Suburbanization in the United States between 1910 and 1970 was concurrent with the diffusion of the automobile. A circular city model is developed in order to access quantitatively the contribution of automobiles and rising incomes to suburbanization. The model incorporates a number of driving forces of suburbanization and car adoption, including falling automobile prices, rising real incomes, changing costs of traveling by car and with public transportation, and urban population growth. According to the model, 60% of postwar (1940–1970) suburbanization can be explained by these factors. Rising real incomes and falling automobile prices are shown to be the key drivers of suburbanization.

13) A COST-BENEFIT ANALYSIS OF ALTERNATIVE DEVICE CONFIGURATIONS FOR AVIATION-CHECKED BAGGAGE SECURITY SCREENING

By Sheldon H. Jacobson; Tamana Karnani; John E. Kobza; and Lynsey Ritchie


The terrorist attacks of September 11, 2001 have resulted in dramatic changes in aviation security. As of early 2003, an estimated 1,100 explosive detection systems (EDS) and 6,000 explosive trace detection machines (ETD) have been deployed to ensure 100% checked baggage screening at all commercial airports throughout the United States. The prohibitive costs associated with deploying and operating such devices is a serious issue for the Transportation Security Administration. This article evaluates the cost effectiveness of the explosive detection technologies currently deployed to screen checked baggage as well as new technologies that could be used in the future. Both single-device and two-device systems are considered. In particular, the expected annual direct cost of using these devices for 100% checked baggage screening under various scenarios is obtained and the tradeoffs between using single- and two device strategies are studied. The expected number of successful threats under the different checked baggage screening scenarios with 100% checked baggage screening is also obtained. Lastly, a risk-based screening strategy proposed in the literature is analyzed. The results reported suggest that for the existing security setup, with current device costs and probability parameters, single-device systems are less costly and have fewer expected number of successful threats than two-device systems due to the way the second device affects the alarm or clear decision. The risk-based approach is found to have the potential to significantly improve security. The cost model introduced provides an effective tool for the execution of cost-benefit analyses of alternative device configurations for aviation-checked baggage security screening.

KEYWORDS: Aviation security; cost benefit; economic analysis; risk assessment
14) COST EFFECTIVENESS ANALYSIS AND TRANSPORTATION: PRACTICES, PROBLEMS, AND PROPOSALS

By Robert J. Eger III and Amanda L. Wilsker

Cost effective analysis (CEA) is used frequently in health and other fields in which controlled experiments are possible. The problem is, however, that for many activities that are outsourced in infrastructure finance, we have no comparison groups, and when comparison groups are present, we have no data on quality, presenting any interested researcher or decision maker with some serious dilemmas. In this article we establish some basic guidelines for the collection and use of quality data, and associate these with our own errors in attempting CEA with a lack of an existing quality measure.

15) TARGETING URBAN CONGESTION: EQUITY AND SECOND-BEST ISSUES

By Harry Clarke
Department of Economics and Finance, La Trobe University

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Distributional and second-best problems of implementing efficiency based demand management of road use in Australian cities are addressed. Both road use pricing and parking policies are considered. Failure to price roads and parking spots efficiently contributes to excessive travel and to excessive urban expansion. A key policy concern is to promote demand management acceptability by offering transportation alternatives and by making explicit the sources of efficiency gain from revenue neutral road charging policies with double dividend advantages. Second-best policies of restricting land releases on city boundaries to encourage more compact city development may be inferior to policies of pricing major roads, cordon pricing and demand based parking policies.

16) POTENTIAL GAINS FROM MORE EFFICIENT SPENDING ON TEXAS HIGHWAYS

By David M. Luskin; Erin E. Mallard; Isabel C. Victoria-Jaramillo

The Federal Highway Administration developed a state-level version of its Highway Economic Requirements System (HERS-ST) model to help states planned manage their highway systems. Unlike frameworks that consider engineering sufficiency criteria only, the HERS-ST model also allows economic
evaluation based on benefit-cost analysis. This study employs the model to address two questions about the level and allocation of investment spending on Texas highways: (1) Does the level of spending fall short of what is economically warranted and, if so, by how much? (2) Could a reallocation of spending between urban and rural areas, and among the highway functional classes produce substantial benefits? The results suggest that Texas is indeed under-investing in highway by a substantial amount. TxDOT expenditure on highway investments within the scope of HERS-ST averaged $2.7 billion per year during the 5 years starting FY 2000, and continuation of recent trends would bring the annual average for the 20 years starting in that year to about $3.4 billion. Relative to this 20-year projected level of spending, our estimates from HERS-ST indicate that a near doubling would be economically warranted. The results also indicate that reallocation of investment spending, relative to the recent historical pattern, would produce substantial benefits. These gains are estimated at over $5.6 billion per year from reallocating funds from rural to urban areas, and over $1.0 billion per year from reallocating urban and rural funding among highway classes. The estimates are only broad indications, however, and numerous caveats apply.

17) A CHOICE EXPERIMENT APPROACH IN EVALUATING PUBLIC TRANSPORTATION PROJECTS

By Junyi Shen
Institute of Social and Economic Research, Osaka University


The necessity of applying cost benefit analysis in evaluating the validity of a public transportation project is well recognized by policy makers in recent days. Originating in this fact, we implement CBA in a new project called Osaka Monorail Saito Line Extension by applying a choice experiment approach. It is estimated that the benefit-cost ratio is 1.87 under a basic scenario. In addition, with a consideration on different kinds of uncertainty in the future, a number of sensitivity analyses are implemented. The results of sensitivity analyses indicate that the possibility of generating net benefit is extremely high for the project studied in this article.

