

SUSTAINABLE TRANSPORTATION: A GLOBAL PERSPECTIVE



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Abstract:-In totality, a transport system has to be economically, environmentally and socially sustainable. Economic sustainability means that the transport system and supporting infrastructure should be cost effective and should provide for efficient transport of people and goods/freight. Environmental sustainability includes the dimension of pollution and efficient use of energy. Social sustainability in an urban setting would mean that the transport system is equitably provided to all the sections of the society and should also be safe, convenient and comfortable. Transportation related Relevant Issues are: Urbanization and motorization, Lack of Effective Land Policy, Fuel Quality and Outdated Technology, Traffic Congestion, Accidents, Air Quality and Health, Noise Pollution and Health, Water pollution, Land degradation, Global Climatic Changes. Now sustainable transportation is the global goals which can be Obtain by The global policy for sustainable transportation which gives Quality-of-life.

Keywords:Sustainable transportation, Global goals: Society, Economy and environment and global policy.

1. INTRODUCTION:

It is generally accepted that sustainable development, and more specifically, sustainable transport, implies finding a proper balance between (current and future) environmental, social and economic qualities (e.g. OECD, 1996, Ruckelhaus, 1989, Litman, 2003 and WCED, 1987). Sustainable transportation is highly linked with sustainable development. The development of more sustainable transport modes, infrastructure, investments and technologies are all related to sustainable development. The basic definition of a transportation system is a facility consisting of the means and equipment necessary for the movement of passengers or goods. This narrow definition only focuses on transport infrastructure and a much broader definition is needed. When referring to a transport system within the context of this study, it will be assumed that transport policies, individual values, habits, safety and all transportation actors be also included. Much encompassing term for transportation system can be defined as something that “integrate all modes of travel including transit, bicycle and pedestrian linkages, and the automobile; and includes a whole range of technologies, facilities, and transportation management strategies” (Caruso and Kern, 2004). Through this study we have focus, the Sustainable transportation, Global goals, Society, Economy and environment and global policy.



Three essential factors of transportation system sustainability

Source: Christy Mihyeon Jeon

2. TRANSPORTATION RELATED RELEVANT ISSUES

2.1 URBANIZATION AND MOTORIZATION

Overall population growth and increasing urbanization have led to the rapid growth of the city. Which have been overwhelmed by the sudden jump in travel demand. The changing life style, better purchasing power, consumer friendly financial scheme and ever increasing demand for various modes of transport all added to the exponential growth of motorized vehicles.

2.2 LACK OF EFFECTIVE LAND POLICY

Land use to large extent determines traffic and transportation characteristics of a city. This complicated the problem of networking the city efficiently when no particular corridor could be identified. The travel demand in cities is rapidly growing and the development and expenses of transport system are lagging behind.

2.3 FUEL QUALITY AND OUTDATED TECHNOLOGY

In recent past effort have been made to improve automotive technology especially after introducing the Euro and Bharat II norms but the quality of fuel is still not up to the mark. The sulphur content in the fuel is not reduced much owing to the enormous cost involved. Also the adulteration rate is equally high which needs regular monitoring.

2.4 TRAFFIC CONGESTION

Vitality of cities depend on the adequacy and efficiency of the road and traffic system, therefore the creation of a system capable of coping with demand of modern traffic, must be taken note of as primary feature in the comprehensive city plan, undoubtedly, the task ahead is staggering because the traffic problems have developed much more rapidly than the technique for their solution because the cost are tremendous and because, even while improvement are in process, the problems continue to grow beyond calculation, traffic problems grow faster than palliative can be applied.

2.4 ACCIDENTS

Traffic accidents are one of the serious problems in cities. Typically they are among the foremost causes of death of male in the age group between 14-45 years. Its impact may result from minor injuries, disability to death that may be very tragic and unfortunate, traffic safety should be very much a part of the whole process of the urban transportations

2.5 AIR QUALITY AND HEALTH

Air quality the major contributor to air pollution in cities are motor vehicles in transportations sector it is responsible for the largest air pollution and it is responsible for 97 percent of hydrocarbon, 76 percent of carbon mono oxide and 48 percent of nitrogen oxide in the atmosphere. High level of sulphur-dioxide and suspended particulate material are associated with lungs diseases and variety of illness like asthma and shortness of breath, lead particle in the air emitted from petro vehicle prevent hemoglobin synthesis in the bone marrow. Damage liver and kidney function and causes neurological damage it is especially associated with impaired intelligence and development of children

2.6 NOISE POLLUTION AND HEALTH

Increase level of noise associated with sleep disturbances: including shorter sleep duration, more frequent awakening, difficulties in falling asleep. Increase Cardiovascular activity, psychological effect, stomach ulcer, vigilance and attention are impaired are health related disorder.

