CHAPTER-1
INTRODUCTION

1.1 Background:
In developing countries like India urbanization and motorization trends are increasing, in these circumstances mass transit systems like commuter rails and bus transportation are largely unavoidable. Cities are mainly governed by site, location, situation, and hinterlands. Hinterland is directly under the influence of urban center with rural landscape. It affords the liter action in terms of goods, labor force and services to the urban center. The current city development seems to be unplanned resulting in inadequate physical connectivity in terms of road network. The urban sprawl characterized by high density development at core with respective to the surrounding fringe areas comparatively. The traditional approach to mitigating the problem with increasing in the size of the road network without paying attention towards sustainability aspects is making the situation grave. It has been observed that current urban planning strategies are not responding to the needs of transportation by and large. An integrative approach is needed so that these modes of transport work together efficiently to facilitate the sustainable transportation by supporting the system of conveying people & goods which have the ability to bear the traffic volume for a long time both quantitatively & qualitatively.

The concept of land use transport integration is based on the nature of interaction between spatial and transport development. While allocation of land uses impact demand for travel as people need to access different activities, transport infrastructure adds to the attractiveness of a location by improving accessibility and leads to change in land values. With improved accessibility, the locations become attractive for investments and it results in further development of these locations. This research provides an understanding of the concept of integration with regards to land use and transport. It endeavors to provide strategies for facilitating adoption of integrated land use transport decisions by Indian cities.

Studies have confirmed that economic and demographic factors influence travel demand (Centrino & McGlukin, 2009), and suggest that these aspects are important in
transportation systems planning, design and operation (Goulias, 2003). Information related to user demographics, behavior and attitudes toward the existing systems can be instrumental in guiding future systems. The transportation behavior also assists in forecasting future travel demand, evaluating the effectiveness of policies, predicting the response to new technologies or services, and anticipating possible unintended consequences. Studies also show that an individual’s travel behavior, attitudes, and personality are influenced by their socio-demographic characteristics (Redmond, 2000; Cao & Mokhtarian, 2005; Kim et al., 2007).

This study examines how architectural and planning aspects and socio-demographic characteristics influence the use of the system in order to develop strategies for development of sustainable transportation. In order to evaluate user’s travel behavior, attitude, and demographic characteristics on mass transit usage, survey information was used to analyze the public usage of the transportation system in city of Pune. This research hypothesized that improper integration of land use and transportation system is the cause of un-sustainability of current transportation system in Pune. It further hypotheses that people’s perceptions and needs and individual attributes such as socio-demographic variables may influence usage, and if identified and better understood, can provide necessary information to create sustainable transport systems. This study examines how architectural and planning aspects and socio-demographic characteristics influence the use of the transportation system in order to develop strategies for development of sustainable transportation. It is aimed to explore interrelationship between land use in core, fringe areas and transportation system which has implications with sustainable development and subsequently develop appropriate strategies for sustainable transportation between core and fringe in the context of Pune as a case.

The findings of this research aim to develop appropriate strategies for sustainable transportation between core and fringe in context of Pune as a case.

1.2 Problem Identification:

The land use in urban planning in regards to transport integration is a combination of spatial and transport development. Various land uses such as residential, industrial, commercial etc. have more need to access for different activities and transport
infrastructure which is not catered for in the present context. The attitudes, perceptions and behaviors of people towards transport are not taken into consideration which are key to the development of a future ‘sustainable transport system’. Research prompts that performance of mass transportation largely depends on user’s satisfaction which is dictated by the manner in which a particular public transportation system meet or surpasses their anticipations (Currie and Wallis, 2008; Geetika and Nandan, 2010). Quality of mass transportation is characterized by various factors like walking distances to get a public transport node, preferences for modes, number of transfers, time consumed in trips, accessibility of service, comfort inside and outside and associated set-ups (Litman, 2008). This phenomenon is neglected in planning and design of current mass transit system. The relation of land and its uses along the transport network is not adequately analyzed and addressed for transport planning and development of infrastructure. There is need Compare and evaluate the appropriate solutions for, safe, feasible, economical mass transit system and relation of land use planning for the region.

1.3 Aim and Objectives:

This research is aimed to investigate the changing patterns of land use and its effect on mass transportation in order to achieve sustainable development through an integrated approach.

1.3.1 The objectives are:

1. To examine the interrelationship between land use pattern and transportation system.
2. Identify the issues that have an effect on working and efficiency of transportation system with reference to core and fringe areas of the city under study.
3. To explore how the current transportation system accomplishes objectives of sustainable transportation.
4. To identify determinants of sustainable transportation from user’s point of view.
5. To establish strategies for an integrated land use and Mass Transit System With reference to Core and Fringe in city of Pune.
1.3.2 **Hypothesis:**
Efficiency of transportation in terms of frequency, availability of transport modes affects people’s perception.
Cost efficiency, environmental concerns and safety are considered as determinants of sustainable transport.

