REGENERATION PLAN FOR WALLED CITY OF AMRITSAR

A DISSERTATION

Submitted in partial fulfillment of the requirements for the award of the degree of

MASTER OF URBAN AND RURAL PLANNING

By

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CANDIDATE'S DECLARATION

I hereby certify that the work which is being presented in the Report entitled **REGENERATION PLAN FOR WALLED CITY OF AMRITSAR** in partial fulfillment of the requirement for the award of the Degree of Masters Urban and Rural Planning and submitted in the Department of Architecture and Planning of the Indian Institute of Technology Roorkee, Roorkee is an authentic record of my own work carried out for Thesis under the supervision of Prof R. Shankar, Department of Architecture and Planning, Indian Institute of Technology Roorkee, Roorkee.

(VIMAL PREET)

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Date: 9th June 2012

(PROF. R. SHANKAR)

Supervisor

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I am gracious to Lord Almighty for the successful completion of this project. I find myself unjustly restrained by words in expressing my sincere thanks to all those, whose contribution is much larger than any magnanimous words can ever claim to describe.

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Executive Summary

Cities are like living organisms, and they require constant maintenance and development for their healthy growth, without which, city functions fail and they decay with time. Changes in functioning have to be adopted at proper time with efficient efforts. Through the history we have seen movements dedicated to eradicate tribulations and problems from the structure of the cities.

With degrading environment, loss of cultural heritage of core areas and degrading economy, today a movement based on ecological, social and economic sustainability is requirement of time. Regeneration is comprehensive program with active participation of the residents and stake holders to generate an effective plan with social, environmental and economic sustainable concepts to eradicate problems of area. Effective steps have been taken by many countries in this direction. Especially European Union and USA have dedicated agencies for regeneration process and their financial aid. With advancement of technology, cities are facing new challenges of pollution, traffic congestion, loss of heritage, and environment degradation.

The aim of this dissertation is to prepare Regeneration plan for the Walled city of Amritsar. The objective of the project is to study the concept of urban regeneration through best practices prevailing in foreign cities, analyze the problems and various plan proposals for walled city and finally to propose regeneration plan for improvement of Walled city area.

Amritsar is one of the most ancient and fascinating cities of India. It is spiritual and cultural center of Sikh religion. After becoming the gateway for travelers coming to India on from central Asia and it soon became the centre of various commercial activities. It is a border city located in the northern western part of the state with an area of 139 Sq. Km.

History of Amritsar dates back to 400 years, when the city was founded by fourth Sikh guru, Sri Guru Ram Dass Ji, in 1577 AD. From 1665 to 1802 various Misl's were established. Poly nucleated city was merged in the time of Maharaja Ranjit Singh in 1802 and a massive city wall was constructed with 14 gates. After independence, city faced setback due to its location close to border. Total population of Amritsar is 1183705 as per census 2011 with density of 8314 persons per sq km. Highest density is

within the walled city of 740 persons per hectare which is 10 time higher than the gross density of city. It may noted that walled city occupies area 1/41th of total area of city while it houses 1/6th of the city population.

Walled city acts as central business district, and has mixed land-use character. Walled city hosts 22 specialized markets. Total number of tourist visiting Amritsar by air were 0.11 million in year 2007, which is 2.2% of tourist population of country. It has been estimated that tourist visiting golden temple is approximately 30000 per day. Walled city beholds a unique character, as it has witnessed history of 400 years. Buildings belonging to different time periods can be seen in whole of the walled city area. Buildings have unique feature of carved balconies protruding out in street at first and second floors giving shade on to street in hot sunny weather. Most of the features were in wood and later on steel was used. As time changed in modern era these features were lost to tall, glass clad structures over-looking to street below. The main commercial streets are wider and have footpath, but as we go to interior parts of the walled city, the width of street constantly decreases to 3 m.

The surveys conducted for the Regeneration Plan for Walled City of Amritsar reveal a sorry state of physical infrastructure. Walled city lacks basic infrastructure facilities. City development plan lists some proposals on up-liftment of the area as road development and pedestrinization projects, no vehicle zone support, parking management and visual intrusion projects. As a JNNURM city, many plans have been prepared for walled city but only few are implemented, Elevated Road Projects (149.49 Cr), Water Supply Projects (19.01 Cr), Augmentation of Sewerage in Walled City Rehabilitation of Water (36.90 Cr), Supply in Walled City (52.97 Cr), Solid Waste Management (72.49 Cr).

But none of these projects focus on overall development of program for up-liftment of social, cultural, economic and ecological aspects of walled city. The loopholes of Master Plan 2031 and City Development Plan 2025 have been analyzed. Analysis of various primary surveys, opinion of experts, visual survey states that transportation, and traffic problem is the most severe problem of Walled city. Unhygienic conditions prevail due to low quality of solid waste management and

clogged open drainage system. Proposals have been formulated to eliminate these problems of the walled city area. The objectives for the proposals are given below:

- Transportation and traffic management: To create an advanced public transport system for the city and develop local public transport for the walled city for better connectivity. To develop better traffic management system with advanced technologies.
- Economic up-gradation: To improve tourism of walled city for effective revenue gains.
- Socio-cultural up-gradation: To improve the heritage value of the walled city and conduct heritage walks.
- Environmental concern: To develop advanced solid waste management program for clean and green city and environment friendly transport for city.

Different levels of public transportation are proposed such as, city level transportation, personal rapid transport system and mini bus system. The public transport should be environment friendly with support facilities such as, shaded bus stop, information panel, walkways, subway crossing and universal accessibility. Effective traffic management has been proposed to eradicate traffic congestion in walled city area. Various traffic management tools such as restricted entry, one way street, pedestrinization, and parking have been proposed.

To develop tourism of the city, proposals focus on development of tourism amenities such as information centers, help desk, adoption of audio video aids, employment of better signage, and improvement of hoardings. Promotion of heritage walk has been proposed by advertisement through written and visual media. Proposals focus on better pedestrian environment with amenities such as street lighting, drinking water facility, dustbins, foot path and public toilets. Better solid waste management program has been proposed with segregation, transportation and management of waste. The proposal focus on reuse, reduce, and recycling of waste.

In chapter 1 the background of the study is discussed, followed by aim, objectives, scope and limitations of the dissertation. The methodology of the dissertation is evolved at end of chapter.

In chapter 2 literature based study has been done on concept, history, theories and principle of Urban Regeneration Process. A step wise discussion on urban regeneration process is given in this chapter. This chapter outlines the difference between various urban development processes such as, urban regeneration, revitalization, redevelopment and reconstruction.

In chapter 3, international case studies have been studied to understand the success stories of Urban Regeneration, strategies employed, and process of regeneration. It also discusses relevant Indian case study of urban revitalization of Jaipur City. Useful lessons from each case study have been drawn at the end of chapter.

In chapter 4, the profile of Amritsar city has been discussed. The chapter gives outline of city, its population, density, land-use, existing roads, tourism, and the projects proposed by Master plan and city development plan. The chapter describes the study area, Walled city of Amritsar. It discusses its profile, ward wise population trend, road network, new mass transit proposal, heritage structures, heritage walk, and physical infrastructure. It gives the institutional setup, and SWOT analysis of the study area. The chapter then ends with inferences drawn from the data available.

In chapter 5, analysis of Master Plan Proposal, and City Development plan Proposal is carried out. The chapter then analyses the problems of Walled city of Amritsar through primary survey, visual survey and survey for opinion of experts. Household survey, vehicular count survey were conducted through questionnaire and analyzed to formulate priority of problems. The inferences and findings all the chapters have been considered for drawing out proposals.

In chapter 6, the proposals and recommendation have been discussed. It discusses the detail proposals for various physical infrastructures of walled city. It also describes general planning recommendations suggested for city. The chapter concludes by suggesting policy recommendations for Indian cities.

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Abbreviations and Acronyms

GNP	Gross National Product
CBD	Central Business District
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
INTERREG	Innovation And Environment Regions Of Europe Sharing Solution
ERDF	European Regional Development Fund
OPAH	*Opérations Programmées D'amélioration De L'habita*
METAP	Middle East And North Africa Solid Waste Management Project
UNESCO	United Nations Educational Scientific And Cultural Organization
URC	Urban Regeneration Company
SRF	Strategic Regeneration Framework
GVA	Gross Value Added
XTD	Xintiandi
JHERICO	Jaipur Heritage Committee
NGO	National Government Organization
LPA	Local Planning Area
MCA	Municipal Corporation Amritsar
ITPI	Institute of Town Planners India
MLD	Million liters per day
OHSR	Overhead Service Reservoir
LPCD	Liters per capita per day
PWSSB	Punjab Water Supply And Sewerage Board
ADA	Amritsar Development Authority
PUDA	Punjab Urban Development Authority
ITA	Improvement Trust Amritsar

1. Identification of Problem

1.1. Introduction

Cities require constant maintenance and development without which they decay with time. Changes in functioning should be adopted at proper time with efficient efforts. Through the history we have seen movements dedicated to eradicate tribulations from the structure of the cities.

In 1950, one-third of the world's people lived in cities. Just 50 years later, this rose to one half and will continue to grow to two-third. At the global level, 30 per cent of all urban dwellers lived in slums in 2005.[1] The WWF states in its Living Planet Reports that in the last 30 years a third of the natural world has been obliterated. 40-50 per cent of Earth's ice-free land surface has been heavily transformed or degraded by human activities, 66 per cent of marine fisheries are either overexploited or at their limit and atmospheric CO2 has increased more than 30 per cent since the advent of industrialization.[2] Urban based economic activities account for 55 per cent of GNP in the least developed countries, 73 per cent in middle income countries and 85 per cent in the most developed countries.[3]

These facts suggest that a movement based on ecological, social and economic sustainability is requirement of present time. Regeneration is comprehensive and integrated program active participation of residents and stake holders to generate an effective plan with social, environmental and economic sustainable concepts to eradicate problems of area. Effective steps have been taken by many countries in this direction. Especially European Union and USA have dedicated agencies for regeneration process and financial aid. With advancement of technology, core areas are facing new challenges of pollution, traffic congestion, loss of heritage, and environment degradation.

Amritsar is one of the important and religious destination of Punjab. It is an important seat of Sikh history and culture. It acted as gateway for travelers coming to India from central Asia and it soon became the centre of various commercial activities. Presently it is border city located in the northern western part of the state with an area of 139 Sq. Km and has population 1183705 as per census 2011 with density of 8314 persons per sq km.

History of Amritsar dates back to 400 years, when the city was founded by fourth Sikh guru, Sri Guru Ram Dass Ji, in 1577 AD. From 1665 to 1802 various misl's were established. Poly nucleated city was merged in the time of Maharaja Ranjit Singh

[1] UN Habitat, 2006/7, The State of the World's Cities.

[2] J. Lubchenco, H.A. Mooney, J. Melillo, 1997, Human Domination of Earth's Ecosystems. Science

[3] WWF, Living Planet Report 2010.

in 1802 and a massive city wall was constructed with 14 gates. After independence, city faced setback due to its location close to border. Walled city occupies area 1/41th of total area of city while it houses 1/6th of the population.

Walled city acts as CBD, and has mixed land-use character. Walled city hosts 22 specialized markets. Total number of tourist visiting Amritsar by air were 0.11 million in year 2007, which is 2.2% of tourist population of country. It has been estimated that tourist visiting golden temple is approximately 30000 visitors per day.

Walled city has a unique character, with buildings belonging to different time periods. Buildings have unique feature of carved balconies protruding out in street giving shade to street in hot sunny weather. Most of the features are in wood and later on steel was used. As time changed these features were lost to tall, glass clad structures.

The main commercial streets are wider and support footpath, but as we go into interior the widths constantly decreases to 3 m. As JNNURM city many plans have been prepared for walled city but only few are implemented, Elevated Road Projects (149.49 Crore), Water Supply Projects (19.01 Crore), Augmentation of Sewerage in Walled City (36.90 Crore), Rehabilitation of Water Supply in Walled City (52.97 Crore), Solid Waste Management (72.49 Crore).

1.2.Need for Study

Walled city lacks basic infrastructure and much of projects focus on infrastructure facilities. CDP mentions some proposals on upliftment of the area as road development and pedestrinization projects, no vehicle zone support, parking management and visual intrusion projects. But none of the projects focus on development of integrated program for upliftment of social, cultural, economic and ecological aspects of walled city. Hence my focus shall be on planning and management of regeneration program of walled city of Amritsar. Some problems which require focus are given below:

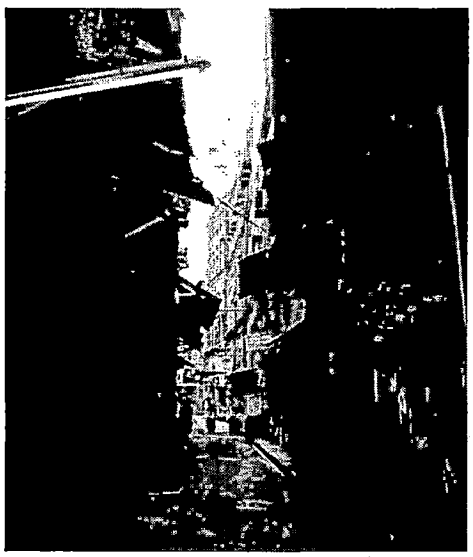


Figure 1.2.1 Congested Streets of Walled City Source: by author

- The markets of the walled city are highly congested and have high density (Fig 1.2.). Due to absence of adequate parking and organized commercial area the movement of traffic and pedestrian in these areas has been hampered.
- The city of Amritsar lacks in public transport facility for intra city operations. With complete absence of formal public transport system, there is increase in personalized modes of transport.

- There is no vehicle control in congested areas of Walled city. 2-wheelers rickshaws, carts move on these congested streets with great difficulty and many times create traffic jams (Fig 1.2.2).
- Road encroachments and improper solid waste management have further degraded the aesthetic and potential of the area and has affected the trade of the markets.
- The existing housing in the walled city area of Amritsar is in dilapidated or poor condition with an average building height of G+3, 100% ground coverage with no setbacks and narrow access roads.
- Construction of buildings in modern style architecture in walled city is destroying the heritage character of the area. Many buildings of heritage importance are in dilapidated condition (Fig 1.2.3)
- There is absence of conservation oriented byelaws, conservation plans and development efforts.

Figure 1.2.2 No Vehicle Control in Congested Area
source: by Author

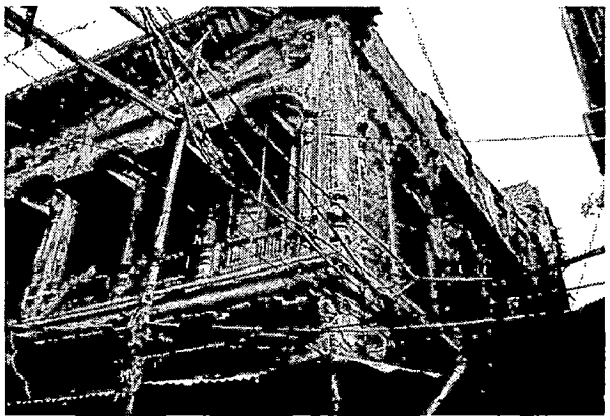


Figure 1.2.3 Dilapidated conditions of heritage structures
Source: By Author

- The walled city area has open drainage covering 1.63% of the city roads. The total length of storm water drainage required by 2031 comes out to be 1931.7 kms, thus there is need of installing 1921.7 km additional storm water lines.
- Lack of public toilets and other civic amenities in the vicinity of majority of the tourist destinations.

1.3.Aim of Study

To prepare Regeneration Plan for the Walled city of Amritsar

1.4.Objective of Study

- To study concept, Principles, Guidelines and strategies of Urban Regeneration.
- To study best practices, planning standards, and institutional arrangements prevailing in foreign cities pertaining to Urban Regeneration.
- To analyze problems of Amritsar walled city, Master Plan proposals and projects implemented or proposed for the walled city.
- To propose Regeneration plan for improvement of Walled city of Amritsar.
- To suggest policy recommendations and institutional arrangements and implementation of Urban Regeneration Process in Indian cities.

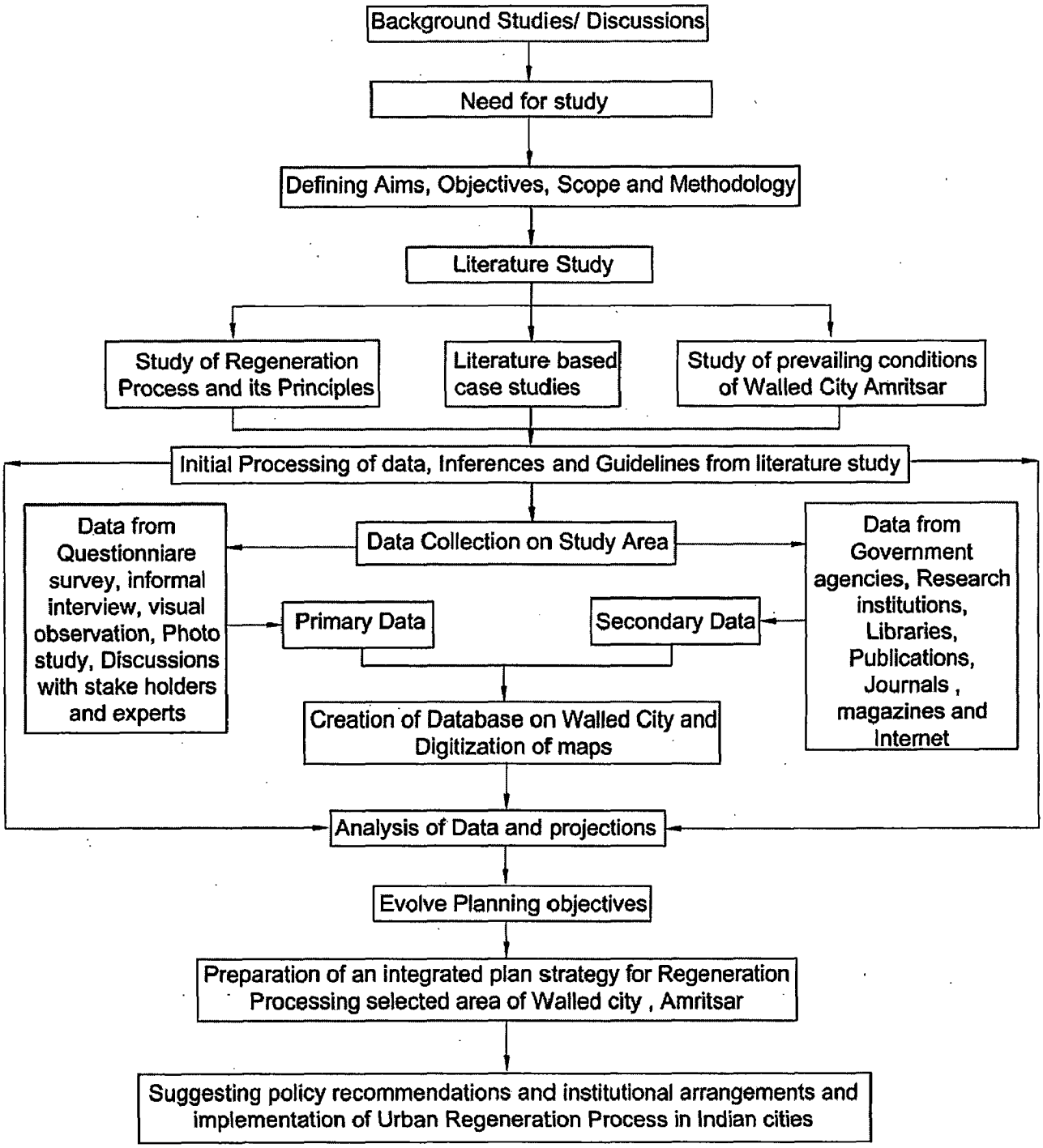
1.5.Scope

- To study Urban Regeneration process and present conditions of walled city of Amritsar
- On basis of availability of secondary data and field survey , study area to be selected
- The outcome of the study could be applied to the Indian cities with suitable alterations.

1.6.Limitation

- The data accuracy, reliability and coverage of primary data would be limited to the practical difficulties of the field survey.
- Due to constraints in time, manpower and availability of resources, only few select areas of Walled city would be studied and their problems analyzed.

1.7.Methodology



2. Literature Study

This chapter deals with definition, concepts and historical perspective of Urban Regeneration. It explains various historical events which formulated the basis of various reforms in urban development. It further differentiates between urban development processes such as reconstruction, revitalization, redevelopment, renewal and regeneration. It briefly describes the Indian scenario for various urban developments. It explains theoretical concepts, approach, and principles of urban regeneration. It explains in detail the major steps required for urban regeneration process. This chapter provides complete understanding of urban regeneration.

2.1. Urban Regeneration: Introduction

Urban regeneration is an effective tool for urban distress in economic and social infrastructure. Today's society is based on profit generating principles which lead to uneven distribution of wealth and resources. Urban based economic activities account for 55 per cent of GNP in the least developed countries, 73 per cent in middle income countries and 85 per cent in the most developed countries. [1]At the global level, 30 per cent of all urban dwellers lived in slums in 2005.[2] Regeneration combines the two area of social and economic benefit and adds another emerging danger to environment. The WWF states in its Living Planet Reports that in the last 30 years a third of the natural world has been obliterated. 40-50 per cent of Earth's ice-free land surface has been heavily transformed or degraded by human activities, 66 per cent of marine fisheries are either overexploited or at their limit and atmospheric CO_2 has increased more than 30 per cent since the advent of industrialization.[3] Regeneration is comprehensive and integrated program with active participation of residents and stake holders to generate an effective plan with social, environmental and economic sustainable concepts to eradicate problems of area.

2.2. Definition

According to Roberts & Sykes, Regeneration can be defined in broad terms as a comprehensive and integrated vision and action which leads to the resolution of (urban) problems and which seeks to bring about a lasting improvement in economic, social and environmental condition of that area that has been subject to change. [4]

[1] UN Habitat, The State of the World's Cities, 2006/7

[2] J. Lubchenco, H.A. Mooney, J. Melillo. 1997. Human domination of Earth's ecosystems. Science

[3] WWF, Living Planet Report 2010

[4] Roberts, Sykes , Urban Regeneration – a Handbook , pg 17

Urban regeneration, in essence, intends to change the nature of a place by involving residents and other stakeholders, embracing multiple objectives and activities, with partnership working among different stakeholders.[5]

Urban regeneration is a holistic, comprehensive and integrated approach that embraces the three aims (the three E's- economy, equity and environment); maintaining economic competitiveness, reducing inequality and protecting and embracing the environment and that suggests a new generation of partnerships for policy development and delivery that includes innovative configurations of public, private and NGO sectors in more equal relationships.[6]

Urban regeneration is concerned with re-growth of economic activity where it has been lost, restoration of social functions where has been dysfunction, or social inclusion where there has been exclusion, and restoration of environmental quality or ecological balance where it has been lost. Thus urban regeneration is an aspect of management and planning of existing area rather than planning and development of new urbanization.[7]

Haussmann's restructuring of central Paris in mid nineteenth century was program of urban regeneration, rebuilding of metropolis after great fire of London. The difference is only in size and complexity of problems, peed of change, the concomitant scale, and sophistication of policy.[8]

2.3.Origin of Urban Regeneration

Urban regeneration was first formalised in U.S.A. in the 1960s, when relocation of marine activities resulted in the total abandonment of large areas. These empty urban lands were developed as central business districts of activities as in Boston, Baltimore and New Orleans.

Since Second World War many western European cities had the problem of obsolete housing, tackled through policies of mass slum clearance and replacement. UK changed policy after 1969 housing act. Netherlands changed housing policy after confrontations between communities and city government in Amsterdam and Rotterdam in early 1970's.[9]

In Germany as the post war housing shortage diminished, the passing of the Stadtebauforderungesgesetz in 1971, allowed the upgrading of rented property in

[5] Turok, 2004 - Skills and Competencies for Community Regeneration : Needs Analysis and Framework

[6] Gibson, M. & Kocabas, A. 2001 -London: Sustainable Urban Regeneration.

[7] Mumford ,1940- The Culture of Cities, pg 4

[8] Couch,1990- Regeneration in Europe , pg 3

[9] Couch,1990 - Regeneration in Europe , pg 109

inner cities.[10] In France legislation was changed in 1970's to facilitate small scale area improvement zones known as Operations Programmee.

In the 1980's, a second phase was launched, on the London Docklands, and then in Barcelona. Urban regeneration led to the complete transformation of empty lands, through reconstruction of multi-activity "bits of the city". Later, in the 1990's, urban regeneration was launched in many urban areas, which were often densely populated, functionally heterogeneous, but facing many urban malfunctions.

2.4.Historical Perspective

In a city, the conflicts of remote forces with the local development are as significant as their harmonies. Responses to these forces have changed over time, due to social economic and political values and urban structure.

The Victorian slums of Britain were result of insufficient attention sanitary conditions. After recognition of these conditions a series of policy interventions emerged in form of in-situ renewal to improve the living condition of urban residents.

In 1860's population density of London doubled but area of city did not increase in proportion. After 1915, city began to spread with the introduction of transport technology. Rapid growth in public transport helped affluent people to shift to suburban areas (Fig 2.4.1).

Figure 2.4.1 Advent of Public Transport (Source: www.20thcenturylondon.org.uk)

After 1945 repairing wartime damage and reconstruction of cities took priority (Fig 2.4.2). A central policy was formulated providing detailed guidance to local authorities for redevelopment plans for central areas. Government led, support from local authorities and private sector, the process of slum clearance and reconstruction lead to embrace of high rise housing and industrialized building techniques.[11]

[10] Gibson, M. & Kocabas, A, 2001 'London: Sustainable Urban Regeneration.

[11] Couch , 1990, **Regeneration in Europe**, pg 29

Fig 2.4.1 Wartime Damage Source: www.ihbc.org.uk

The Urban White Paper of *1977* recognized the special problems affecting the inner areas of towns and cities that now had large areas of empty industrial buildings and derelict land. It promoted the idea of partnerships and programs between government and local authorities, with concerted efforts to help improve the worst off places.[12]

European Urban Renaissance Year in 1980 promoted the idea of 'social balance' and the need to involve communities in the planning process, with some great examples from historic towns. The Community Initiative Program INTERREG and the Urban Pilot Projects URBAN I(1994-1999) and URBAN II (2000-2006) initiated funded by the European Regional Development Fund, ERDF.

URBAN I, 1994-1999, funded 900 million Euros, in 118 programs, with a total investment of 1,800 million Euros, covering 3 million inhabitants, 52% in the cities of more than 250 000 inhabitants (large cities); 51% in the cities between 100 000 and 250 000 inhabitants (medium size cities), and 17% in the cities with less than 100 000 inhabitants (small size cities).

URBAN I funded different strategies:

- integrated physical infrastructures, social inclusion, and environmental improvements - 44,8%;

[12] J M P Teixeira , Urban Renaissance : Role of Urban Regeneration in Europe's Urban Development Future

- Integrated approaches with a focus on social or economic or physical or environmental;
- Flagship approach - 10,4%;
- Integrated community group approach - 18,4%.

URBAN II, 2000-2006, funded 700 million Euros, in 70 programs with a total investment of 1,580 million Euros, covering 2,2 million inhabitants, 39% of large cities; 44% of medium size cities; and 17% of small size cities.

The objectives of URBAN II were:

- To formulate and implement innovative strategies for sustainable economic and social regeneration of small and medium-sized towns and cites or of distressed urban neighborhoods in larger cities;
- To enhance and exchange knowledge and experience in relation to sustainable urban regeneration and development in the areas concerned".

Major historic events which led to Urban Regeneration are depicted in time line (Fig 2.4.3)

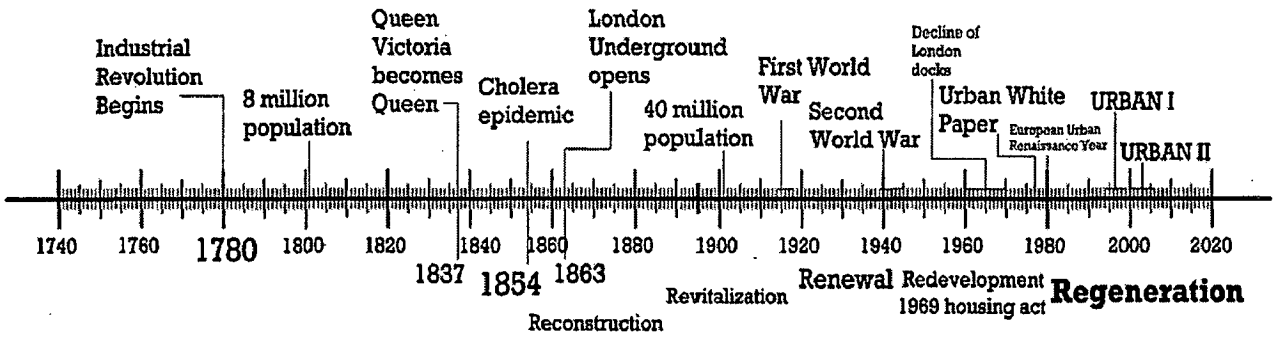


Figure 2.4.2 Time Line of Historic Events (Source: by Author)

2.5.Interpretation

Urban regeneration moves beyond the aims and achievements of Urban Renewal, and Urban Development (redevelopment), with its general mission and less well defined purpose and Urban Revitalization, suggest need for action and fails to specify precise method of approach. In addition Urban Regeneration implies that approach to tackle problems should be constructed with long term strategic plan with participation of stakeholders. Comparison in terms of socio, economic and environmental between different terminologies is provided in Table 2.5.1

Table 2.5.1 Comparison of various terminologies (Source: Roberts, Sykes , Urban Regeneration – a Handbook)

Period / policy type	1950's Reconstruction	1960's Revitalization	1970's Renewal	1980's Redevelopment	1990's Regeneration
Major strategy and orientation	Reconstruction and extension of older area of towns and cities often based on a master plan suburban growth	Continuation of 1950's theme, suburban and peripheral growth	Focus on in-situ renewal and neighborhood scheme, still development at periphery	Major schemes of redevelopment, flagship projects , of town projects	Towards comprehensive form of policy and practice, more emphasis on **integrated treatments**
Key actors / stock holders	National and local government, private sector developers and contractors	Move towards a greater balance between public and private sector	Growing role of private sector and development centralization in local govt.	Emphasis on private sector and special agencies, growth of partnerships	Partnership; the dominant approach
Spatial level activity	Emphasis on local and site levels	Regional level of activity emerged	Regional and local levels initially later more local emphasis	Focus on site, later emphasis on local level	Re- introduction of strategic perspective , growth of regional activity
Economic focus	Public sector investment with some private sector involvement	Continuing from 1950's with growing influence of private investment	Resource constraints in public sector and growth of private investment	Private sector dominant with selective public funds	**Greater balance between public private and voluntary funding**
Social content	Improvement of housing and living standards	Social and welfare improvement	Community based action and greater empowerment	Community self-help with selective state support	**Emphasis on role of community**
Physical emphasis	Replacement of inner areas and peripheral development	Continuation from 1950's with parallel rehabilitation of existing areas	More extensive renewal of older urban areas	Major schemes of replacement and new development, flagship schemes	**More modest than 1980's, heritage and retention**
Environmental approach	landscaping	Selective improvements	Improvement with innovation	Growth of concern for wider approach	**Introduction of broader idea of environmental sustainability**

2.6.Indian Context

Regeneration in India is recent, though several cities, particularly metropolises, have been attempting to tackle the problem of decline and dilapidation through ad-hoc initiatives. Indian cities primary has high density of population concentrated within a limited space Indian society is diverse and complex, problems are different, contexts differ, needs change, and therefore, policies and programme to deal with each city and town would also differ.

For example, urban renewal of Jaipur city would be conservation and restoration of its cultural heritage of being a pink city while in Delhi it would be of effective use of traditional core areas or in Calcutta it would revolve around the phenomenon of bastis as better measure. The present urban renewal mission is more inclined towards provision of infrastructure rather than all around development. [13]

2.7.Theoretical Concept

Theoretical concept of urban regeneration includes main features and approach for urban regeneration program. It discusses main steps for regeneration process and important principles of urban regeneration.

2.7.1. Main features

Urban Regeneration as a Process: Urban regeneration is a process of analysis, problem definition, solution, policy making, and eventually, implementation. In this process input is the current urban environment and other influencing factors while output is decisions and policies that lead to changes in the urban environment. The outputs of the urban regeneration process can be grouped under five headings; neighborhood strategies, training and education, physical improvements, economic development and environmental action.[14]

Urban regeneration is a strategic activity, engaged in short-term measures for high priorities and long term approaches for future problems. It focuses on developing and achieving a clear vision for improvement.

Urban regeneration is an interventionist approach, best achieved through partnership working, intending to benefit a range of organizations, agencies and communities. It can be measured, evaluated and reviewed. It is related to specific needs and potentials in an individual region, city, town, or neighborhood. It is linked to other appropriate policy areas and programs.

[13] Preeti Onkar : Exploring The Concept Of Urban Renewal In The Indian Context
[14] Roberts, Sykes, Urban Regeneration – a Handbook, p. 13

2.7.2. Approach to Regeneration Process

- *Asset-Based Community Development (ABCD)* is based on building sustainable future on the community and individual strengths and resources. It is interaction based strategy which considers community members and stakeholders as active change agents rather than passive beneficiaries.[15]
- *Needs-oriented strategy and potential-based strategy* focus on identification of the baseline situation and community's deficiencies, solving the problems and satisfying the community needs.
- *Vision-oriented strategy,* involves integrating the future thinking, goals and objectives to be achieved by the regeneration process and to target on the achievement of the defined vision.

2.7.3. Major Steps in Urban Regeneration Process

Important steps for urban regeneration include analysis of current situation, formation of goals and objectives, development of strategy, planning for regeneration, setting up of institutions for implementation of the regeneration program, and finally monitoring and evaluation of results.