Water pollution: marine and inland water transport causes pollution to life giving resource the water, which ultimately becomes cause for the loss of precious water resources like food and medicinal plants.

Land degradation: For construction of roads, rail and airports, activity of deforestation taken at great pace which ultimately causes soil degradation and landslides, also the decomposition of the wastes from construction activities causes degradation of land.

Global Climatic Changes: Deforestations, Harmful emission from means of transport and thermal power plant which provides electricity to these means of transport causes climatic change at global level.

3. REASONS FOR ARISE OF TRANSPORTATION PROBLEMS

1. Lack of coordination between the transportation system and the spatial land use. The growing demand for housing, as well as the various local authorities wish to create jobs inside their jurisdiction and attract investors, provoke a rapid decentralization of population and activities, regardless of the ability of the transportation system to serve them efficiently. This process encourages a growing dependence on cars and a worsening of traffic problems.

2. Lack of coordination between different authorities and interested parties in the transportation section: There are at least ten different authorities and interested parties currently involved in the transportation section without any clear status hierarchy. This situation often causes difficulties in the implementation of

new projects, maintenance of infrastructure and the coordination and regulation of public transportation.

3. Low level of service of the public transportation system: The main problems of public transport are the lack of right-of-way and allow level of service including delays, lack of time schedule reliability, insufficient frequencies on some of the lines, and lack of coordination between the two bus cooperatives and the railways authority, which creates difficulties for passengers who have to transfer between lines or modes.

4. Negative economical, social and environmental external effects: As a result of the growing loads of traffic and the problems stated above, negative external effects of the transportation system are enhanced.

4. SUSTAINABLE TRANSPORTATION: THE GLOBAL GOALS

For this study the following nine sustainable transportation development goals under three main categories as follows:

Environmental goals: (1) Reductions in air pollution and noise from road vehicles, (2) preservation of open land (3) protection of wild life and natural habitats.

Economic goals: (1) Energy savings, (2) minimizing the costs of transportation infrastructure (3) travel time saving.

Social goals: (1) Improvement of accessibility to employment, cultural activities and open land areas, (2) maximization of the availability of public transport to the population, (3) increasing road safety by decreasing the number of road accidents and their severity.

Many of the goals can belong to more than one category. For example, increasing road safety was categorized as a social goal but it is also an economic goal. However, the goals were assigned to the main category for purposes of discussion regarding the achievement of different families of goals.

5. OBSTACLES FOR SUSTAINABLE TRANSPORTATION

Public awareness: This is the initial step and very crucial in making the sustainable transportation. This should be carried out through the media and by public and/or professional organizations.

Information: Necessary informational input on public transportation should be provided to public through public and government channels

Environmental education and training: This can be implemented as a completing part of the information. Any approach which does not have an integral education and training is likely to fail. That is why this can be considered as the significant prerequisite for a sustainable transport program. For this reason, a wide scope of specialized agencies and training facilities should be made available to the public.

Innovative energy strategies: Sustainable transportation, require the efficient dissemination of information, based on new methods and consisting of public relations, training and counseling for generation of new energy products like biodiesel.

Promoting renewable energy resources: In order to achieve environmentally benign sustainable transportation programs, renewable energy sources should be promoted in every stage. This will create a strong basis for the short- and long-term policies.

Financing: This is a very important tool that can be used for reaching the main goal and will accelerate the implementation of renewable energy systems and technologies for sustainable transportation development of the country.

Monitoring and evaluation tools: In order to see how successfully the program has been implemented, it is of great importance to monitor each step and evaluate the data and findings obtained. In this regard, appropriate monitoring and evaluation tools should be used.