18) SHOULD URBAN TRANSIT SUBSIDIES BE REDUCED?

By Ian W. H. Parry and Kenneth A. Small
This paper derives empirically tractable formulas for the welfare effects of fare adjustments in passenger peak and off-peak rail and bus transit, and for optimal pricing of those services. The formulas account for congestion, pollution, accident externalities, scale economies, and agency adjustment of transit service offerings. We apply them using parameter values for Washington (DC), Los Angeles, and London. The results support the efficiency of the large current fare subsidies; even starting with fares at 50 percent of operating costs, incremental fare reductions are welfare improving in almost all cases. These findings are robust to alternative assumptions and parameters. (JEL L92, R41, R42, R48)

19) PUBLIC TRANSPORT VERSUS PRIVATE CAR GIS-BASED ESTIMATION OF ACCESSIBILITY APPLIED TO THE TEL AVIV METROPOLITAN AREA

By Itzhak Benenson; Karel Martens; Yodan Rofé; Ariela Kwartler

The increasing interest in sustainable development has underlined the importance of accessibility as a key indicator to assess transport investments, urban policy, and urban form. From both the environmental and the equity component of sustainability, a comparison of accessibility by car versus public transport is of utmost importance. However, most studies in this direction have used rather rough estimates of travel time, especially by public transport. In this paper, we present Urban Access, an ArcGIS extension for estimating car-based and transit-based accessibility to employment and other land uses. Urban Access enables a detailed representation of travel times by transit and car and thus makes it possible to adequately compare accessibility levels by transport mode. The application of Urban Access to the Tel Aviv metropolitan area shows that the gaps between car-based and transit-based accessibility are larger than those found in other studies. We argue that this is not the result of a poorer transit system, but rather of a more detailed description of travel by transit in the Urban Access application. The larger gaps point to a greater need for adequate policy responses, both for reducing car dependence as well as for creating a more equitable transport system. Hence, we uphold that an adequate representation of transit travel times is more than a scientific matter—it is a matter of great social importance.

20) COST OF A RIDE: THE EFFECTS OF DENSITIES ON FIXED-GUIDE WAY TRANSIT RIDERSHIP AND COSTS

By Erick Guerra and Robert Cervero
High costs and low ridership are the bane of fixed-guide way transit investments. The net capital and operating cost per passenger mile of recent investments ranged from $0.22 to over $10 in 2008. A better understanding of characteristics of the most successful transit investments can help inform future investment policy and improve the performance of existing transit systems. We evaluated the ridership, operating costs, and capital costs of recent transit investments and identified job and population densities that can support more cost-effective fixed-guide way transit service. Combining investment and station-level data from over 50 American fixed-guide way transit investments with time-series data on 23 transit systems and surrounding land uses, we modeled the influence of job and population densities on transit ridership and capital and operating costs. Based on these results, we estimated the marginal costs per passenger mile of increasing transit ridership through system expansion, increased service, and decreased fares. Controlling for neighborhood, regional, and transit service attributes, population and job density are positively correlated with both ridership and capital costs. As density increases, so do capital costs and ridership. Density, however, has an inverse relationship to capital cost per rider and total costs per passenger mile. Higher densities tend to improve transit's cost effectiveness, in spite of higher capital costs. Job and population densities around transit stations are frequently below minimum thresholds needed for cost-effective transit investments and operation. This contributes to high costs per passenger mile on many transit systems. We generate density guidelines for cities and towns to use as a point of comparison and a potential target for zoning around existing and proposed transit stations based on actual or projected capital costs.

KEYWORDS: transit-supportive density, fixed-guide way transit, rail capital costs, transit ridership, public transportation.

21) AN EFFECTIVE OUTLINE BUSINESS CASE TO FACILITATE SUCCESSFUL DECISION-MAKING

By Mark John Gannon; Nigel John Smith

Construction Management and Economics (February 2011)29, 185–197

Historically the public sector’s outline business case for Light Rapid Transit/Metro public–private partnership projects delivered in the United Kingdom has frequently failed to address the project affordability decision. As a consequence the business cases have had to be reworked, redeveloped or have required the project to be revoked, in each case wasting significant amounts of public and private sector time and money. The development and testing of an effective outline business case to facilitate successful project affordability decision-making for PPP projects is described. A mixed methods research approach was
adopted utilizing a case study research methodology, interviews with PPP experts to identify business case critical success factors and application of the analytical hierarchical process to assess their effectiveness. The Delphi technique was used to verify and validate the effectiveness of the outline business case. The findings demonstrated that the success of the outline business case in practice relies on three critical success factors: the degree of political support, achieving a balance between political PPP ideology and the market’s acceptance of the contractual model and the level of transparency and commitment from suppliers. These factors are major uncertainties, are difficult to represent accurately within the business case and signify a major constraint to the sponsor forecasting the project’s affordability.

KEYWORDS: Public–private partnership, business case, project affordability, project decision-making, analytical hierarchical process.