2.7.3.1. Analysis of Current Situation

The analysis of the current situation is the first step of any regeneration project. Analysis is helpful to identify the constraints and assets of the area. All diagnoses must include an in-depth analysis of the state of the land, its structures, divisions and the applicable private or public legal regime. Much of this information can be organized in a Geographical Information System (GIS).[16]

Environmental assessment is important in terms of the impacts of the intervention on resources and environmental components but also in providing a good quality environment. Improving the environment is a basic component of a strategy for sustainable development of cities. Therefore, environmental assessment acquires a key role since it identifies key problems and options for urban regeneration.

Analysis of the problems identified for urban regeneration involves:

- Exploring the broader economic and social development issues
- Foreseeing the anticipated development of the city in terms of the existing policies and planned projects/programs
- Identifying the opportunities for action.

2.7.3.2. Goals and Objectives

One of the main difficulties in urban regeneration is the determination of objectives, and the future of the inhabitants. Objectives may be applied in combination, and target the transformation of the urban structure, the functions, the

[15] LUDA E-compendium : Integrating Assessment into Sustainable Urban Regeneration

[16] Guidelines For Urban Regeneration In The Mediterranean Region

image of the city and its attractiveness, as in Manchester, Glasgow, Bordeaux, Marseilles and Barcelona.

Social objectives can be the main focus, within the framework of a national policy directed towards the consolidation of urban social fabric for example French legislation in 1999, established that in each city, at least 20% of the rentals in town housings must be available, within the scope of the local "renewal policy".[17]

Objectives of Urban Regeneration

- **Economic:** to attract investors, create employment, renew the urban economy (e.g. Manchester)
- **Social:** to increase urban housing and develop local infrastructure ("politique de la ville" in France)
- **Environmental:** to improve living conditions, combat pollution (Agenda 21),
- **Cultural:** to enhance architectural heritage and urban tourism (e.g. Alexandria, Split).

2.7.3.3. Developing a Strategy

Goals and objectives must be translated into strategies. Strategies result into planning interventions, financial schemes and organizational structures. It requires assignment of the task to a key agency or special organization with a strong technical capacity in planning for urban development. The strategy influences the decisions on institutional arrangements and vice versa. The basic framework of procedures is also established for consultation, consensus building and conflict resolution.

2.7.3.4. Planning for Urban Regeneration

The scope of the operations determines which tools and instruments are to be used: the plot, the block or the district. The control of land is the first important aspect if territories are already urbanized and belong to different owners. When regeneration entails restructuring the entire plot of land and new land assembly, the following methods are used:

- Agreed and negotiated purchase;
- Pre-emption, if this rule applies in the country involved;
- Eviction, if absolutely necessary, but this procedure is often traumatic.

Where the built-up surfaces are old, negotiations are organized with the owners, so that they accept to contribute to regeneration work expenses. If no agreement can be reached, the local authorities buy back or evict, as in the Old Town of Barcelona or Ciutat Vella. The transfer of development rights procedure can be helpful to create an open area.

The traditional tools of spatial planning, at various scales, zoning, density, land-use patterns, are not ideal to meet the needs of urban regeneration, which requires:

[17] Guidelines For Urban Regeneration In The Mediterranean Region

- Adapting to local demands and shorter time span
- Responding with flexibility to the national and international economic context, which determine the decisions of public and private investors
- To ensure compliance of local authorities and developers with local urban development plans.

Project-based strategic planning offers a wide range of interpretations and choices for zoning (combined land and building use), organization of open space and built-up areas, and of their density. When permissions to build are granted, each aspect is discussed and defined between the developers and the technical urban development services, to stay aligned with local plans.

Programming is very useful in the pre-operational phase, and it involves the expected volumes, expressed in square meters of floor surface for each of the major components. Plans in the major Seine Rive Gauche regeneration operation in Paris over a surface of 136 ha, include, in agreement with residents' associations, 430,000 m^2 residential space for 5,000 different types of housing, to host 20,000 inhabitants, 730,000 m^2 of office space for 60,000 jobs, 210,000 m^2 for higher education, to accommodate 30,000 students, 400,000 m^2 for shops and services, and 98,000 m^2 of open space.[18]

Implementation stages depend on the scope and nature of the regenerated sites:

- On very large sites, each block, district, or piece of equipment, is sold to a developer who is granted permission to build and to carry out the project as scheduled and described in the specifications. Large operations such as these can take up to 15 or 20 years, e.g. Euroméditerranée in Marseilles.
- The reallocation of a single urban derelict land is determined in agreement with the zoning specifications of the Local City Development Plan. On surfaces under 5 ha, the number of potential new uses will be limited. The operation usually only involves a single public or private developer, and can be completed in under 5 years.
- The regeneration of an old district can require ten years, since it covers many sites and the related owners. Buildings may be demolished, rebuilt, and rejuvenated, e.g. OPAH (*Opérations programmées d'amélioration de l'habitat* – Programs to improve housing).

2.7.3.5. Institutional Arrangements

In most countries, **the State** alone makes decisions concerning major urban regeneration operations, and selects the main contractors since only the State has the necessary financial resources, as in Tunisia, Algeria, Egypt and Turkey.

[18] Guidelines For Urban Regeneration In The Mediterranean Region

Regional Organization or municipality: In Spain and France, State create a specific organisation, and grant it mandate to undertake the work as in Spain and France. In UK *Urban Development Corporations* are in charge of the regeneration of large derelict harbour lands such as the London Docklands, and Cardiff Bay. In France, this is covered by the Etablissements Publics 23 d'Aménagement,

Private and public partnership: large urban land-owners can develop their own regeneration projects, as RENFE (Spanish railway) in Madrid, autonomous ports can play a role, as the Pasillo Verde Ferroviaro project in Barcelona which strongly contributed to the transformation of the Port Vell.

International organisations and funds: such as METAP, European Investment Bank, EuroMed Heritage II, UNESCO, and Council of Europe encourage regeneration though international funds.

Participation of Stakeholders: In most countries, the participation of the inhabitants is officially requested and encouraged. People can be involved as early as during the development of the projects, can contribute to information mechanisms or public surveys.

2.7.3.6. Results and Evaluation

Urban Regeneration assessment matrices must be developed, and should include:

- the relevant qualitative and quantitative criteria
- the tools and cost/benefit indicators over the short, medium and long term, concerning such major options as the creation of play or leisure areas
- the positive or negative external effects of urban regeneration projects
- the alignment of urban composition options with the practices and life style of the inhabitants, such as in the creation of public space, which may impact traditional habits and customs
- The reconciliation between sustainable development objectives and the need of populations for tradition, and maintaining the quest for new economic activities.

2.8. Main Themes of Regeneration

- *Physical conditions and social response:* The responses made to the questions of improvement and maintenance of urban areas change over time, depending on the socio-political and economic circumstances.

- *Housing and health: Improvement of living conditions of urban residents by* providing pure water, open space, suitable housing, etc.

- *Social welfare and economic progress: The linking of economic prosperity to* better social welfare and physical conditions, such as the Garden City Movement tried to achieve with their Garden cities in which the good aspects of town and country were combined

- *Containing urban growth: The attempt to restrain urban growth and protect* nature from the ever-growing cities by using urban space more efficiently.

- *Changing urban policy: Since the mid-twentieth century urban policy changed* from a central-led activity to a regional or local approach, with a style of consensus politics and more attention for environmental problems.

- *Sustainable development: The last and latest theme of urban regeneration* which will influence the future of urban areas. "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

2.9.Principles of Urban Regeneration

Urban regeneration should:

- Be based on detailed analysis of condition of urban area.
- Involve adaptation of the physical fabric, social structure, economic base and environmental condition of urban area
- Involve Implementation of integrated strategy for solution of problems.
- Ensure strategy aims at sustainable development.
- Set clear objectives which can be quantified.
- Make best possible use of natural, economic, physical and human recourses.
- Ensure full participation of stakeholders
- Include measurement of progress by supervision monitoring and revision of regeneration process.

2.10. Inferences

- Regeneration is comprehensive and integrated program with active participation of residents and stake holders to generate an effective plan with lasting improvement in social, cultural, environmental and economic condition of area.
- Regeneration process had evolved through time from various development processes according to need of hour

- European cities have promoted the idea of regeneration with planning initiatives such as INTERREG, URBAN-I and URBAN-II
- The objective of various development processes is basically to solve a problem persisting in one area. The approach may vary according to the theories of development process. Today the need of hour suggests focus on regional planning, a balance in public private partnership, socio economic upliftment, and environmental concern. These concerns formulate the basic principles of Urban Regeneration.
- Regeneration is process of analysis, problem definition, solution, decision making/ policy formulation, and eventually implementation.
- There are three approaches to regeneration process: asset based community development, need oriented strategy, vision based strategy.

3. Case studies for Urban Regeneration:

The chapter focuses on practical examples of Urban Regeneration in terms on strategies, proposals made for improving the condition of area. The case studies include Liverpool City Center regeneration, Regeneration in Copenhagen and Urban Regeneration in Shanghai. Revitalization of Jaipur city has also been studied for understanding proposals and strategies for Indian conditions.

3.1. Liverpool City Center Regeneration

Liverpool is a city of Merseyside, England and was founded as a borough in 1207 and was granted city status in 1880.

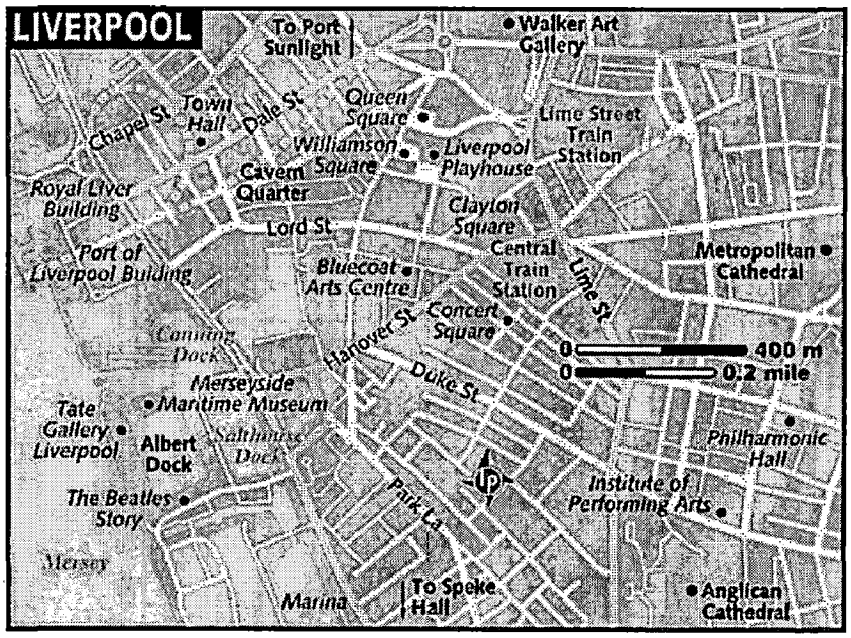
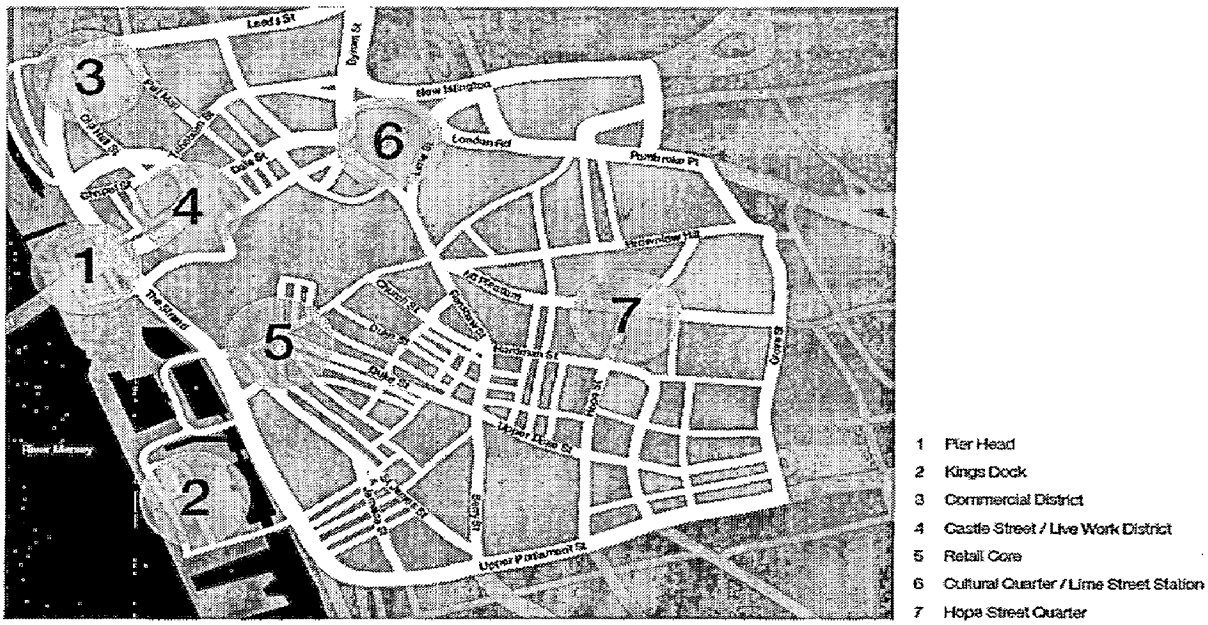


Figure 3.1.1 Map of Liverpool (source: http://www.lonelyplanet.com)

From the early 1970s to the early 1990s Liverpool had gone through a series of economic, financial and political traumas. The decline of the traditional industries especially the port, led to huge job losses, heavy unemployment, and industrial militancy. The city lost half its population in forty years.

Liverpool Vision was the first Urban Regeneration Company (URC)[19] designated by government in 1999 in response to Lord Rogers' Urban Task Force Report.

[19] URCs are companies limited by guarantee, established by local authorities, the Regional Development Agency and often English Partnerships. They do not have their own budgets and rely on existing agencies for their core funding



Source: Strategic Regeneration Framework, 2000

Figure 3.1.2 Areas of Regeneration (Source: Report on Regeneration of Liverpool city)

C worked with private and public sector organizations to redevelop and bring estment back to the worst areas in our cities and towns. Their job was to identify velopment opportunities and to develop a strategic plan with key stakeholders and public which would address those opportunities and provide a collective vision for future of the area.

e company was founded by three partners namely Liverpool City Council, the rthwest Regional Development Agency and English Partnerships. The regeneration Liverpool city centre covers 42 acres under six districts. After extensive public sultation Strategic Regeneration Framework (SRF) was produced in 2000. The plan ludes 40 new constructions of buildings in the area stretching from Duke Street and nover Street across Chevasse Park to North John Street and Paradise Street. [20]

3.1.1. Objectives

The Pier Head: transform into a world class urban environment and visitor destination.

Commercial District: create a world-class business exchange.

Castle Street / Live Work District: establish linkages within the historic core by creating a mixed-use urban environment and quality public realm.

Cultural Quarter and Lime Street Station: reinforce quality gateway to the city.

Retail Core: Improvement by extending the main retail area of the city centre.

Kings Dock: develop a world-class leisure and family entertainment facility.

Hope Street Quarter: make it a cultural resource for the city.

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rof. Michael Parkinson: Make No Little Plans- The regeneration of Liverpool city centre 1999 - 2008

3.1.2. Financial Investment

ECF invested heavily in Liverpool. The level of developer and investor interest in the area is reflected in the acquisition and refurbishment of existing buildings. Various fanincial organizations are given below (Figure 3.1.2.1)

	Total spend to 31/3/08 (£m)	Anticipated total lifetime spend (£m)	% Anticipated total outturn achieved to date	Lifetime outturn as % share of total LV spend
SRB	7.40	7.40	100.0%	0.9%
ERDF	94.00	120.39	78.1%	15.2%
NWDA	101.76	123.08	82.7%	15.6%
EP	86.59	97.92	88.4%	12.4%
Other Public	27.90	36.96	75.5%	4.7%
Public Sector pre 03/04	47.26	47.26	100.0%	6.0%
Total Public Sector	364.91	433.01	84.3%	54.7%
Private Sector	224.66	358.44	62.7%	45.3%
Total Funding	589.57	791.45	74.5%	-

Figure 3.1.3 Various Financial Organizations (Source: Report on Regeneration of Liverpool city)

Private Investment	£170 million
Employment Floor space	24,500 m²
Jobs Created	1,300
Land brought back into use	5 hectares
Residential units	1,700

Figure 3.1.4 Output of completed projects (Source: Report on Regeneration of Liverpool city)

3.1.3. Regeneration Process

The city has created business opportunities in commercial area and has better competitive business offer. It has captured opportunities for growth in retail and leisure. It has made the waterfront a world class leisure destination. Liverpool is a much better destination for visitors, shoppers and business. A new Arena and Convention Centre on Kings Waterfront (Figure 3.1.2.2), transformed the city's ability for conferences and cultural events and bring significant long term investment from business visitors and tourists. Mann Island a Museum of Liverpool and a major mixed-use scheme are under construction.

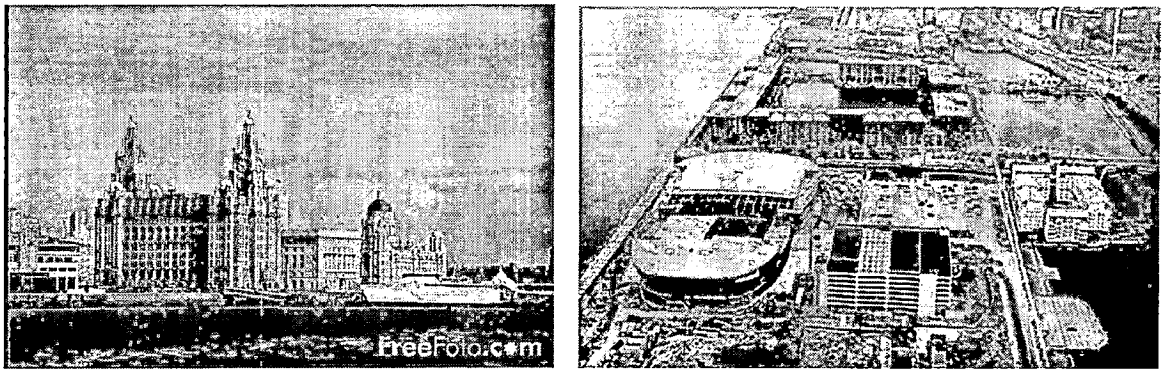


Figure 3.1.5 Pier Head (Source http://www.freefoto.com) **and Kings Dock** (Source http://myweb.tiscali.co.uk)

Centre pieces of the development include a new 240,000 sq ft John Lewis store and 180,000 sq ft Debenhams. The £920 million development includes new public spaces, gardens and parks and connection with existing shopping areas with the Albert Dock and the waterfront.

Kings Waterfront: arena open in 2008 has a capacity of 9,500 with a multipurpose hall, 1,350 seater auditorium and 70,000 sq ft of exhibition space (Figure 3.1.3.1).

Museum of Liverpool has 10,000 sq ft of exhibition space enabling National Museums Liverpool to showcase more items from its large collection.

Bluecoat Arts Centre The oldest building in the city centre, the Bluecoat Arts Centre was refurbished with a new wing containing a gallery and performance space.

Cruise Liner Facility at Princes Dock allows the world's largest cruise ships to berth in Liverpool (25 ships per year).

West Tower The 40 storey tower between King Edward Street and Old Hall Street has five floors of office space and residential accommodation.

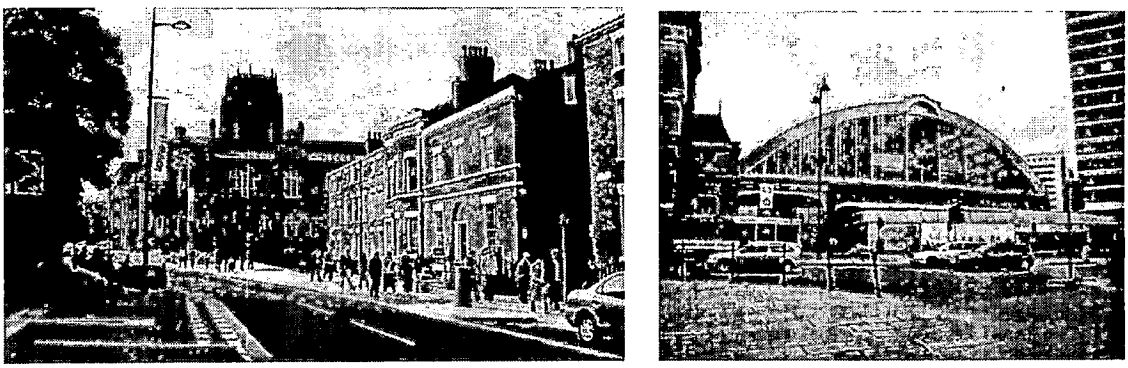


Figure 3.1.6 Hope Street: (http://www.bigdig.liverpool.gov.uk) **and Lime Street Station** (http://www.geograph.org.uk)

3.1.4. Analysis and Monitoring

The estimated life time outputs in terms of jobs created, new floor space created, land developed and residential units built (Figure 3.1.4.1).

Output Measure	Anticipated lifetime outputs to 2010/11	Achieved to 31/3/08	% Anticipated lifetime total achieved to date
New Floor space m²	102,678	83,218	81.0%
Refurbished Floor space m²	30,630	30,630	100.0%
Jobs Created	5,126	2,692	52.5%
Jobs Safeguarded	1,700	1,700	100%
Construction Person Years	9,078	6,298	69.4%
Land Developed (hectares)	34.5	31.4	91.0%
Residential Units	1,253	328	26.2%
Private Investment £m	358.4	224.6	62.7%

Figure 3.1.7 Anticipated lifetime outputs (Source: Report on Regeneration of Liverpool city)

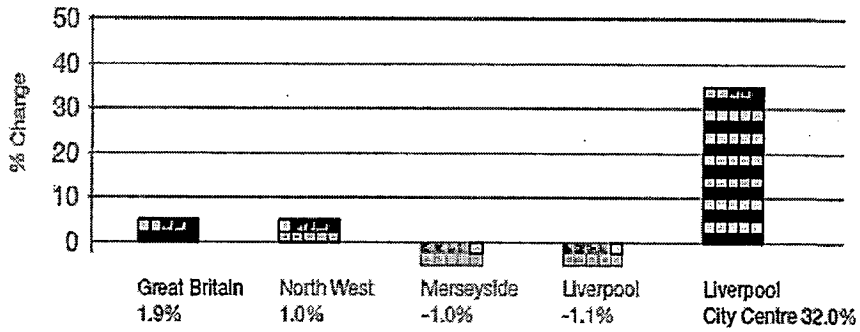


Figure 3.1.8 Population Change 2000 to 2005 (Source: Report on Regeneration of Liverpool city)

The population of Liverpool City center has increesd by 32% which is much higher than whole of britan or liverpool city itself (Figure 3.1.4.2).

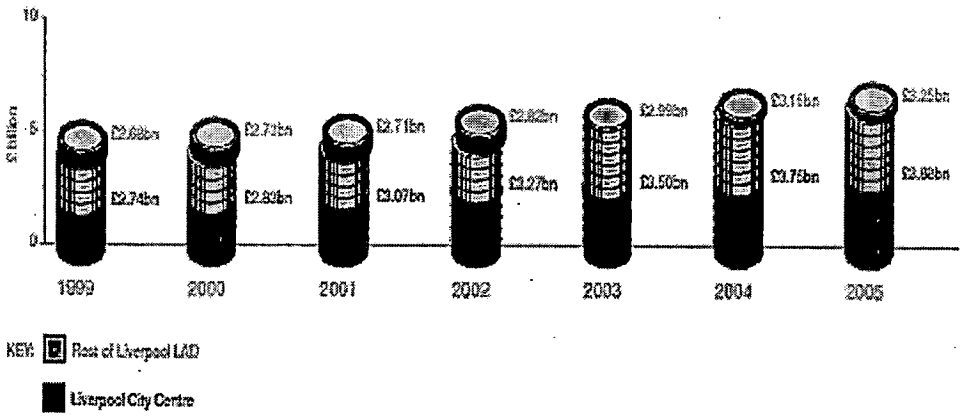


Figure 3.1.9 GVA Liverpool and city center 1999 to 2005 (Source: Report on Regeneration of Liverpool city)

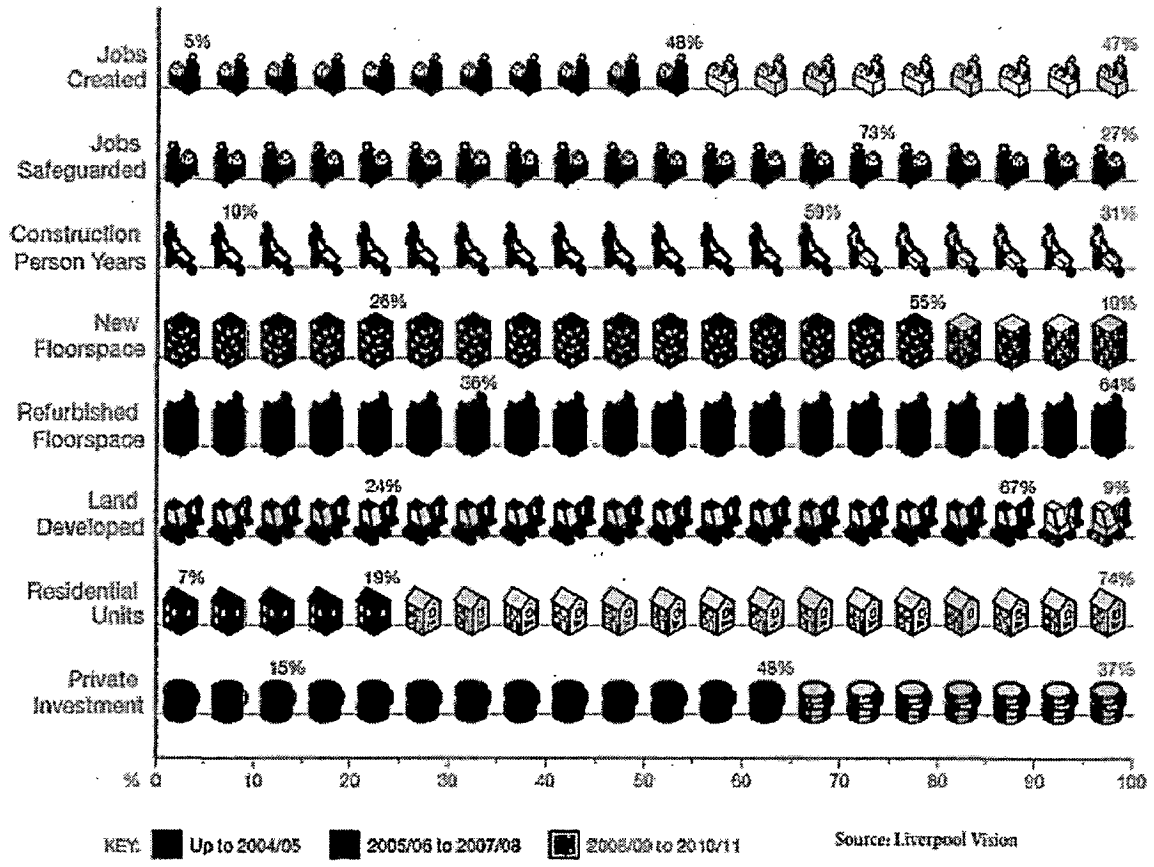


Figure 3.1.10 Outputs delivered over time (Source: Report on Regeneration of Liverpool city)

Gross Value Added (GVA) by Liverpool City center is higher than Liverpool city area (Figure 3.1.4.3). the outputs delivered by Liverpool city centre from year 2005 to 2011 are given in Figure 3.1.4.4.

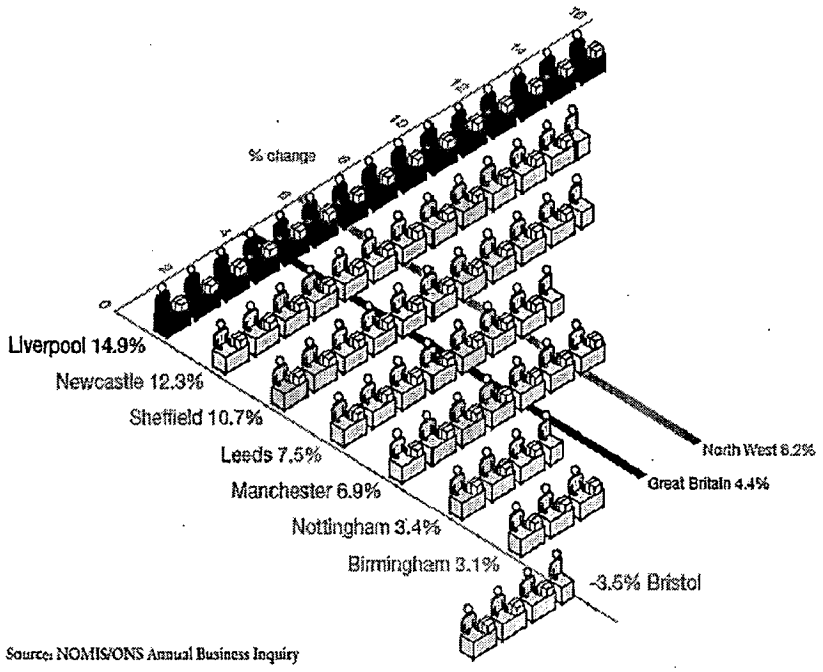
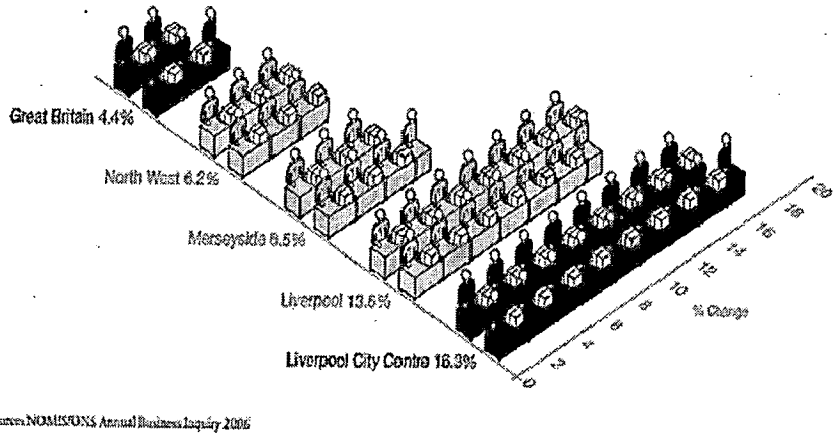


Figure 3.1.11 Job growth in Liverpool 2000 to 2006 (Source: Report on Regeneration of Liverpool city)



Source: NOMISONS Annual Business Inquiry 2006

Figure 3.1.12 Job increases 2000 to 2006(Source: Report on Regeneration of Liverpool city)

Job Growth in Liverpool city is 10 times higher than Great Britain(Figure 3.1.4.5).. The increase in job growth in Liverpool city center is 16.3% much higher than Liverpool city, or Great Britain (Figure 3.1.4.6).

3.2. Regeneration in Copenhagen

In 1996, a new program, *Kvarterløft*, was launched, connected to the urban renewal act, but with holistic and regional based view (Kvarterløft literally means, "Lift the neighborhood"). Kvarterløft is a program with an investment frame of 160 Million Euro distributed among 11 districts. The investment frame is divided between national level and municipalities with 75% and 25% financing.

According to the planning act, every local government must within the first two years of its election period (i.e. every four years) pass a strategy for the spatial development of the municipality. The municipality of Copenhagen at the present runs 5 regeneration projects of the Kvarterløft and 2 local partnership projects.[21]

A Kvarterløft project in Copenhagen has three different stages.

- In first Stage (neighborhood planning stage), public meetings are held and working groups are set up to prepare a neighborhood plan in co-operation with the municipal departments.
- The second stage (neighborhood planning stage) is followed by the implementation stage in which the projects are developed, planned in details and implemented.
- The final stage is the monitoring stage in which its benefits and losses are analyzed and clarified if the project is feasible or not.

Monitoring is important to ensure that implemented projects are maintained and that initiated activities are continued. Kvarterløft is a partnership in which the local stakeholders in a neighborhood co-operate on laying down the framework for the development of the neighborhood.

3.2.1. Kongens Enghave Regeneration

Kongens Enghave is situated in the south-western part of Copenhagen, is surrounded, by motorways and railways (Figure 3.2.1.1).The southern part of the harbor lost its economic importance and the local industry disappeared. As a result Kongens Enghave became the poorest neighborhood of Copenhagen in the mid 90's with population of 15.500, the lowest average household income in Denmark, the lowest average life expectancy and a high concentration of people with social problems. After regeneration in 1996, the businesses are returning to Kongens Enghave – it has become the fastest growing business neighborhood in Denmark (Table 3.2.1.1).