6. SUSTAINABLE TRANSPORTATION: THE GLOBAL POLICY MEASURES

The 26 policy measures of sustainable transportation we defined under the five main categories mentioned above are as follow, as in the case of the goals, many of these measures can belong to more than

one category but we chose the most appropriate one.

Spatial measures: (1) Defining car-restricted, pedestrian-friendly zones in city centers (2) high density land uses along main public transport corridors (3) high density development near major public transport stations (4) mixed land use development (5) high density development around the Central Business District (CBD) area.

Economic measures: (1) Heavy taxes on more than one vehicle per household (2) high parking fees in the CBD area (3) congestion pricing around the CBD area (4) heavy subsidization of public transport in order to decrease fares (5) privatization of public transport (6) consideration of external costs in the evaluation of new projects.

Technological measures: (1) Incentives for buying zero emission vehicles, (2) intensive development of information technology systems, (3) a high quality public transport system based on buses and light rail transit, (4) a high quality public transport system based on subway in the core area, (5) the development of communication infrastructure and local centers for telecommuting, (6) increasing parking spaces in the core area by automated parking.

Governmental measures: (1) Operating public transport daily, 24 hours a day, (2) reducing the development of new roads, (3) extensive development of new roads, (4) limiting parking spaces in zones that are well served by public transport, (5) granting a business license on the basis of the provision of adequate public transport for employees.

Social and behavioural measures: (1) Public information as an aid to trip planning (time tables, different means of travel, fastest path from-to destination), (2) information about the negative external effects of transportation on the environment, (3) information about how telecommuting can reduce the number of trips, (4) educational programs to increase public transport ridership and car pooling.

7. DIFFERENT WAYS FOR SUSTAINABLE TRANSPORTATION

7.1. Multi Level Car Parking:

By incorporating a speed-building technology, a car park can be erected over the top of an existing car park in a matter of days, increasing parking capacity by 80%-100 %. These car parks can be built on awkward-shaped sites as well. They come equipped with adequate provisions for lighting, rainwater management and lightning conduction.

7.2. Safety Rollers: Fatal accidents are a major concern on roads. A safety roller is a fixture that absorbs shock energy converting it into rotational energy. It's feasible on sites prone to accidents. These devices can safely lead a vehicle back to the road or stop the vehicle by absorbing shock energy. Placed along the side of a road as a railing, the roller has an LED guide lamp and a self-luminescent reflective band that warns a driver that has near an edge. It glows like cats eyes. These devices are best installed at curved median strips, curved ramps, diverging points, curved tunnels, passage intersections, school zones and other danger zones. The technology is currently being used in Korea, Japan, Iran, Thailand and Pakistan among other countries.

7.3. Adaptive Traffic Management System: Traffic management in any metropolitan city has to have a multi-pronged approach, including traffic integration, operation, maintenance and road user education programmes. An adaptive traffic management system looks at specific characteristics of a city and forms an intelligent traffic system. Once developed, the software can monitor an intersection, change signal timings, waiting time, flash traffic messages, reduce speed limits on stretches and provide diversions. A history reporter collects data and adapts itself, operating differently on holidays or other events. At present, intelligent signals in the city have to be manually used during peak hours, as signals are unable to respond to a long tail of traffic at intersections. However, with a traffic management system in place, commuters will be provided fast transit. Australia, Scotland, London and Glasgow use the system.

7.4. Licence Plate Reader: Motor vehicle thefts are on the rise in the city. Criminals are increasingly using two-wheelers as getaway vehicles. And this is where a licence plate reader comes handy. This device can record licence plate numbers of vehicles travelling at a speed of up to 250 kmph. If a crime has been

reported, the licence plate number can be fed into the system. Within seconds, it sends back an alert to the main control room. Once the location is discovered, enforcement agencies can immediately be alerted. The device can help check speeding as well. These cameras do not require licence plates to have RFID tags. They are already in use at Delhi International Airport.

7.5. Parking Meter: Imagine your smart phone telling you where to find parking space particularly in a cramped city like Delhi which tops global charts in terms of parking pain. These parking meters can be identified with the help of your cellphone. Not only do these meters talk to the user, but in case you take longer than expected to park your vehicle, you can add money to the meter to ensure you do not park overtime. A magnetic sensor near the meter informs the control room that a vehicle has been parked. Enforcement agencies can be alerted if the user does not pay the parking fee. As soon as the vehicle pulls away from the meter, any extra credit left in the meter is reset. The technology is in place in US, South Africa, Australia and New Zealand.