22) A COMPARATIVE STUDY OF EXECUTIVE AND NON-EXECUTIVE ASSOCIATES OF DELHI METRO RAIL CORPORATION FOR THEIR LEVEL OF COMMITMENT AND PERSONAL EFFICIENCY

By Anu Singh Lather and Sangeeta Mohan

Present research was designed to study the level of commitment and personal efficacy amongst the associates of Delhi Metro Rail Corporation (DMRC) and also to understand the relationship between these two variables. Data was collected from 50 executives and 50 non-executives of DMRC. For this purpose, Organizational Commitment Instrument (OCI) and Personal Efficacy Test were administered individually to all employees. Chi-Square was applied to see the level of commitment and personal efficacy of executives and non-executives. The results were analyzed using Chi–square test Pearson Product Moment correlation. The results revealed that Chi–square for commitment was 35.78, which was significant at 0.01 level. The comparison of results of executive and non–executive associates showed that large number of executive associates (n = 27) where highly committed, moderate number of employees (n = 15) fell into medium commitment range and few (n = 8) were low committed executives. The results were almost reverse in case of non–executive employees. There was only one employee from non–executive group who showed high level of commitment. Majority of this group was either moderately committed (n =22) or low on commitment (n = 27). The comparison of results on personal efficacy between executive and non–executive employees showed a Chi–square value of 27.01 significant at 0.01 level. The results reflect that the executive employees showed high personal efficacy (n =27), medium personal efficacy (n = 17) and few showed low personal efficacy (n=6). The reverse trend was seen with the non–executive employees.
Majority of employees showed low personal efficacy (n = 25) and medium personal efficacy (n=20). There were only 5 non-executive employees who showed high personal efficacy. The correlation coefficient of commitment with personal efficacy (n–100) came out to be 0.324 significant at 0.001 level.

KEYWORDS: Delhi Metro Rail Corporation, Executive Associates, Non-Executive Associates, Personal Efficacy.

23) MASS URBAN TRANSPORTATION IN INDIA: FEATURES OF THREE MODELS AND LEARNING

By Ramakrishna Nallathiga

Urbanization and urban population growth have now firmly gripped India, and together with them metropolitanization of cities has also been happening. It is expected that the metro class cities (cities with more than 1 million population) shall have the mass urban transport systems in order to sustain their growth and function efficiently on that scale. All the three modes of transport—rail, road and water—can play an important role in the development of suitable transport system in Indian cities. This paper evaluates the attempts to provide mass urban transport systems in the three major metropolitan cities in India—Mumbai, Delhi and Ahmedabad. It brings out the features for each of them, which refer to different systems of transport. The learning and way forward for the remaining metro cities have also been spelt out.

24) MYTHOLOGIES, METROS & FUTURE URBAN TRANSPORT

By Dinesh Mohan

There is still no clear vision among planners, policy makers and transport experts about what cities in India need and what will make them better places to live in as far as mobility and access are concerned. The prevailing mythology is that construction of metro rail systems will somehow solve problems of the future and they remain the single one point agenda of almost all transport consultants in India. Review of urban mass transport systems over the past century shows that metro systems were the obvious choice when relatively inexpensive cars and two-wheelers were not available. With the introduction of efficient buses, computer and information technologies to manage large fleets and the need to have flexible, medium capacity systems that go close to homes and destinations, bus rapid transit systems with dedicated lanes seem to be the only choice for providing affordable mass transport in our cities.
25) LET US BEGIN THE JOURNEY THROUGH DELHI METRO

By Amol Azad; RajatSingla

The National Capital Territory of Delhi with a population of around 14 million has a vehicle population of around 4 million. Bus travel is the pre-dominant mass transportation system in Delhi. This has resulted in increasing traffic congestion, increasing road accidents and increasing air pollution. Though a number of studies were carried out and recommendations made to solve the mass transportation problem of Delhi, it was only in 1998 that the DMRC was formed with equal equity participation of the Government of India and the Government of the capital territory of Delhi to plan, execute, operate and maintain the Delhi Metro. The Delhi Metro Rail Project is being planned and executed in four phases – Phase I, Phase II, Phase III, Phase IV.

26) DELHI METRO RAIL – A TECHNOLOGICAL AND FINANCIAL BREAKTHROUGH

By Fenil Shah

Main reason behind Metro Planning

As cities grow in size, the number of vehicular trips on road system goes up. This requires a pragmatic policy shift to discourage private modes and encourage public transport. Delhi has experienced phenomenal growth in population in the last few decades. Its population has increased from 6 million to almost 18 million today. For want of an efficient mass transport system, the number of motor vehicles had increased from 0.5 million to more than 4 million today. The result is extreme congestion on Delhi roads, ever slowing speed, increase in road accidents, fuel wastage and environmental pollution with motorized vehicles alone contributing to about two thirds of the atmospheric pollution.

27) THE PLANNING AND DEVELOPMENT OF A NEW METRO SYSTEM: THE CASE OF THE DUBAI METRO

By Yung; Hiu-wah; Eva

Dubai has a vision of becoming the financial and economic hub in the Middle-East to attract both regional and global investment. To achieve this vision, the Ruler of Dubai has made strategic decision to improve the infrastructure support in Dubai including the building of Dubai Metro which is a massive network.
This paper has a central theme of analyzing the appropriateness of building a new metro system to solve the current transport problems in Dubai. With the given population of 1.25 million in 2007 and predicted to reach 5.25 million by 2020, the accuracy and reliability of the population growth prediction is an unknown. The population growth will be the basis of determining the financial sustainability of the Metro system. The factors which affect the government policies and planning decision of building Dubai Metro are identified.