[21] The Danish Neighbourhood Regeneration Programme- Kvarterløft in Copenhagen

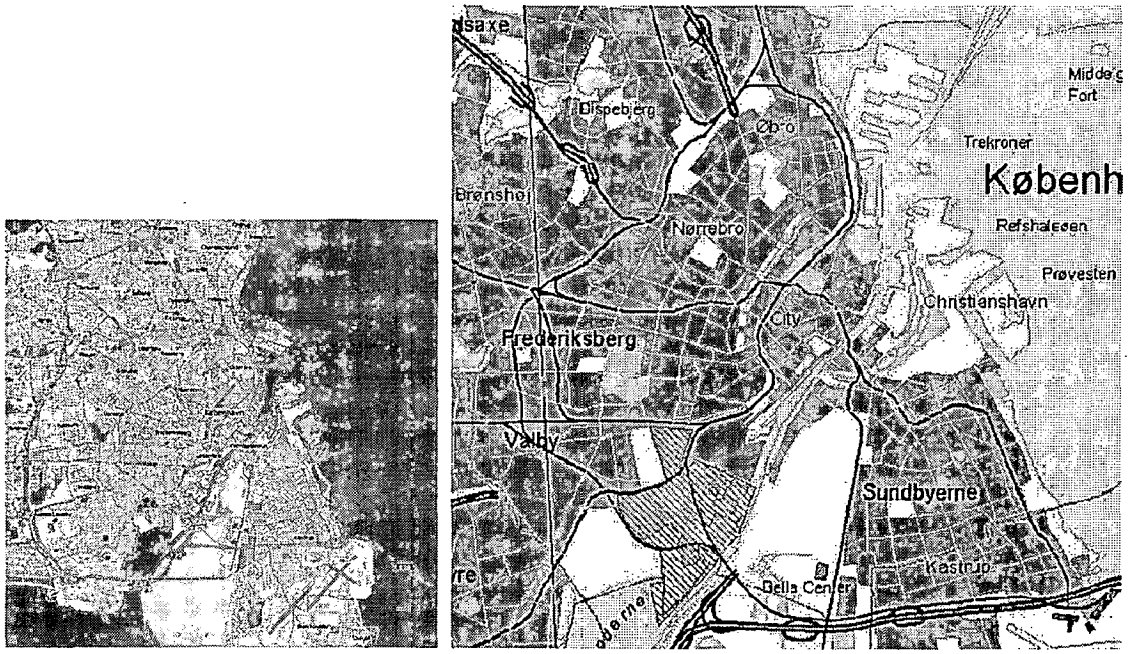


Figure 3.2.1 Map of Copenhagen (Source: Danish Neighborhood Regeneration Programme)

Table 3.2.1 Facts about Kongens Enghave (Source: Danish Neighborhood Regeneration Programme)

Facts about Kongens Enghave	
Area	445 ha CPH: 8955 ha
Government system	1997-2001 Local council – 17 local politicians elected in direct elections 2002 – Central municipality government
Demographics	
Number of residents 2000	15.515
Average no. Of person pr. Household 2000	1,6
Average personal income 1998	127.900 kr. CPH: 147.900 kr.
Housing	
Ownership 2000	50% owned by housing associations 25% private co-ops 15% owner occupied 10% private rented
Structure (height/ number of stories) 2000	Multi-storey: 92%

3.2.2. Stakeholders

The regeneration program in Kongens Enghave has the following main stakeholders:

- Residents
- Businesses – both large globally oriented businesses such as Nokia and Ericsson and smaller companies and shops
- Housing organizations (including large housing organizations representing almost 3000 housing units – and smaller housing co-ops, private owners etc)

- Voluntary organizations (Social organizations with projects for homeless, mentally ill, addicts (mainly alcoholics))
- Sports and culture institutions
- Central municipality departments
- Local administration/services (includes schools, library, day care institutions etc)

3.2.3. Neighborhood analysis

At the beginning of the project the municipality of Copenhagen and local secretariat produced a neighborhood-analysis to be used as the basic information for the program. The contents of the analysis were:

1) Statistical information concerning physical layout, population, employment, businesses, economy etc.

2) Qualitative information about architecture, history, culture etc.

In August 1997, the project workers set up a series of dialogue meetings were held with representatives of the major stakeholder groups of the neighborhood: Housing organizations, organizations, businesses, local institutions etc.

3.2.4. Strategy

Kvarterløft project in Kongens Enghave had a set of preconditions such as:

- National legislation on neighborhood based regeneration
- A municipality act on decentralization of government and administration
- A municipality decision that Kongens Enghave would be a both a Local Council neighborhood and a regeneration neighborhood
- Information about the social, economic, environmental, physical conditions

In October 1997 the local secretariat was set up – and first public meetings in which:

- People were invited to formulate goals and objectives for each theme areas
- People were asked to identify issues to be tackled
- people were asked to join Working Groups to discuss action

The working groups worked for 2½ months till January 1998. And came up with 80 proposals for action started a discussion on prioritizing the many proposals – and discussing the procedure for proposal.

Examples of projects/ideas for action in the plan:

- The creation of the Green Job-house as a local job-centre
- The Green Nerve – a streetscape project to tie the neighborhood together
- A multi-media centre
- Rebuilding of existing housing to create bigger flats
- Reduction of the problems arising from the traffic in the neighborhood

3.2.5. Creating vision

1. *Housing and residents:* construction of more differentiated housing structure and a more diverse population without forcing anybody out of the neighborhood (Figure 3.2.5.1).

Figure 3.2.2 Housing and Streetscape (http://www.panoramio.com)

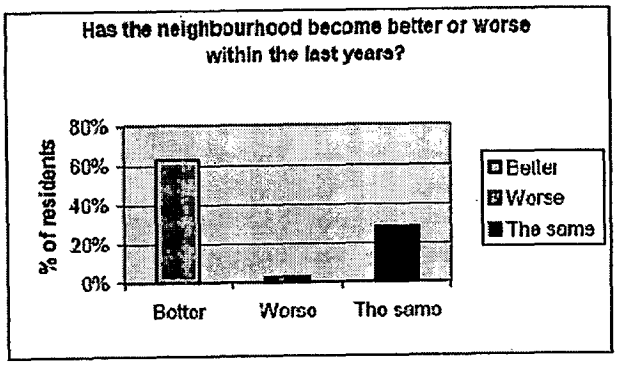
2. *Traffic:* The neighborhood must be better integrated with the rest of the city. The through traffic to be reduced and the safety within the neighborhood to be improved.
3. *Employment:* The business area and the neighborhood housing were integrated, physically and functionally. The balance between the workforce and the jobs available was improved.

Figure 3.2.3 Copenhagen Harbor and park (http://www.panoramio.com)

4. *The environment:* Parks and harbor were redeveloped and a special solid waste management program initiated (Figure 3.2.5.2).

3.2.6. Measuring progress – monitoring and evaluation

In 2003final evaluation report gave analysis based on survey in 2002 (Figure 3.2.6.1). The analysis of Kongens Enghave showed considerable progress, surveys showed a marked improvement on the way the neighborhood has progressed and positive expectations to the future development.



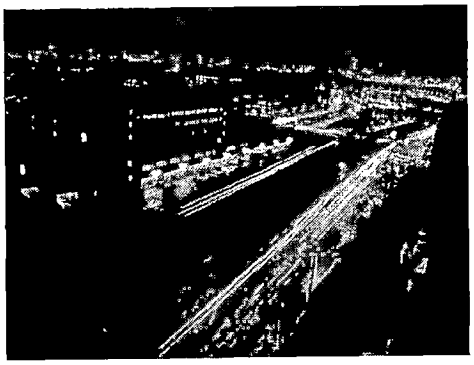


Figure 3.2.4 Analysis of Copenhagen regeneration (Source: Danish Neighborhood Regeneration Programme)

3.2.7. Financing

The basic funding consists of:

- € 22,5 million for housing and open space improvements
- € 3.3 million for holistic projects
- € 2.7 million for involvement of residents, information and secretariat
- € 1.7 million for social activities in residential neighborhoods

Apart from that the project has successfully been fundraising for

- Employment projects (European Social Fund (ESF EU) and National funds)
- Social projects (National funds)
- Environmental projects (National funds)
- Youth activities (National funds)
- Culture (National funds and private)

Kongens Enghave

Commenced: 1997 concluded: 2003
Population 1.1.2000
Number of inhabitants: 15,000
Number of houses: 9000
Cash benefit claimants: 5 per cent
Early retirees: 7 per cent
Unemployed persons: 9 per cent
Immigrants and their children: 23 per cent

3.3. Urban Regeneration in Shanghai

Luwan district is one of the central areas in Shanghai (Figure3.3.1). The Luwan district was one of the most densely populated districts in Shanghai. There was concentration of shanty housing and winding streets. 87.8 per cent of the dwellings in this district consisted of public housing (Luwan District Government, 1998). After two rounds of urban redevelopment, Luwan's northern and southern areas had become expensive commercial and residential districts. As a result, the old and rundown area in the middle degraded in value. Taipingqiao is located in this area has many historical sites. Taipingqiao area was 52 hectares in size, with a population of about 70 000 people constituting more than 20 000 households.[22]

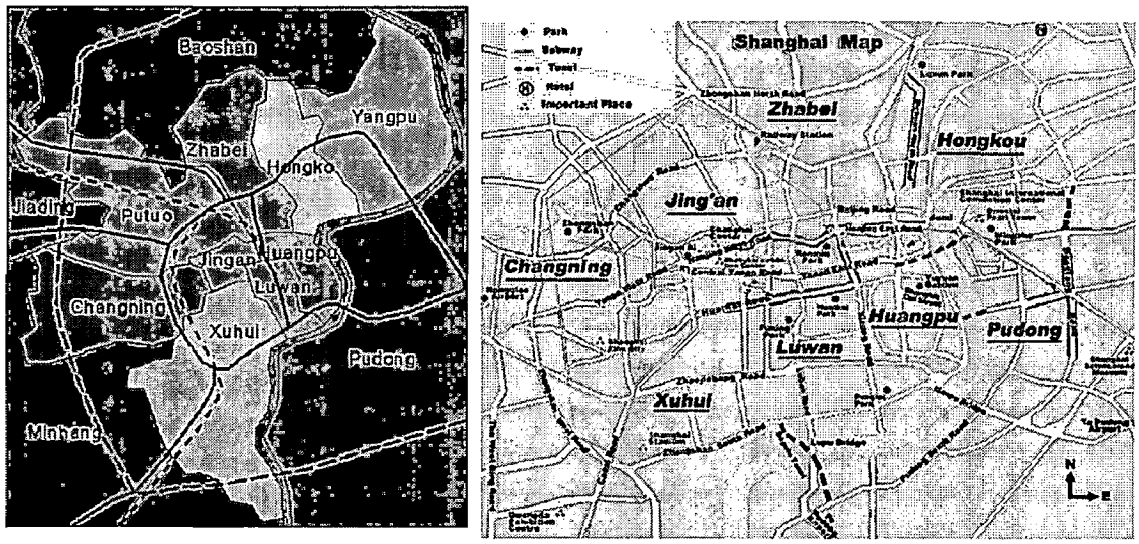


Figure 3.3.1 Location of Luwan District in Central Shanghai (Source: Redevelopment on China's urban neighbourhoods)

The population density continued to rise during various events including the Japanese invasion, the Chinese civil war and the Cultural Revolution. The quality of the environment continued to decline (Luwan District Government, 1998).

3.3.1. Urban Regeneration process

Since 1992, Taipingqiao area was regarded as a district that urgently needed redevelopment, district government tried to attract the foreign capital to carry out the redevelopment. Shui On Group, a Hong Kong real estate company, was the most important participant in the urban redevelopment project in Taipingqiao. 52 hectares of Taipingqiao were leased to the Shui On Group by the district government. The stakeholders in development projects include city and district governments, foreign real estate capital, planning and design companies, removal and relocation companies, as well as academic institutes.

In 1997 the Spatial Formation of Xintiandi (XTD), Luwan district government submitted a 'detailed control plan' to the Municipal Planning Bureau for approval. After several rounds of negotiation, the Shui On Group, the District Planning Bureau

[22] Socio-Spatial Impacts of Property led Redevelopment on China's: Urban Neighbourhoods

and city government repositioned XTD as a high-end commercial area, so that land prices rise and funds can be generated for redevelopment process. The Shui On Group subsequently repositioned XTD as a space for restaurants, culture and entertainment, and made it a service area for the CBD, aiming for white collar employees (Figure 3.3.2.1). XTD can be considered as two plots, divided into the North Lane side (plot 109) and South Lane side (plot 112).

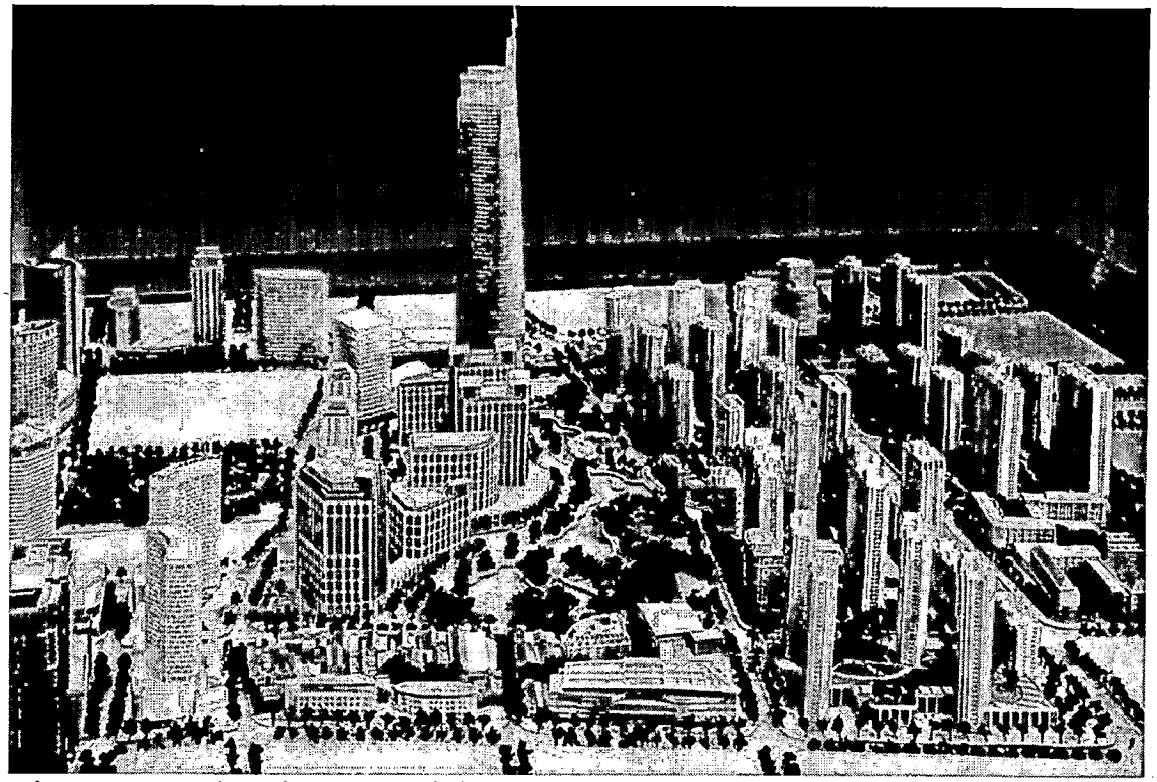


Figure 3.3.2 3-D view of XTD, Shanghai (Source: Redevelopment on China's urban neighbourhoods)

The strategy of Shui On Group was to upgrade the image of the Shikumen and to use cultural activities to build up a unique atmosphere in the area, transforming the Shikumen from an area of old, run-down residences to high-end, fashionable, cultural district.

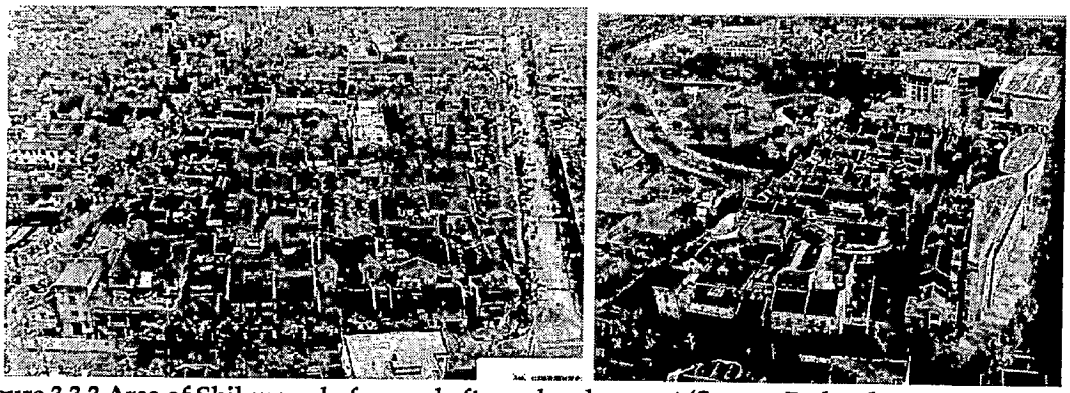


Figure 3.3.3 Area of Shikumen before and after redevelopment (Source: Redevelopment on China's urban neighbourhoods)

The strategy proved successful, attracting investors from France, Hong Kong, Japan, Taiwan, the US and south-east Asia, including a number of leading global firms. With

the XTD brand name gaining recognition, consumers came in droves and the value of shops in the Shikumen skyrocketed. Rents for the second wave of merchants to arrive rose by 4–5 times in the 6-month period from August 2001 to March 2002, but investors were still keen. Even 'modern buildings' in South Lane that were not part of the Shikumen were attractive to investors with an eye towards the foot traffic drawn by North Lane, despite the high rents charged.[23]

Figure 3.3.4 XTD , hub of economic and socio-cultural activity (Source: www. picasa .com)

3.3.2. Residential Relocation

Removal and resettlement are major issues of urban development. around 70 per cent of the land acquisition fee for the project was for removal and resettlement. Resettlement not only affects the cost of development but also represents a key step in the transformation of property rights, as well for the continuity of the social life of the original habitants. There have been around seven million people involved in the urban redevelopment of Taipingqiao. According to our fieldwork, when the district government started negotiating with the developer, the average compensation per household was to be RMB200 000–300 000.[24]

3.3.3. Inferences

The historical preservation of XTD evolved out of the need of capital accumulation. The end result is neither complete historical preservation as the city officials imagined, nor the primitive blueprint sketched by the developer; instead, the strategy of an 'adaptive reuse' introduced by American architects was successfully applied to the urban redevelopment project of XTD .

[23] Socio-Spatial Impacts of Property led Redevelopment on China's: Urban Neighbourhoods

[24] Shui On Land Limited (272.HK) 2009 Annual Results

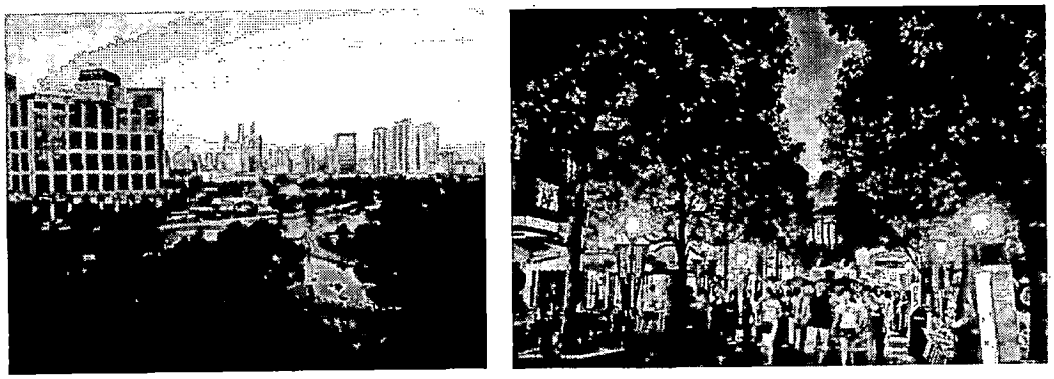


Figure 3.3.5 Lively atmosphere of XTD (Source: www. picasa .com)

3.4. Revitalization of walled city of Jaipur

Jaipur is the largest city in Rajasthan and was built in the eighteenth century by Sawai Jai Singh as India's first planned city (Figure 3.4.1.1). The economy of Jaipur today relies heavily on heritage tourism and cultural industries with at least 30 percent of Jaipur population living and working in heritage structures within the walled city. The area of Walled city is 6.7 sq km and has the highest density of 58207 persons/per sq km (Table3.4.1.1). Around 3000 tourists visit the city every day. [25]

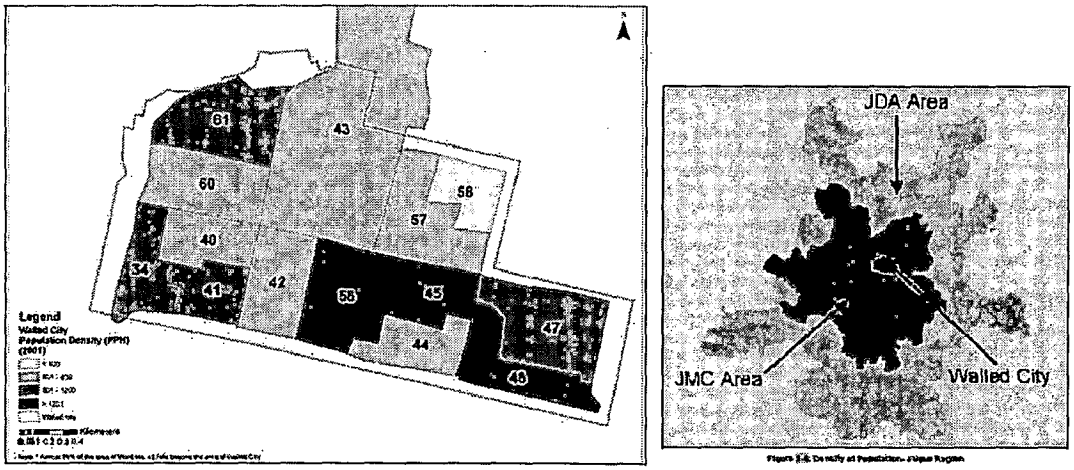


Figure 3.4.1 Location and Density of Walled city of Jaipur (Source: Jaipur City Development Plan)

Table 3.4.1 Area and Population of Jaipur Region (Source: Jaipur City Development Plan)

S. No.	Area	Total Area (sq. km.)		Total Population (Million)		% JDA Population	
		1991	2001	1991	2001	1991	2001
1.	JMC	218.3	288.4	1.52	2.32	81.4	86.8
1.a.	Walled City	6.7	6.7	0.5	0.4	26.4	15.0
1.b.	Rest of JMC	192.3	281.7	1.02	1.92	54.7	71.8
2.	Rest of JDA	1220	1149.9	0.35	0.36	18.6	13.2
3.	Total JDA	1464	1464	1.87	2.68	100	100

3.4.1. Historical perspective

The city of Jaipur was Planed and constructed by Sawai Jai Singh II in 1727. The factors responsible for the origin of the city and its layout were:

- The need of a new capital for 18th century Dhoondhar as the earlier one of Amber built on a hill was getting congested;
- Sawai Raja Jai Singh's vision of the new capital as a strong political statement at par with Mughal cities and as a thriving trade and commerce hub for the region.

The east-west axis of the town was divided by three perpendicular roads into eight portions with the central ones of equal size and the outer ones as per the remaining

[25] City Development Plan of Jaipur

dimensions till the Chand Pol in the west and Suraj Pol in the east. A sawaya system of measurement was used in the planning and details of Jaipur, (Figure 3.4.2.1).

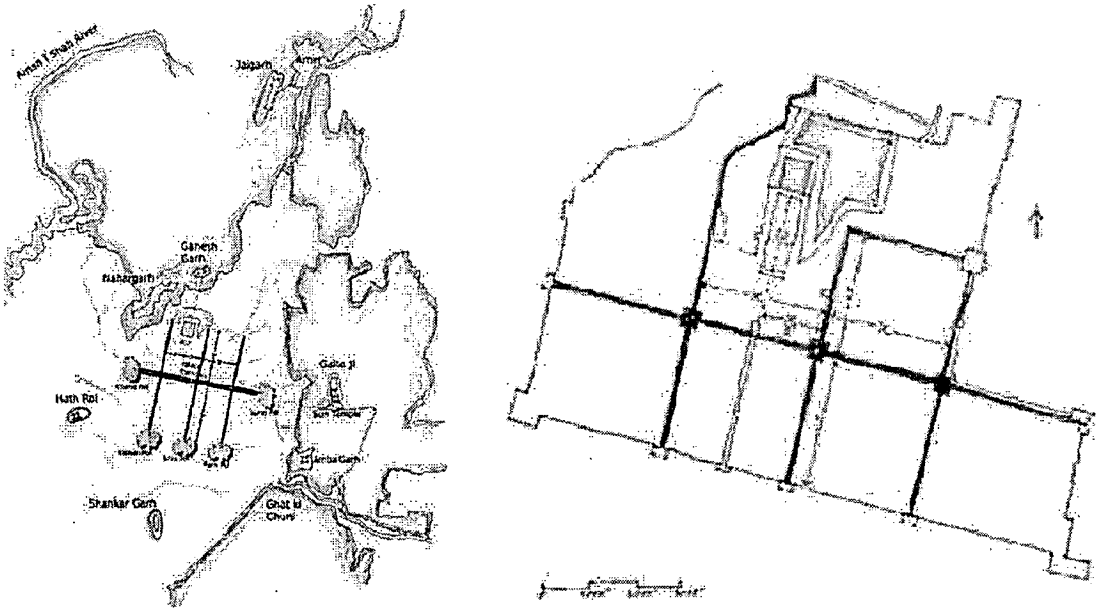


Figure 3.4.2 Planning of walled city

In the 19th century, the city extended beyond the old city walls, adapted newer modes of transport and adopted modernized drainage and piped water supply system. There were interesting additions in the urban fabric within the walled city with new buildings constructed in the Indo Saracenic vocabulary such as the Mubarak Mahal within the Palace Complex, Vidhan Sabha and the Maharaja's College in 1873 and Ramniwas Bagh.

The 20th century observed further modernization and urban renovations within the walled city, including the restoration work of the city walls and gates and, converting the inner temporary houses in the sectors into more permanent structures. Junctions of the main axial streets formed the two square public open spaces called chaupars (Badi chaupar and Chhoti chaupar). The width of the square chaupars was three times that of the main street. Original markets in the city include Kishanpole bazaar, Gangauri bazaar, Johari bazaar, Sireh Deorhi bazaar, along the main north-south and east-west axes that intersect at Chhoti and Badi Chaupars. Typical architectural features of the bazaar streets are - use of chhajjas (sunshades) resulting in strong horizontal lines, projecting vertical blocks on brackets, a modular system of arches filled with delicate latticed screens to cut direct sun and glare of reflected sun in the street(Figure 3.4.2.2).

Water being scarce in the region, indigenous methods for effective water collection have been evolved and practiced across Rajasthan. A vast number of reservoirs, artificial lakes, tanks, kunds (stepped ponds), step-wells or baories, wells, ponds etc, have been built and renovated over the centuries.

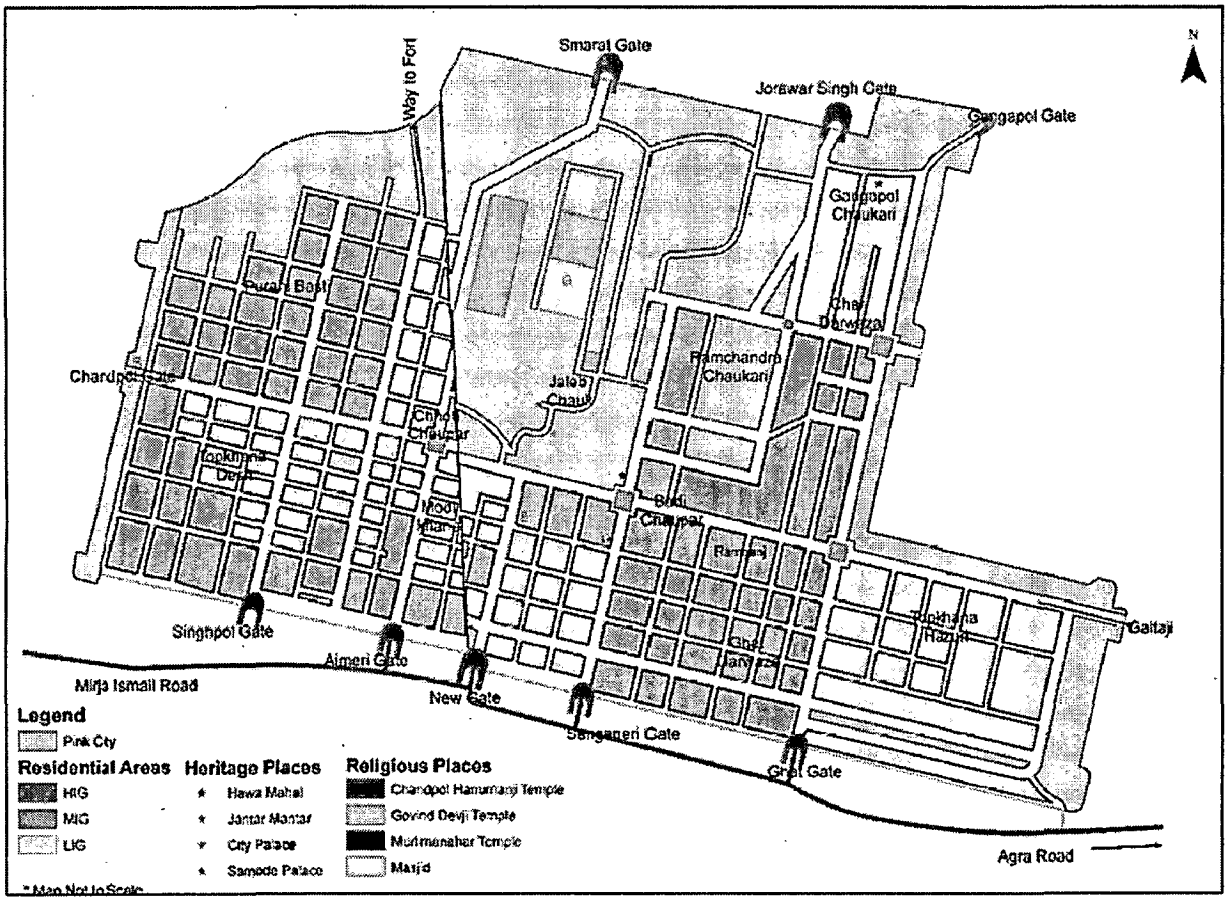


Figure 3.4.3 Land-use of Walled city of Jaipur

3.4.2. Challenges

- Lack of awareness of the people towards heritage conservation has led to deteriorating condition of the heritage buildings. Violation of rules and regulations for the conservation of heritage buildings and their surroundings is a common (Figure 3.4.3.1).

Figure 3.4.4 Deteriorating condition of heritage buildings

- There is no sewage treatment plant and the sewage flows through the natural drains into the Mansagar Lake.
- The drainage situation in the city ranges from average to poor with water logging being a very common phenomenon in Jaipur. Even with less amount of

rain, roads and open areas get waterlogged. Water logging could be attributed to choking of drains with solid waste or later interventions and inadequate design of drains – irregular slope and form.

- Solid waste management has emerged as one of the most pressing urban environment issues for the city as the majority of the city does not have a primary waste collection system.
- The overhead wires and cables for electrical supply, telephone wiring and television cables in the walled city area not only cause an aesthetic issue for the built heritage as they are loose and unorganized obscuring the building façades, but are possible sources of electric and fire hazard.
- The lack of a good public transport system, traffic planning (such as one way streets, sufficient designated parking space and environmentally friendly transport options), traffic norms and regulations in the city enhances the problem with no specific pedestrian areas (such as heritage walkways) demarcated; affecting both the tourist and the local community negatively.

3.4.3. Revitalization process

A number of conservation initiatives for the walled city have been taken by international organizations, NGO's and local government authorities since Jaipur became the capital of Rajasthan. More recent initiatives by Government of Rajasthan since 2005 include conservation of city gates, Amber Palace, Jaleb Chowk in City Palace and Ghat Ki Guni heritage zone, lighting of several monuments, making of Heritage Acts and Laws and Empanelment of Conservation Architects to prepare Conservation Proposals for Grade 1 and Grade II monuments.[26]

Urban renewal plan: the total project cost for urban renewal of chowkdi sarhad ward no. 58 in walled city is Rs 1159.64 lack, of which Rs 929.74 lakh is released by GoI , GoR and JMC. The amount spent is rs 1009.84 lakh. The additional amount of Rs 80.1 lakh is funded by JMC. The project has received three installments. The project includes 18 packages out of which 17 packages are under tendering process. The total project cost of renewal of walled city area jaipur phase 1 is Rs 2896 lakh of which Rs 506.80 lakh is released.[27]

[26] Dr.Shikha Jain, Indian Heritage City Network: Walking into the microcosm of Jaipur

[27] Dr. Shikha Jain, **Jaipur as a Recurring Renaissance,** Dronah (Development and Research Organisation for Nature, Arts and Heritage) and JVF (Jaipur Virasat Foundation)

Table 3.4.2 Conservation and Renewal initiatives in Jaipur since 1971 (Source: Dr. Shikha Jain, Jaipur as recurring renaissance)

S.n	Walled City Renewal Initiatives	Year	Organization	Result
1	Master Plan Proposal with Specific Heritage Development Works	1971	JDA (Jaipur Development Authority)	No enforcement of works
2	Study of Heritage Buildings in walled city	1985	Ford Foundation' and JDA	Identified 300 buildings for conservation
3	Conservation and Restoration of heritage structures	1995	Avas Vikas Sansthan and Department of Tourism	no implementation
4	Master Plan -2011	1998	JDA	work in process
5	Operation Pink, removal of encroachments in main commercial streets of the walled city	2001	JMC	Successfully executed
6	Heritage walk in the Chowkri Modi Khana	2001	INTACH and JVF	Walks continued by JVF but infrastructure conditions are bad
7	The Asian Development Bank project of infrastructure	2001	ADB & JMC	works were executed but not effectively
8	Multi-storeyed parking	2002	JMC, JDA and CTP (Country and Town Planning)	Does not involve conservation professionals
9	Jaipur Heritage International Festival	2003	JVF	Successful with UNESCO endorsement
10	Revitalization proposal for Chowkri Modikhana	2004	Asia Urbs	not executed

Table 3.4.3 JNNURM Project Progress (Source: JMC)

S.n	Name of Project	Project Cost	Status
1	Urban Renewal of Walled City	1159.64	work in progress
2	Solid Waste Management	1319	work in progress
3	Sewerage System Phase-1 JDA	7495	work in progress
4	Sewerage System Phase-2 JMC	11086	work in progress
5	Bus Rapid Transit System (JDA)	7500	launched
6	Conservation and Propagation of Pnna Meena Kund	530	to be launched
7	Resettlement Of Slums In Sanjay Nagar Bhatta Basti	16943	launched
	Total	46033	launched

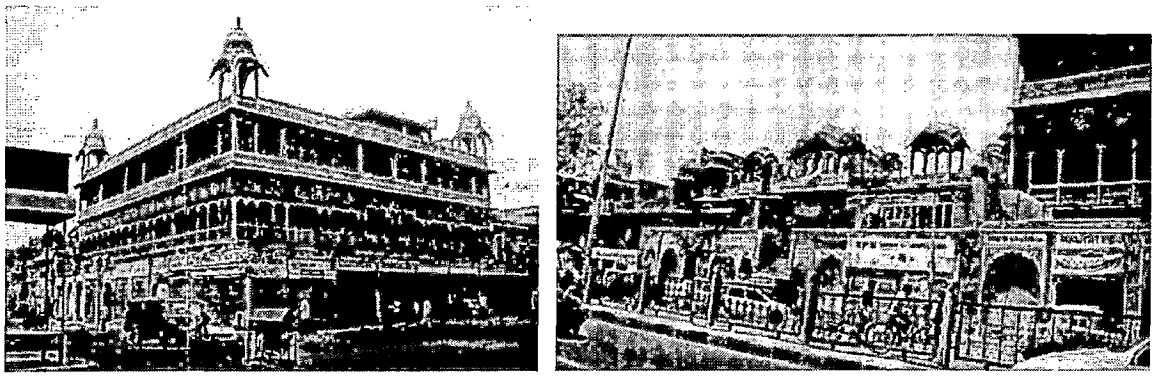


Figure 3.4.5 Characteristics of Walled City

Heritage Plan: The increasing tourist and local pressures in historic Jaipur and the inefficacy of continual conservation efforts by multiple organisations have finally lead to the formulation of JHERICO (Jaipur Heritage Committee) that includes government organisations such as the Jaipur Municipal Corporation, Jaipur Heritage Development and Management Authority, Department of Art and Archaeology and NGO's such as Jaipur Virasat Foundation. The committee is in the process of making a Heritage Plan for Jaipur city that proposes to review the historic fabric of the city and integrates the 18th century unique planning of Sawai Jai Singh's Jaipur to the '21st Century Renaissance Vision' of the local residents and NGO's.

