Specific experience and expertise in policy and program development relate to fields environment, habitat risk reduction, climate change impacts, and climate finance.



### **Abstract:**

Though Pakistan is not a big Global Co2 contributor, it is in Top 10 countries most vulnerable to climate change impacts. And these impacts will extensively and expensively effect Pakistan Transport sector and country transportation infrastructure. Of Pakistan present emissions of about 280~300 MTCoe2, about 50 % are in the Energy sector. Within Energy, Transport sector emissions account for about 25 % of the country emissions. Simultaneous interventions to a) reduce emission from transport sector and b) adapt to CC threats to protect transport infrastructure in Pakistan present vistas for development of good business-case opportunities to attract vast amount of global climate finance available today to inject into the country to promote sustainable transport. Surface rolling stock, especially public transit and mass transit, among others are good case for business approach to access climate finance, especially in conjunction with the Private Sector. This presentation will outline the benefits of accessing global climate finance for transportation in the country, identifications of some options that could be pursued, as well as some suggestions on way and means to do it for Pakistan.

## Paper 5: Eco-Friendly Freight Transport

### Mr. Mahboob Ellahi, Ex-Director General, Ministry of Climate Change

Mr. Mahboob Elahi is a highly motivated and results oriented development professional with a more than 30 years of practical experience at various levels in the government, UN organizations, international and multilateral agencies, regional development banks and the private sector.



He is a trained urban specialist with varied experience in areas of social and economic development, environmental protection, global warming and climate change, sustainable development, managing urban infrastructure and services, financing of development, transportation engineering, balanced urban and rural development and renewable energy.

Mr. Elahi had held the important positions and delivered results. These among others include as Director General of Environment, Ministry of Environment, Urban Affairs, Forestry and Wildlife, Government of Pakistan; Director General and Head of the Mission of South Asia Cooperative Environment Programme (SACEP), Colombo; Managing Director, Water and Sanitation Agency (WASA) at Lahore and Faisalabad; and National Project Manager of National Environmental Management System under the UNDP Programme of Environmental Policy and Governance. Earlier, he also held senior level positions in the Ministries of Petroleum and Natural Resources, Housing and Works and with the local development agencies of the cities of Karachi and Islamabad.

Mr. Elahi holds master's degree in urban and regional planning from University of Hawaii, USA, after obtaining bachelor's degree from the University of Engineering and Technology, Lahore. This formal education was supplemented with specialized courses and trainings at the Harvard and Washington Universities in USA; and Edinburg and Sussex Universities in the UK in the areas relating to environmental protection, biodiversity, biosafety, desertification, chemicals, planning systems, transportation engineering, public health engineering, planning, budgeting and programming and evaluation research and analysis methods. He is also alumni of East West Centre, Honolulu, Hawaii, sponsored by US International Communication Agency.

### **Abstract:**

Road freight transport is one of the most important components of the transport sector, and accounts for about 96 percent of inland freight ton-km in Pakistan. In expenditure terms, it is between 3-4 percent of GDP. It is nevertheless, poorly regulated in terms of investments and control of gaseous emissions and other pollutants. With declining share of railways, and virtually non-existence of inland water transport in Pakistan, huge investments would be required in the trucking sector as well as the creation and maintenance of trucking infrastructure.

Trucks also consume large amounts of diesel fuel in country and hence are one of the largest sources of air pollution (fine particulate matter-PM, nitrogen oxide-Nox). Health impacts caused by diesel pollution from trucks, not only affect the national economy but also ecology, ecosystems and environment. Adopting and implementing a regulation to reduce diesel pollution from trucks is needed to protect public health, meet national air quality standards, and reduce related risks

Road transport including trucks predominantly relies on a single fossil resource, petroleum that supplies 95% of the total energy used by world transport. In 2004, transport was responsible for 23% of world energy-related Green House Gases (GHG) emissions with about three quarters coming from road vehicles. Over the past decade, transport's GHG emissions have increased at a faster rate than any other energy using sector. Trucking is responsible for about 18-24 percent of the total energy use in transport sector, and as such the share of greenhouse gasses, which are responsible for global warming and climate change.

Technology improvement and introduction of hybrid vehicles can also play a role, though their market penetration is currently small. Reductions in drag coefficients of 20–50% seem achievable for heavy intercity trucks, with consequent reductions in fuel use of 10–20%. Hybrid technology is applicable to trucks and buses that operate in urban environments, and the diesel engine's efficiency may be improved by 10% or more. Road vehicle efficiency could be improved by 5–20% through strategies such as eco-driving styles, increased load factors, improved maintenance, in-vehicle technological aids, more efficient replacement tyres, reduced idling and better traffic management and route choice.

Although rail transport is one of the most energy efficient modes today, substantial opportunities for further efficiency improvements remain. Reduced aerodynamic drag, lower train weight, regenerative braking and higher efficiency propulsion systems can make significant reductions in rail energy use. Biofuels, flex-fuels, fuel economy regulations, and transport demand management measures have great potential to replace a substantial part of petroleum use by transport.