The transport policy and decision making of Dubai Metro is mainly vision-led. It heavily depended on the leader’s vision to grow the future of the city. On the other hand, Hong Kong takes a different approach which the vision, transport policy and planning has gone through public consultation. As such, the policymakers in Hong Kong had a better understanding of the community needs.

Mass transit is a new concept in Dubai. There is not any policy or solution being able to tackle the transport problems. It takes time for Dubai Government to evolve its policies by trial and error. The first Strategic Plan by RTA was a good mark of moving towards sophisticated policy development like other mature cities. There is a strong car-culture established in Dubai. It would take Dubai Government a lot of efforts in adopting different administrative measures to shape the travelers’ individualistic behavior to use public mass transit. However, Hong Kong had many years of experience in formulating transport policies and planning. With 90% of the daily transport (12 million trips per day) made by public transport, Hong Kong urban transport was always benchmarked by other modern cities worldwide.

The comparative studies of transport policy and planning between Dubai and Hong Kong drew some useful guidance for other cities as reference. There are two major findings in this paper:

The success of implementing the transport policy to tackle the transport problems depends on the policy formulation process. It is suggested to take a public consultative approach to better understand the community’s needs. The community benefits would be the ultimate achievement of formulating transport policies.

The achievement of Dubai Metro in tackling the traffic congestion problems depends on the travel behavior of the people shifting from private car to mass transit.

28) TOWARD SUSTAINABLE MOBILITY IN URBAN INDIA

By Om Prakash Agarwal; Samuel L. Zimmerman
With rapid growth in the number of personal motor vehicles, Indian cities have been facing increasing congestion and worsening air quality. Yet until early 2005 little attention was paid to this problem, and remedial measures were focused largely on overpasses and new roadway capacity. Only Delhi, Calcutta, and Chennai had built functioning metro rail systems. However, by the second half of 2006, barely a year and a half later, the situation changed considerably, and public transport became the focus of attention in most large and medium-sized cities. This paper looks at the national initiatives that helped bring about those changes. The adoption of a national urban transport policy along with the launching of a national urban renewal mission with a sizable commitment of funds helped focus attention on improving public transportation. These were supplemented by a series of well-conceived and -planned initiatives, again led by the national government, to generate more widespread awareness of urban mobility problems and how they could be successfully addressed. The results were visible in a mere 18 months, by which time several cities had already formulated plans for significantly improved public transport and the first incremental phase of what will be India’s first bus rapid transit system had become operational.

29) DEMAND FOR HYBRID CAR IN INDIAN METRO CITIES

By Debabrata Das; R. Srinivasan; Raj S. Dhankar

The depleting stock of fossil fuels, environmental problems, and global warming are today’s major concerns. Existing studies identify that transport sector is one of the major contributors towards these problems. Constant efforts in search of alternative, less polluting fuel are being made. Hybrid car technology uses the gasoline and electric technology to reduce air pollution, and save oil. From the field study it is observed that the people with conventional thinking, constituting about one-third of respondents, show more concern for environment. The variables leading to demand for hybrid cars could be energy efficiency, concern for environment, etc. Despite being price sensitive, Indian consumers are willing to pay a decent premium for acquiring this environment friendly car. This study is undertaken with the objective of analyzing the scenario of hybrid car in India, and its market potential. The study conducts a questionnaire-based consumer survey based on demographic, economic, and desirable features in a hybrid car; using logit model and factor analysis for identifying variables useful for the study.

KEYWORDS: hybrid car; logit model; factor analysis; alternative fuel; fuel efficiency; metro cities; India.
30) MESSAGE IN A METRO: BUILDING URBAN RAIL INFRASTRUCTURE AND IMAGE IN DELHI, INDIA

By Matti Siemiatycki

The world over, infrastructure mega projects have become more prevalent, even as evidence suggests that such projects often experience significant cost overruns while failing to fully deliver on their projected benefits. In this light, this article will argue that continued support for infrastructure mega projects stems from the way that such projects are presented to the public. Using the case of the development of a metro railway in Delhi, India, it shows that galvanizing public support and attracting patrons to a public transit system stems from creating an all-round positive image that combines tangible variables with an intangible set of symbolic meanings. Of course, image is only an impression, and does not necessarily reflect reality. In this light, the final section of this article examines the broad physical and societal implications of the metro development in Delhi, and uncovers the driving forces behind the project. The article concludes that, in spite of the cultivation of a positive image, the specific metro form that was developed in Delhi to satisfy each of the special interest groups involved in its production might be specifically one that fails to suit the transportation needs of the city.

31) DUBAI METRO AND RTA DUBAI BUS: LOCAL EFFICIENCY AND THE CITY’S GLOBAL IMAGE

By Jack Keilo; Clémence Montagne

Since the reconfiguration of the United Arab Emirates in 1971, the three major modes of transport - maritime, air and road- were incorporated in Dubai’s global identity. However, an efficient intra-urban public transport system was lacking. Since its inauguration in 2009, Dubai Metro was presented as a response to the challenges posed by the local road network, by traffic congestion and pollution, and it is more and more present in the urban image of the city and in the construction of its global identity. However, RTA Dubai Bus is the less-known public transport system.