The Heritage Plan of Jaipur distinctly categorises the present day heritage resources and heritage managers for Jaipur city and outlines the heritage objectives. Besides policies for data collection and documentation, conservation and urban renewal, interpretation and heritage awareness and heritage valuation, it presents an action plan that identifies planning level and project level activities for the heritage resources namely, heritage sites outside the walled city, walled city fabric, cultural heritage, archeological/archival heritage and the natural heritage of Jaipur. It analyses the relevance of each within the contextual framework of ownership, heritage significance and economic potential.

Heritage Byelaws: The Government of Rajasthan has put into place a numbers of regulations and byelaws which aimed at protecting heritage monuments and structures. These include the Rajasthan Monuments, Archaeological Sites and Antiquities Act 1961 that applies on any state protected monument under the jurisdiction of the Department of Art and Archaeology and Heritage Byelaws for properties within Walled City as outlined in the Master plan of Jaipur 2011(Figure 3.4.4.2).

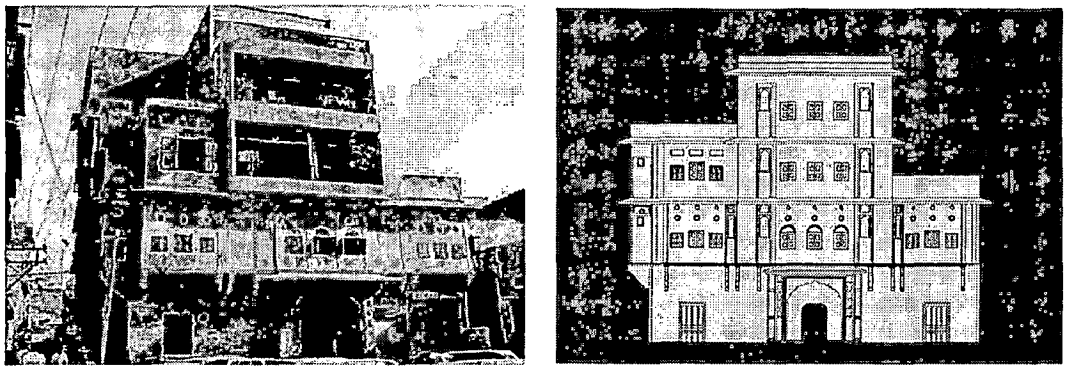


Figure 3.4.6 Heritage byelaws to maintain the character of city

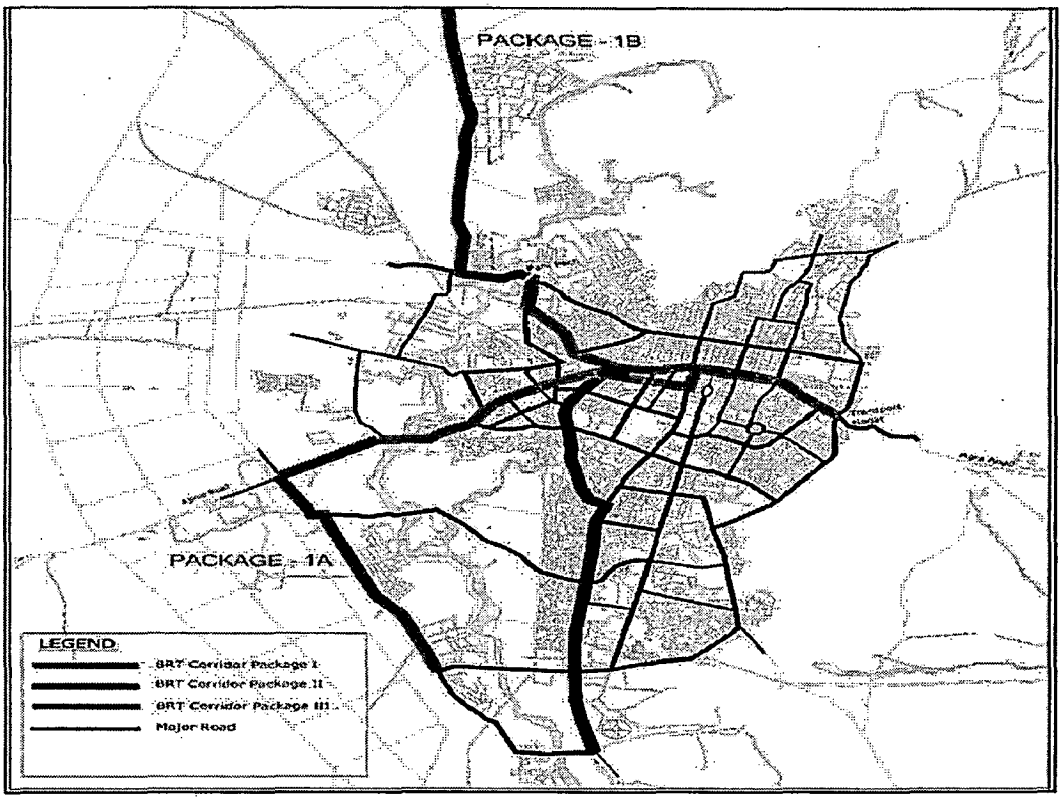


Figure 3.4.7 BRT Corridor

Figure 3.4.8 BRTS in Jaipur

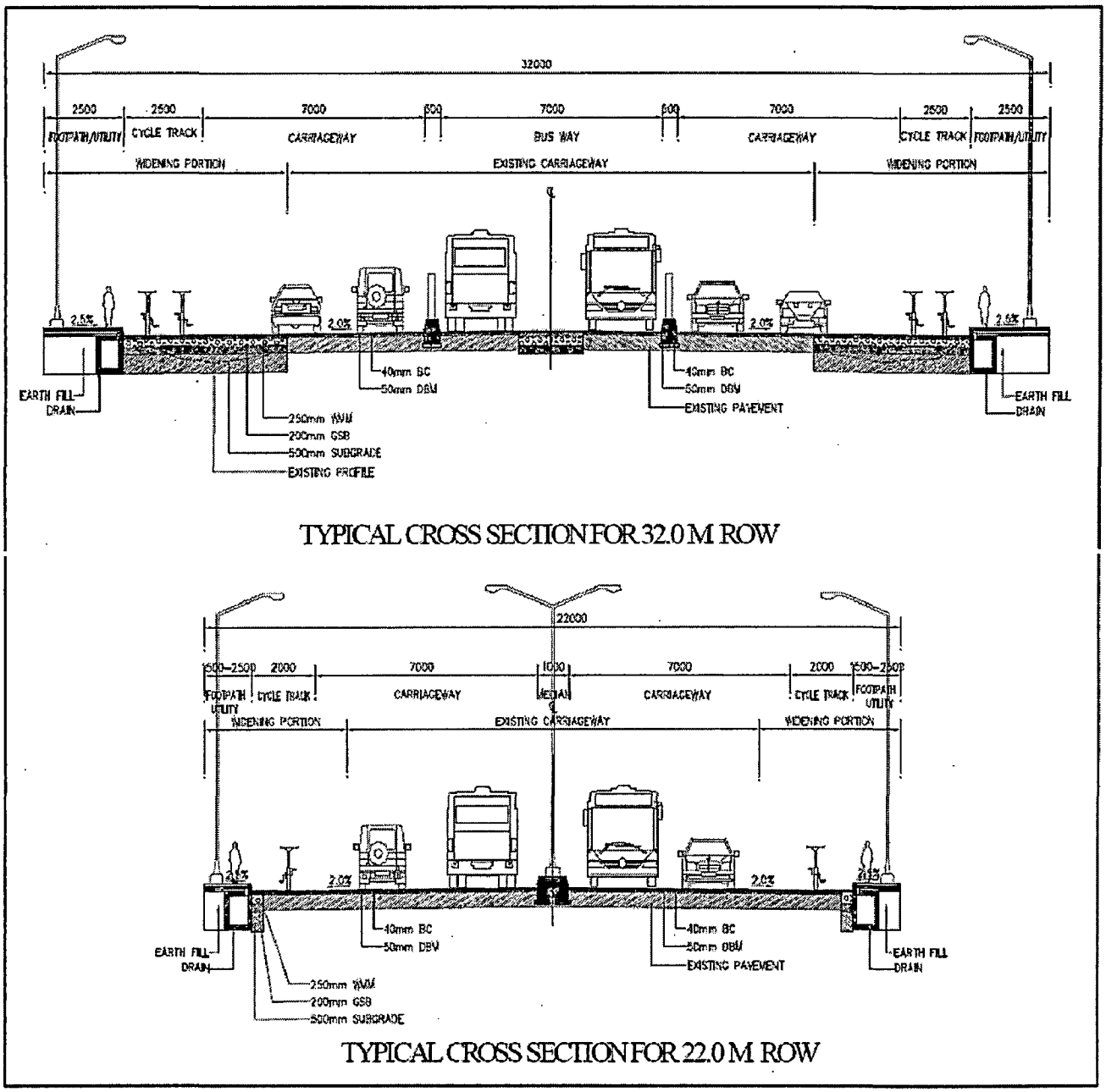


Figure 3.4.9 Cross section of 32.0M and 22.0M ROW

As per the Master Plan of BRTS total 138 km of corridor length has been identified for the system. The project is proposed to be taken in three phases. In first phase, a corridor length of 46.7 km has been selected on priority basis for implementation purpose. Phase-I corridors connect North-South and East-West ends of the City and fulfill major transport needs of the city.. The estimated cost towards the development of road infrastructure for the first phase of BRTS, Jaipur was Rs 587.00 crores (block cost). MoUD, GoI on September 2006, approved the project in principle, for funding under JNNURM. As per the approval given on 20th July 2007, the estimated cost was ` 479.60 crores.[28]

[28] Urban Transport Initiatives in India: Best Practices in PPP

3.1. Inferences

Liverpool City Center Regeneration

- Liverpool is one of the important business cities of England, but in 1970's and 1980's the population was drastically decreasing due to series of financial, economic and political traumas.
- To overcome this situation, regeneration of Liverpool city center was proposed. A strategic regeneration framework was developed in 2000.
- Under this program the city center core was regenerated by building new arena, a commercial center, reviving the Kings dock, creating a world-class business exchange, establishing linkages within the historic core by creating a mixed-use urban environment and quality public realm, developing leisure and family entertainment facility
- 170 million pound were invested in the project, 1300 jobs were created, 1700 residential units built. The population of city center grew by 32%, GVA contributed by Liverpool city center is greater than GVA of whole of the city.

Kongens Enghave Neighborhood Regeneration

- Kongens Enghave lost its economic importance and local industry disappeared as a result it became poorest neighborhood of Copenhagen.
- A comprehensive regeneration program was prepared under ***Kvarterløft***-Copenhagen Urban Regeneration Program.
- Stakeholders were invited for numerous discussions. Analysis of all the economic, financial, social, environmental factors was done.
- Neighborhood based regeneration process started with establishment of of working group from neighborhood. Working group prepared the vision for the program. Strategy for the program was discussed and proposals were formulated.
- Monitoring and evaluation of the program was done with survey
- The total 232.7 million euros were invested in the program. Funds from national agencies were utilized.

Urban regeneration in Shanghai

- Regeneration of Taipingqiao , Luwan district of Shanghai, was proposed after the area lost its social importance as the surrounding parts developed.
- District urgently needed regeneration, public private partnership was encouraged and Shui On Gorup became active participants in regeneration process.
- A new development was proposed, Xintiandi XTD as a space for restaurants, culture and entertainment, and made it a service area for the CBD. The whole project was divided into two parts, the old dilapidated buildings were demolished and a new high rise development was proposed. The other part of

the area with traditional housing was preserved and face uplift was given the area. A comparative analysis of three case studies is done in table below.

	Redevelopment in Shanghai	Regeneration in Liverpool	Regeneration in Copenhagen
Location	Xintiandi (XTD), Luwan district, Shanghai.	City Center, Liverpool. UK	Kongens Enghave, Copenhagen
Time of Launch	1997	1999	1996
Area	52 ha	42 acres	445 ha
Objectives	Preservation of Shikumen houses recreational and commercial facilities Providing commercial services	Create a world-class business exchange. mixed-use urban environment and quality public realm. leisure and family entertainment facility.	better integration of traffic balance between the workforce and the jobs available green neighbourhood of Copenhagen
Investment	3 billion US dollars	£920 million	232.7 million €
Public participation	Urban functional transformation serving people with higher socioeconomic statuses	After extensive public consultation the plan – or Strategic Regeneration Framework (SRF)	Invited people to formulate goals and objectives, Asked people to join Working Groups.
Socio cultural Upliftment	Shikumen architectures were preserved, leisure and entertainment center , tourist destination in Shanghai.	328 residences, Waterfront development, World Heritage site	New housing area with 5000 dwellings.
Employment generation		2692 jobs created as on 31/3/08 , 16.3% increase in jobs	31 companies for process of regeneration, Green Job House is a job-training centre
Environment Concern		More than half said the number of green spaces poor,	The Waste Disposal Project Tree Plantation

- Walled cities of Amritsar, Jaipur, Ahmadabad, and Delhi are compared in table 3.4.4.6. Area of Amritsar Walled City is smallest with 3.47 sq km. density of the walled city id comparable with Delhi as both have CBD, public buildings and high density residential areas. Walled city Amritsar does not have industrial

area inside. Jaipur and delhi has 25% and 23% area under roads but Amritsar has only 16%.

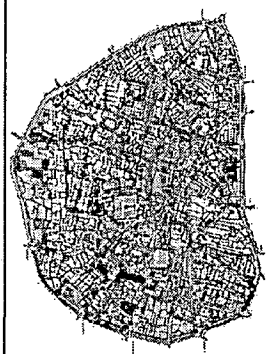
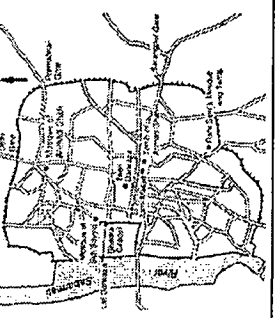
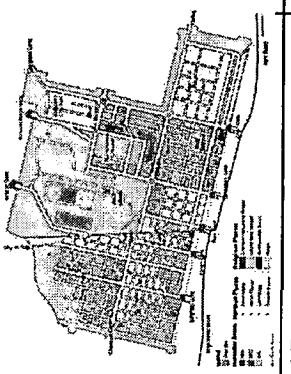
City	Amritsar	Ahmedabad	Jaipur	Delhi
Plan				
Area (sq.km)	3.47	5.78	6.7	11.59
Population (2001 census)	1.69 Lakh	3.75 Lakh	4 Lakh	5. 7 Lakh
Density	48803 person / sq km	64878 person / sq km	58207 person / sq km	49180 person / sq km
Land-use breakup	Residential= 53.84% Commercial= 14.61% Institutional =6.06% Mixed= 6.0% Parks =3.44% Water bodies= 0.05% Streets = 16%		Residential= 67.3% Commercial= 4.2% Institutional =1.5% Industry= 1.0% Parks =1.1% Streets = 25%	Residential= 31% Commercial= 11.7% Institutional =10.1% Industry= 5.6% Parks =17.0% Streets = 23.1%
Important features	CBD, specialized markets	Organic form, Traditional Architecture, Residential neighbourhoods - pols	Planned city , CBD, traditional markets and bazars	CBD, administrative functions, Railway station, traditional markets.
Attractions	Golden temple, jallian wala bagh,	Heritage Walk, City Gates; Mosques,	City palace, maharaja swai man singh museum, hawa mehal, jantar mantar	Red fort, mughal heritage,

Figure 3.1.1 Comparative Analysis of walled cities of India (Source: Master plans of respective cities)

4. Study Area Profile: Amritsar

This chapter gives general profile of Amritsar city, its location, area, land-use, population, and planning history. The chapter further discuses about existing transport scenario, tourism of city, important markets, informal sector locations, and key factors. The chapter further discuses about study area i.e. walled city. It deals with details of the walled city such as population, land use, existing road network, physical infrastructure, tourism. The chapter ends discussing about inferences and SWOT analysis of the city.

4.1.Introduction

Amritsar, the second largest metropolitan city of Punjab, located at western side bordering Pakistan, has a total population of 1,183,705 persons (Figure 4.1.1) and area of 142.37 sq km. Rapid upward trend in population growth was observed with growth rate of 65.3% in1921-1931 and 47.64% in 1931-1941. The city grew from an area of 840 acres in 1849 to about 8316.49 acres in the 1940's. After independence the growth declined due to its location close to border.

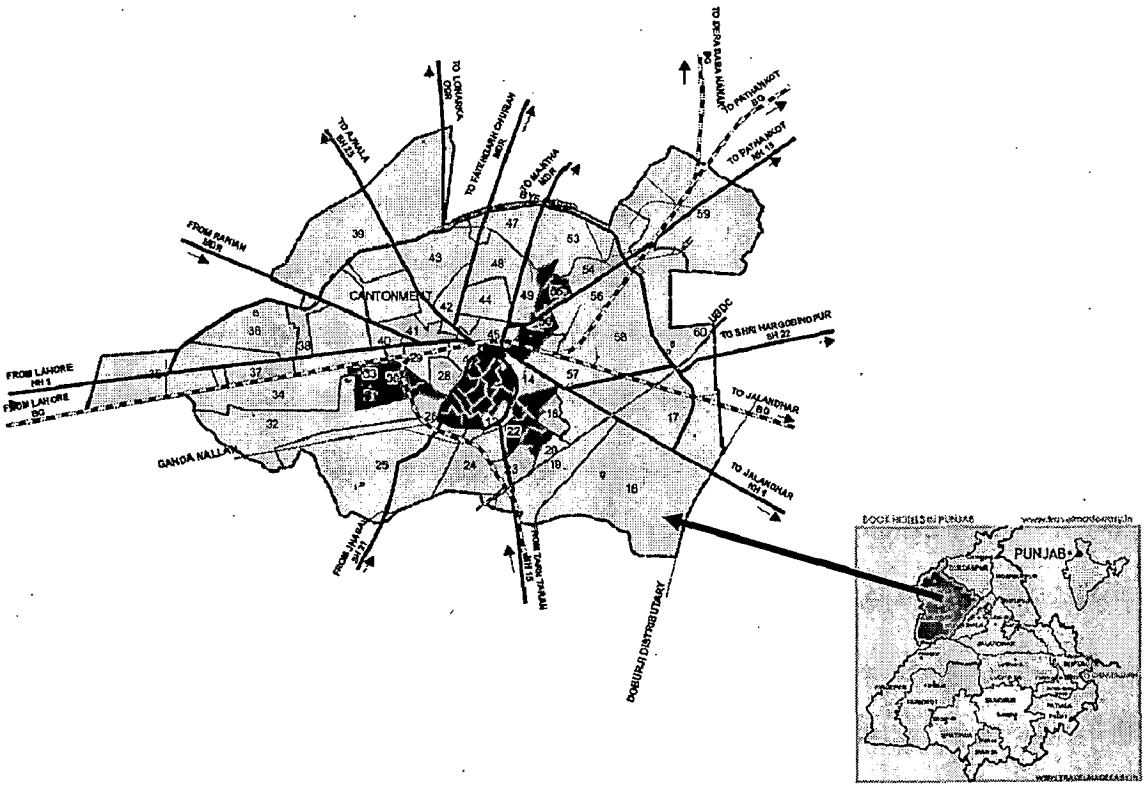


Fig 4.1.1 Location of Amritsar (Source: Master Plan Report 2010-2031)

4.2.Physical features

Amritsar district lies between River Beas and River Ravi giving it a saucer like shape. Amritsar is situated at 31'37"N latitude and 74'55" E latitude. The average height above mean sea level is 755 feet. The climate of Amritsar region is hot and arid type with very hot and long summers and cold winters. Hottest day of May and June have recorded a temperature of 116 F (47 C). January has recorded the lowest temperature of 29 F (-2C). Maximum rainfall occurs during July-September from the monsoons. The average rainfall is 61.1 cm. The prevailing wind direction is north -west.[29]

4.3. Historical Overview

Amritsar is symbol of spiritual and cultural heritage of Punjab. It has history of 423 years and is center of trade and commerce, seat of learning and literature, centre of Sikh politics. The city has gone through various periods such as Guru Period, Sikh Misil Period, Maharaja Ranjit Singh Period, British Period, and Post Independence Period.

GURU PERIOD (1577-1628): The fourth guru, Sri Guru Ram Dass Ji in 1577 AD founded the Amritsar. After the death of Guru Ram Das Ji in 1588, fifth guru of Sikhs "Sri Guru Arjun Dev Ji" took up the task of completing the holy temple. Sri Hari Mandir Sahib was completed in 1604 AD many traders from various places settled around it as shown in Figure 4.3.1

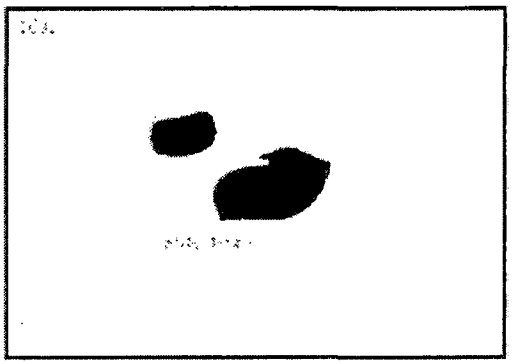


Figure 4.3.1 Amritsar in 1600 AD (Source Master Plan Report 2010-2031)

AMRITSAR UNDER SIKH MISLS (1764-1802): With the establishment of number of independent misl's (with power of Misldars) estates surrounding Ramdaspura, it became a poly nucleated city. Function of the city predominantly remained as a religious and pilgrimage centre. It also became capital of many misl estates.

AMRITSAR UNDER MAHARAJA RANJIT SINGH (1802-1849): Maharaja Ranjit Singh conquered Amritsar from Misl Bhangian in 1802 and Misl Ramgarhia in 1816. a special importance was given to Amritsar. various constructions were commenced in form of forts (Gobindgarh Fort), gates, wall, gardens, havelis, akharas like Balanand, Brahm Bareck (centre of learning) etc. A massive wall was constructed (25 yards broad and 7 yard high) in 1825(Figure 4.3.3). The fortified city had

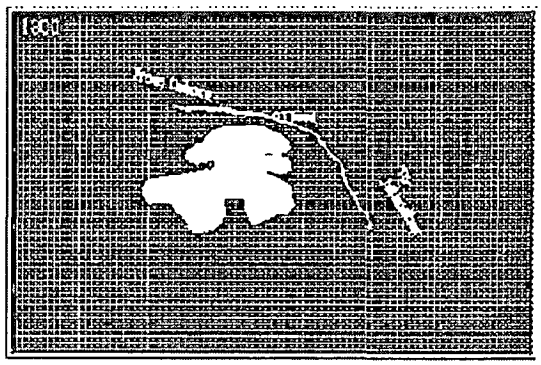


Figure 4.3.2 Amritsar during 1800 AD (Source Master Plan Report 2010-2031)

[29] http://www.ayurlivingindiatv.com

open spaces in the form of *bagichas* (gardens) inside the katras. Special markets occupied different areas in Walled city. The retail trade was carried out in linear bazaars. This period is known as 'Golden Period' in the history of Amritsar[30]

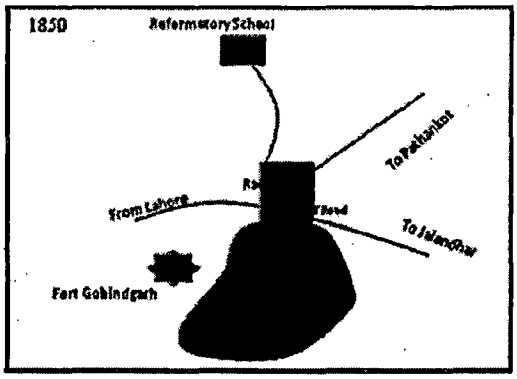


Figure 4.3.3 Amritsar in 1850 AD (Source Master Plan Report 2010-2031)

AMRITSAR UNDER THE BRITISH RULE (1849-1947). This period had various physical developments in new technologies, craftsmanship skills etc. The old wall (in western part of city) was demolished and a new masonry wall 14 feet high was constructed along with new gates in 1866-1868 from Lahori Gate to Ram Bagh, Gate. Outside the walled city, Circular Road (Figure4.3.4) was constructed. Municipal Committee was also set up which gave much importance to water supply, sanitation, streetlights, etc.

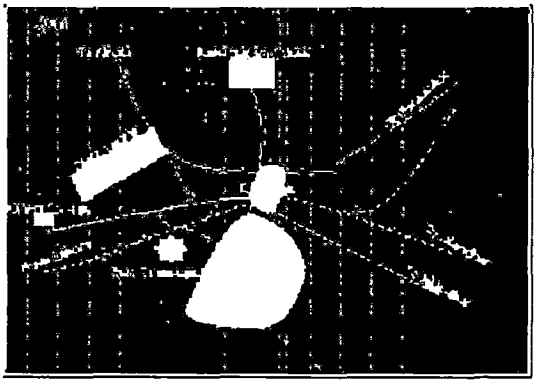


Figure 4.3.4 Amritsar under British Rule (Source Master Plan Report 2010-2031)

AMRITSAR IN POST INDEPENDENCE PERIOD (1947-1994)

The communal riots during the partition of India in 1947 led to large scale burning of one-fifth of the walled city. To rebuild these damaged areas Government of Punjab enacted a law 'The Punjab Development of Damaged Areas Act, 1951'. Amritsar Improvement Trust was established in 1949 and framed number of Development Schemes, notable among them is widening of approach road to Golden Temple within the walled city (widening up to 60 feet). This scheme changed the entire concept of walled city from pedestrian to motorization, which led to many problems of traffic chaos and congestion. In 1981, population of the Amritsar city grew to 5,89,229 persons and the city became congested with commercial activities continuing still in the walled city area. In 1984, Operation Blue Star did much loss to the Golden Temple Complex and its surroundings. Akal Takhat was demolished completely with guns and mortars. The Watch Towers were also affected badly. Further, in order to make for loss, the project for beautification of surroundings of Golden Temple was undertaken commonly known as Galiara Scheme in which 30 meters of area around the Golden Temple complex was acquired for the aforesaid purpose and were demolished (named as Corridor Plan but the press called it Operation Demolition). The main historical events and planning history post independence is given in Table 4.3.1

[30] Master Plan Report Amritsar 2010-2031

Table 4.3.1 Post Independence Planning History of Amritsar (Source: by Author)

Year	Events
1947	**Large scale riots**, fire and unprecedented rains caused **huge damage** to buildings in the walled city
1962	The entire area of the **walled city was declared as damaged area** under Punjab Development of Damaged Areas Act, 1951
1962	59 development schemes were framed by the Improvement trust out of which 30 have been executed and 11 are under execution
1976	The Punjab Municipal Corporation Act was passed which empowers the corporation to acquire land and **buildings** as per the procedures in the land acquisition act, 1894
1984	Large scale military action (operation blue star) against terrorists hiding in the golden temple complex left 310 residential and commercial units in the periphery of the complex damage
1984	A long term **redevelopment project was planned around Golden Temple** complex within a radius of 300 m from the complex boundary
1986	A **dairy scheme** was taken up by Improvement Trust where 301 dairies and 8074 cattle in walled city were shifted out
1986	Good transport booking agencies from the Walled City were shifted out
1988	Short term redevelopment project undertaken for redevelopment of area within 30 m belt around the Golden Temple complex **(Galliara Project)**
1991	The first election to the Municipal Corporation
1995	Creation of Amritsar Development Authority (ADA) by Punjab Regional and Town Planning & Development Act, 1995
1997	The number of wards was increased to 60
2005	**City Development Plan 2025** under JNNURM
2010	**Master Plan Amritsar 2010-2031**
2010	**Elevated road project** completes its first phase
2010	3 km **Heritage walk** launched

Punjab Development of Damaged Areas Act 1951

This legislation laid down a convenient procedure for acquisition of land enabling the Improvement Trust to take immediate possession of land, defer the payment of compensation for land to each owner.

Under this Act, the walled city of Amritsar was declared as damaged area and the Amritsar Improvement Trust was given the responsibility of Planning and implementation of redevelopment projects. Amritsar is the only city in Punjab where 56 maximum number of redevelopment projects have been undertaken but an integrated survey technique was missing during the redevelopment.

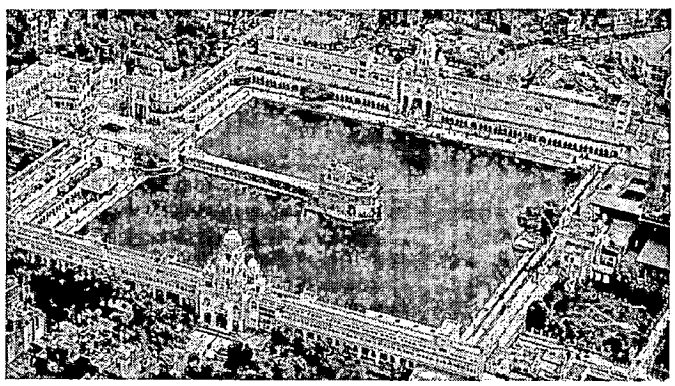


Figure 4.3.5 Green belt of Galliara Project around Golden Temple (Source: Picasa.com)

Many people were dislocated and rehabilitated. Conservation is an important component of redevelopment considered. The concept of redevelopment was considered equivalent to 'demolition'. Another project known as "Project for the Redevelopment of Areas around Golden Temple Complex" was undertaken in 1988. They demolished 30' areas all around the Temple Complex and created open space with trees, shrubs and grass and is known as "Corridor Plan". Although maximum number of redevelopment projects have been undertaken but the aim was to simply demolish and either widen the road or create a corridor and an open space.[31]

4.4. Demographic Characteristics

Amritsar, has a total population of 1,183,705 persons according to census 2011and has density of 8314 person per sq km. it has 4.27% population share of total Punjab Population.

Table 4.4.1 Demographic Characteristics (Source: Census 2011)

Description	2011
Actual Population	1,183,705
Male	630,114
Female	553,591
Population Growth	167626
Area Sq. Km	142.37
Density/km2	8314
Proportion to Punjab Population	4.27%
Sex Ratio (Per 1000)	879
Child Sex Ratio (0-6 Age)	824
Average Literacy	84.64
Male Literacy	87.46
Female Literacy	81.44
Total Child Population (0-6 Age)	115,368
Male Population (0-6 Age)	63,238
Female Population (0-6 Age)	52,130
Literates	904,190
Male Literates	495,804
Female Literates	408,386

[31] B. Singh , **Integrated Survey Techniques: Need For Redevelopment Projects: Experience Of An Indian City Amritsar-** Guru Ramdas School Of Planning Guru Nanak Dev University, Amritsar

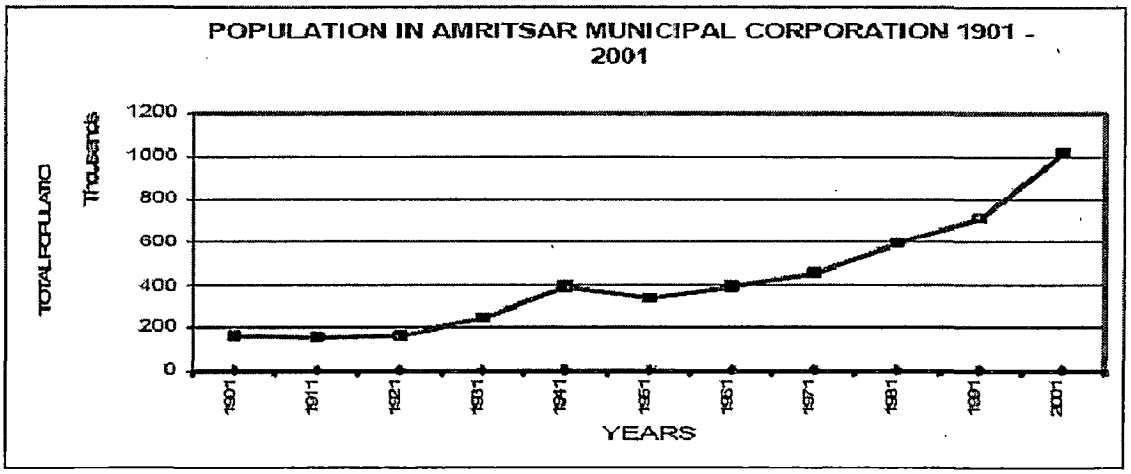


Fig 4.4.1Population in Amritsar MCA 1901-2001 (Source: CDP)

The population growth of Amritsar M.C. from period of 1901 up to 2000 is given in Figure 4.4.1. The rapid growth was observed since 1855when census was conducted for first time. Growth rate of 65.3% was observed for 1921-1931 and 47.64% for 1931-1941. The population growth dropped to -14.04%, due to its close proximity to international border. However, after 1990, the city has become the second largest city of Punjab state after Ludhiana and is achieving the fastest growth rate of 42.67%.