# Theme 2: Managing the Urban Transport System

## Paper 6: Developing Sustainable Urban Transport Corridor through Bus Rapid Transit

### Ms. Faela Sufa, Vice Director of Institute for Transportation and Development Policy (ITDP), Indonesia

Faela has done ST, Civil Engineering, University of Gadjah Mada, Indonesia and MSc (Eng), Transport Planning and Engineering, Leeds University, UK. Faela has an experience as a transport engineer and planner on transport modelling and developing sustainable transport for more than 10 years in the United Kingdom and Indonesia. As a Vice Director of ITDP Indonesia, Faela has responsibility on managing all ITDP Indonesia project such as Transjakarta Bus Rapid Transit (BRT) capacity improvement, Medan Non-Motorized Transport (NMT) and Bicycle Sharing Design Concept for Jakarta. Faela's work experience vary from transport planning and modelling, BRT planning design and capacity improvement, NMT network design, accessibility improvement and Bicycle Sharing Design. Faela's projects are not only in the UK and Indonesia where her office is based but also in Azerbaijan, Pakistan and Ireland. To support the job, Faela also can use the transport program such as Saturn and Visum.



### **Abstract:**

Currently, it is not an easy task to solve the transportation problem for many cities in the world. With the world's urban population projected between now and 2050 to increase from 3.4 to 6.4 billion, cities need to make sure that the urban mass transit systems facilities will be able to keep pace with the rapidly growing urban population. One of the key elements is making sure that cities are choosing the right dedication on facilitating these new urban residents with urban mobility that allowing them to live without depending on the use of private car.

In order to meet the demand of mobility for rapidly growing urban population, BRT has allowed to develop more transit that will be faster and cheaper compare to other transport modes. BRT is an innovative mass transit system which has the efficiency and quality similar to metros with the flexibility and relatively low cost of buses that bring significant environmental benefits. BRT can provide an affordable solution to ensure that the transit system meet the demand of urban mobility growth.

Cities that have applied BRT, such as Bogota, Mexico and Guangzhou get numerous environmental benefits. For example, Bogota turns their city center into transit mall which only allows bus, bicycle and pedestrian to access the city center. Guangzhou BRT reduces travel time not only for bus passenger but also for the car. Pedestrian access improvement, bicycle lane and bicycle sharing system are introduced along the BRT corridor at those three cities. To put on a good use of BRT, the Transit Oriented Development (TOD) principles should be applied along the BRT corridor.



## Paper 7: Public Transport Scenarios of Karachi in line KTIP Master Plan for Mass Transit

### Mr. Ashar Hashmat Lodi, Director, Exponent Engineers (Pvt) Limited Karachi

Ashar Hashmat Lodi has a Bachelor's degree in Civil Engineering from NED University of Engineering & Technology, Karachi and a Master Degree in Transportation Engineering from Asian Institute of Technology, Bangkok Thailand. He has more than 20 years of experience and an expert in Transportation Planning, Demand Forecast, Public Transport Planning and Geographic Information Systems (GIS). He is currently working as a Director in Exponent Engineers (Pvt.) Limited.



Mr. Lodi has been actively involved in most of the projects related transport planning in Karachi for past decade. He also worked on Japan International Cooperation Agency (JICA) Projects including Revival of Karachi Circular Railway (KCR) and Karachi Transportation Improvement Plan (KTIP) 2030 in preparation of transport master plan for Karachi in 2010. The result of this study proposed 6 BRT and 3 MRT routes in Karachi, which eventually became part of the mass transit master plan of the city for 2030.

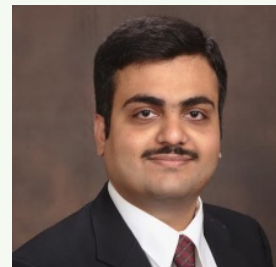
#### **Abstract:**

The presentation covers an overview of public transport sector performance in Karachi and highlights the reason for its deterioration. Issues related to increase in population and urban growth are discussed. Various options for mass transit in Karachi are presented. Finally, 6 BRT and 3 MRT routes resulting from the study of Karachi Mass Transit are explained, with their present status.

## Paper 8: Asset Management Approach for Urban Transportation Infrastructure Management: Learning from International Best Practices

### Dr. Farrukh Arif, Assistant Professor, Department of Civil Engineering, NED University of Engineering & Technology

Dr. Farrukh Arif currently works as an Assistant Professor at the Department of Civil Engineering, NED University of Engineering and Technology, Karachi, Pakistan. He earned Ph.D. degree in Civil Engineering from Florida International University. His dissertation was titled as “A Decision Support Framework for Infrastructure Maintenance Investment Decision-Making.” Prior to Ph.D., he also had a Masters in Engineering Management and Bachelors in Civil Engineering from NED University of Engineering and Technology, Karachi, Pakistan. Furthermore, Dr. Arif also worked as a Post-Doctoral Associate at Florida International University.



Dr. Arif received several honors and awards in recognition to academic and research performance. On completion of his Ph.D. degree, Dr. Arif was also honored with “**Outstanding Doctoral Degree Graduate Award**” by the College of Engineering & Computing, FIU. This award is given in recognition to academic and research achievements as well as services to the university and community.