This paper will examine the role of the two intra-urban public transport systems in the building of Dubai’s global identity; it will compare the forceful role of Metro Dubai with the more absent one of RTA Dubai Bus. A survey was implemented to identify the users of both the Metro and the Bus; accessibility was measured by an analysis of the routes. It is argued that Dubai Metro is being integrated in the global identity of Dubai, while the RTA Dubai Bus is not. It is assumed that cities are selective in what to integrate in their
identity on the global scale, and efficiency is not the only important factor. Dubai has shown that modernity can be a clear determinant in choosing a particular mode of intra-urban public transport.

32) EVALUATION OF PUBLIC TRANSPORT SYSTEMS: CASE STUDY OF DELHI METRO

By Mukti Advani; Geetam Tiwari

Growing number of vehicular trips by cars and two wheelers which result in traffic congestion, air pollution and traffic accidents has become a major concern in urban areas. Investments in high capacity rail based mass transit systems are being promoted to arrest this trend. In the last two decades Kolkata, Chennai and Delhi have invested in MRTS/LRT systems. This paper analyses the methodology and arguments used to justify these systems. The paper presents evaluation of Delhi metro in terms of capacity, travel time and accessibility to the system and evaluation indices reflecting commuter’s perspective.

KEYWORDS Delhi Metro, Public Transport, Buses

33) MEASURING THE NEIGHBORHOOD BENEFITS OF RAIL TRANSIT ACCESSIBILITY

By Steven Lewis Workman; Daniel Brod

For many Americans, living near high-quality rail transit stations provides an array of benefits. The benefits arise from lower transportation expenses, changing development patterns, and other nonuse factors. Automobile-centered development patterns increase congestion, sprawl, and pollution. The benefits of transit-oriented neighborhoods are explored. A hedonic price function is used to estimate property values and the effect of proximity to rail transit stations. Geographical information system databases were used to calculate actual walking distances to transit, providing a much more accurate measure of the “proximity” variable than the usual measure of straight-line distance. The results indicate that proximity to rail transit stations can be a significant source of benefit to residents within walking distance. Whereas light rail transit stations in Portland, Oregon, indicate minimal effects, the magnitude of the benefits for the Bay Area Rapid Transit and New York City Metropolitan Transportation Authority stations, when compared with standard measures of transit benefits, indicate that benefits from transit exceed those attributable to transit use.
34) MEASURING ENVIRONMENTAL EFFICIENCY OF INDUSTRY: A CASE STUDY OF THERMAL POWER GENERATION IN INDIA.

By Murty M N and Surender Kumar and Kishore Dhavala

Institute of Economic Growth, New Delhi

Technical and environmental efficiency of some coal-fired thermal power plants in India is estimated using a methodology that accounts for firm’s efforts to increase the production of good output and reduce pollution with the given resources and technology. The methodology used is directional output distance function. Estimates of firm-specific shadow prices of pollutants (bad outputs), and elasticity of substitution between good and bad outputs are also obtained. The technical and environmental inefficiency of a representative firm is estimated as 0.10 implying that the thermal power generating industry in Andhra Pradesh state of India could increase production of electricity by 10 per cent while decreasing generation of pollution by 10 percent. This result shows that there are incentives or win-win opportunities for the firms to voluntarily comply with the environmental regulation. It is found that there is a significant variation in marginal cost of pollution abatement or shadow prices of bad outputs across the firms and an increasing marginal cost of pollution abatement with respect to pollution reduction by the firms. The variation in marginal cost of pollution abatement and compliance to regulation across firms could be reduced by having economic instruments like emission tax.

Key words: environmental and technical efficiency, shadow prices of bad outputs, air pollution

35) AIR POLLUTION DUE TO ROAD TRANSPORTATION IN INDIA: A REVIEW ON ASSESSMENT AND REDUCTION STRATEGIES

By Shrivastava R. K., Saxena Neeta and Gautam Geeta

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Rapid urbanization and growth of motor vehicles impose a serious effect on human life and its environment in recent years. Most of the cities of India are being suffered by extremely high level of urban air pollution particularly in the form of CO, SO2, NO2, PM (Particulate Matter) and RSPM (Respirable Suspended Particulate Matter). Transport sectors contribute a major share to environmental pollution (around 70%). A among these pollutants CO is the major pollutant coming from the transport sector, contributing 90% of total emission. Hydrocarbons are next to CO .It is indeed interesting to observe that the contribution of transport
sector to the particulate pollution is as less as 3-5%, most of the SPM (Suspended Particulate Matter) are generated due to re-suspension of dust out of which PM10 is the most prominent air pollutant. NOx is another important air quality indicator. All these situations indicate that air pollution becoming a major problem in Indian context and there is an essential need to build up healthy environment and increase level of research around the world. The present study is a review of an assessment model for emitted pollutants and effective strategies to reduce air pollution due to road transport.

Key Words: Air pollution, Road traffic, Transport modeling, Vehicle emission, Pollution standard, PM10 (Particulate Matter with diameters less than 10 micron.)