4.5. Land-use Pattern

Commercial land use has increased almost three times in last two decades i.e. 173 acres to 514 acres, depicting importance of Amritsar as a trade centre. Commercial use has fluctuated from 2 % to 5 % and reduced to 3 % in 2001

Table 4.5.1 Land-use pattern of Amritsar (Source ITPI)

AREA IN ACRES (in %)

S. NO.	LANDUSE	2001	1991	1987	1971
1	Residential	9042.67 (43.99)	6602.30(48.43)	4472.18 (46.67)	3235.00 (42.30)
2	Commercial	622.44 (3.03)	513.76 (3.77)	485.77 (5.07)	173.00 (2.26)
3	Industrial	1356.03 (6.60)	1222.65 (8.97)	1098.01 (11.46)	758.00 (9.91)
4	Transportation	2363.79 (11.50)	1785.81(13.10)	1077.95 (11.25)	1028.00 (13.44)
5	Public/Semi-Public	1384.19 (6.73)	1192.31 (8.75)	1117.55 (11.66)	1209.00 (15.81)
6	Recreational	151.90 (0.74)	151.90 (1.11)	151.99 (1.59)	155.00 (2.03)
7	Govt. Land	5634.07 (27.41)	2164.70 (15.88)	1179.99 (12.31)	1090.00 (14.25)
	TOTAL	**20555.09** (100)	**13633.43** (100)	**9583.44** (100)	**7648.00** (100)

The concentration of commercial activity is in the walled city along the main bazaar i.e. Hall bazaar. Therefore being a thickly populated area, it is has problems of parking and informal activities. Other commercial activities are spread across the city. Residential area is also being converted into commercial area, which is becoming a problem in the city.

4.6. Population Density

The population density of Amritsar city was 7,137 persons per sq.km, Taking into consideration the ward wise density in Amritsar, the highest density is observed in the 12 wards which fall within the walled city having density more than 300 persons per hectare (PPH) whereas 7 wards falling outside walled city also have density in the range of 300 persons per hectare (Figure 4.6.1)

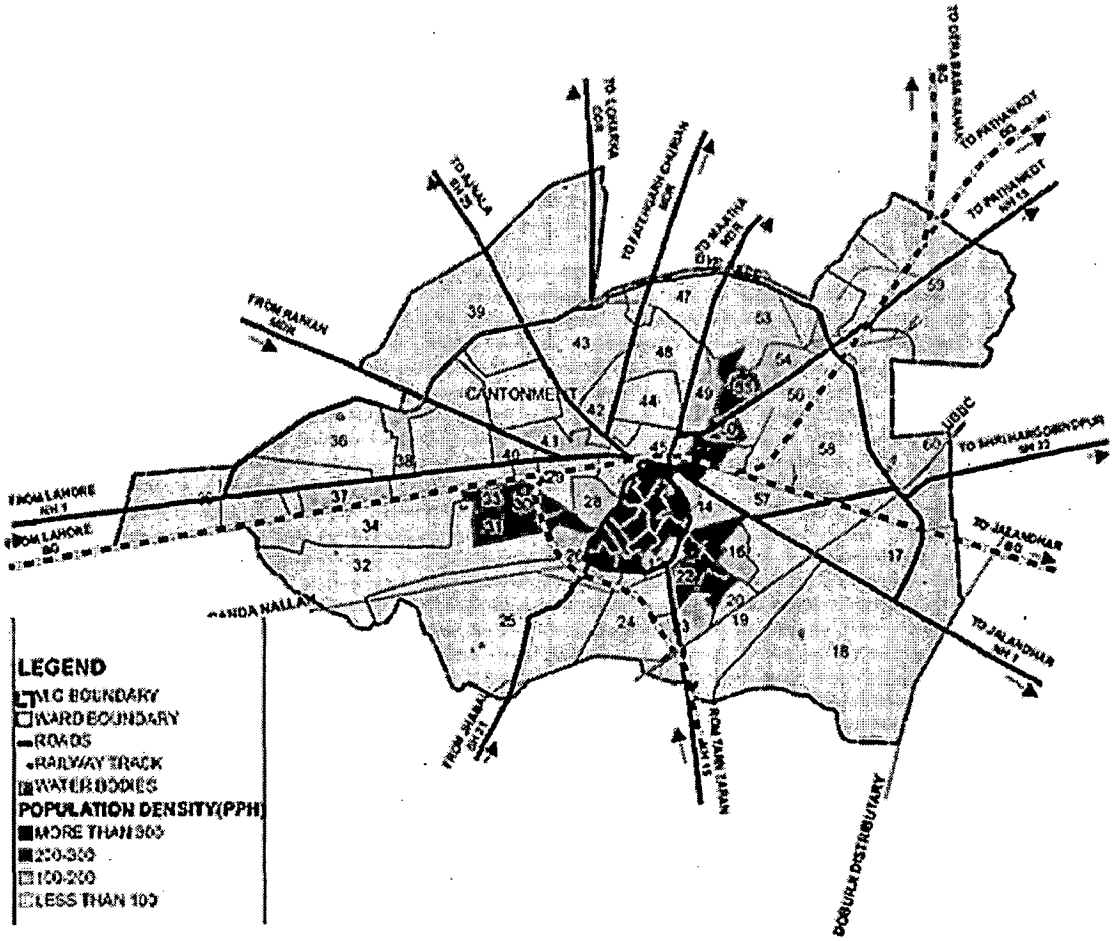


Fig 4.6.1Population Density (Source: Master Plan 2010-2031)

The highest density observed within the wards is of ward no.21 and 4 where it is of the order of 860 persons per hectare and 740 persons per hectare respectively. The ward no. 4 is located within the walled city area while ward no.21 is located adjoining the walled city in the southern direction and have density approximately 10 times higher than the city's gross density(Table 4.6.1). The overall sex ratio for the LPA, Amritsar stands at 865 which is less than the district and state figure of 872 and 876 females/1000 males respectively.

Table 4.6.1Density in different wards of Amritsar city (Source: Census 2001)

Density	Range (PPH)	No. of Wards	%age
Walled City			
High	Above 300	12	20.00
Medium I	100-200	1	1.67
Outside Walled City			
High	Above 300	7	11.67
Medium II	200-300	6	10
Medium I	100-200	11	18.33
Low	Less than 100	23	38.33
Total		60	100

4.7. Economy and Employment

Amritsar is mainly a trade and religious tourism centre. Historically, the city has been part of international trade routes like the ancient silk route from China to Europe. With the improvements in the bilateral ties with Pakistan, the city may re-emerge as prominent trade hub of the Northern India.

4.7.1. Work Force Participation

The total population of Amritsar is 1016079 and total workers are 328919 according to census 2001. 32.37 % of the population of Amritsar is workforce population. Out of which 93.7 % of the workers are main workers and 6.3 % of the workers are marginal workers.

Table 4.7.1.1Percentage of Workers and Non-Workers in Amritsar, 2001 (Source: Census 2001)

	Amritsar (MC)	Amritsar District	Punjab
Total population	1016079	2157000	24358999
Total workers	328919	763452	9127474
%age worker population	32.37	35.39	37.5
%age non- worker population	67.63	64.61	62.5
%age main workers	93.7	86.32	85.8
%age marginal workers	6.3	13.68	14.2

4.7.2. Occupational Structure:

It has been observed that 93% of the workers in Amritsar city are engaged in other activities (mainly tertiary activities), 4% in household industry and 3% in primary activities i.e cultivators and agricultural laborers (Table 4.7.2.1).

Table 4.7.2.1Occupational Structure of Amritsar (Source: Census 2001)

	Amritsar MC population	%age
Cultivators	3004	1%
Agricultural laborers	6213	2%
Household industries	12317	4%
Others	286663	93%
Total	308197	100%

Total worker population of Amritsar is 308197 according to census 2001. The worker population working under commercial and retail sector was 79033(Table 4.7.2.2)

Table 4.7.2.2 Industrial Classification of Main Workers in Amritsar City (Source: Census 2001)

Classification No.	NIC Code	Type of worker	1991		2001	
			Number of Workers	%age	Number of Workers	%age
		(I) PRIMARY-				
1	A & B	Cultivators	4,603	2.16	3,004	0.97
2		Agricultural laborers	12,405	5.81	6,213	2.02
3		Plantation, Livestock, Forestry, Fishing, Hunting and allied activities	1,398	0.65	3,023	0.98
4	C	Mining and Quarrying	9	0.00	212	0.07
		(II) SECONDARY-				
5 (a)	D	Manufacturing processing and repairs industry (Household industry)	483	0.23	12,317	4.00
5 (b)		Manufacturing processing and repairs industry (Other than Household)	60,678	28.43	67,632	21.94
	E	Electricity, Gas and Water Supply			3,592	1.17
6	F	Constructions	6,957	3.26	20,989	6.81
		(III) TERTIARY-				
7	G	Whole sale and Retail trade	64,730	30.32	79,033	25.64
	H	Hotels and Restaurants			4,073	1.32
8	I	Transport, Storage and Communications	15,903	7.45	24,595	7.98
9	J & K	Financial Intermediation; Real Estate Renting and Business Activities.	46,293	21.69	19,814	6.43
	L to Q	Public Administration and Defence; Compulsory Social Security; Education; Health and Social Work; Other Community, Social and Personal Service Activities; Private Households with Employed Persons; Extra-Territorial Organisations and Bodies.			63,700	20.67
		Total	2,13,459	100.00	3,08,197	100.00

4.8. Tourism

No of domestic and foreign tourist coming to Punjab is lower than neighboring states. Total number of tourists visiting Amritsar city by air were 0.11 million in the year 2007, which works out to be 2.2% of the total country's share. However, majority of visitors use rail and road as mode of transport because of its high connectivity with other parts of the country.

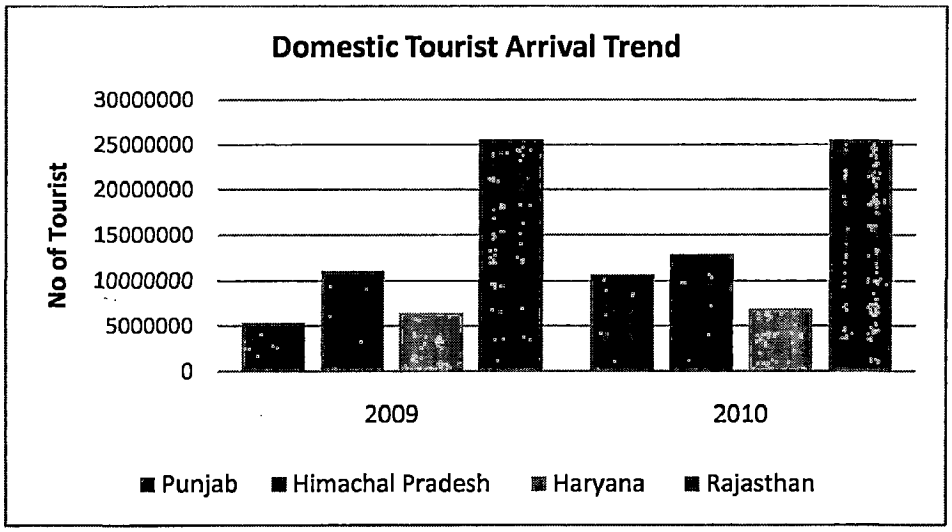


Fig 4.7.2.1Domestic Tourist Arrival Trend (Source India Tourism Statistics 2010)

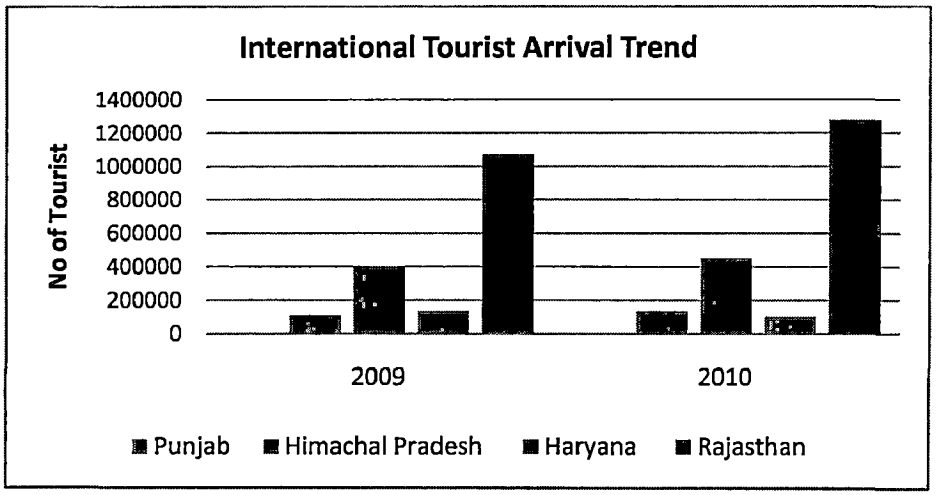


Fig 4.7.2.2 International Tourist Arrival Trend (Source India Tourism Statistics 2010)

No. of tourists visiting the Amritsar in year 2010 is 10720631(Table 4.7.2.3). In addition, large numbers of people visit the city to avail higher level of educational and healthcare infrastructure.

Table 4.7.2.3Tourism Trend in Amritsar (source Punjab Tourism and Heritage Conservation Board)

	Category	Total Tourist population
	Domestic (Indian)	10583509
	Foreigners	137122
	Total	**10720631**
Mode of transport of foreign tourist	Air	82043
	Rail	12649
	Road	20242

4.8.1. Hotels

There are more than 150 hotels in the city. Some of the prominent hotels of the city are MK International, Ritz Plaza, Mohan International, Grand Legacy, Ranjit's Svassa, etc.

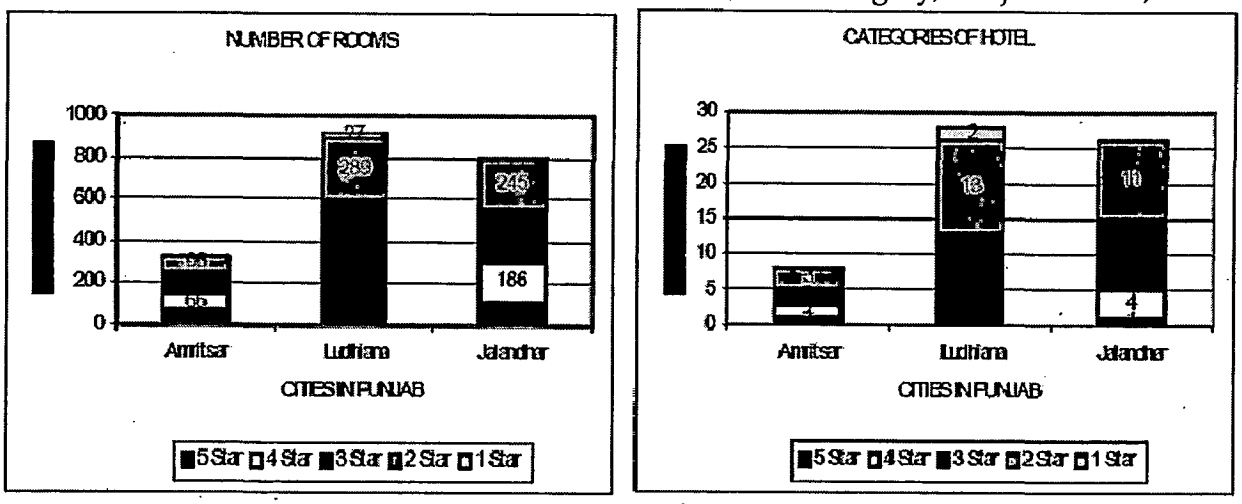


Fig 4.8.1.1No of Rooms and Type of Hotels in Amritsar city (source: CDP 2025)

The number of rooms available in the city is inadequate considering the large number of tourists (Figure 4.8.1.1). In addition to hotels, religious institutions such as Golden Temple, Durgiana Mandir, etc. provide affordable accommodation. There are five *sarais (dharmshalas)* providing lodging facilities near Golden Temple by the Shiromani Gurudwara Prabandhak Committee (the management authority of the Golden Temple). They are:

- Sarai Shri Guru Ramdas
- Shri Guru Har Gobind Niwas
- Shri Guru Arjun Niwas
- Akal Rest House
- Shri Guru Nanak Niwas

Accordingly, large number of residential houses within the walled city in general and around Golden Temple in particular, have been converted into make shift hotels providing accommodation at a high cost. There is urgent need for creating affordable and budget accommodation with quality facilities for the tourists in the city.

4.8.2. Ongoing Projects/Proposals

- Creating Tourist Information Centres at Ram Bagh, Golden Temple and Qila Gobindgarh.
- Creating high-tech Office at outer gate of the Railway Station.
- Conservation and up-gradation of 6 gates of the walled city namely Lahori Gate, Gate Hakima, Hathi Gate, Hall Gate, Khazana Gate, and Sultanwind Gate at a cost of Rs. 40.00 lacs.
- Renovating Ram Bagh Gate at a cost of Rs. 1crore
- Conservation of Town Hall building at a cost of Rs.5.00 crores for state level museum by renovation of Town Hall Building.
- A beautiful open Plaza to be set up in front of Golden Temple at a cost of Rs.7.00 crore by shifting Ghanta Ghar Market to the newly constructed shopping complex in front of Shani Mandir.
- Conservation and beautification of Jallianwala Bagh at a cost of Rs. 5.00 crore with the Visitors Facilitation Centre, Light and Sound Program.

4.9. Trade and Commerce

Amritsar from the historical times has earned the image of being an important commercial city. It is also an important regional market center for agricultural goods, woolen, spices and dry fruits. Today, it is India's important distribution centre of dryfruits, tea (next only to Kolkata), and is leading exporter of goods to the Middle East. Woolen tweeds, suiting's, blankets, shawls in traditional weaves, ivory (now plastic) inlay furniture, swords of all designs, oils, scents, *jutties* (traditional embroidered shoes), cut-glass crockery, selective musical instruments, carpets are manufactured here. Its pickles, *murabbas* (Indian jams), *papads*, *warian* and sweetmeats are exported to far off places, right into Punjabi Diaspora abroad.

The importance of trade and commerce as an economic function of the Amritsar city can be judged from the very fact that 92.28% of the total working population of the city is involved into tertiary activities while 75.22% of the total working population of Amritsar LPA is engaged into tertiary sector.

4.9.1. Major Commercial Areas/Markets in Amritsar

Commercial area in Amritsar constitutes 3% of the total city area. The walled city, Amritsar is the major commercial area or "CBD" of the city having many specialized bazaars (Table 4.9.1.1). The total character of the walled city is marked by mixed land use with commercial use on the ground floor while with residential on the upper floors. However, with the passage of time and commercial activities getting concentrated in the walled city, there is large scale conversion of residential areas into commercial use. This pattern is seen in the areas such as Katra Ahluwalia, Karmon Deori, Shastri Market, Hall Bazaar etc. These specialized bazaars of the city are given below in Table 4.9.1.1.

Table 4.9.1.1Major specialized Markets in Amritsar City (Source: Census 2001)

Major specialized Markets in Amritsar City			
	Name of Market	Type of Goods Available	Whole sale/Retail/Both
Walled city	Guru Bazaar	Gold Jewellery	Both
	Bazaar Kesarian	Steel and Brass Utensils	Retail
	Katra Kathian	Papads, Warian, Murabbas, Pickles, Aam Papad	Both
	Mishri Bazaar	Dry Fruits	Whole sale
	Churi bazaar	Glass Bangles	Whole sale
	Katra Jaimal	Clothes/Garments and Shoes	Both
	Partap Bazaar	Clothes/Wholesale Readymade Garments	Both
	Shastri Market	Wholesale Woolen (Blankets, Shawls, etc.) and Sales	Whole sale
	Katra Ahluwalia	Wholesale Clothes	Whole sale
	Bazaar Mai Sewan	Wholesale Stationery	Whole sale
	Hall Bazaar	Electronics and Books	Both
	Katra Sher Singh	Wholesale Medicines	Whole sale
	Fish Market	Fish	Whole sale
	Lawrence Road	Garments and Restaurants	Retail
	Majith Mandi	Wholesale Dry Fruits and Spices	Whole sale
	Dal Mandi	Pulses and Spices	Whole sale
	Dhab Basti Ram	Soaps	Whole sale
	Queens Road & Court Road	Car Dealers	Retail
	Malviya Road	Readymade Garments	Retail
	Pink plaza	Garments	Retail
	IDH Market (Behind bus stand)	Multipurpose	Both
	Putligarh market	Garments , Mix	Retail

4.9.2. Informal Sector

Most of these informal markets are located around the major traffic nodes including railway station, bus stand and places of tourist interest and religious centers including Golden Temple, Jallianwala Bagh, Durgiana Mandir, Baba Atal etc., areas outside walled city to supplement the commercial requirements of people living within the walled city and visitors to the city (Figure 4.9.2.1).

The details of stretches with informal activity, land-use, characteristics, encroachment, and infrastructure available and pedestrian facilities are given in Table 4.9.2.1

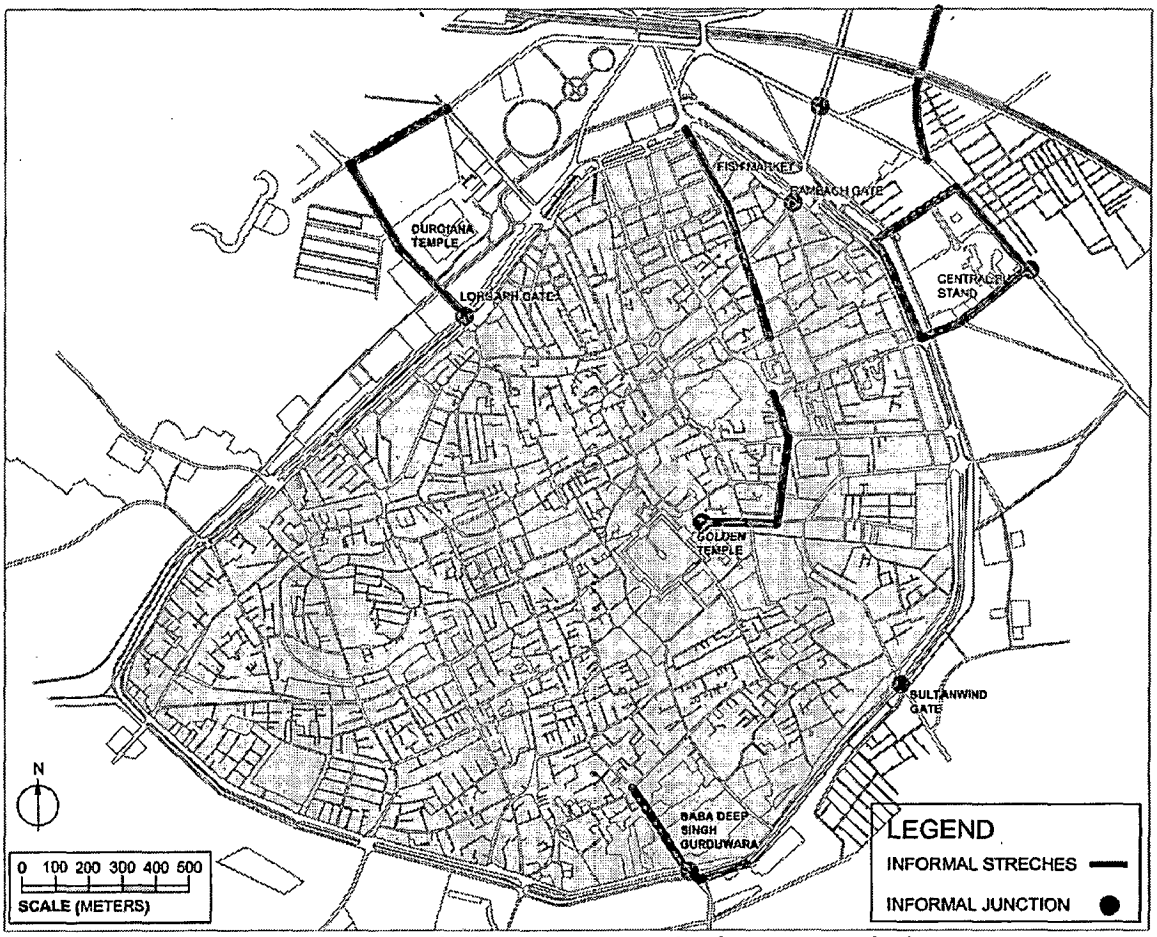


Fig 4.9.2.1Location of Informal Sector Stretches (Source: By Author)

Table 4.9.2.1Informal Sector Stretches (Source Master Plan Report 2031)

Name of stretches/ junctions	Surrounding Land uses	Major Character	Encroachment	No of rehris	Infrastructure Available	SWM	Parking	Pedestrian Facilities
Guru Teg Bahadur Hospital	Mixed	commercial	yes	25	no	collection bins of MCA	no	no
Nera Golden Temple	Mixed	commercial	yes	50	yes	collection bins of MCA	yes, on street paking seen	no
Baba Deep Singh Gurudwara	Mixed	commercial	yes	40	electricity from batteries	collection bins of MCA	inadequate	yes
Durgiana Temple	Mixed	commercial	yes	15	yes	collection bins of MCA	on street parking	yes
Fish Market	Mixed	commercial	yes	12	no	no	no	no
Bus Stand	Mixed	commercial	yes	28	yes	collection bins of MCA	yes	yes
Sultanwind Gate	Mixed	commercial	yes	20	-	-	-	-
Lohgarh Gate	Mixed	commercial	yes	30	no	collection bins of MCA	no	no

4.10. Study area: Walled City Amritsar

The walled city is the most important in the history of Amritsar where the fourth Guru Ram Das Ji constructed the Golden Temple. Though it constitutes only 2.44% of the total MC area, yet it houses 1/6th of the total MC population. The walled city Amritsar has a history spanning 423 years and is marked by the presence of historical buildings with heritage elements such as Town Hall building, old hospital (Prince Wales Zanana Hospital), etc. It had traditionally spaces like streets, squares and common courtyards. The architectural styles, materials used for different purposes in different ways, like wood carvings, *jali* work, etc. reflect the high level of craftsmanship. The narrow winding streets with squares, have the influence of Islamic Architecture and Rajputana style. The narrow zigzag street pattern is a typical medieval planning concept and was not meant for vehicular movement. The maximum distance from one corner to another is 3 km and almost every area around Golden Temple (the nucleus of city) is within 1-2 km reach. The walled city of Amritsar was marked with number of parks and open spaces, which over the time have been used for commercial purpose. The area such as Hall gate, which at present is acting as C.B.D., was initially a green open space. Likewise, Ramanand Bagh, Jhande Wala Bagh, Kesari Bagh, Bagh Akalian, etc. have been exploited for commercial use. The maps above show the walled city over a period of time. The walled city of Amritsar has a rich heritage in the form of historical buildings/areas, gardens, artifacts, townscape and streetscape.[32]

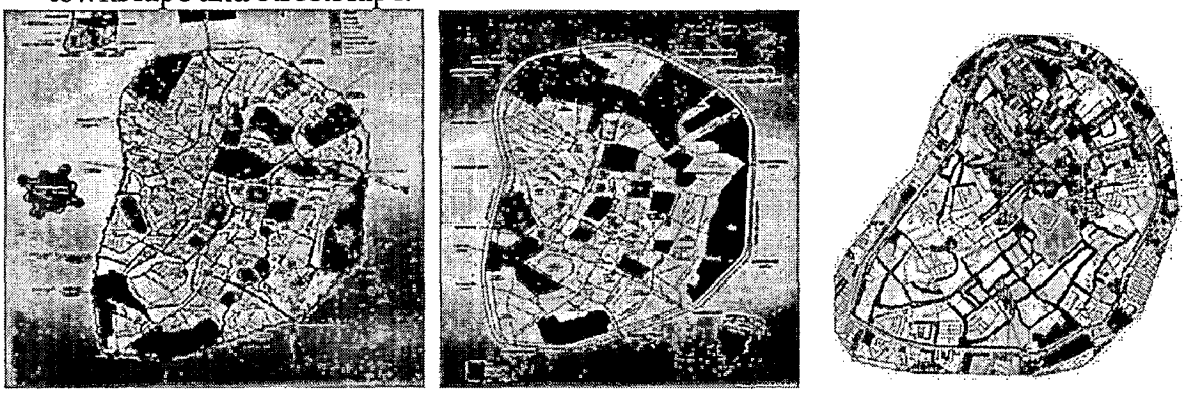


Fig 4.10.1 Walled City in 1849, 1947, 2005 (Source: Master Plan Report 2031)

4.10.1. Population Density

Population Density of ward of walled city is higher than most of the wards in Amritsar (Figure 4.10.1.1).

Table 4.10.1.1 Population of Amritsar MC and Walled City (Source: Census Department, MCA)

Population	Amritsar MC	Walled City	% Age Of Walled City Population
1991	708835	116885	16.49
2001	1003917	151769	15.12
2011	1132761	135260	11.94

[32] Master Plan Report Amritsar 2010-2031

From 1991 to 2001 the population of walled city increased by 34884 and from 2001 to 2011 the population has decreased by 16509. The percentage of walled city population from Amritsar city has also decreased from 16.49% to 11.94% (Table 4.10.1.1). The population has also shifted from North of Walled City to South of Walled City as the land use has changed from residential to mixed and commercial.

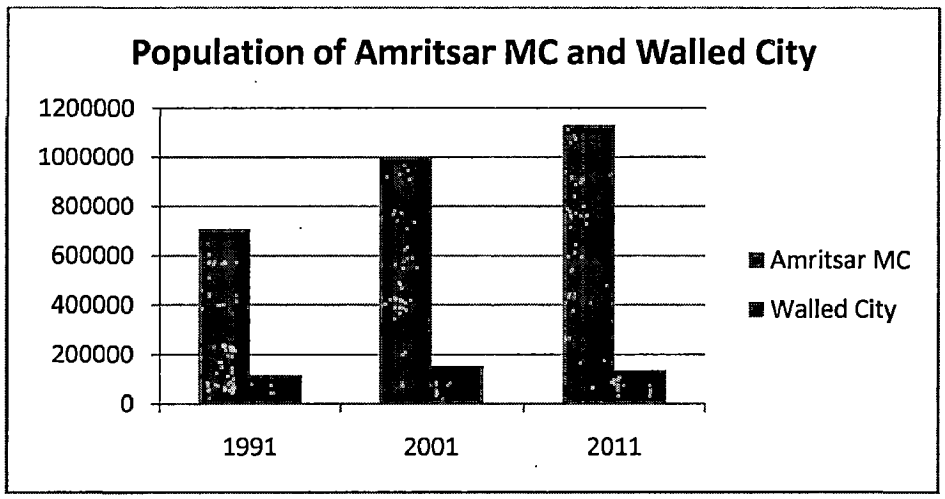


Figure 4.10.1.1Population of Amritsar MC and Walled City

In 1991 the population of walled city was evenly distributed. The southern side i.e. the tip of the walled city had highest density. The figure below shows the ward wise population density of walled city.

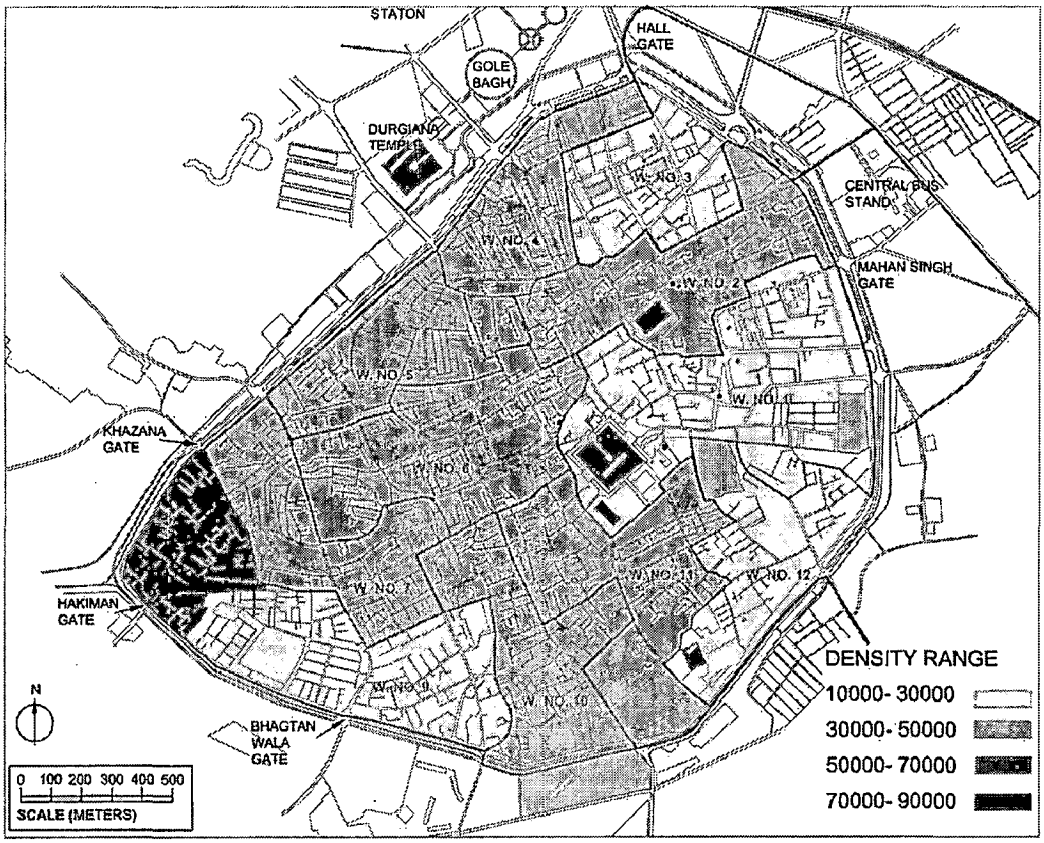


Figure 4.10.1.2 Ward Wise Population Density in 1991(Source: by author)

In 2001 the concentration of the population shifted from commercial area near hall bazaar to southern side as shown in Figure 4.10.1.10.1.4.10.1.3 . This trend has continued till 2011 where most of the high density wards are located in southern side Figure 4.10.1.10.1.4.