### **Abstract:**

The urban transportation infrastructure agencies traditionally focus on expansion of existing infrastructure. In the recent past, however, balance has shifted towards intelligently maintaining the existing infrastructure. This is due to increase in budget deficits, and increased demand to provide quality service to the infrastructure users i.e. public. This shift unearths and emphasizes the requirement to develop and maintain urban infrastructure based on asset management philosophy. Asset management is a business process that often changes the way of thinking in an organization and drives the decisions based on information. A strong asset management system provides a solid foundation that optimizes the performance and cost effectiveness of transportation facilities’ operations and maintenance. In developing countries, adopting asset management approach by the urban transportation infrastructure management agencies is intense requirement, as those countries are usually in more financial and strategic stress than developed countries. As a first step, such agencies need to learn and benchmark their status against those from the developed countries. Considering this scenario, the speaker will discuss best practices of transportation infrastructure asset management in the developed countries and will propose a conceptual framework for similar agencies in developing countries. This will focus on six important aspects of an asset management system i.e. asset management organization and concept, planning, contractual arrangement and mechanisms, monitoring and performance measurement, information systems and decision making. At the end, brief account on potential of asset management approach adoption in the urban transportation infrastructure management agencies of developing countries will be discussed.

## Paper 9: How to do sustainable development of urban transport system by sustainable finance methods in Korea

### Professor Chae Ilkwon, Researcher at Global Railway Corporation (GRC), Seoul, South Korea

Prof. Chae Ilkwon has been 19 years experience on sustainable transportation policy & planner and urban transport project manager of Korea. Nowadays, he appointed ADB international consultant to Afghanistan Railway Authority, his role of senior policy advisor and International Team leader since November 2015. He had 15 years international experiences of urban transportation policy and sustainable funding issues. Also he has been worked on over 20 countries, policy advisor, planner and lecturer such as Korea, Philippine, Guatemala, Thailand, Singapore, Dubai, Malaysia, Indonesia, Vietnam, Cambodia, Laos, ADB and World Bank Group. Before he was worked Adjunct Professor at Woosong International Railway Graduate school and senior researcher at Seoul National University since September 2012.



He was appointed advisory professor both MLRM (Ministry land, transportation and Maritime Affairs, Korea government) and KOICA (Korea International Cooperation Agency) organization in the field of transportation sector.

He got bachelor degree to Korea University, major in Public Administration by Korea government full-scholarship, and 4 Master degrees for economics, business administration, industrial design and construction management both Korea and UK.

He is currently Senior Policy advisor, Railway policy and planning management for ADB, AfRA (Afghanistan Railway Authority), Kabul, Afghanistan and is working on all aspects of railway and transport. He is also international transportation researcher of Korea transportation industry (USA, Brazil high-speed railway projects and other road projects).

#### **Abstract:**

In the presentation Prof. Chae will share about the Seoul city and Seoul metropolitan area, how to sustainable development of urban transport system in Korea. Korea public transport systems are BRT and Metro system will be truck line. He will introduce Seoul and Republic of Korea's political pros and cons, sustainable urban transport policy last 50 years. Also I will deliver to make the Korea's self-financing methods to make the BRT and Metro projects. This paper will deliver new knowledge and inspiration for the Pakistan urban transport officials to 50 year experience, sustainable railway development by Korea case study.

## Paper 10: Sustainable Urban Transportation System: Concept, Challenges & Opportunities

### Dr. Muhamad Irfan, NUST Risalpur

Dr Irfan is a civil engineering graduate (with honours) from National University of Sciences and Technology (NUST) and holds MS Civil Engineering and a Ph.D degree from Purdue University, USA. He has also completed Applied Management Principles Program (Mini-MBA) from Krannert School of Management, USA. Dr Irfan has served as United Nations Observer and faculty member at National University of Sciences & Technology. His areas of research include transportation systems evaluation & decision-making, highway infrastructure engineering & management, travel behavior & transport modeling and transportation planning and urban mass transit systems. He has supervised over 20 MS thesis research studies and has over 45 publications to his credit. He is recipient of Best Dissertation Award at Purdue University, USA, and Best University Teacher Award by Higher Education Commission of Pakistan. Dr Irfan is actively involved in Research & Development in collaboration with National Highway Authority, Frontier Works Organization and Capital Development Authority on various National level projects. He is member American Society of Civil Engineers USA, Pakistan Engineering Council, Institute of Engineers Pakistan and Fellow of International Road Federation USA. Currently, he is Head of Department, and Director Local Quality Enhancement Cell at Military College of Engineering, NUST Campus Risalpur.



### **Abstract:**

Cities are incredibly vibrant centers of education, health, employment and commerce. Many cities in Pakistan are plagued by seemingly endless congestion, environmental degradation, road accidents and lengthy commute travel times, thus compromising overall urban mobility. Taking due cognizance from wealth of best practices for sustainable urban mobility, a number of transportation development projects including mass transit systems have been undertaken in Pakistan with positive repercussions in terms of socio-economic and environmental benefits. Sustainability in urban transport is quite complicated and is linked to many factors including long-term development of the urban infrastructure, modal split, land use planning paradigms and related policy measures. There is a need to reinforce knowledge on sustainable urban transport based on the principles of socio-economic and environmental factors, understand the concepts of transportation demand and supply management, congestion mitigation measures through developing mass transit systems, and recognize related policy measures. This talk will provide an overview of the urban transport issues in the context of urbanization and to suggest a way forward by presenting a framework for adopting sustainable solutions to the emerging urban transportation problems like: Urban transport sustainability, its issues and challenges; transportation demand and supply management. It is envisaged that the participants will be able to identify the core transportation issues affecting the urban transport planning, management and recognize the solutions to transform urban transport challenges into opportunities through sustainable practices.