1.3.3 **Research Questions:**
The research is a thoughtful consideration of following questions:
1. What is the current land use pattern between core and fringe?
2. What change happened in Land use pattern in the study area?
3. What is the current status of transport in city of Pune?
4. Is Pune’s transportation plan is prepared in accordance with land use plan?
5. What are the constraints and issues people face in commuting between core and fringe?
6. Do transportation responds to the needs of end users?
7. What are the people’s perceptions, needs regarding transportation for commuting between core and fringe?
8. What are the determinants of sustainable transport from user’s point of view?

1.4 **Purpose of the Study:**
The urban road chaos is increasing day by day with ever-increasing car ownership and other private vehicles. Infrastructure shortages are increasingly showing their ugly arm with traffic snarls and gridlocks. Unless problems are remedied, poor mobility can became a major dampener to economic growth and also cause the quality of life to deteriorate. Pune is Oxford of Asia bestowed with various educational institutes which further resulted in availability skill manpower. The growth of the city directly affects on the transportation & land use pattern which result into the urban sprawl into the fringe areas of the city. In last two decades the city became overcrowded with numerous problems with reference to transportation like traffic congestions, parking problems etc. Development plan & Regional plan proposals, central and state Govt. planning authority has not considered the issues of transportation and traffic, environment,
overcome of the increasing population within the city and surrounding growth centers. Well established global policy of planning and sustainability is not addressed by the authorities and no adequate step has been taken for strict implementation of land use policies particularly infringe or peri-urban areas. The city's population has increased beyond its original capacity; the need for housing, especially from the migrant population from the nearby districts and other states, is the critical issue of the development. The same trend may be repeated in future in developing fringes which need to be joined to core city in a smart, sustainable way.

1.4.1 Need for Research:
During the 180-year span from 1817 to 1997, urban areas in and around the city of Pune (including areas under adjoining municipal bodies) have grown from 5 square km to 700 square km. Within this framework –Development plan & Regional plan proposals, central and state Govt. planning authority has not considered the issues of transportation and traffic, environment, overcome of the increasing population within the Pune city and its surrounding areas. The city population has grown tremendously as a result, there is more than the double load on existing services such as the road network, traffic, and transportation, water supply, drainage, wastage management etc. Most of the land allotted for parks playground and Bio-Development Park has been encroached by slums and unauthorized residential constructions. Unplanned haphazard growth not as per the land use pattern sanctioned in Development Plan seems leaving no scope to accommodate future needs of the city and people. The city dwellers who are the end users are continuously under stress that the city is not acting and fulfilling aspirations as per their expectations. There is the boom in the development in all sectors such as constructions, industry, agro-development etc. To fulfill aspirations of the citizens it has became imperative that the city should have fast movement mechanism of transport where Pune is no exception.

1.5 Scope and Limitations:
The scope of this research is limited to study of the main approach road via NH-4 segment starting from Khandala small town to main entrance of the Pune city called Swargate.
1.6 Organization of Thesis:
The thesis is tentatively divided into six chapters where first chapter provides the overview and introduction to the research problem. It includes a general introduction, an emerging global concern towards urban sprawl, land use planning and interrelation with transportation. Followed by rationale of the research, aim and objectives, research questions, need of the study, significance, scope and limitations and expected outcome of the study and organization of thesis.

Chapter Two provides a review of the related literature focused on literature related to various concepts, definitions, theories, and historical reviews of research, published papers and journals and study of traffic and transport issues. It includes various aspects like sustainable development and transport, the impact of transport on environment, travel behavior and behavioral theories, transportation and city development, urban sprawl, transport and land use relationship, theories of land use and transportation planning, sustainable transportation indicators and urban mass transit systems

Chapter Three discusses the context of research whereby research premise is established and the Conceptual Framework for the study is outlined. It describes elaborate methods and procedures used in the study. Development of instruments is discussed, followed by data collection process and analysis techniques are discussed for quantitative descriptive and qualitative enquiry. Formation of research method and its scheduling is done in this chapter to achieve the correct orientation and results.

Fourth chapter presents the observations, analyses and results of empirical inquiry conducted in the selected core area aimed to find out land use changes and its impact on transportation. It includes the observation and analysis of naturalistic observation, visual and photographic survey.

Fifth chapter is focused on the fringe area where land uses changes and its interrelation with transportation network is examined. The analysis is aimed to explore the issues related to land use planning and transportation.

In the sixth chapter choices preferences constraints faced by users are examined in order to find out the determinants of sustainable transport which are to be taken into
consideration in establishing strategies for an integrated mass transit system and land use planning.

Chapter seven presents the findings of qualitative and quantitative inquiry applied in this study which includes the comprehensive discussion with respect to the findings regarding land use and its relationship with transportation system based on empirical work. It further discusses the implications, scope and limitations of the study as well as provides suggestions and recommendations regarding strategies for an integrated land use and mass transit system between core and fringe.