36) ENVIRONMENTAL POLLUTION AND CONTROL: A CASE STUDY OF DELHI MEGA CITY

By Dewaram A. Nagdeve

International Institute for Population Sciences

The present paper is an attempt to examine the trend in the level of environmental pollution in Delhi and measures taken to control it. The data have been analyzed from various secondary sources of data. The analysis reveals that rapid population growth continues to be a matter of concern as it has manifold effects, one of the most important being environmental pollution. Densely populated and rapidly growing Delhi mega city is often entombed in a pall of pollution from vehicles, sewage and liquid wastes generated by human settlement and uncontrolled pollution from industries. The recent pollution control measures taken by central government reduced the environmental pollution up to some extent.

KEY WORDS: environment, pollution, control, mega city.

37) ODDITY OF MANAGING AIR POLLUTION IN DELHI: PUBLIC POLICY MYOPIA

By Srirang Jha

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Recent decision of the Government of Delhi to introduce odd-even formula entailing restrictive mobility for curbing vehicular pollution in the city has attracted phenomenal public outcry. From day one of 2016, citizens can drive their cars of odd or even numbers only three times a week except on Sundays when there
is no bar. Such an extreme move of the Government aimed at improving air quality of the city is likely to cause tremendous inconvenience to the people who are forced to take private vehicles to their workplaces due to constantly overcrowded and inefficient public transport. Executive decision of the government is majorly inspired by judicial activism on environmental issues. However, the government has failed to discharge its role of working out public policy on the matter under pressure from the courts to undertake urgent measures to reduce level of air pollution which has crossed all limits for safe breathing. Unfortunately, odd-even formula, presented by the government as panacea, appears to be half-hearted and thoughtless intervention which at best reflects public policy myopia. This discussion paper tries to examine the root causes of the deteriorating air quality in the city and explore appropriate public policy options to let Delhi breathe without causing much trouble to the citizens.

Keywords: Air Pollution, Air Quality, Delhi, Public Policy

38) CAR OWNERSHIP GROWTH IN DELHI

By Debabrata Das; Subhash Dutta; Sharifuddin

The aim of this paper is to forecast the level of car ownership in Delhi, the capital city of India up to the year 2021. The in-sample forecasting is based on estimation of logistic and Gompertz distributions using annual data of car ownership from the year 1965-66 to 2000-2001 under three alternative saturation levels viz. 25, 33 and 50 cars per 100 persons, the saturation levels being evolved from household size. It is observed that, by the year 2020-21, the car ownership level will touch the mark of 14 and 17 cars per 100 persons in Delhi under the saturation levels 25 and 50 respectively. This study will be useful for planners, policy makers and researchers in the area of transport, energy and road for realistic view of the subject and for the planning of appropriate strategy.

Key words: Car ownership, logistic distribution, Gompertz distribution, saturation level, in-sample forecasting

39) A STOCHASTIC DEMAND CVP MODEL WITH RETURN ON INVESTMENT CRITERION

By Rashmi B. Thakkar; David R. Finley; Woody M. Liao

University of Calgary; University of Houston; University of Houston
The stochastic demand cost-volume-profit (CVP) model has recently received considerable attention. For this model, management must determine optimal production prior to knowing the actual demand, a stochastic variable with known distribution. Management must choose the production quantity to balance prospects for sales revenue against risks of losses from shortages and from unsold items. This paper develops an expected return on investment criterion model for determining the optimal production quantity. Formulas and solution methods applicable to general demand distributions are obtained. A special solution technique for normally distributed demand is presented. The resulting choice criterion offers the advantages inherent in return rate methods. In addition, compared to a profit maximization approach, the expected rate of return on investment criterion is more widely applicable.

40) THE FINANCIAL REPERCUSSION OF COST, REVENUE AND PROFIT: AN EXTENSION IN THE BEP AND CVP ANALYSIS

By Ayub Mehar

Institute of Business and Technology – BIZTEK, Karachi, Pakistan

The study measures the impacts of the profitability factors on the capital structure of a firm. A simulation analysis has been applied in the study and the impacts of Cost, Revenue, Profit, Tax Liability and Dividend have been tested. It has been found that capital growth of a firm does not depend on the profitability factors. However, the factors of the profitability are important in determination of the liquidity position of a firm. It is interesting that a large number of studies have measured the effects of capital structure on the profitability, but the present study measured the effect of the profits’ factors on the capital structure of a firm.

41) SHOPPERS’ TYPOLOGIES AND DIVERSITIES IN THEIR STORE CHOICE BEHAVIOR

By Reena Garg

The research paper highlights that retailers are required to choose a particular set of customers and position themselves distinctively as per their chosen market segment. The services of the retailers have to be distinctive in terms of the target market they want to serve. Proper targeting and positioning is imperative to attract and retain the ever demanding customers. The study features the psychographic segmentation as a vital basis to understand the diverse behavior of consumers particularly of food and grocery stores. The data for this study was collected through personally administered questionnaire from different parts of Delhi.
Reponses of 396 respondents were analyzed by applying techniques such as Factor analysis, Cluster analysis, one-way A N O V A and Welch ANOVA. Post-hoc tests (Tukey’s HSD and Games Howell) were also carried out. The study has segmented the Indian consumers into three categories: Recreational shoppers, Apathetic shoppers and Economic shoppers. It has been found that all the groups differ significantly in their choice patterns. The empirical findings of the study would facilitate the retailers in choosing their target group and designing the marketing strategies. Carefully chosen segment and properly designed positioning strategy would provide the retailers a key to attract and retain their customers.