# Theme 3: Eco-Friendly Freight Transport

## Paper 11: An Overview of Laws and Rules Governing Road Freight Transport and Their Enforcement Issues in Pakistan

**Mr. Shahbaz Latif Mirza, Assistant Chief, National Training Research Centre (NTRC), Ministry of Communications, Government of Pakistan**

Mr. Shahbaz has done BSc in City and Regional Planning from University of Engineering & Technology Lahore and also Masters in Sociology. He has over 12 years of experience in the field of road and road transport. He is currently working as Assistant Chief, National Training Research Centre (NTRC), Ministry of Communications and Government of Pakistan. In this capacity he has carried out a number of studies relating to road transport both in urban and intercity context. He was part of peer review committee for the project “Fuel Efficiency in Road Transport Sector (FERTS)”. In 2011, he attended a course on environmentally sustainable transport held in Nagoya, Japan which was jointly organized by JICA and UNCRD.



### **Abstract:**

Currently, a number of laws and rules are applicable to road freight transport. The most significant among these are MVO 1965, MVR1969, NHSO2000. Moreover, “the International Convention on Contract for International Carriage of Goods by Road” covers the international dimensions of freight transport. There are a number of issues in the implementation of these laws. Lack of proper enforcement of regulations is one of the serious impediments to operation of eco-friendly freight transport. The presentation covers all these aspects.

## Paper 12: Modernization in Freight Truck Transport in Pakistan

**Dr. Uneb Gazdar, Assistant Professor Department of Urban and Infrastructure Engineering, NED University of Engineering and Technology, Karachi**

Dr. Uneb Gazdar is an assistant professor in the department of Urban & Infrastructure Engineering, NED University. He has a PhD in Transportation planning from King Fahd University of Petroleum and Minerals. His area of research was related to Artificial Intelligence. He has contributed in more than 20 research papers which have been published in international journals and proceedings. He has 10 years of experience for teaching and research. He has also been involved 4 research projects related to the area of transportation modeling in Pakistan and Saudi Arabia.



### **Abstract**

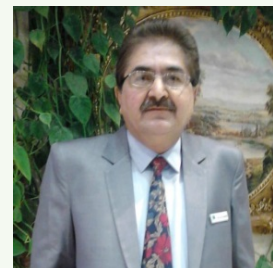
Approximately 67,4271 thousand ton cargo handled during year 2010-11 at the sea ports. Pakistan's total road network is around 263,942 Km which carries over 96 percent of inland freight and 92 percent of passenger traffic. Roads deterioration due to higher axle loads are imposing huge infrastructure maintenance cost, higher travel times and fuel costs. Modification in truck dimensions results in poor aerodynamics causing road crashes. The present situation can be greatly improved with the utilization of modern technologies such as; modern vehicles with better aerodynamics, upgradation of vehicle certification standards, and utilization of fleet management systems. This presentation will discuss the present situation in the trucking industry of Pakistan as well as the possibilities of improving the situation and their adaptation.

# Theme 4: Technological Advancement and Emissions Control

## Paper 13: Revival of Pakistan Railways as a Freight Carrier: Progress of last 3 years

### Mr. Mahmood Hasan, Chief Operating Superintendent (COPS), Pakistan railway (PR) Lahore

Mr. Mahmood Hasan is presently working as Chief Operating Superintendent Pakistan Railways, Lahore. He is a graduate of Civil Services Academy, Lahore and has done MSc and BSc in Geology from Karachi University. He has served in senior positions in Pakistan Railways, NIPA and Provincial Ombudsman Sindh. He has attended international and national seminars and has delivered various lectures in management courses at National Institutes in Pakistan.



### **Abstract:**

Pakistan Railways is the largest public sector organization of the country providing passenger and freight services across its four provinces. His paper is about “*Revival of Pakistan Railways as a Freight Carrier*” especially in the context of breakthrough achievement of the last three years which can be presented as one of the success stories of the present regime. The freight movement which had plunged to its lowest ebb i.e. exporting less than one train per day from Karachi in year 2010-11 has now touched to a phenomenal figure of 11 freight trains per day from Port area to various parts of Pakistan.

Transforming Pakistan Railways from a sick and non performing unit into a vibrant and forward looking organization was not a small ask. It took extraordinary leadership and visionary approach to put Pakistan Railways back on track. It is no wonder that Pakistan Railways are now earning more than our budgetary targets. Railways being a sustainable transport mode have attracted the attention of present government. The inclusion of new locomotives, high capacity wagons and rehabilitation of track to support a maximum speed of 120 KMs/hr are a few hardcore steps of this success story. The multi-pronged strategy resulted into 278% extra income in freight sector. The locomotives dedicated towards freight sector increased from 8 to 80 within a period of two years.

The opportunities envisaged in terms of coal transportation are boundless and that too at minimum environmental damage. The agreements made with Maple Leaf Cement Ltd for transportation of Coal / Cement and other Chinese Companies for Coal to Qadirabad Power Plant are a few to give enormous boost to freight activity through Pakistan Railways. In addition to this regenerated freight sector, the achievements at passenger sector have been acknowledged by the foreign media as well. The launch of 5-UP, 6-DN (Green Line) has been termed as one of the milestones achieved by the present government. Over the last two years an increase of 10.3 million passengers has been witnessed. Pakistan Railways look forward to play its vital role in CPEC by joining Peshawar with Jalalabad and establishing a new dry port at Havelian to promote cross border freight movement through an integrated and sustainable railway system.