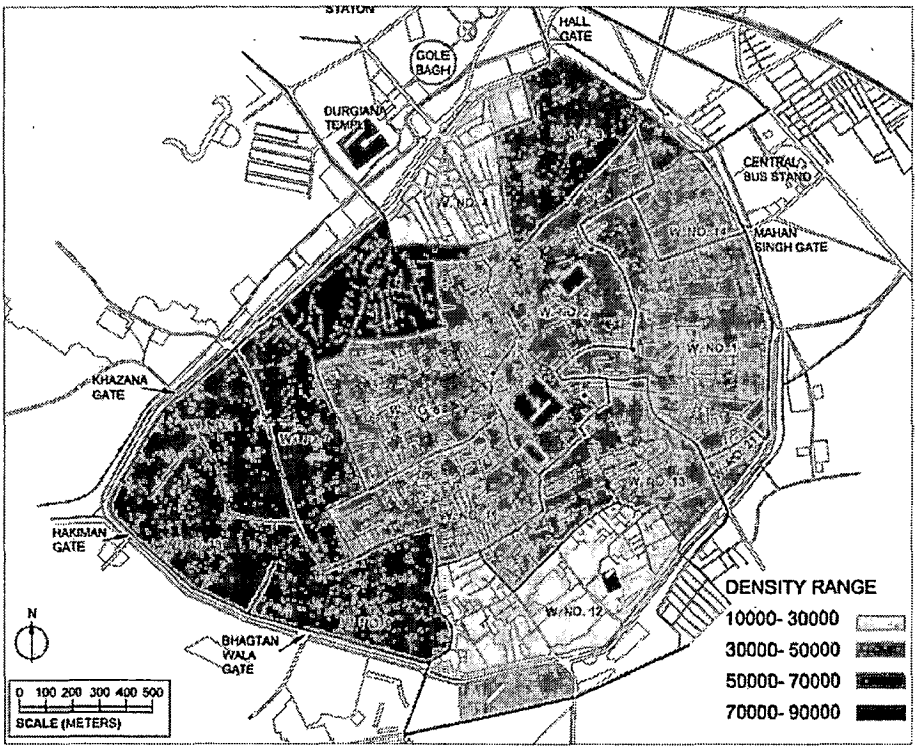


Figure 4.10.1.3 Ward Wise Population Density in 2001(Source: by Author)

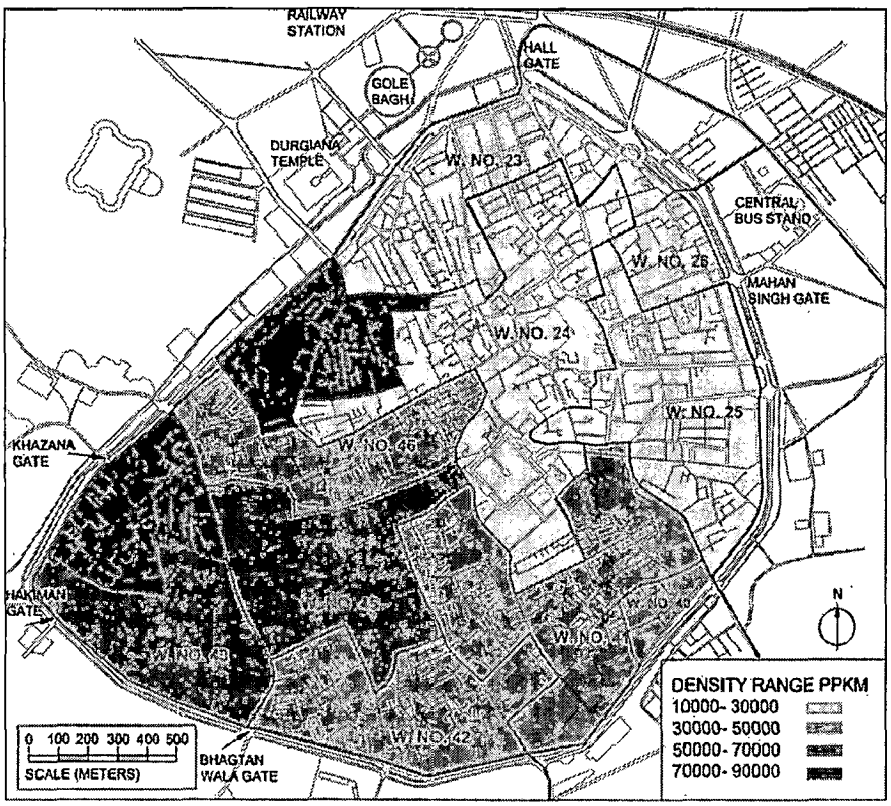


Figure 4.10.1.4 Ward Wise Population Density in 2011(Source: by author)

4.10.2. Heritage Structures in the Walled City

Golden Temple

Golden Temple is the core of the walled city (Figure 4.10.2.1) from where the settlement originated. At present various issues like parking, congestion on approach roads have arisen. There is need of proposing pedestrianization, landuse freezing, and traffic management for betterment of the area.

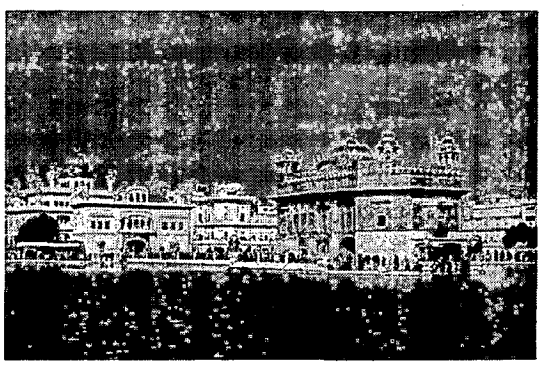


Figure 4.10.2.1 Golden Temple (Source: by Author)

Mosque of Khair-ud-Din

The mosque was built in 1877 in traditional Islamic architecture. It is located in Hall bazaar and it reminds the socio-cultural aspect of the city. Mosque has been overshadowed by the high rise structures.

Mosque of Mohammed Jan

Built in 1872, is a good piece of Islamic architecture. The mosque is now in a state of complete neglect and should be declared a protected monument.

Figure 4.10.2.2 Lohgarh Gate (source: by Author)

Gates and Walls

Massive wall and gates (25 yards broad and 7 yards high) was constructed in 1925 during Maharaja Ranjit Singh period (Figure4.10.2.2). The wall was demolished British and rebuilt with outer circular road around it. In today's context, historic character of wall has vanished largely due to encroachments (Figure 4.10.2.3).

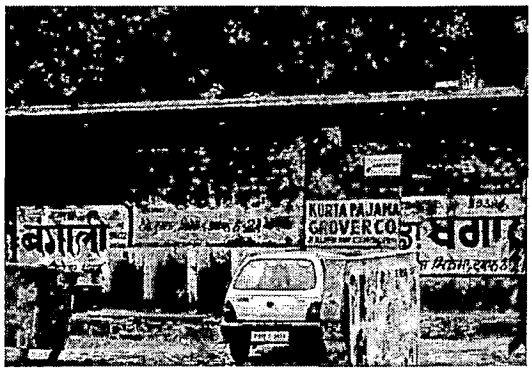


Figure 4.10.2.3 bad state of wall of walled city (Source: By Author)

Town Hall:

This was built for administrative purpose in 1863 by the Britishers. It is located on the southern side of Hall Bazaar. It has semi-circular arcades and a *chhatri* at the top. It has a flat roof of timber planks and brick tiles. Presently MC office located in this complex which is going to be shifted in a short period and this building will be renovated and used as a city museum (Figure 4.10.2.4).

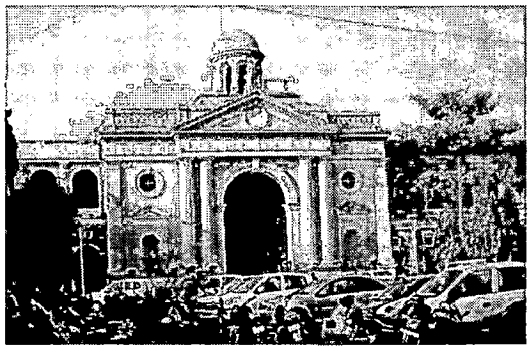


Figure 4.10.2.4 Town Hall Building

4.10.2.1. Heritage walk

The Punjab Heritage and Tourism Promotion Board launched Heritage walk, in September 2011 which starts every morning at 8 am from the Town Hall and ends at the Golden Temple at 10 am. Two guides have been hired. The guides speak English, French, Punjabi, hindi, kandha languages

The walk covers important religious, historic, and architectural spots. The heritage walk of Amritsar was chalked out by Debashish Nayak. The spots shown in heritage walk are Saragarhi Gurdwara, Quila Ahluwalia, Chowk Jalebiyan Wala, Akhara Sangalwala, Darshani Deori, Chaurasti Attari chowk, Radha Krishan Mandir, Crawling street, Puratan Rasta and concludes at Akhara Brahm Buta (Figure 4.10.2.1.1). [33]

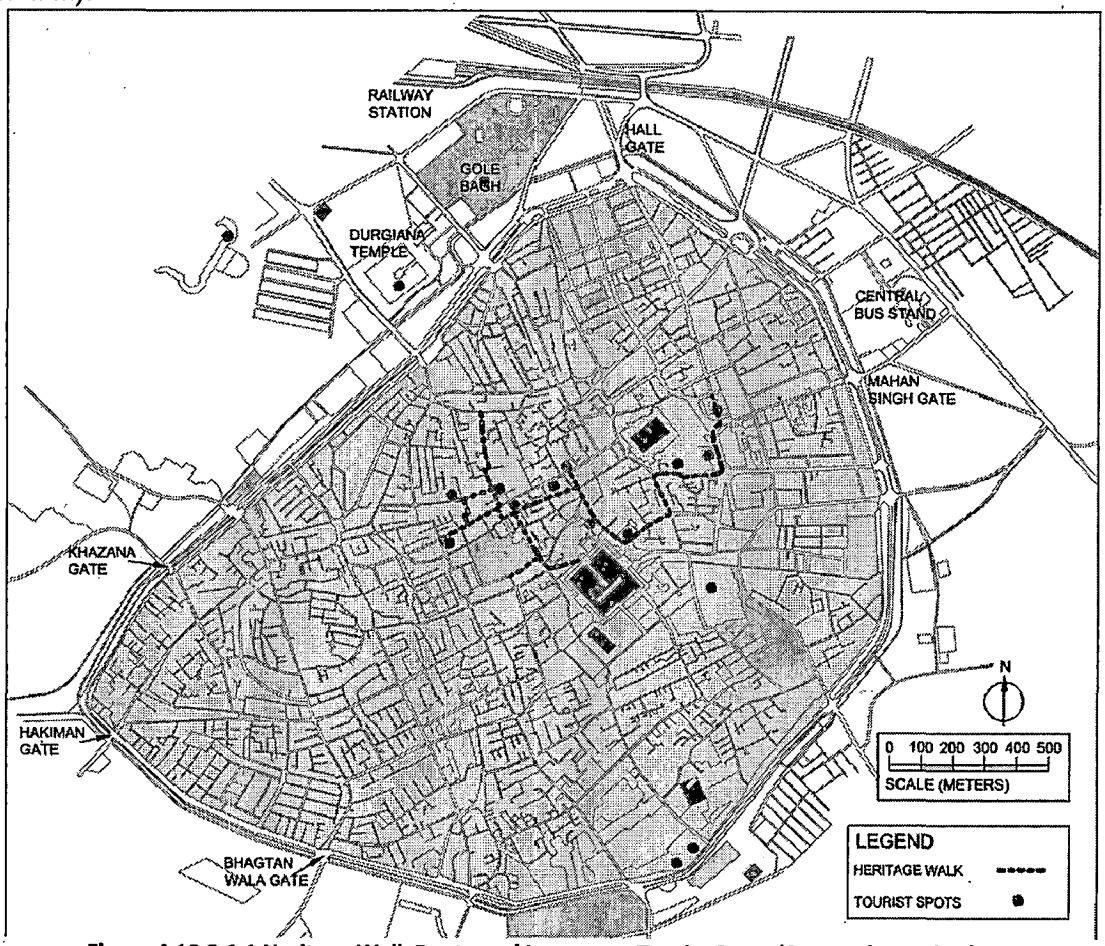


Figure 4.10.2.1.1 Heritage Walk Route and Important Tourist Spots (Source: by Author)

Most of these sites have garbage dumps in front, demolished buildings, defaced walls, wire meshes. Average 3-4 people go for Heritage walk. The heritage walk has been funded by Asian Development Bank. Along with the promotion of tourism, the heritage walk project aims to build 4 parking at fish market, Hathi gate, Ram Bagh surface parking, and Crystal chowk surface parking. The project also aims at façade improvement to 11 buildings and comprehensive conservation of Tharur Dwara, paving and road infrastructure along the heritage route.

[33] Akharas were learning centers, more than 250 year old. There are 12 functional akharas in Amritsar. The Sangalwara Akhara, Chitta Akhara, are coverd in heritage walk route

4.10.3. Existing Land-use Plan

The gross density of Amritsar city is of the order of 71 PPH but walled city area, has very high population density (> 300 PPH). The walled city area is characterized by mixed land use, with commercial use on the ground floor and residential on upper floors. The total area under mixed land use in the city is 0.8% of the total developed area of the city. (Figure 4.10.3.1)

From 1987 to 2010 the residential land use of walled city has decreased from 50% to 44.5%. The mixed land use has considerably increased from 1% to 8.78%. Area of parks and open spaces has also increase from 1% to 3.5 % mainly due to redevelopment projects (Table 4.10.3.1).

Table 4.10.3.1Land use Pattern of Walled City of Amritsar (Source: Town Planning Department, MCA)

Sr no	Land-use	1987	2000	2010
1	Residential	50	46.45	44.5
2	Commercial	19	18	15.11
3	Institutional	7	7	6.06
4	Mixed use	1	3	8.78
5	Parks and open spaces	1	3.5	3.5
6	Water bodies	0.05	0.05	0.05
7	Roads and pavements	19	22	22

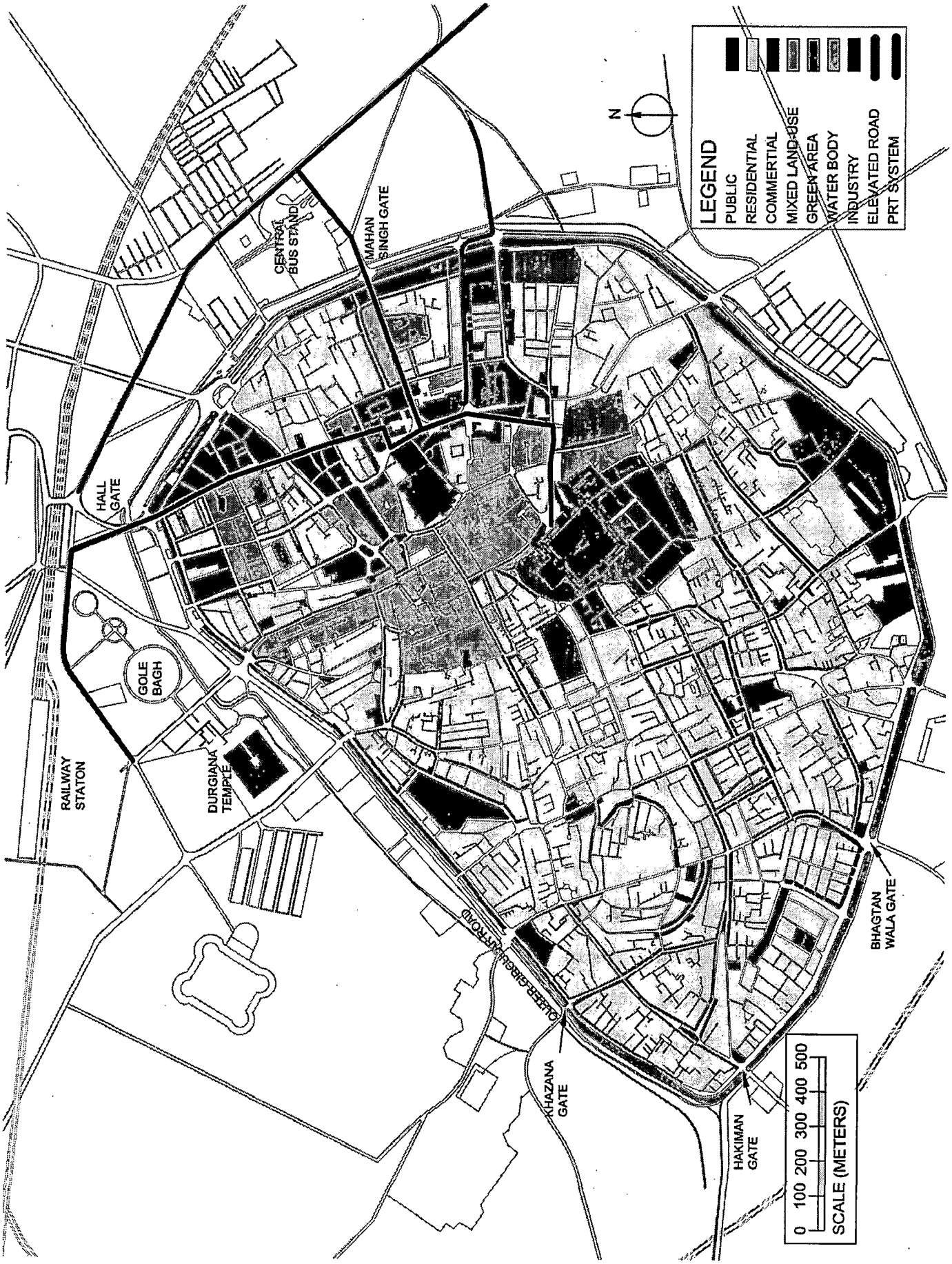


Figure 4.10.3.1Land-use of Walled City 2010 (Source: By Author)

4.10.4. Existing Road Network

There are 14 entry gates of the walled city. It has typical medieval road network characteristic. Narrow winding streets and lanes built on human scale with surprising open spaces. The dense road network with narrow width fails to meet the existing demands of multi-modal transport with majority of motorized vehicles.

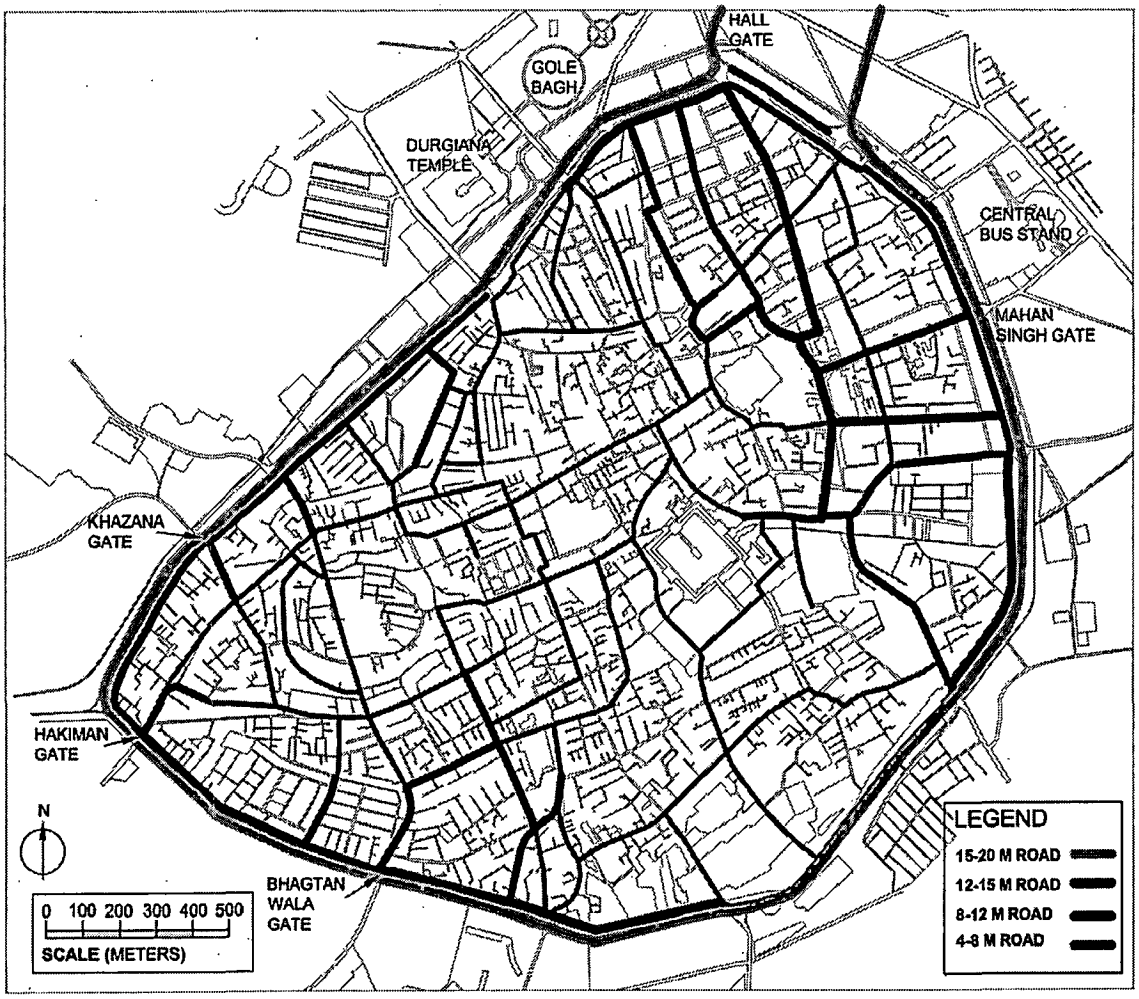


Figure 4.10.4.1 Road hierarchy of Walled City (Source: by author)

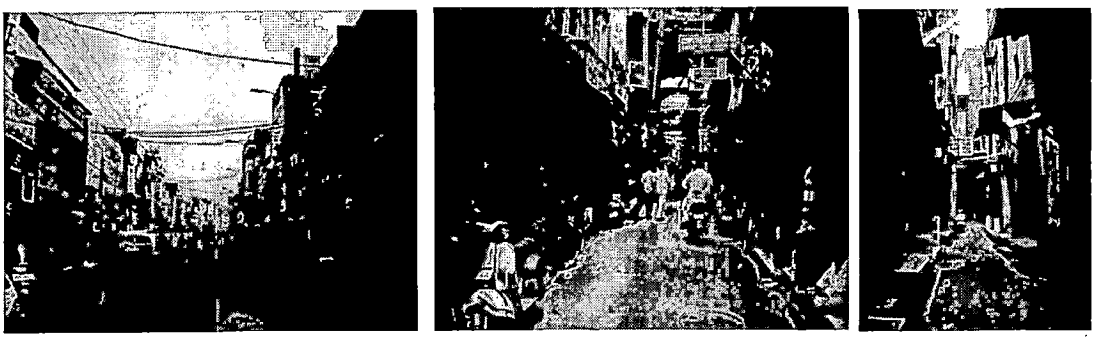


Figure 4.10.4.2 Various widths of roads in Walled city

4.10.5. Parking

Parking is one of the major problems of the area, although lots of parking lots are provided but more parking availability attracts more traffic walled city and creates problems. The wholesale markets like fish & iron market, plywood & furniture market of Katra Sher Singh, Bagh Akalian, iron and steel market, Cheel Mandi, attract traffic. Pandit Deen Dayal Upadhya Parking lot which have been constructed by the Amritsar M.C to decongest the walled city traffic especially Hall Bazaar and areas surrounding it, but it lies vacant because of longer distances. Number of parking lots have been proposed or are under construction in different areas of the city to solve parking related issues (Figure 4.10.5.1).

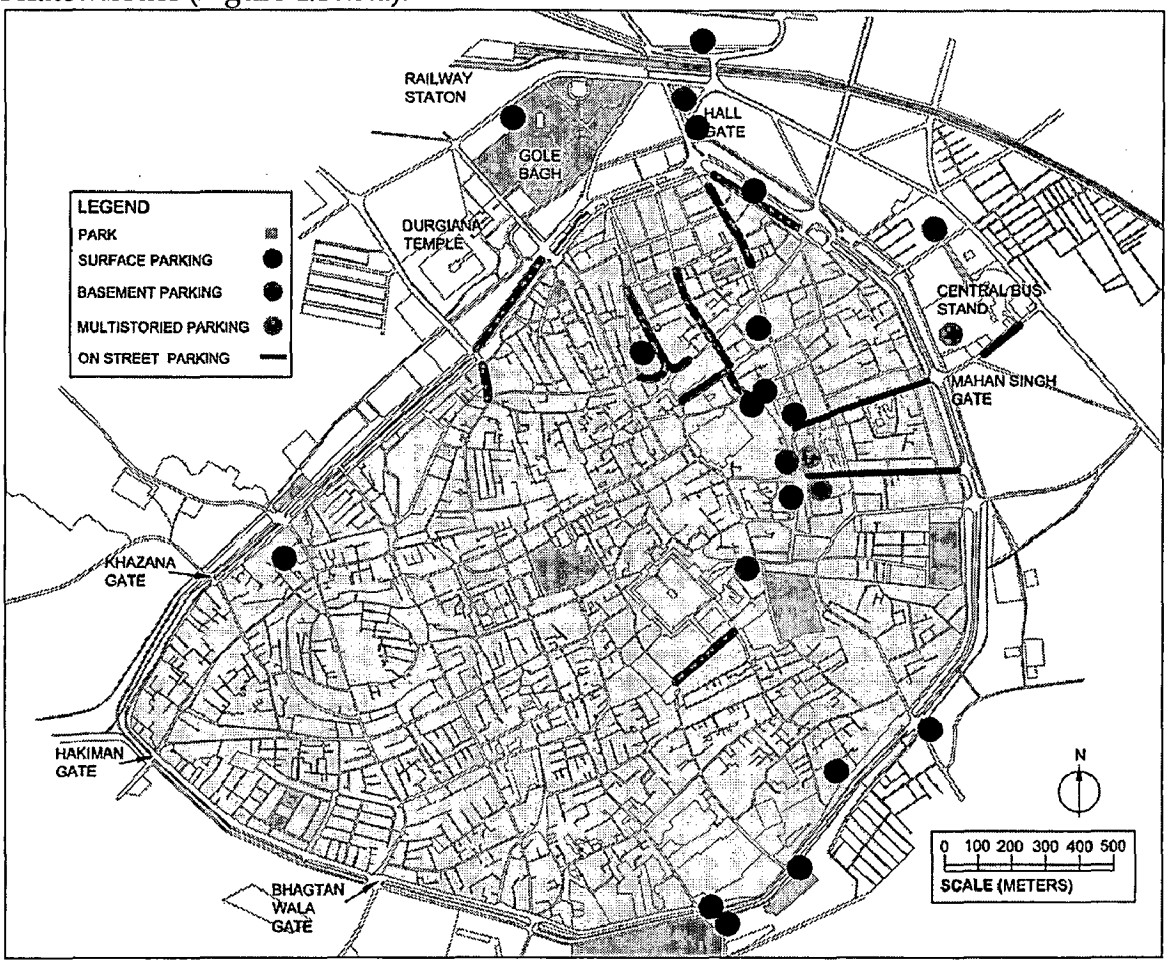


Figure 4.10.5.1Location of Organized Parking Lots in Amritsar City(Source: by Author)

Figure 4.10.5.2 Condition of parking with in Walled City (Source: by Author)

Table 4.10.5.1Organized Parking Lots in Amritsar City (Source: MCA)

Name of Area	No.	Type of Parking Lot	Existing / proposed	Free/ Paid	Type of Vehicles	Managed By	Area
Near Golden Temple	2	Multistoried	Existing	free	2 wheelers & 4 wheelers	SGPC	-
Chowk Phowara	1	Multistoried	Existing	free	2 wheelers & 4 wheelers	SGPC	-
Gurudwara Shaheed Ganj	2	Basement	Existing	free	2 wheelers & 4 wheelers	SGPC	-
Bhandari Bridge	1	Basement	Existing	paid	2 wheelers & 4 wheelers	Muncipal Corporation	22500, 300 cars, 300 scooters
Telephone exchange	1	Surface	Existing	paid	2 wheelers & 4 wheelers	Muncipal Corporation	3600 sq ft
Galiara Parking	2	Multistoried	Existing	paid	2 wheelers & 4 wheelers	Muncipal Corporation	4000 sqft, 1200 sqft
Kesariyan bagh Parking	1	Surface	Existing	paid	2 wheelers & 4 wheelers	Muncipal Corporation	-
Saranghi Parking	1	Multistoried	Existing	paid	2 wheelers & 4 wheelers	Under Elevated Road Project	-
Bus Stand Parking	1	Basement	Existing	paid	2 wheelers & 4 wheelers	Rohan &Rajdeep	-

4.10.6. Public Transport

The city of Amritsar lacks in public transport facility for intra city operations. Due to complete absence of formal public transport system, there is increase in personalized modes of transport. The number of 3-wheelers in the city has increased at an average rate of 5.3% from 12149 in year 2003-04 to 15176 in year 2007-08

Three wheelers on create traffic problems and many use kerosene oil/diesel which creates environmental degradation with air pollution and noise pollution. Free bus service from Railway Station to Golden Temple is provided by SGPC for tourists visiting Golden Temple. Taxis provide an intermediate private transport system within 40kms radius of the city but it is expensive as it charges Rs.20 per kilometer.

Elevated Road Project from Partap Avenue to Bhandari Bridge and to Golden Temple is under construction. The construction of multi level car parking at various places of the city to reduce traffic congestion: a) Outside Hall Gate, b) Outside Durgiana Temple, c) Kairon Market, d) Telephone Exchange and e) Fish Market.

Table 4.10.6.1 Number of registered vehicles (Source CDP, 2025)

Type of Vehicle	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01
Heavy Vehicles						
Trucks	4979	4985	4993	4994	5006	5114
Buses	1556	1564	1591	1599	1619	1624
Light Vehicles						
Two Wheelers	189371	205568	221562	249658	277458	306891
3-Wheelers	5650	5998	6481	6958	7425	7945
4-Wheelers	22878	28657	36368	44248	52659	62685
Taxies	528	688	769	1158	1458	1958
Non-motorized Vehicles						
Rickshaw	16500	16913	16572	16520	15530	15716

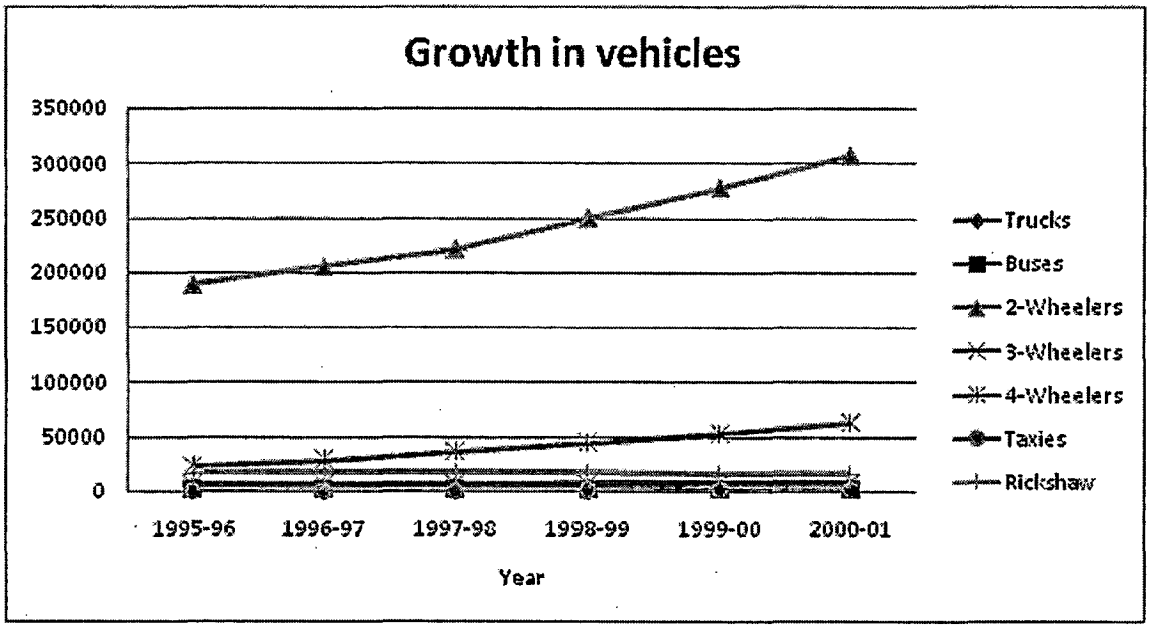


Figure 4.10.6.1Growth in vehicles from 1995-2000

4.10.7. Proposed PRT System

Personal Rapid Transit (PRT) system is low cost, on demand service running on overhead guide-ways. The max speed of the system is 40km/hr and it runs on battery power which can be charged on the stations. Vehicles stand parked off line at stations for passengers. As there are no intermediated stops the trip time is relatively short. The vehicles have capacity of 4-6 passengers with space for luggage at back.