7.6. Alcohol Interlock: Alcohol interlocks are breath-analyzers which prevent the starting of an engine if the drivers alcohol level exceeds a preset safety limit. This technology which has been in use in drink-driver programmes in several countries enables errant drivers to regain their driving privilege provided they use a vehicle equipped with an approved alcohol interlock. The alcohol interlock technology is used as a remedial measure, whereas in commercial applications it is installed as a safety measure. In Sweden, the device is being used in commercial vehicles for over 10 years, Alcohol interlocks are installed in over 30,000 buses, trucks, taxis and other vehicles, monitoring sobriety of drivers More recently, programmes for commercial application of the technology have expanded in Europe with France and Spain where school buses will be fitted with such a device

7.7. Integrated Video Sensors: These video sensors can detect unusual activity and alert the main control room. The camera sends a round-the-clock feed to the control room to keep tabs on offenders. If vehicles shift to the wrong lane, pedestrians hog road space or sudden smoke is noticed, the camera zeroes in on the image, records it for future reference and sends back an alarm to the control room. The alert is sounded even if operator does not notice the unusual activity himself. These cameras also help detect accidents and can check vandalism and other crime as well. At present, 30,000 such detector cards are operational on a 24x7 basis in 65 countries. The parameters for unusual activity can be configured in the card detection system.

8. CONCLUSION

Given the shifts in notions and idea considered in contemporary transport policy and infrastructure has developed over the years, it is practical to assume that walking and cycling would not be feasible as stand-alone modes of sustainable transport. Cities, with a high and ever increasing population density; overwhelmed by peri-urbanisation ;center of many trade routes and of wholesale trade in different types of commodities- from iron to vegetables, has varied requirements for transport in terms of mode, speed, efficiency and cost. In the context of sustainable transport cities, mass transit systems play a most important role and in fact they are already doing so. Integrating the complementarities of BRT, LRT and MRT is up on the policy table of the government and is essential too.

There is no escaping the fact that these public modes of transport are the only options in the long run and hence a collective will from the policy makers and citizens has to be invested to bring about this change. Cities world over are trying to reach out to people and encourage them to turn pedestrians and use public transport. Rock shows, cycling events, incorporating sustainable transport in school education curricula are just a few measures.

REFERENCES

- 1.Caruso, A & Kern,F., (2004), 'Transition Management' in Developing a More Sustainable Transportation System, Department of Environment, Technology and Social Studies Roskilde University Center,Denmark.
- 2.Dincer,I.,(2000),Renewable energy and sustainable development: a crucial review, Renewable and Sustainable Energy Reviews Volume 4, Issue 2, June 2000, Pages 157–175
- 3.Hartley DL. Perspectives on renewable energy and the environment. In: Tester JW, Wood DO,Ferrari NA, editors. Energy and the environment in the 21st Century. Massachusetts: MIT, 1990.
- 4.Jain, A. K., (2009), Urban Transport: Planning and management, A.P.H. Publication, New Delhi.
- 5.Litman, T., (2003), Sustainable transportation indicators. Victoria Transport Policy Institute, Victoria,

- BC, Canada.
- 6.Lowson, M. (2003). A new approach to effective and sustainable urban transport. Transportation Research Board Annual Meeting, 03-2140.
- 7.OECD, 1996. Towards Sustainable Transportation. OECD Publications, Paris
- 8.Poortinga et al., (2004),Expected quality of life impacts of experimental scenarios for sustainable household energy use. Unpublished manuscript. Groningen (NL): Centre for Environmental and Traffic Psychology/Centre for Environmental Studies, University of Groningen
- 9.Ruckelhaus, W.D., (1989), Toward a sustainable world. Scientific American, PP 114–120.
- 10.Shiftan, Y., Kaplan, S., and Hakkert, S., (2003), Scenario building as a tool for planning a sustainable transportation system Transportation Research Part D 8 323–342, Pergamon publication.
- 11.The Times of India: Intelligent Tech to Curb Traffic Mayhem, october 5, 2011, PP-4.
- 12.WCED (World Commission on Environment and Development, (1987). Our common future. Oxford University Press, Oxford.