Key Words: Retailers, Store choice, Consumer behavior, Segmentation, Psychographic characteristics, marketing strategy

42) NEAR FIELD COMMUNICATION TECHNOLOGY BENEFITTED FOR METRO RIDES

By Manju Khari; Chetna Bajaj

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Near Field Communication, being a new trend in technology has facilitated a wide variety of users by its extensive uses. Near Field Communication allows contactless communication between devices to exchange information to use it in different applications. The paper elaborates about NFC, its operation and overwhelming usage streams. Afterwards, we have proposed a new framework that can be used as an NFC application to provide comfort to customers who are travelling across the city. The application will make an interface between NFC enabled devices for information communication. It will process the information along with different web servers and databases. The proposed application resembles an easy and efficient use of NFC technology that can ensure comfort to commuters. It will facilitate users by saving their precious time and effort indulged in travel formalities.

Keywords: Near Field Communication; RFID; Metro Rides; Security.

43) AN ANALYSIS OF PUBLIC BUS TRANSIT PERFORMANCE IN INDIAN CITIES

By Madhav G. Badamia; Murtaza Haider

Maintaining and enhancing public transit service in Indian cities is important, to meet rapidly growing mass mobility needs, and curb personal motor vehicle activity and its impacts at low cost. Indian cities rely
predominantly on buses for public transport, and are likely to continue to do so for years. However, the public bus transit service is inadequate and unaffordable for the urban poor. The paper explores the factors that contribute to and affect efforts to improve this situation, based on an analysis of the financial and operational performance of the public bus transit service in the four metropolitan centres and four secondary cities during the 1990s. Overall, there were persistent losses, owing to increasing input costs and declining productivity. The losses occurred despite rapidly increasing fares, and ridership declined. The situation, and the ability to address it, is worse in the secondary cities than the metropolitan centres. We suggest a disaggregated approach based on the needs and motivations of different groups in relation to public transit, along with improved operating conditions and policies to internalize costs of personal motor vehicle use, to address the challenge of providing financially viable and affordable public bus transit service.

Keywords: Urban transport; Public transit; Low-income countries; India; Bus transit; Transit performance.

44) ESTIMATING COST OF AIR POLLUTION ABATEMENT FOR ROAD TRANSPORT IN INDIA: CASE STUDIES OF ANDHRA PRADESH AND HIMACHAL PRADESH

By Kishore Kumar Dhavala; M. Narsimha Murty

This paper provides a method of estimation of physical and monetary accounts of air pollution from the road transport. Using the data from the secondary sources and a vehicular survey, estimates of annual air pollution abatement cost for the vehicles (passenger cars, trucks, buses and two wheelers) complying with Euro norms are made for the road transport sector in Andhra Pradesh (AP) and Himachal Pradesh (HP) states. The pollution abatement cost of each vehicle comprises the cost of upgrading the vehicular technology and the cost of improving fuel quality. For example, this cost estimate is Rs. 32309.54 million for AP in the year 2001-2002 and Rs. 3688.72 million for HP in the year 2002-2003 at current prices and it forms 2.134 percent and 5.88 percent of State Domestic Product of the respective states.

45) A METHODOLOGY FOR EVALUATING ENVIRONMENTAL CO-BENEFITS IN THE TRANSPORT SECTOR: APPLICATION TO THE DELHI METRO

By Christopher N.H. Dolla; Osman Balaban

This paper presents a methodology to measure the environmental co-benefits of transport initiatives, defined here as carbon emissions in conjunction with local air pollution. An evaluation tool was developed and then
tested on the case of the Delhi metro. The metro is an extensive rail project spanning the Indian capital, which is also the world's first rail based Clean Development Mechanism (CDM) project. However, it has also been a flashpoint in urban policy-making in the city in recent years. This analysis identifies the co-benefits based on the current situation as well potential co-benefits based on increased ridership and altering mode share contributions. The paper then discusses the challenges faced in the quantification process and the practical implications of achieving increased co-benefits. The paper highlights issues of data quality as well as data access, whilst identifying that factors peripheral to the project itself can have a critical effect in achieving co-benefits from large scale transport infrastructure projects in developing countries.

Keywords: Urban transport; Delhi metro; Co-benefits; CO2 emissions; Local air pollution

46) ACCESSIBILITY AND SAFETY INDICATORS FOR ALL ROAD USERS: CASE STUDY DELHI BRT

By Geetam Tiwaria; Deepty Jain

Traditional focus of transportation planning has been to improve mobility of motorized vehicles measuring benefits as increased speed and saved travel time. Since 1950s, indicators are being developed to evaluate accessibility and safety of different types of road users like non-motorized transport (NMT) and public transport (PT) users. However, the application of the indicators is still limited to evaluate the impacts on one type of road user only. The paper proposes indicators to evaluate the impact of a transport project on all types of road users and on the society as a whole. Both conventional and proposed indicators are applied to evaluate the Delhi-BRT corridor stretch of 5.8 km. The conventional approach showed reduced personal vehicular speed and delays at junctions. Whereas, the proposed indicators of accessibility measured number of relevant destinations that are within reach of different types of road users which were not within the reach before and the number and type of road users for whom the accessibility has increased. The safety indicators evaluated the change in interaction between different road users and safety of different types of road users. The indicators also evaluated the change in competitive position of different modes that may result in causing modal shift. The proposed indicators are suggested to be used along with the traditional indicators for complete evaluation of transport projects.