Key features of PRTS

1. Low capital and operational cost
2. On demand service
3. Greater privacy and safety
4. Zero carbon emission

Vehicle details and track details

The PRT vehicle has gross weight of 1300 kg as the weight of vehicles is low and it travels at low speed hence the power requirement is also low. The width of track is 2.1 m, depth of the track is 0.45 m and clear height is 5.7 m.

The typical PRT system has multiple intersecting single lane routes. The station has flexibility to be constructed on grade, overhead, under-ground and even directly inside buildings. The average PRT system energy usage is 0.55 MJ per passenger Km and conventional modes of transport such as LRT, Auto, Bus and Train consume 1.2 to 2.4 MJ per passenger Km.[34]

4.10.7.1. Historical Overview of PRTS

- Many systems were researched in design and development in UK, Europe and USA in 1970's but only Morgantown, West Virginia was put to public operation as larger vehicle derivative. Morgantown Group Rapid Transit developed by University of West Virginia. The University was land constrained and distributed among 3 campuses in city with congested streets. A PRT system was identified to move students between campuses Alden staRRcar system was selected for implementation under UMTA funded study in 1972. Vehicles can carry 21 passengers, and guide-way is 8.7 miles with 70 vehicles on track. The Morgantown Project was influenced by political interference hence the overruns in cost was seriously compromised [35]
- The phase 1 of Chicago RTA (Regional Transportation Authority)/Raytheom Program started in 1990 and in 1993 a test track was constructed in Massachusetts. After various studies the project was cancelled due to high cost of large guide-way infrastructure and financial risk.
- ULTRA PRT Ltd. Formally known as Advanced Transport System Ltd. of Bristol development of prototype test track and vehicles funded by UK Department for Transport. EDICT (Evaluation and Demonstration of Innovative City Transport) program was European Union 5th framework program to analyze and assessment PRT.
- Heathrow PRT system was designed to connect remote parking lots with Central Terminal Area. It has 3.8 km guide way, with 78 vehicles and 27 stations serving multiple parking stops. It was launched in 20009 with investment of 25 million pound.
- A comparative study of Morgan Town, Heathrow and Proposed Amritsar PRTS is given below in Table

[34] Detail project report of Ultra Fairwoord PRT System, 2011
[35] Viability of Personal Rapid Transit in New Jersey, February 2007

Table 4.10.7.1.1 Comparative study of PRT Systems (Source: By Author)

	Morgan town	Heathrow PRT	Amritsar
No of passengers per day	1500	Approx. 3000	
Length of Route (km)	14	3.8	3.3
No of stations	9	27	7
No of vehicles	70	78	80
No of passengers per vehicle	21	4-6	4-6
Year of development	1972	2009	2011
Cost of infrastructure		25 million pound	198 crores Rs

4.10.7.2. Amritsar PRTS

The public transport system has not been able to keep in pace with the development and urbanization. The vehicular population has been increasing. Amritsar has grave problems of road encroachments, on street parking, high rise of vehicles on roads leads to traffic congestion, lack of pedestrian facilities and high levels of air and noise pollution. The core area has narrow winding streets with 2 wheelers, autos and rickshaw crowding and jamming the streets. Amritsar Walled city has high density and mixed land-use and was planned for walking but after the widening of road, vehicular activity increased congestion increased on the road.

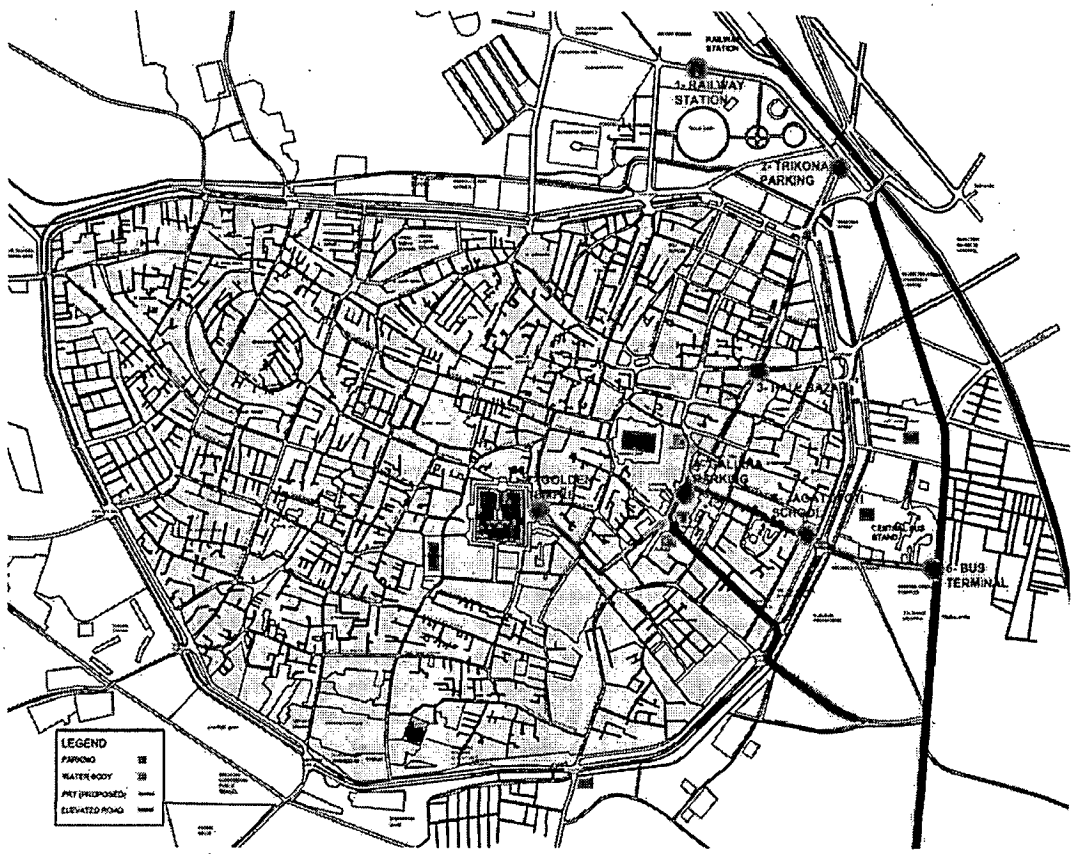


Figure 4.10.7.2.1 Proposed PRTS route and Stations (Source: By Author)

Amritsar PRT system will connect railway station and bus stand with golden temple (Figure 4.10.7.2.1). 7 stations have been proposed on elevated route length of 3.3 Kms with 80 pods in first phase. The details of the stations are given in Table 4.10.7.2.2. The system will have overhead track, maintenance yard, control room and the pods which will cost 198 crores. The PRT is effective in high density areas such as Amritsar.

Table 4.10.7.2.1Detail of PRT Stations (Source: By Author)

Sr no	Station	Plot Location	Total Area (sqm)	Height	No of berths	No of Floors	Technical Area + Concourse	Purpose
1	Golden Temple	Gantaghar Market roof	Existing Roof	5 m	24	3	1452	Station
2	Galiara MLP	3rd Floor	NA	9.0	10	1	3871	Station, Maintenance Yard
3	Hall Bazar	Kairon Market	2264	7.2	10	3	1294	Station
4	Trikona Parking		existing plaza +5.486	3.5	4	2	244	Station
5	Railway Station	Gol Bagh side, 4 wheeler parking	2157	7.2	4	3	1854.5	Station
6	Jagat Jyoti School	Parking	263	6.0	4	4	522.75	Station, Control Room
7	Bus Stand		1603	7.2	2	3	1408	Station

The operating hour of PRT is 16 hr per day from 6 AM to 10 pm. Total power requirement of stations load including yard and control room is 3.6 MW and water requirement of total stations requirement yard and control room is 0.34 MLD. The system works as car pooling method, the whole pod cost 45 Rs per pod per Km. A typical journey will cost 135 Rs per pod for 3 Km length the system will be beneficial during peek hour [36]

4.10.7.3. Comparative analysis

A comparative analysis of four transportation modes is done. These transportation modes are, PRTS, City Bus Service, Mono Rail, and Auto. The comparisons in terms of commutation time, safety level, comfort, flexibility, and environmental aspect of these systems. The cost per person per km is same as autos but PRT provide better comfort and safety. Flexibility level of PRT system is low because the route is fixed and the coverage area is only 3.3 km. the commutation time for PRT system depends upon the

[36] Detail project report of Ultra Fairwoord PRT System, 2011

demand of vehicles during that time. As there are limited vehicles and waiting time for empty vehicles to return to stations of demand will vary according to the traffic on the PRTS.

Table 4.10.7.3.1 Comparative analysis of different transport system (Source: by Author)

	PRT system	City bus service	Mono-Rail system	Auto
Cost/person/ km	10/-	5/-	15/-	10/-
Commutation time	5-7 mins	15 mins	5-7 mins	15 min
Safety level	Good (elevated track: no risk of accidents, private travel)	Poor,(risk of road accidents, and theft)	Moderate, (elevated track, no private travel)	Poor (high accident risk)
Comfort	Good	good	good	Poor
Flexibility/ penetration	moderate	moderate	bad	good
Environmental aspect	Environmental friendly, runs on electricity, no carbon emission,	High carbon emission, (Amritsar has 232 microgram/cum SPM)	Environmental friendly if use electric power	High carbon emission

4.10.7.4. Critical analysis

The central control system provides empty vehicle management (EVM) process which ensures the vehicles are sent where they are required. As most of the tourist population comes around 8-12 in morning and leaves by 4-7 in evening the flow is mostly one sided hence the vehicles will be moving empty to cut the demand of one sided trips hence energy will be wasted

The fare is higher than any other mode of transport and the lower and middle income groups will resist paying, although PRTS is safe and comfortable than any other system. It will cost 135 rs per pod and for family of 4 in auto and bus it will hardly cost 40 Rs

PRT system will not connect airport and as the passengers who will be willing to pay will be upper class, NRI'S and foreigners. The foreign tourist coming to Amritsar in 2010 was 137122. Approximately 150 foreign tourists come by rail and road per day.

4.10.8. Schemes Implemented in Walled City Area

Out of the total schemes sanctioned and implemented, merely 20% of the schemes have been undertaken in the walled city area(Table 4.11.1).

Table 4.10.8.1Comparison of Various Schemes Implemented in Walled City Vs Total No. of Schemes (Source: MCA)

Schemes	Total no. of Schemes	Total Area of Schemes (in Acres)	No. of Schemes inside walled city	Total Area of Schemes inside walled city (in Acres)
Town Planning Schemes	86	3891	3 (6.66%)	7.2
Building Schemes	16	617	1 (2.23%)	4
Development Schemes	43	3346.25	0	0
Re-Development Schemes	41	137.5	41 (91.11%)	137.46
P.U.D.A. Schemes	5	64.12	0	0
O.U.V.G.L. Scheme	3	7.5	0	0
Private Promoters	77	30.56	0	0
Total Area Under Various Schemes	**271**	**8093.9**	**45 (100%)**	**148.66**

91 percent of the total schemes implemented in the walled city are Re-Development Schemes undertaken by Amritsar Improvement Trust covering an area of 137.5 acres approximately. These are spread over whole of the walled city area. The 6.66 percent of the schemes implemented in the walled city are Town Planning Schemes and only 1 Building Scheme has been undertaken which is inside Bhagtanwala Gate. Still the condition of walled city requires very strong policies/ strategies in terms of Urban Renewal Program. 70.5% of the walled city area to be covered under various schemes.

4.10.9. Physical Infrastructure

4.10.9.1. Water Supply

Initially, water supply in the walled city was based on a network of 40 *khuhs* (wells) located outside the city through which water was extracted and supplied through a well designed and properly laid down network. Over a period of time, numbers of tube wells have been installed to extract ground water and meet the increased needs of its residents. This has resulted to rapidly falling water table in the range of 180 to 460 feet. With the fast depletion of ground water, shallow tube wells used for water extraction have to be abandoned.

At present, rainwater harvesting is practiced neither at city level nor at individual house level as there are no guidelines for making this as mandatory provision. So a minimum size of plot should be fixed for water harvesting and it should be included in the building byelaws too. The population served by piped water supply includes service through the house connections, stand posts and independent institutional set ups. Despite the fact, the water extracted is higher (240 MLD) than the actual consumption (137.6 MLD), but the water available to the residents is of much lower order due to high wastage (about 43%) of the water supply. Major reason for wastage of water is leakage in the network, which is more than 50 years old, poor maintenance and lack of awareness on the part of the community.

At present 91% of water supply in the city is made through tube wells under direct supply system and 9% is through 29 over head reservoirs (OHSR). Out of the total 29 OHSRs, only 19 are operational with total capacity of 17 MLD, whereas rest of 10 OHSRs are not working due to problems related to leakage, structure, etc.

Walled city area also contains boosting stations at Bhagat Singh Road, located in vicinity of MCA office near Rm Bagh. This boosting sation along with 9 OHSR meet water demand of walled city area total water produced by MCA id 58.71 MLD , in 2007 per capita consumption of water in walled city area is 278.35 LPCD. The total demand of water of walled city area is 27.835 MLD

Plan for Rehabilitation of existing water supply of Amritsar Walled City Area under JNNURM has been prepared by Punjab Water Supply and Sewerage Board (PWSSB). The total cost of the project is 52.75 crores. Total length of the proposed rehablitaion of water supply is 77 km and 9 OHRS are proposed for repair.[37]

Table 4.10.9.1.1 Details of Proposed rehabilitation work (Source: PWSSB)

Proposed rehabilitation work	
Diameter of Pipes Mm	Length of pipes proposed for rehabilitation
75-80	60000
100	6000
150	7882
200	1857
250	913
300	966
total	77618

Charges for water supply levied in Amritsar are:

Table 4.10.9.1.2 Water Supply Charges (Source: MCA)

	Category	Charges
Charges according to plot size	Less than 125 yards	nil
	125-300 yards	105 rs per month
	Above 300 sq yards	140 rs per month
Metered connection	domestic	3.8 rs per liter
	commercial	6 rs per liter

[37] DPR of Rehabilitation of existing water supply of Amritsar Walled City, 2006

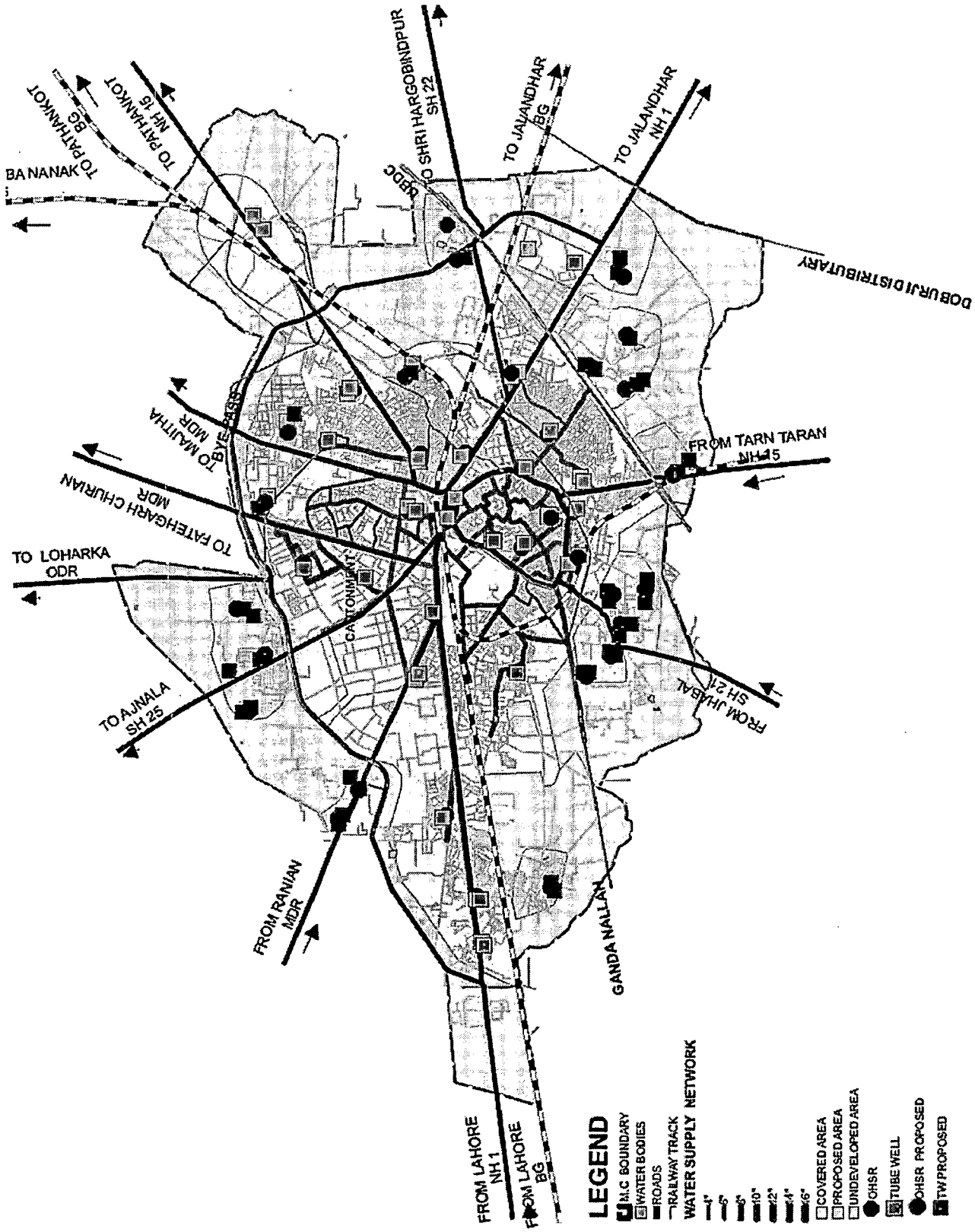


Fig 4.10.9.1.1Water Supply Network 2010 (Source: Master Plan 2010-2031)

4.10.9.2. Sewerage System

The total quantity of daily sewage generated in the Amritsar city is of the order of 192 MLD, In addition, large number of industrial units operating within and outside walled city also discharge their effluents directly into the network without making any initial treatment. All industries are required to treat their effluents to neutralize the chemicals before discharging into the network.

Water availability for tube wells in Walled city area varies from 50m to 100 m. major components of the total waste water is being discharged directly by street drains , creating environmental nuisance.

There is no existing sewerage treatment plant and untreated waste water from the walled city is being discharged through Fatehpur MPS to Gandha Nala, eventually discharging to Hudiara drain.

Walled city area has concave shape with local depressions in the centre. Due to radial pattern of sewers there are 18 subzones with in walled city. During monsoons the city is susceptible to floods due to high population, and less soft surface for water to seep into ground. The existing length of sewers is 84.04km. The sewers with diameter 400mm to 1450 mm are brick sewers circular in shape.

Under JNNURM rehabilitation of existing sewerage system of walled city is proposed by government in year 2005. The first phase of the project cost 179.34 crore. Waste water flow of 121.20 mld is estimated in 2005. The estimated waste water flow at end of 2020 is 179.2 mld.[38]

Under this project sewerage components proposed are given in table below:

Table 4.10.9.2.1 Details of Sewerage Project (Source: PWSSB)

Sr. no.	Project Component	Quantity
1	Sewer150mm-300mm (SW) pipe	244.02km
2	RCC 400mm-915mm pipe	62.80km
3	Outfall sewer 915-2590mm	41.18km
4	Pumping stations	
5	STP	3nos. with total capacity 200 mld to cater entire city including walled city area.

[38] DPR of rehabilitation of existing sewerage system of walled city, 2006

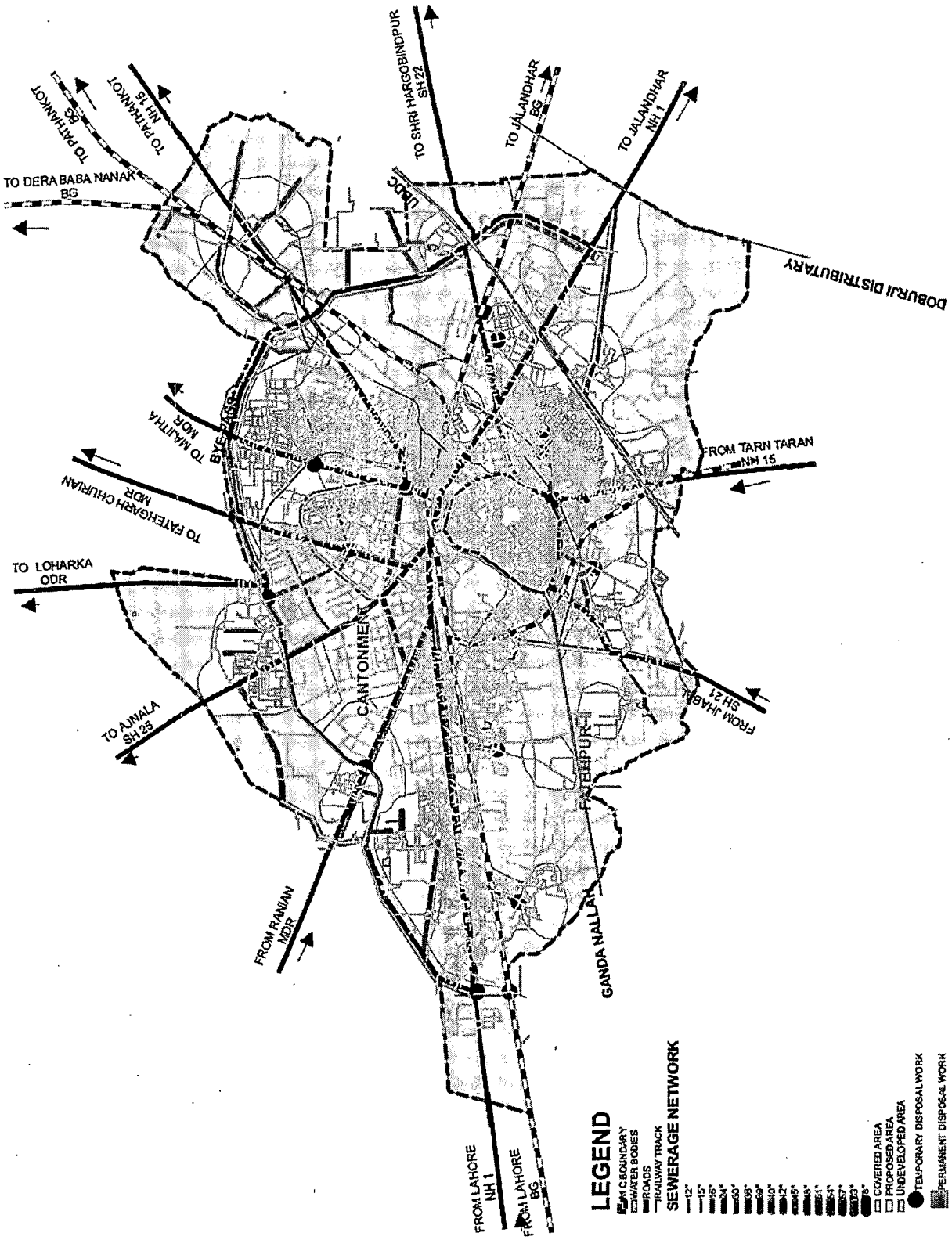


Fig 4.10.9.2.1Sewerage Network (Source: Master Plan 2010-2031)

4.10.9.3. Storm Water Drainage Network

The walled city, Amritsar has system of open drains while for the areas outside it, the disposal of storm water is combined with sewerage network leading to choking of the pipes, overflow of the sullage and backflow of the sewerage water. Storm water also gets into low lying areas flooding them in the process. The problem of acute water logging during heavy rains has been experienced in the entire city of Amritsar. This is mainly due to the trough or saucer shape of the city, which requires adoption of specialized approach to drain off the rainwater due to its typical topography. The network available is hardly 10 Kms in length, which is highly inadequate considering the size of city. The details of population and area coverage in Amritsar are given in table below:

Table 4.10.9.3.1 Length of Drainage Network in Amritsar Municipal Corporation Area

Item	Length (km)	Area under Coverage (%)	Population under Coverage (%)
Storm Water Line	10	20%	20%

Source: Municipal Corporation Amritsar, 2006-07.

4.10.9.4. Solid Waste Management

It is estimated that about 450 Metric Tonnes (MT) of solid waste is generated every day within the administrative jurisdiction of the Municipal Corporation. Considering an estimated present population of 1,065,000 and **a daily floating population of around 30,000** at an estimated per capita generation of solid waste of 400 grams per day for the Local inhabitants and 300 grams per day for the visitors, the total estimated solid waste generation works out to about 447 MT.[39]

Table 4.10.9.4.1 Composition of Municipal Solid waste in Amritsar (Source: MCA)

Composition/ type	% of the Total Wastes
Bio-degradable kitchen waste	50-55[1]
Paper	5
Plastic	1
Metal	Not significant
Glass	1
Woody waste (twigs, bark, furniture waste.)	5
Building waste (bricks, cement, demolition waste etc.)	25-30
Industrial waste (from household industries within MCA limits)	8-10
TOTAL	100%

Primary Collection of Waste: There appears to be a well-practiced arrangement for house-to house collection of waste in some parts of the city; in the walled city and in the new planned areas.

[39] City development plan Amritsar 2025

Temporary Storage of Waste: MCA have placed about 125 metallic dustbins of 4.5 cu. m size and 10 bins of 10.0 cu. m. size for the temporary storage of waste collected by the sanitary workers as well as for the citizens to deposit their domestic waste. In some areas, there is inadequacy of such bins especially in market places.

Table 4.10.9.4.2 Location of City Landfill Sites (Source: MCA)

Name	Size (ha)	Location	Distance (km) from city centre	Age (years)	Present status
Land fill site no. 1	8.1	Outside gate Bhagatawala	2 km	25 years	Could be used for next 15 years
Land fill site no. 2	5.8	Fatahpur	6 km	Recently acquired	Under development
Others	2.65	Bharaiwal	5 km	Recently acquired	Under development

In some of the old localities of the walled city with high poor population, the existing water supply infrastructure, sewers and drains need rehabilitation. There is a need for appropriate institutional mechanism with community involvement to ensure proper maintenance of sewers, solid waste and street sanitation.

One of the major services to be handed over to the private sector for operations in the municipal solid waste management sector wherein a private company Anthony Waste handling Private Limited has been given the responsibility of handling waste management operations in the city. Under the model the walled city area is covered by the AMC and the rest of the area is to be covered by the private player. The irony of the model is that it leaves out one of the important stakeholders who has till date been handling the solid waste management process when the AMC operations left much to be desired. The informal sector in the waste management cycle comprising of the informal scrap dealers and the rag-pickers has been entirely ignored.

4.10.9.5. Electricity

The whole of the city of Amritsar is covered by electric supply. The Bhakra Nangal Dam, Ranjit Sagar & Shanan Power Extension are the three important sources of power supply to the city. The gap for electric demand and supply in the city of Amritsar is of the order of 34% approximately, as the total electricity demand for the city is 6700 MKWH against which the supply of 4400 MKWH is made.

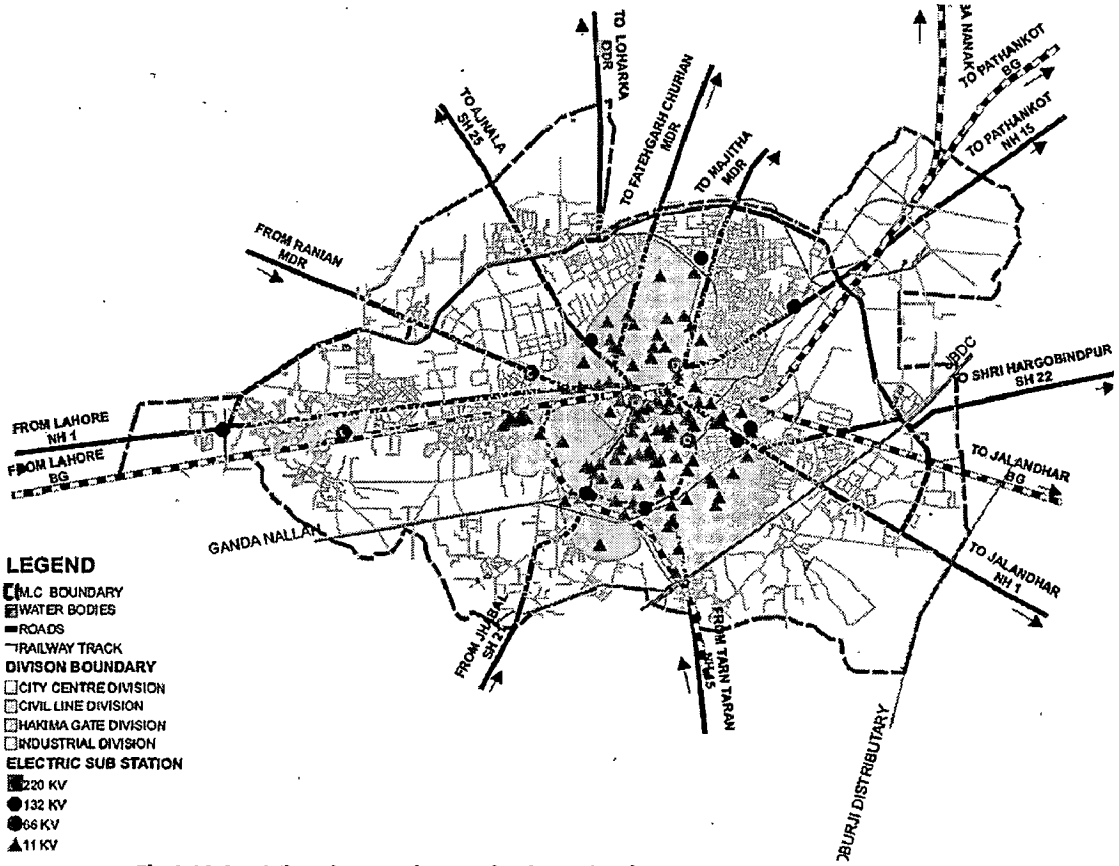


Fig 4.10.9.5.1Electric Boundary and Sub Station (Source: Master Plan 2010-2031)

4.10.9.6. Social Infrastructure

colleges located in walled city area such as DAV College at Hathi Gate and Hindu Sabha College at Dhab Khatikan are located on narrow city roads and lacks in adequate areas for parking, playground, reading rooms etc.

They have been observed to be functioning in every corner of the city, which makes it evident that they are spread evenly throughout the city, especially in walled city areas where these health institutions exist in the residential areas. Walled city area of Amritsar lacks in open areas/parks where these only exists in form of tot lots. There is no park left as such within walled city area, as they have been encroached or converted into commercial spaces such as

The Shiv Puri Cremation Ground near Durgiana Mandir is located on the circular road adjoining walled city and serves the major Hindu population of the city while the another cremation ground at Chatiwind Gate-opposite Shaheedan serves the sikh population of the city.

Out of the 11 police stations existing in the city, only one is situated inside the walled city that is Police Station of E-Division at Town Hall, while 4 police stations are located on the outer circular road adjoining walled city.

The walled city area has open drainage covering 1.63% of the city roads. The total length of storm water drainage required by 2031 comes out to be 1931.7 kms, thus there is need of installing 1921.7 km additional storm water lines. It is proposed to construct underground

pucca drains.

Figure 4.10.9.6.1 Social infrastructure of Walled city

4.11. Institutional Setup

The institutional setup for different functions of city is given below

Table 4.11.1Institutional Setup (Source: City Development Plan 2025)

Sr. no	Service/ function	Planning & Design	Implementation	Operation & Maintenance
1	Development Plan Preparation (Land use Zoning)	Town planning department, GoP	MCA	
2	Water Supply	Punjab Water Supply and Sewerage Board(PWSSB)	MCA	MCA
3	Sewerage and sanitation	PWSSB	MCA	MCA
4	Strom water drainage	PWSSB	MCA	MCA
5	Solid Waste Management	MCA	MCA	MCA
6	Roads and drains	MCA	MCA	MCA
7	Street lighting	MCA	MCA	MCA
8	Urban Transportation	MCA	Private operators	Private operators
9	Traffic Management	Traffic Police/ MCA	traffic police	traffic police/ MCA
10	Parks and Play Fields	MCA	MCA	MCA
11	Health and Education	GoP &MCA	GoP &MCA	GoP &MCA
12	Fire Services	MCA	MCA	MCA
13	Slum Development	MCA	MCA	MCA
14	Poverty Alleviation Programs	GoI/GoP/MCA	GoP/MCA	GoP/MCA

4.12. SWOT analysis

Strengths

- religious significance, rich history and culture
- Proactive state and local governments.
- Regional hub for education and health facilities.

Weaknesses

- Inadequate Infrastructure.
- Lack of focused effort on Heritage Conservation and promotion.
- Growth of informal sector.

Opportunities

- Tourism
- Improved security in the region
- Infrastructure Development
- Access to Assistance under JNNURM.

Threats

- Proximity to the international border
- Inter-Regional Competitions for Economic Space (Ludhiana, Chandigarh).

4.13. Inferences

Tourism

- Lack of focus on preservation and conservation of heritage buildings
- Lack of strategies for promoting tourism
- Construction of buildings with modern architecture in and around heritage buildings is destroying the heritage character of the area.
- Absence of public mode of transport connecting different tourist destinations within the city.
- Lack of public toilets and civic amenities near majority of tourist destinations.
- Large-scale conversion of buildings and open spaces of Walled City to commercial uses.