## Paper 14: A viable Intelligent Transport System for Urban Mass Transit in 21st Century Pakistan

### Mr. Samir A. Hoodbhoy, MD Data Communication and Control (Pvt.) Ltd.

Samir received his BS in Engineering Sciences & Applied Physics from Harvard and his MS in Electrical Engineering from University of Rhode Island, USA. He has acquired a wealth of experience in systems engineering and has pioneered in the Applications of Information Technology in Pakistan spanning the sectors of Industry, Defense, Public utilities, Transport, and Education. To his credit he has designed and directed development of more than 100 IT systems and services employing Simulators, Control Systems and Telecommunication networks.



As a former Advisor to the Mayor and City Nazim of Karachi, he has been interested in the Application of Technology for solving Civic problems including Mass Transit, and Urban planning issues. His major initiative on civic issues resulted in the creation of three Educational Institutions including the first Computer Sciences Institute in Pakistan (FAST) in '82, the first IT Institute (Hamdard) in '97 and the Usman Institute of Technology. His interest in the transport sector led him to initiate a feasibility study on an Elevated Expressway on the Lyari river in '90; he has Co-directed Environmental Impact Assessment study of Karachi Mass Transit Program '91-'93 and later prepared computer animated simulation of Priority 1 corridor. In the USA, he became founder director of Industrial Controls Div. in Minneapolis Minnesota where he developed more than 25 Industrial products in the area of robot controls.

His current professional interest includes development work for the Smart Grid, Alternate Energy Systems and the BRT system.

### **Abstract:**

Taking single motorized vehicle riders off the city's major arteries and onto articulated buses on dedicated bus lanes is the objective of the BRT systems; this facilitates larger ridership and reduces Carbon emission. An Intelligent Transport System based on computer and communication networks and intelligent sensors will ease the burden of traffic flow by optimizing traffic flow conditions for the immediate future.

In due course, however, as the number of high-rise buildings in the metropolitan inner cities proliferates, the traffic channels will saturate and the pressures for **multi-level** traffic flow will become inexorable. Technology advancement has created new opportunities for building subways. The necessity for a national level plan, relying on indigenous human and material resources is formulated in this paper, with a view to exploring the economic viability of subways in Pakistan by the year 2025.



## Paper 15: Incorporating Environmental Impacts in Transportation Decision Making

### Dr. Anwar Ahmed, Associate Prof NUST Islamabad

Anwaar Ahmed received M.S. and Ph.D in Transportation Engineering from Purdue University USA, in 2009 and 2012 respectively. He has been on the faculty of the Department of Civil and Environmental Engineering at National University of Sciences and Technology since 2012. Dr. Anwaar teaches undergraduate and graduate courses and conducts research in transportation system evaluation, urban public transportation, intelligent transportation systems, traffic operations, and traffic safety. Dr Anwaar Ahmed is recipient of American Association of State Highway and Transportation Official (AASHTO) High Value Research Project Award and Fellow of International Road Federation. He has presented his research work at various scientific forums and authored several peer-reviewed journal publications.



### **Abstract:**

The transportation systems generally constitute the largest public-sector investment by any society. Quality and quantity of transportation infrastructure has direct influence on the global competitiveness and economic vitality of a nation. The new millennium is characterized by growing travel demand, higher user expectations and gaining infrastructure, and transportation agencies are striving to provide desirable level of service in a cost-effective manner. Transportation engineers and planners, policymakers, transportation agency administrators, service providers, environmental groups, and the general public are interested in refined procedures of project evaluation. Thus there is a need of best project evaluation practices and monitoring of the expected impacts of alternative investment decisions and other stimuli on the operations of existing or planned transportation systems. Also, recent environmental and legislative initiatives in transportation around the globe and the sheer size of transportation investment levels necessitates a comprehensive, yet integrated and consistent approach to transportation projects evaluation to incorporate economics, environmental or ecological impacts (such as air, water, or noise pollution, community effects, and land-use shifts); and technical impacts (such as changes in facility condition, vulnerability and longevity) in transportation decision making. Multiple criteria evaluation and decision making processes involving weighting, scaling and amalgamation can be used to make decision that appropriately incorporate environmental impacts, lead to sustainable systems and address the concerns of all major stakeholders (highway agency, road users and community).

## Paper 16: Technological Advancement and Emissions Control

### Dr. Badar Ghauri, Head of Department, Remote Sensing and Geo information Science, Institute of Space Technology Karachi

Dr. Badar is an Environmental Engineer by training and Ex. Deputy Chief Manager/ Director of Environment and Space Science Directorate, SUPARCO from 1989 to 2012. He has been heading Environmental Monitoring and Research program of SUPARCO since 1985. His main interests are: Atmospheric Aerosols Studies, Space Weather, Climate Change Studies, Atmospheric Trace Gases and Aerosol Chemistry, Terrestrial Carbon and Biospheric Studies, Land Use, Land Cover Dynamics and Ecosystem Studies, Glacier and Snow monitoring using satellites.



He carried out number of national level projects on various environmental issues including urban transport management. He has been consultant to World Bank Pakistan, Ministry of Environment, New York State Department of Health, Department of Environment and Alternative Energy Sindh, City District Government Karachi. He holds PhD degree in Environmental Engineering and is an author of 110 international scientific papers. He is presently attached with Institute of Space Technology Islamabad as Head of Remote Sensing and Geo-Information Science Department.

