# Dissertation Report on

# Understanding and Applying the Concept of Sustainable Development in Indian Transportation


**Submitted By:**

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**2k11/MBA/04**

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# Certificate

This is to certify that Amandeep Singh – 2K11/MBA/04, student of Delhi School of Management has pursued dissertation. This work has not been submitted in part or full to this or any other university as part of project work to the best of our knowledge.

We wish him success in the future.

# Declaration

I, Amandeep Singh do hereby declare that the project entitled "Understanding and Applying the Concept of Sustainable Development in Indian Transportation" is an original work. The contents of this project report reflect the work done by me as a component of the Master of Business Administration in Supply Chain Management and Marketing Management of the Delhi School of Management, Delhi Technological University, New Delhi.

Date:

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# Executive Summary

*Sustainable Development*- An issue that has triggered concerns over the recent decades relates to the capacity of the global economy to accommodate an enduring demographic, economic and resource consumption growth. Since the 1970s, many statements have been made asserting that the world would be unable to sustain such growth without a possible socioeconomic and/or environmental breakdown. While these perspectives have been demonstrated to be inaccurate, since resources availability and the quality of life increased, there are enduring concerns that at some point a threshold will be reached. Under such conditions, an emphasis on sustainable development has been advocated as a priority for future social and economic development. Sustainable development is however a complex concept that is subject to numerous interpretations. It is not surprising that the subject is prone to much demagogy leading to confusion in terms of its nature, consequences and appropriate response. It is however generally agreed that a sustainable society favours conditions that benefits the environment, the economy and the society without compromising the welfare of future generations. Still, as history clearly demonstrates, the conditions of future societies will largely depend upon the legacy of current societies on resources and the environment. All form of assets (capital, real estate, infrastructures, resources) passed on to the next generation should be at least of equal value (utility) per capita. The basic definition of sustainability has been expanded to include three major points (often referred as the three Es):

- **Social equity**. Relates to conditions favoring a distribution of resources among the current generation based upon comparative levels of productivity. This implies that individuals or institutions are free to pursue the ventures of their choice and reaps the rewards for the risk they take and the efforts they make. Social equity should not be confused with welfare programs (socialism) where the productive segment of the population agrees or is coerced to support a non-productive segment; this is not equity but redistribution. Thus, central planning and socialism are much at odd with the concept of social equity.
- **Economic efficiency**. Concerns conditions permitting higher levels of economic efficiency in terms of resource and labor usage. It focuses on competitiveness, flexibility in production and providing goods and services that supply a market demand. Under such circumstances, factors of production should be freely allocated and markets open to trade.
- **Environmental responsibility**. Involves a "footprint" which is lesser than the capacity of the environment to accommodate. This includes the supply of resources (food, water, energy, etc.), but also the safe disposal of numerous forms of wastes. Its core tenets include the conservation and reuse of resources.

Another important debate relates to what extent public entities (both at the national and supra-national levels) have a role to play. More bluntly, should sustainability be coerced by governments or be the outcome of market forces? Environmentalists are dominantly leaning towards coercion as they distrust market forces and would argue that sustainability is a much too long term concept to be addressed by corporations focused on the short term. A counter argument could be made that the time horizon

of governments, especially democratic regimes, is also very short and on rare instances governments have shown to be proactive regarding environmental matters. The question remains as if expectations can be placed on entities that seek to optimize positive perception (governments) or on entities that seek to optimize efficiency (corporations). Paradoxically, while governments tend to be inflexible and unable to adapt, corporations have demonstrated a resounding ability to shift their strategies and provide products that reflect the needs of their customers (including environmentally responsible products). It could thus be argued that the private sector is more likely to achieve sustainability than the public sector. Societies do not contribute to environmental problems at the same level. A comparison between developed countries and developing countries reveals that the developed world consumes 70% of the world's energy, 75% of minerals and 85% of wood. Sustainability can be thus expressed at two spatial levels:

- **Global**. Long term stability of the earth's environment and availability of resources to support human activities.
- **Local**. Localized forms often related to urban areas in terms of jobs, housing and environmental pollution.