Keywords: Indicators; Accessibility; Safety; Delhi BRT; Mobility
47) CULTURES OF COMMUTING: THE MOBILE NEGOTIATION OF SPACE AND SUBJECTIVITY ON DELHI’S METRO

By Melissa Butcher

As part of Delhi’s redevelopment, aimed at creating a ‘global city’, new public transport infrastructure is being built. The Metro, in particular, has become iconic of what city authorities and developers refer to as Delhi’s ‘cosmopolitan’ and ‘world city’ status. Authorities have attempted to change commuting practices embedded in the culture of Delhi, a crowded, economically and culturally diverse city, in line with desired new behaviours including an emphasis on cleanliness, order and quiet. To explore these developments this paper presents findings from a qualitative study (conducted in 2009) analyzing the urban mobility of a diverse group of young people. Their experiences of the Metro revealed interacting fields of power in the city, between passengers, and between passengers and those in control of the network. These relationships were situated within wider processes of urban reconstruction that intersect with global flows of capital, technology and ideologies of ‘modernity’ and development. The findings also highlighted the contestation of cosmopolitanism: its use to describe a desired urban imagination and its deployment as everyday competencies of negotiation and flexibility designed to manage change, unfamiliarity and inequality.

Key Words: Delhi, identity, culture, commuting, public transport

48) ECONOMIC AND EQUITY EVALUATION OF DELHI METRO

By Kirti Bhandaria, Hirokazu Katob & Yoshitsugu Hayashi

This paper examines the economic and equity implications of the introduction of a metro system in Delhi. Generalized cost of each mode is used as an indicator of mobility, whereas, accessibility is measured in terms of consumer surplus. A combined mode destination choice model is employed to assess the change in the generalized costs of existing modes after the metro introduction. The accessibility benefits of a metro are estimated using the logsum approach to estimate the consumer surplus of transit riders. The well established quantitative measure of equity, the GINI coefficient, is used to link mobility and accessibility to equity. Results indicate a reduction in the generalized costs of three existing modes, i.e. bus, car and the two wheelers. The magnitude of change is the lowest for bus and the highest for two wheelers. The estimated average change in welfare according the calibrated model is 45.32 Rs/trip (0.923 $US) which equals 90.64 Rs/day (1.85 $US), assuming two work trips per person per day. The results of the equity measure indicate a
shift towards the line of perfect equality, concluding that the introduction of metro shows a positive impact on equity (of mobility and accessibility).

Keywords: Mobility, Accessibility, Equity, GINI coefficient, Delhi metro

49) UNDERSTANDING URBAN VEHICULAR POLLUTION PROBLEM VIS-À-VIS AMBIENT AIR QUALITY – CASE STUDY OF A MEGA CITY, DELHI

By S. K. Goyal; S. V. Ghatge; P. Nema; S. M. Tamhane

Air pollution has become a growing problem in megacities and large urban areas throughout the globe, and transportation is recognized as the major source of air pollution in many cities, especially in developing countries. Contribution of automobiles is reported in the range of 40 to 80% of the total air pollution. The challenge facing megacities is how to reduce the adverse environmental impacts and other negative effects of transportation without giving up the benefits of mobility. The dilemma becomes most pressing under conditions of rapid urban growth, which is likely to increase travel demand significantly.

The paper is aimed at understanding the problem of vehicular pollution vis-a-vis ambient air quality for a highly traffic affected megacity, Delhi, wherein, the contribution of transport sector was estimated to be as high as 72%. An effort has been made to review and evaluate the benefits (in terms of improved air quality) of the technological interventions/policies adopted for vehicular pollution control in Delhi. It also highlights the outcome of the efforts and suggests further improvements thereon. The importance of public participation and awareness are also discussed. The paper focuses on deriving the benefits of the implementation of management strategies, supported by scientific and technical data/interpretation, so that the people can realize and participate in the government’s endeavor for clean city drive in a more effective manner.

Keywords: Ambient, Air quality, Control strategies, Delhi inspection & maintenance vehicular pollution

50) METHODOLOGY FOR ESTIMATION OF CO₂ REDUCTION FROM MASS RAPID TRANSIT SYSTEM (MRTS) PROJECTS

By N Sharma; S Gangopadhyay and R Dhyani

Central Road Research Institute
Mass rapid transit system (MRTS) have been provided in major cities in developed countries to improve public transportation system. There is a huge potential of reducing CO₂ emissions from transportation sector, particularly from projects like MRTS. Further, they are growing opportunities for various public transportation projects to earn carbon credits under CDM (Clean Development Mechanism) as per provisions of Kyoto Protocol. Using proposed methodology, reduction in CO₂ due to MRTS and other public transportation projects can be estimated conveniently, and also estimate other emissions (CO, HC, SPM/PM₁₀, and NOₓ) from other similar public transportation related projects.

Keywords: Carbon credits, Clean development mechanism (CDM), CO₂ emissions, Emission factors, Mass Rapid Transit System (MRTS), Sensitivity analysis, Vehicle Shift.