#### **Abstract:**

Virtually all human activities have an impact on our environment, and transportation is no exception. While transportation is crucial to our economy and our personal lives, as a sector, it is also a significant source of greenhouse gas (GHG) emissions and other important air pollutants. The presenter will focus on different types of fuels and relevant technologies and how they can be applied in specific situations.

Based on current GHG emission reports, the transportation sector is the second largest source of GHG emissions, behind only electricity generation and cement manufacture. Nearly 95 percent of transportation GHG emissions come through direct combustion of fossil fuels, with the remainder due to carbon dioxide (CO<sub>2</sub>) from electricity (for rail) and hydro fluorocarbons emitted from vehicle air conditioners. A wide range of strategies and methods are available to reduce greenhouse gas (GHG) and pollutants emissions from the transportation sector. Some of these can be implemented by transportation agencies, and others involve action by industry (e.g., auto manufacturers, freight shippers, airlines, railroads) and the public. The development and implementation may be affected by transportation or environmental policies.

## Paper 17: Public Transport Pricing Strategies using an Agent-based Simulation Platform – A case study of Singapore, lessons for Pakistan

**Dr. Muhammad Adnan, Associate Professor, Department of Urban and Infrastructure Engineering, NED, University of Engineering and Technology, Karachi**

Dr. Muhammad Adnan is working as Associate Professor in the Department of Urban and Infrastructure Engineering, NED University of Engineering and Technology, Karachi. He has around 12 years of experience in teaching and research. He has more than 25 publications that are published in top level International conferences and Journals. He completed his PhD in 2010 from University of Leeds, UK in the field of Transport Modeling and Network Analysis. In 2014, he was awarded one-year Post-doctorate fellowship from Singapore-MIT Alliance for Research and Technology, National University of Singapore. He was involved in carrying out number of case studies for Singapore with local government for improvement of public mass transit system using state of the art agent-based simulation platforms. His research interests include Activity-based modeling, dynamic network assignment and public mass transport operations. He has completed number of research projects in collaboration with national and international funding agencies that are directly related to Transport problems and issues of Karachi metropolitan.



### **Abstract:**

Public transportation authorities across the world are implementing various peak and off-peak pricing strategies to manage travel demand and improve the overall system performance. In this study, an activity-based demand framework is used to evaluate two off-peak pricing policies currently in use in Singapore. These policies consist of a free pre-peak travel on mass rapid transit (MRT) system and an off-peak discount for an integrated transit (public buses and MRT). Smart card data collected before and after the implementation of the first policy was used to calibrate the behavioral models involved, in order to properly capture travelers' preferences and choices. To evaluate both pricing strategies, a comprehensive set of key performance indicators was considered, including the changes in peak ridership, average trip fare, operator's revenue, the number of public transit trips and mode share. The results indicate that off-peak discount pricing strategies are a viable policy option for spreading demand peaks, and that they are more effective in the afternoon peak. This study also demonstrates the capabilities and the advantages of an agent-based modeling platform SimMobility as a tool for policy analysis. In context of Pakistan, where Bus Rapid Transit (BRT) and Light Rail Transit (LRT) systems are conceived as solution of transport problems of commuters and huge amount of investment being made in this sector. It is therefore at the same time vital to invest in advanced planning tools and simulation platforms that are able to assess impacts of innovative policies once the system are operational. For example; policy in which system is running to follow skip-stop operations, time, location-people-based pricing policy, multi-modal travel options in terms of innovative access and egress modes, such as bike sharing and free access or egress ride.

## Paper 18: Estimation of Vehicular Emissions and climate co-benefits of technology upgradation in Islamabad

**Prof. Dr. Zeeshan Ali Khan, Professor Environmental Sciences,  
NUST Islamabad**

Dr. Muhammad Zeeshan Ali Khan did his Bachelors in Chemical Engineering from NWFP UET Peshawar and served in Fauji Fertilizer as trainee engineer for a year before leaving for his MS leading to PhD in Asian Institute of Technology (AIT), Bangkok, Thailand. His research interests include, Air pollution Control and Alternate Energy resources. He is currently serving in Institute of Environmental Sciences and Engineering (IESE), National University of Science and Technology (NUST), H-12 campus, Islamabad.



### **Abstract:**

Light Duty Vehicles (LDVs) hold a major share in Islamabad's vehicle fleet. In this presentation, mainly, LDV emissions in Islamabad for the base year (2014) and two optimistic 'what-if' scenarios were estimated by using the International Vehicle Emissions (IVE) model are presented. Considering the recent implementation of Euro II as emission standard in Pakistan, scenario 1 assumed entire LDV fleet meeting at least Euro II standards while scenario 2 assumed all LDVs meeting Euro IV standards except motorcycles which would be meeting Euro III emission standards. Higher average age for all vehicles and lower share of Euro compliant vehicles was found in the base case. Low engine stress mode (lower speeds with frequent decelerations) was observed for all vehicles especially on arterials and residential roads. Highest overall emissions (59%) were observed on arterials, followed by residential roads (24%) and highways (17%) with higher emissions observed during morning (8-10 am) and evening (4-6 pm) rush hours. Composite emission factors were also calculated.