Since a growing share of the global population is urbanized, sustainability has increasingly become focused on **urban areas**. Major cities are requiring a vast array of supporting infrastructures including energy, water, sewers and transport. A key to urban sustainability issues is linked with the provision and maintenance of a wide range of urban infrastructure. Every city has specific infrastructure and environmental problems. For instance, cities in developing countries have chronic deficiencies in the provision of the most basic infrastructure while their environmental conditions are deteriorating. Infrastructures can be **publicly or privately owned**. Public infrastructures have the advantage to be available to a larger share of the population at a low cost, but are expensive for the government to maintain (subsidies). Private infrastructures tend to service a smaller share of the population, at the choice of the infrastructure company, but are financially profitable. As income levels increase, some infrastructure problems are solved while some environmental problems are created. For instance, an increase in income is linked to better sanitation and water provision, but at the expense of greater waste and carbon dioxide emissions.

*Sustainable Transportation*- Transportation, as a core component supporting the interactions and the development of socioeconomic systems, has also been the object of much consideration about to what extent it is sustainable. Sustainable transportation can be defined as:

The capacity to support the mobility needs of people, freight and information in a manner that is the least damageable to the environment.

Sustainable development applied to transport systems requires the promotion of linkages between environmental protection, economic efficiency and social progress. Under the environmental dimension, the objective consists in understanding the reciprocal influences of the physical environment and the practices of the industry and that environmental issues are addressed by all aspects of the transport industry. Other transport alternatives commonly do not measure up to the convenience of the automobile. Private and flexible forms of transportation, such as the automobile, are thus fundamental to urban mobility and should not be discarded as options for the sake of sustainability. A bias is observed in the transport community towards an

emphasis for public transit and non-motorized transportation as the dominant, if not sole, strategy towards sustainable transportation. Yet, almost all public transit systems are financially unsustainable, imposing burdens on the society. Freight transportation must also be involved in this process considering the substantial growth of raw materials and goods being traded in a global economy. In fact, freight transportation relies on much more environmentally sound modes such as rail and transport. Despite the apparent and projected success of measures to promote transport sustainability, they have their limits. Indeed, the built environment and transport infrastructure cannot change quickly enough to solve the bulk of problems related to unsustainable transport. Most of the investment that is already in place will remain in place for 50 years or more and new investment (in additional or improved infrastructure) will not represent much more than a few percentage points change in terms of reducing traffic congestion and its negative externalities. While policies, rules and regulations have a tendency to favor a misallocation of resources (such as compliance), users tend to instinctively react to price signals and discard modes that are becoming costly (unsustainable).Transportation and sustainability for both passengers and freight must also contend with mitigation versus adaptation issues:

- **Mitigation** concerns the improvement of productivity and efficiency of existing modes, terminals and managerial approaches so that environmental externalities are reduced. They tend to be short to medium term strategies.
- **Adaptation** is a change in the level of use and the market share of respective modes to better reflect a long term trend, such as higher energy prices and stricter environmental regulations.

There is a wide range of responses to environmental sustainability. The various outcomes for a sustainable environment involve three steps: 1) transport operations must conform to local, national and international regulations; 2) environmental costs of transport operations must be built into the price of providing transport facilities and services; 3) environmental performance must be introduced into the organization's management. Environmental sustainability represents a growing area of responsibility for transport companies, one that is forcing them to acquire expertise in environmental management. The most important challenge for the industry is to implement environmentally sustainable transport within competitive market structures leaning on coping with changes in transport demand while improving transport supply.

There are over 200 definitions of 'sustainable development'. But if defining it is difficult, putting it into practice is even harder. This dissertation reviews what 'sustainability' and 'sustainable development' actually mean in real-world terms, and discusses the practical challenge they represent. It provides an overview of the current Indian sustainable development agenda and of the key drivers that influence various stakeholders. It covers initiatives relevant to the transportation sector in the context of changes at the macro level brought about by government policy and public opinion. Examples and references are given to facilitate further reading and research as well as to provide a mechanism for getting in touch with the initiatives themselves.