# Theme 5: Institutional Framework and Sustainable Transport

## Paper 19: Role of Planning and Development Agencies in Achieving Sustainable Transport

### Prof. Dr. Syed Shabih-ul-Hassan Zaidi, Ex-Dean and Chairman of City and Regional Planning Department, UET, Lahore

Prof. Dr. Syed Shabih-ul-Hassan Zaidi is currently working as Spatial Planning Expert with MM Pakistan (Prvt.) Limited Lahore. He is former Chairman of City and Regional Planning Department of the University of Engineering and Technology (UET), Lahore, Pakistan. Previously, he was appointed as the Chairman of City and Regional Planning Department from 1997 to 2004 and the Dean of the Faculty of Architecture and Planning from 2004 to 2010 at UET, Lahore. He obtained his Ph.D. degree in Urban and Regional Planning from the University of Birmingham, England in 1990. Earlier, he graduated in City and Regional Planning from the UET, Lahore in 1975 and obtained an M.Sc. in Human Settlements Planning from Asian Institute of Technology, Bangkok in 1982. He started his career as a Lecturer in 1975 and was appointed as Professor in 1995. He has been a visiting faculty member of the Civil Services Academy, DMG Campus Lahore for the last 10 years. He has over 40 years experience of teaching and research in the field of Urban and Regional Planning. He has also participated in many urban and regional studies sponsored by the World Bank, UNICEF, IUCN and the Government of Pakistan and contributed as team leader in a number of consultancy projects of national importance. He obtained the Best University Teacher Award from Higher Education Commission of Pakistan in 2002 and achieved the rank of University Meritorious Professor in 2005. Prof. Zaidi is a Fellow of the Institute of Planners Pakistan (IPP), and a Member of the American Planners Association (APA). He has over 50 national and international publications to his credit including journal articles, conference proceedings and book chapters.



#### **Abstract:**

Sustainable transport is the need of the day for our cities. However, the present situation of our metropolitan cities reveals that sustainable transport is not available anywhere in this country. The local development authorities responsible for the planning and development of our large cities have made byelaws, rules and regulations that encourage the use of private vehicles for local travel. This paper will critically examine the current role of Planning and Development agencies such as Lahore Development Authority (LDA) in achieving sustainable transport. The current policies and master plans prepared and followed by LDA have encouraged urban sprawl which has resulted in a transport system which is mainly based on cars or personal vehicles. This has resulted in the development of a non-sustainable transport system. A recent research has revealed that the trip length for job, schooling and shopping has increased uncontrollably and caused an increased carbon footprint in the city. The low density new housing schemes developed on the outskirts of the city do not encourage walkability. There is a need to develop a new, sustainable public transport system which would help to reduce the use of cars and the carbon footprint in the city. For this the public planning and development agencies such as LDA will have to redefine their role and follow

such policies and strategies that will help in achieving sustainable transport as well as sustainable communities by modifying their existing Housing Scheme Approval Regulations and revising the existing Master Plans. The new policies should be geared towards the development of pedestrian precincts or walkable communities which are very well linked with other housing schemes through a sustainable public transport system (Local Bus or Train). The residents would be directed to park their personal cars in the public parking areas created at nodal points of their housing schemes and only emergency vehicles would be allowed to reach the individual houses at the time of need. This arrangement would not only help in improving people's health (by reducing obesity) but also reduce the carbon footprint which will ultimately help in averting climate change.

## Paper 20: Institutional alignment for sustainable public transport.... case study of Punjab

### **Dr. Nasir Javed, Chief Executive Officer, Urban Sector Planning & Management Services Unit (Pvt.) Ltd., P&D Department, GoPb, Pakistan / Component Director Punjab PAKSTRAN**

Dr. Nasir Javed is a senior civil servant with wide administrative experience in various Government departments. He holds graduate degrees in medical sciences and law. He is a Chevening scholar for 1998, wherein he distinctively passed MBA from the University of Wales, Cardiff, UK, and a seasoned institutional and capacity development specialist, who has led many successful projects in the development sector in Pakistan. Though he belongs to the prestigious Pakistan Administrative Services Group of the Civil Services, he opted to spend most of his career in the Urban Sector, starting from Karachi Metropolitan Corporation in 1995. During his professional career spanning more than 3 decades, he has been offering significant consultancy services to various local and global organizations, apart from coaching and mentoring the academia while he was associated with elite academic institutions. He has provided consultancy services to various National and International organizations including ADB, UNICEF, UNDP, WWF, LEAD Pakistan and USAID. He designed and established the Urban Sector Policy & Management Unit at the P&D Department GoPb in 2005. Under his leadership some of the key projects of the Urban Unit include, Punjab Cities Governance Improvement Project, Pakistan Sustainable Transport (PAKSTRAN) Project, Establishment of Intelligent Transport System for Metro Bus Service (MBS) Lahore, Punjab Intermediate Cities Improvement Investment Program, Urban Immovable Property Tax Project, Changa Paani Program, Drafting the Punjab Municipal Water Act 2011, technical support for the establishment of the Lahore Waste Management Company and organizing the first ever Pakistan Urban Forum in 2011. He is the founding chief editor of 'Pakistan Journal of Urban Affairs' and has contributed to many publications of the Urban Unit regarding urban issues and municipal services.



## Paper 21: Innovative Ways of Funding Public Transport

**Dr. Imran Muhammad, Associate Professor of Transport & Urban Planning,  
Massey University, New Zealand**

Dr Imran Muhammad is Associate Professor of transport and urban planning at Massey University New Zealand. Imran received his BSc and MSc Urban Planning degrees from UET, Lahore, the University of Hong Kong and Ph.D. from the University of Melbourne. He has worked as a researcher at the University of Melbourne, Monash University and RMIT University in Australia and as a practitioner at the Victorian Road Authority and British Columbia International. Imran's research interest broadly focuses on how institutions can promote sustainable transport in cities in developed and developed countries. Imran research argues for a greater recognition of the role of politics and the capacity of local institutions in transport decision making. Imran is the sole author of a book, *Institutional barriers to sustainable urban transport in Pakistan* published by Oxford University Press. Imran provided consultancy services to local councils in New Zealand and Australia, New Zealand Transport Agency and the World Bank.



### **Abstract:**

The lack of funding for public transport is a serious issue in the cities of developed and developing countries. Traditional methods of public sector funding are not enough to build and then improve public transport infrastructure and services, and innovative funding mechanisms are needed to address this issue. From a global review of the literature, this presentation explains a number of ways of funding public transport and suggests some options that might be useful for funding public transport in Pakistan. Based on the review, funding sources are grouped into five categories: beneficiary pays development taxes, polluter pays carbon taxes, public transport operational and infrastructure funds, private sector funding and other funds. These broad categories are further divided into specific funding opportunities and their strengths, weaknesses and experiences of their use in cities across the world are discussed. Finally, appropriate funding options for Pakistani cities have been selected from the range of options presented and their potential contribution and challenges are considered.



## Paper 22: Institutional Framework and Sustainable Transport – a case study of Islamabad BRT

### Mr. Qazi Mohammad Omar, Director BRT CDA Headquarter, Islamabad

Mr. Qazi Muhammad Omar holds a Masters degree in Civil Engineering (Construction Management) from Near East University - Cyprus. From the last three years he has been working with Capital Development Authority (CDA) Islamabad as Project Director (Bus Rapid Transit). Mr. Omar is also registered as professional Engineer with PEC Pakistan and YÖK Turkey.



Mr. Omar has an extensive work experience in Project Planning & Management within the Construction Industry. He started his career in 1996 with STFA Joint Venture (Turkish Construction Company) as a Construction Engineer. Moving on he worked at GOVSA Construction Co. Ltd. as a Construction Manager for two years. From 1999 – 2001, Mr. Omar was engaged with National Engineering Services of Pakistan (NESPAK) as a Senior Site Engineer (SSE). Later he worked at Communication and Works, Physical Planning & Housing Department (Government of Balochistan) as a Sub Divisional Officer (Projects) from 2001 to 2007. Mr. Omar joined Capital Development Authority (CDA) Islamabad in 2007 where he worked as Project Director PMO till 2012.

As a bonus to his work experience, Mr. Omar has attended many trainings, workshops and short courses at credible institutes on varied topics such as; Cities and Climate Change, Modern Trends in Project Management, High Strength & High Performance Concrete for High rise Buildings, Heating Ventilating Air-Conditioning and Refrigerating HVACR, Water Problems in the Mediterranean Countries, and Earthquake Hazards & its preventions.

## Paper 23: Performance Indicators for a Sustainable Design of Intercity Bus Terminal

**Professor Dr. Tanvir Iqbal Qayyum, Associate Dean Civil Engineering Department, University of South Asia, Lahore**

Professor Dr. Tanvir established Department of Transportation Engineering and Management (DTEM), at University of Engineering and Technology Lahore. He was the Founder Chairman of DTEM since 2006 - 2013. He developed “Stratigraphic Map of Pakistan”, published in 13th Asian Regional Conference on Soil Mechanics and Geotechnical Engineering, held on 10–14 December, 2007 at ITC Sonar Bangla, Kolkata, India. Netlon Advanced Turf based on his Ph.D. research, got worldwide acceptance.



He holds Ph.D. Civil Engineering from U.K.-and MSc. Civil Engineering in Transportation Engineering from Saudi Arabia. He taught several Transportation Engineering courses to under and post-graduate classes, supervised BSc/MSc. Projects.

He was granted several Gold Medal awards for excellent performance in Transportation Engineering by NGO's. He has published seventy six national and international research papers and participated in several TV and Radio programs as Transport Expert.

### **Abstract:**

Rapid growth and increased mobility in metropolitan cities of developing countries contribute towards more congestion, pollution and environmental degradation on transportation infrastructure. A significant factor in this regard is the higher use of private transport for both the intra and intercity trips. For intercity travel the decreased mode share of public transport can be attributed towards poor design of bus terminals, non-availability of design standards and out dated classification based on area and administration authority only. Therefore, there is a need of better and effective criteria for evaluation of intercity bus terminals. The research was conducted to evaluate the intercity bus terminals in metropolitan Lahore, Pakistan. Eleven intercity bus terminals of Lahore were selected. Evaluation based on Performance Indicators (PIs) for a sustainable design of intercity bus terminal was conducted with the help of different types of surveys. Six PIs from user's perception were developed i.e. Safety and Security, Access, Information, Connection and Reliability, Environment and Facilities. The bus terminals were also ranked according to user satisfaction. It was found that there is a complete absence of any standards for sustainable design of intercity bus terminals in Lahore. The results showed that the privately owned intercity bus terminals perform better and are more likely to be sustainable as compared to the government owned terminals. Likewise, the users indicated to be more satisfied with the privately owned terminals. In addition, the users rated “Safety and Security” as the most important among the six PIs. It is therefore recommended to establish standards/classification for sustainable design of intercity bus terminals using six PIs as measures of performance.