Commercial Area

- The markets of the walled city are highly congested and have high density. Due to absence of adequate parking movement in these areas is difficult.
- The narrow streets and road encroachments have degraded the aesthetic the area.
- No dedicated institution for research and development of traditional industrial products to improve their quality, cost and marketing.
- No commercial area for banking, insurance and share market in the city

Transportation

- Road jams, congestion and accidents due to Increased number of registered vehicles in Amritsar.
- There is no limit to the number of licenses issued to the auto rickshaws
- The entry of private heavy vehicles and four wheelers inside the Walled City is creating lot of congestion on the roads.
- Parking is a major problem in Amritsar city. On road parking is common, leading to jams and delays.
- There is lack of direct connectivity with Airport and city.
- Lack of mass transit system within the Walled City. Trams or CNG run mini buses may be introduced in this regard.
- Due to construction of elevated road traffic will increase tremendously at Bhandari Bridge therefore it requires redesigning and widening.
- The PRT system covers only 3.3 kms of route and mainly caters to tourist population only.

Solid waste Management

- Inadequate measures from Municipal Corporation in regard to solid waste management.
- Difficulty in penetration in narrow streets of Walled city.

Electricity

- The crisscross of overhanging surface wires within the Walled City is destroying the architectural beauty of the old buildings.

Drainage

- The walled city, Amritsar has system of open drains. the disposal of storm water is combined with sewerage network leading to choking of the pipes, overflow of the sullage and backflow of the sewerage water.

Social Infrastructure

- Hospitals with in walled city alongside residential uses create parking problems and land use violation.
- Fire department lacks disaster management equipments. The existing vehicles are not able to serve the population in case of any disaster. No such vehicles exist to enter narrow streets of walled city in case of huge fire in high rise buildings.
- The Walled City area of Amritsar has been identified as critical in case of any disastrous situation because of the age-old buildings.

5. Analysis of Plan Proposals and Problems

This chapter deals with analysis of proposals of Master plan and City Development Plan for Walled City area. It further deals with primary survey and field study carried out in walled city and analysis and inferences drawn from it. The chapter includes household survey conducted through questionnaire and its analysis. It also includes vehicular survey and its analysis. The chapter also includes visual and photographic survey of study area focusing on problems in walled city area.

5.1. Analysis of Master Plan Proposals

Master Plan for Local Planning area, Amritsar have been prepared for Punjab Urban Development Authority, Mohali in year 2010 by SAI Consulting Engineers Pvt Ltd, Ahmadabad. PUDA has taken up the preparation of the Master Plan for Local Planning Area Amritsar to address the infrastructure and service delivery gaps in Amritsar and to make the growth and development of Local Planning Area (LPA) rational. The key objective of the Master Plan is to formulate a long-term vision and strategy to make the LPA vibrant, livable and creditworthy

the Walled City, Amritsar has a unique quality of growth and development. It has the distinction of housing the major cultural and religious landmarks. In addition, it is also the hub of trade and commerce and symbol of Amritsar City. Accordingly, Walled City has been considered as the first layer of the entire planning area, being its heart and soul. The walled city has a total area of 350 hectares, which constitutes merely 2.5 percent of the area of the Amritsar city. It houses approximately 16% of the population of the city. Considering the historicity of the area due to the presence of Golden Temple, Jallianwala Bagh, Durgiana Mandir, Katras, Bungas, Havelis of historical times, narrow streets and specialized markets, the zone is proposed for preservation, conservation and up-gradation of infrastructure in order to make it a cultural hub of Amritsar. Considering the inherent strength and value of walled city as the symbol of physical, social, economic and historical growth, it is proposed to be developed and declared as "**Heritage City** to preserve the existing rich heritage. General Proposal of Master Plan for Walled City area are given below.

Table 5.1.1 General Proposals of Master Plan for Walled city Area

Sr. no	Master Plan Proposals	Analysis
1	To preserve, enhance and promote the basic character of the Walled City	
2	To promote quality of life by improving, upgrading and providing state of art infrastructure and services.	Plan for rehabilitation of water supply and rehabilitation of sewerage system for walled city has been prepared unden JNNURM, but not implemented yet. Condition of solid waste management is bad, but nothing has been proposed yet

3	To undertake selective de-congestion of the walled city by shifting of wholesale and bulk material markets including Fish/Iron Market, Cheel Mandi, Iron Market (Bagh Akalian), Goldsmith Market, Ghee Mandi, Namak Mandi, wholesale medicine market, building materials, etc. to identified planned areas outside the Walled City near Bhagtanwala Gate/along the major road and rail networks.	no plan has been prepared yet
4	To promote de-congestion by eliminating sub-division of land and change of land use from residential to commercial and others.	Walled city has already been declared as mixed land use area
5	To promote revitalization of walled city area by way of conservative surgery.	No plan has been prepared for revitalization
6	To frame detailed "Urban Design Guidelines" for promoting and enhancing the quality of urban spaces. Shifting of the Goldsmiths market/ activities operating near Golden Temple in order to minimize the damage caused by them to the world heritage monument "Golden Temple"	Guru Bazar(goldsmith market) which is one of the major bazars of the walled city lies in vicinity of golden temple. Coal was used by the goldsmiths to melt gold but according to new regulation coal has been banned and only LPG can be used.
7	To promote conservation and preservation of heritage buildings	Heritage Walk Plan incorporated façade upliftment of 11 heritage buildings but no effort is put in conservation
8	To promote Heritage Walk by developing processional route of Maharaja Ranjit Singh from Ram Bagh Garden to Walled City and its surroundings areas.	Heritage walk was introduced in 2011, but it has been a failure as only 3-4 tourist attend the walk, Lack of awareness among people and promotional strategies are the main reasons for the failure. Bad state of solid waste managemnet also creates unhygienic and filthy atmosphere.
9	Provision/ Up-gradation of higher level of urban and tourist infrastructure	Sulabh Toitels have been proposed in various locations in walled city, but it lacks in drinking water facility and visitor booths at important tourist spots.

10	To promote, preserve, enhance and augment the bazaar culture in the walled city in order to make it a role model of urban heritage.	To promote bazar culture , pedestrinization has to be done , for which no plan has been prepared yet
11	To minimize vehicular pollution by promoting electric based mass transportation system.	150 busses has been sectioned under JNNURM
12	Pedestrianization of the walled city in order to decongest and eliminate the traffic problems due to lack of adequate road width/parking.	No plan has been prepared .
13	To promote pedestrianization by building special walkways on the stretch from Chowk Phowara to Golden Temple.	
14	Implementing time regulation for undertaking loading and unloading activity for existing wholesale markets within walled city area.	Time regulation has been implemented but it is not followed
15	To identify, create and develop available open spaces through proper landscaping within walled city.	most of the open spaces are used as surface parking

Considering the critical role, historical importance and typical character of the walled city, it is proposed that it shall be developed as a distinct entity. Accordingly, a specific, exclusive and detailed plan for the development of walled city needs to be prepared. The plan should be based on the prime consideration, having focus on Urban Design and Heritage Conservation & Preservation.

5.1.1. Heritage Zone proposed by Master Plan

It has been observed that the areas around heritage buildings are undergoing rapid change in terms of architectural vocabulary. The old buildings are being demolished and new ones are constructed. The new construction does not gel with the existing pattern of development. The land use is also undergoing rapid transformation with residential areas being converted into commercial areas for catering to tourism and trade. Large volume of built up spaces and change land use has resulted in many developmental and transportation problems and also destroying the heritage of Amritsar.

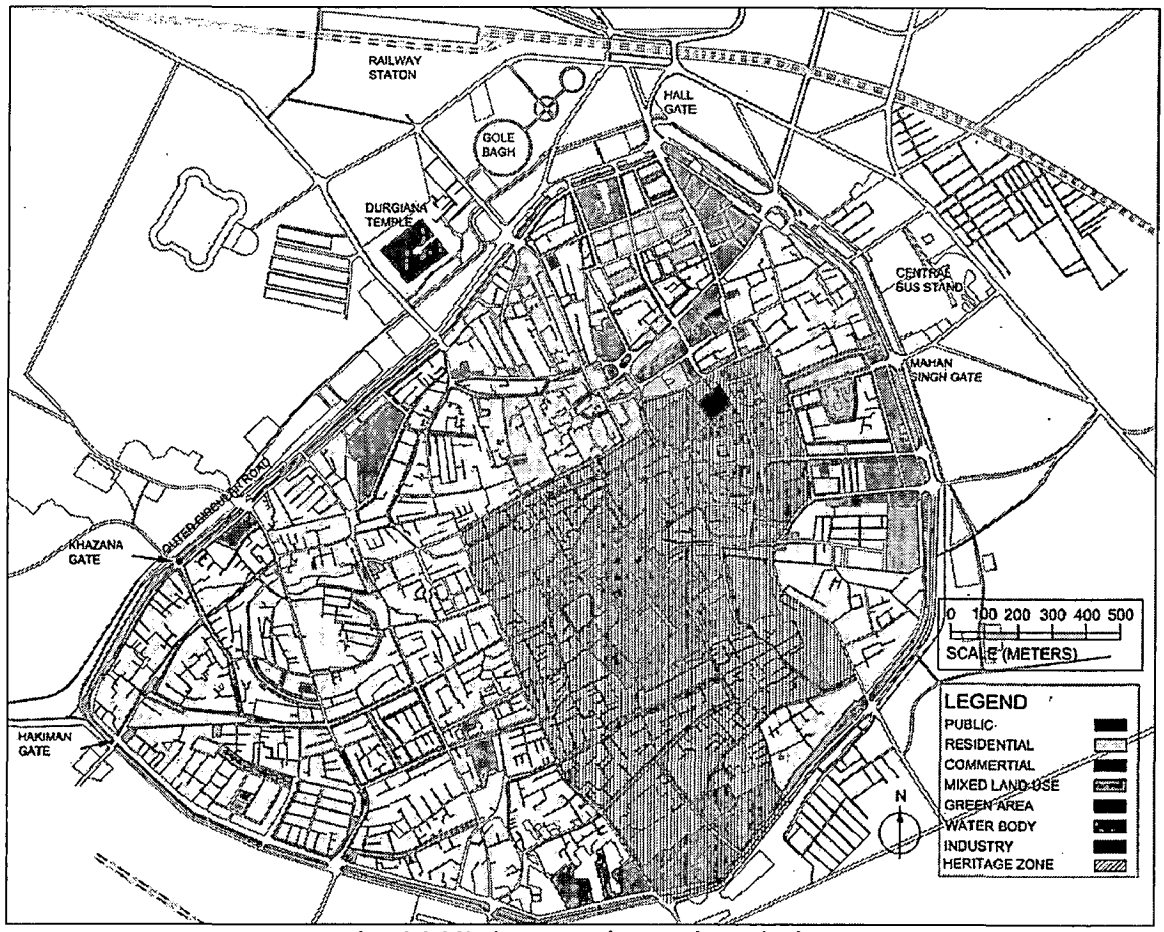


Fig 5.1.1.1 Heritage Zone (Source: by Author)

The Heritage Zone has been identified in the map of walled city and comprises of areas enclosed by Guru Bazaar, Chaurasti Attari, Chowk Passian, Katra Jaimal Singh, Katra Baghian, Bazar Cheel Mandi, Bazar Mahan Singh, Katra Mahan singh, Bazaar Ghee Mandi, Abadi Bagh Ramanand, Katra Himmat Singh, Chhauni Nihanga, Circular Road, Chatiwind Gate, Bazar Chatiwind, Katra Ramgarhian, Dhab Basti Ram, Namak Mandi, Katra Amar Singh, Katra Mohar Singh and Bazar Tunda Talab(Figure 5.1.1.1). The area includes the most valuable heritage of the city including Golden Temple, Jallianwala bagh, Gurudwara Shaheedan, Gurudwara Santokh Sar Sahib, Gurudwara Ramsar Sahib besides Town Hall and other buildings. The area to be brought under the Heritage Zone works out to be approximately 244 acres.[40]

The heritage walk which was launched in 2011 does not coincide with the heritage zone (Figure 5.1.1.2). There are 3 heritage structures which lie outside the heritage zone. These structures should also be included in the heritage zone so that they can be protected. Proposals of the Heritage zone given by Master Plan are analyzed in table

[40] Master Plan Report 2010-2031

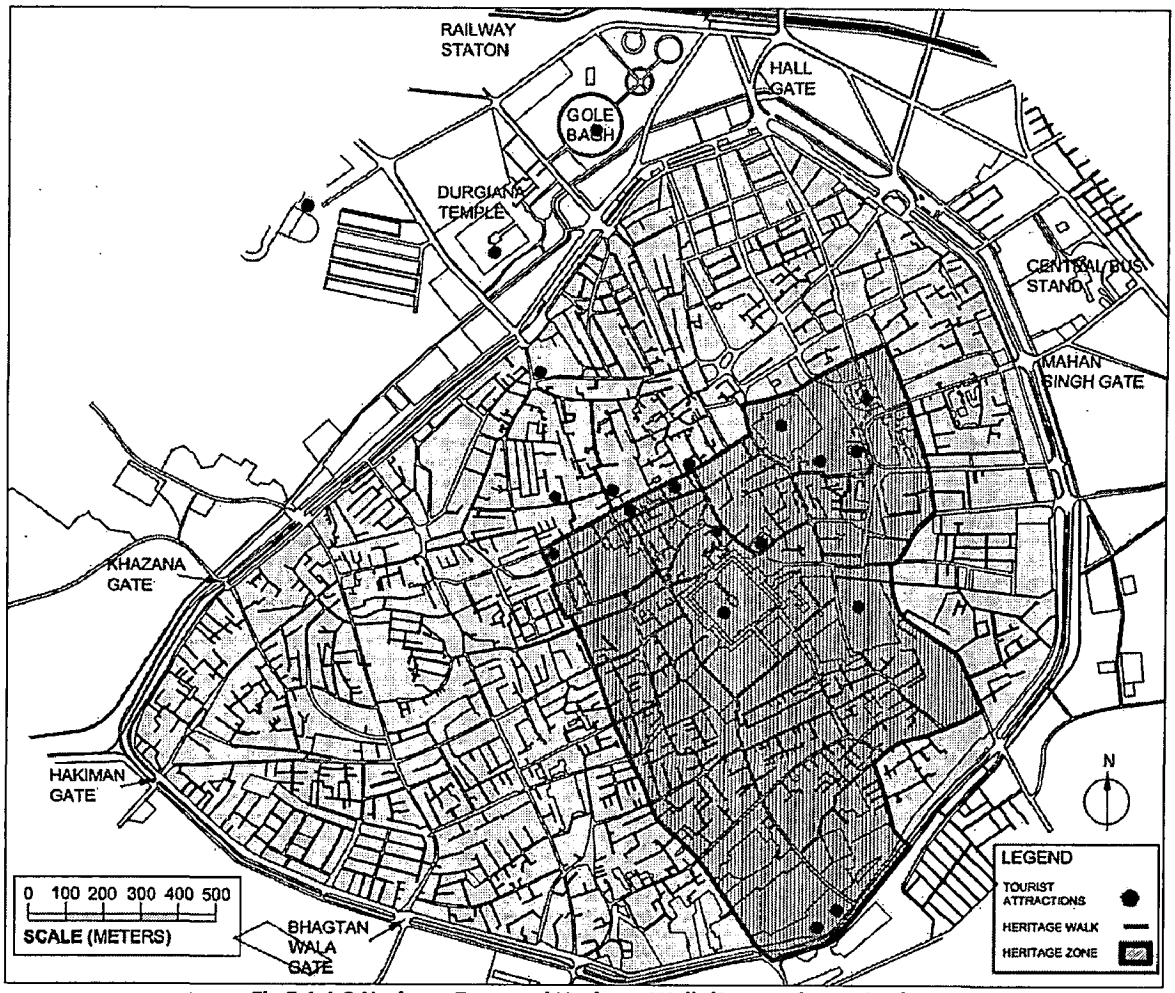


Fig 5.1.1.2 Heritage Zone and Heritage Walk (Source: by Author)

Table 5.1.1.1 Proposals for Heritage Zone by Master Plan

Sr. no	Heritage zone proposals	Analysis
1	Prohibiting the change of land use and subdivision of land within the heritage zone	20% of heritage zone area is under mixed land use
2	Framing exclusive development control regulation for the heritage zone.	Many new buildings are coming up which do not gel with surroundings. Many old structures are being demolished and no efforts on conservation of the heritage buildings are taken
3	Using different controls in terms of , Floor Area Ratio, Height controls, Land Use control, Set backs/projections, Facade control, Material control	
4	Constitution of High Powered Committee comprising of experts in Art, Architecture, Town Planning, Heritage, History and Engineering to evolve strategies for development of Heritage Zone including sanctioning of the building plan falling in the said zone.	
5	Using Vernacular Architecture and the existing architectural features as integral part of the building design.	

6	Rationalizing advertisement in the heritage zone through advertisement controls.	No regulation has been issued yet
7	Pedestrianisation of approach road to Golden Temple and Jallianwala Bagh from Hall Gate to Town Hall to Jallianwala Bagh/ Golden Temple.	Dedicated pedestrian walkway is required but no plan has been drawn
8	Widening the scope of Galiara project for creating more open spaces/ public vistas around Golden Temple/ Jallianwala Bagh	1761 properties were demolished under Galiara project. Many buildings were of heritage importance. Green spaces should not be concentrated in one area but should be distributed for benefit of all.
9	Shifting the Municipal Corporation office from the Town Hall and remodelling the building to convert it into a Museum of Amritsar Heritage. Undertaking large-scale plantation of the available open spaces/ parks existing within walled city	No plan has been prepared yet
10	Appropriately designed signage's to be put in place at critical areas for identification of areas of historical, architectural and tourist importance.	
11	All the services laid down in the heritage zone shall be made underground including, electrical, telephone etc. in order to minimize visual pollution.	Plan for Rehalitation of water and sewrage project has been prepared but not yet implemented.
12	Congestion shall be eliminated by regulating the movements of vehicles and widening of the fore - courts of historic buildings.	
13	Special lighting arrangements shall be made to enhance the visual effect of historic buildings and available spaces.	Special lighting arrangements have been made at Colden Temple and Jalian wala bhag

5.2. Analysis of City Development Plan 2025 Proposals

The Government of Punjab through Municipal Corporation Amritsar (MCA) has take up preparation of City Development Plan – Amritsar 2025 under Jawaharlal Nehru National Urban Renewal Mission (JNNURM). The process of preparation of CDP Amritsar was started in 2006. Various proposals and projects under City Development Plan 2025 have been analyzed below

Table 5.2.1 Proposals of City Development Plan, 2025 for Walled City area

Sr. no.	Proposals	Analysis
Conservation, preservation and development of heritage and culture (Urban Renewal)		
1	Identify structures of historical importance and generate list of structures for heritage conservation by a competent authority. Organizing heritage walks in the Walled city revealing the glorious past.	Heritage walk was launched in 2011 but it has been failed to attract tourist.
2	Preparation of detailed and comprehensive plan for urban renewal, conservation and design	Not plan has been prepared yet
3	Urban renewal including streets, katras and precincts. Suitable storm water drainage and related infrastructure	Open drains create unhygienic atmosphere. No action has been taken
4	Special project for gates including restoration, cleaning and upgrading surrounding areas	6 gates were restored
5	Conservation of heritage buildings, including private buildings and their incorporation in public domain (With participatory Process)	Plan for Façade Upliftment of 11 buildings has prepared under heritage walk
Promotion of Tourism		
1	Tourism Products including Cultural, Cuisine and Urban Haat etc.	No action
2	Sound and light show at Jallianwala Bagh	Sound and light show at jallianwala bag has completed
3	Construction of new Vishram Sthal, Dharamshalas (tourist accommodations) etc.	3 new Vishram Sthal have been constructed by SGPC around Golden Temple
Integrated Infrastructure Development		
1	Rehabilitation of water supply project	Plan prepared under JNNURM but not yet implemented
2	Rehabilitation of sewerage project	Plan prepared under JNNURM but not yet implemented
3	Construction and maintenance of House Connection with Meter	Plan part of JIBC integrated water and sewerage project 20 % work complete
4	Construction of Sewerage Treatment Plants (STP)	Plan part of JIBC integrated water and sewerage project

Transport		
1	Developing 'pedestrian friendly precincts' with the traffic being rerouted. Besides, 1.5 - 2 meter wide pedestrian pathway, 3.0/2.5 Meter wide Bicycle way and amenities	Plan not yet prepared
2	Developing 'no vehicle zones' inside the walled city, facilities for non-motorised mobility, Demarcation of zones for informal activities and vendors so that traffic is not hindered.	No vehicle zone was implemented but it is not strictly followed. problem with management
3	Organized parking and multi storied parking lots to be introduced where possible, at present; about 4 such locations are under consideration.	Parking lots under various projects of MCA, SGPC
4	Making of overhead wires underground, removing of Electric/Telephone poles and street signage etc.	No plan has been prepared
5	Construction of elevated road G.T. road	Third phase of the project stared. Double lane elevated road constructed and is being used
7	Development of Mass Transit System	150 buses sanctioned under JNNURM

Priority of problems according to City development plan is given in table below

Table 5.2.2 Priority of Projects and cost

Sectors	Priority	Total project cost
Integrated infrastructure : Water and sanitation	1	312
Road network improvement	2A	400
Accessible Walled City	2B	95
Basic services to urban poor	3	20
Urban governance	4	10
Urban renewal of walled city	5	36
Housing for urban poor	6	50

5.3. Household survey

The house hold survey was conducted in every ward of the walled city to analyse the problems and their priority. The survey was targeted mainly on condition of physical infrastructure and its related issues like quality, expenditure, priority, availability, implementation strategies.

5.3.1. Aim of the survey

Aim of the survey is to find the condition of the present infrastructure of various parts of walled city and to determine the priority of the problems of the walled city.

5.3.2. Objective of Survey

- To determine the present state of physical infrastructure of walled city
- To Access various problems faced by the people
- To determine the priority of the problems of walled city
- To gather inputs and recommendations from the residents
- To compare proposals of Plans with problems faced by the residents.

5.3.3. Methodology

The survey was conducted from 17.2.2012 to 22.2.2012. There are total 11 wards in walled city. 5 household were taken from each ward for survey. One or two household were surveyed from each locality. The survey was carried out through questionnaire method with multiple choices. Total 55 households were survey.

5.3.4. Members in Households

Out of the total 55 households, 80 % of them have 3-5 members in family and 10% households have 2 members earning (Figure 5.3.4.2). While 9 % have 6 members in family. Out of 55 households 27 households have 2 members earning (Table 5.3.4.1, Figure 5.3.4.1)).

Table 5.3.4.1 No of Members in House Holds (Source: Primary Survey)

No of Members	No of Households	Percentage
2	6	10.9
3	13	23.6
4	17	31.1
5	14	25.4
6	5	9

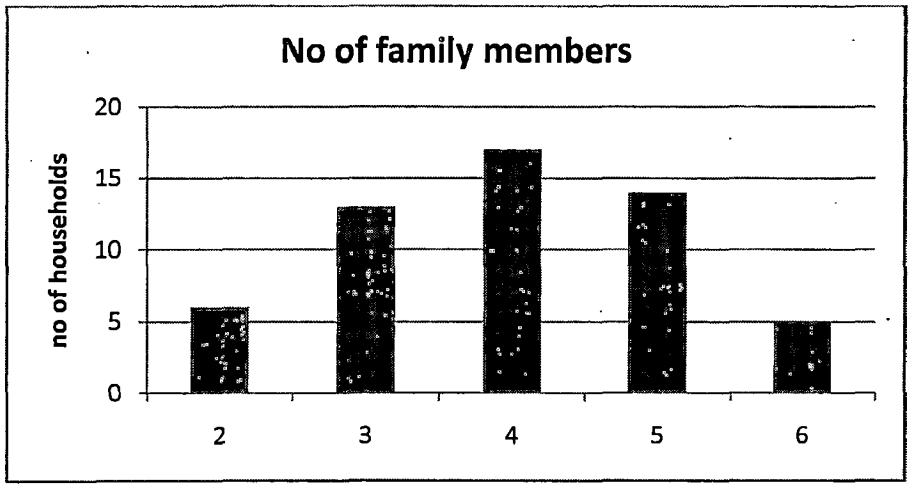


Fig 5.3.4.1 No of Members in House Holds (Source: Primary Survey)

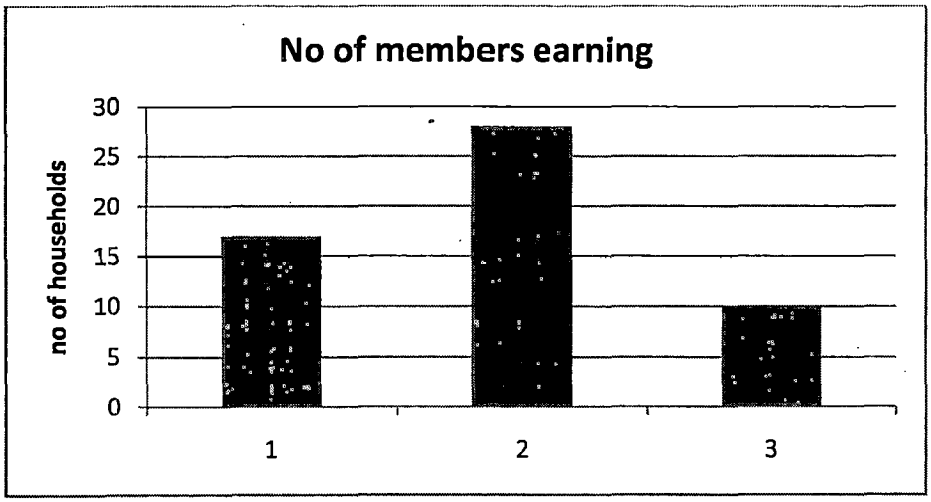


Fig 5.3.4.2 No of Members Earning (Source: Primary Survey)

5.3.5. Water Supply

The Source of water supply is either government tube-wells or direct pipe connection. Charges of water supply are done by two methods – one is by meter reading (areas with new water supply connections) and other is based on the size of the plot. Frequency of water supply is 2 times/day (i.e. morning 5- 9 and evening 5-7). 72% of households do not pay anything for water supply and 28% pay less than 50 rs (Table 5.3.5.1, Figure 5.3.5.1)

Table 5.3.5.1 Expenditure on Water Supply (Source: Primary Survey)

Expenditure On Water Supply	No of Households	percentage
nil	40	72%
>50 rs	15	28%

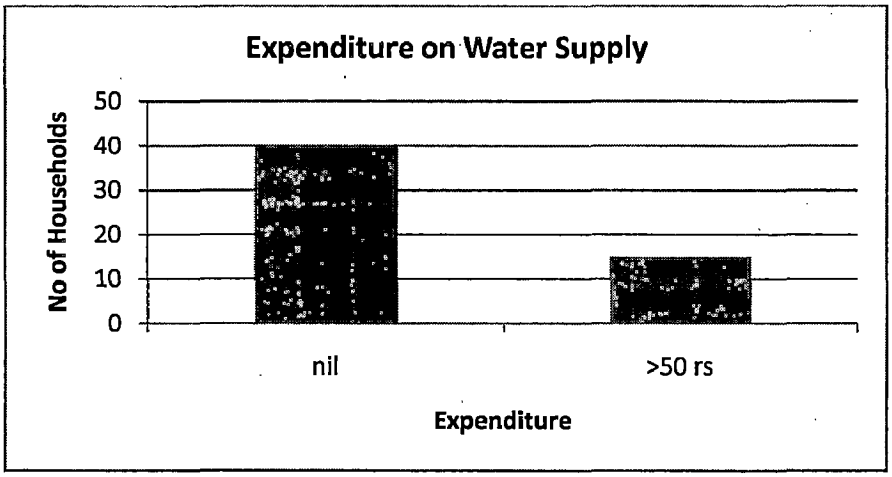


Figure 5.3.5.1 Expenditure on Water Supply (Source: Primary Survey)

Analysis:

Walled city is very congested and have tightly packed houses. Most of the plots are less than 125 yards hence the revenue collected from the walled city is low. Quality of water supply is satisfactory for general public (Figure 5.3.5.2).

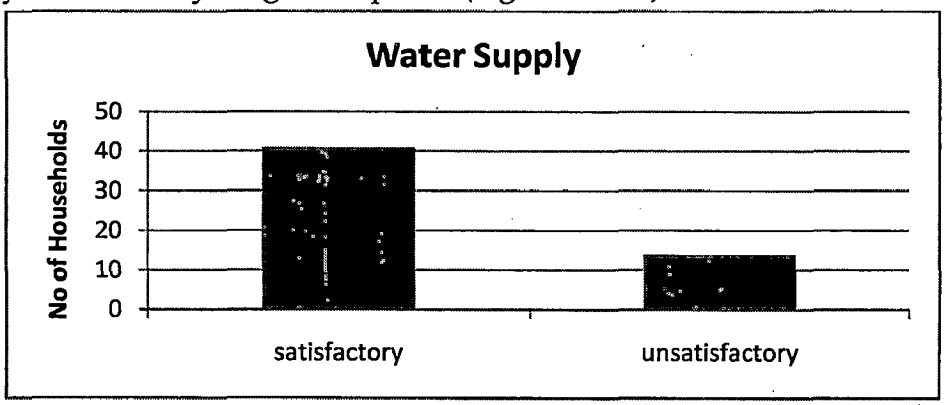


Figure 5.3.5.2 Condition of Water Supply (Source: Primary Survey)

5.3.6. Electricity

Electricity supply is available 24 hrs for most of the days except in summers when the duration of power supply is 20-21 hrs/ day due to shortage of power supply. Power cut is there on every 3rd or 4th Monday from 9 to 5 for maintenance or such reasons during rest of the year. Charges for electricity is given below

Table 5.3.6.1 Electricity Charges (Source: Primary Survey)

Electricity charges	No of Households	percentage
500-1000	7	12%
1000-1500	24	43%
1500-2000	20	36%
2000-2500	4	9%

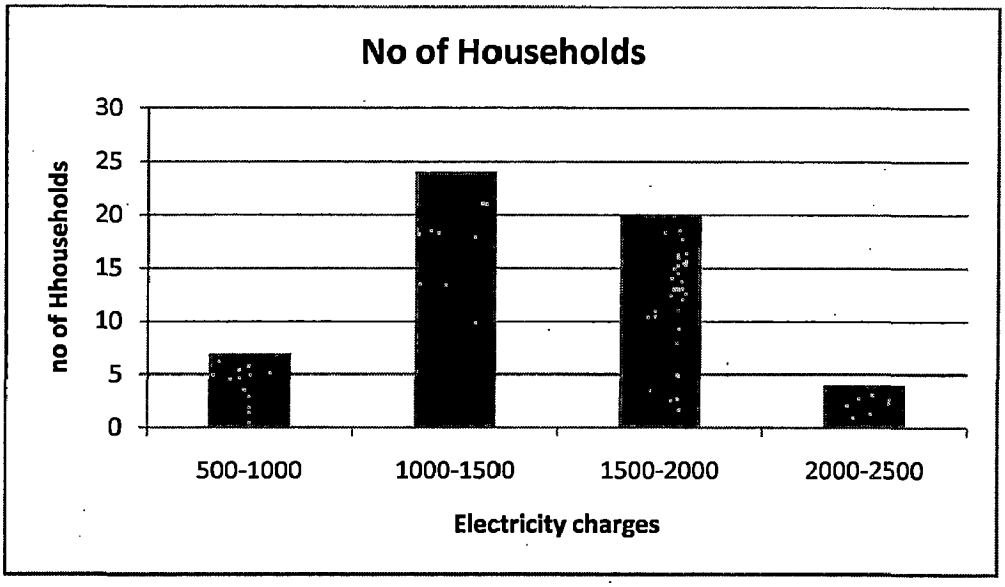


Fig 5.3.6.1 Electricity Charges(Source Primary Survey)

Analysis:

Out of 55, 36 households were satisfied with supply of electricity and 19 were unsatisfied. Although there are power cuts during summer season but most of people own a generator or invertors as a backup.

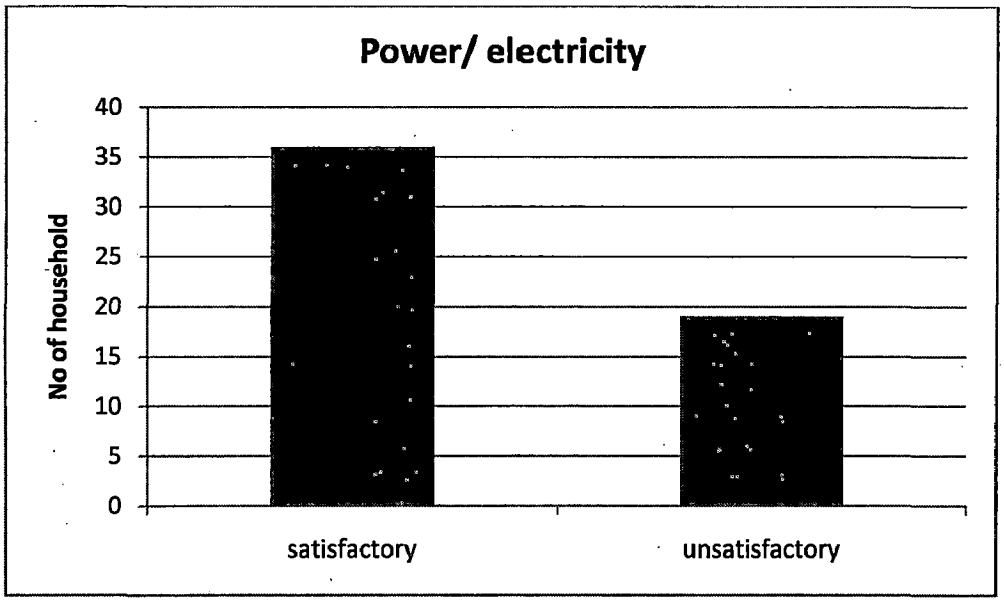


Fig 5.3.6.2 Condition of Electric Supply (Source: Primary Survey)

5.3.7. Waste Water Management:

Waste water is managed by government sewers. Since the sizes of most of plots are less than 125 yards hence there are no charges for it. Out of 55, 41 household consider waste water management satisfactory and 14 unsatisfactory(Figure 5.3.7.1).

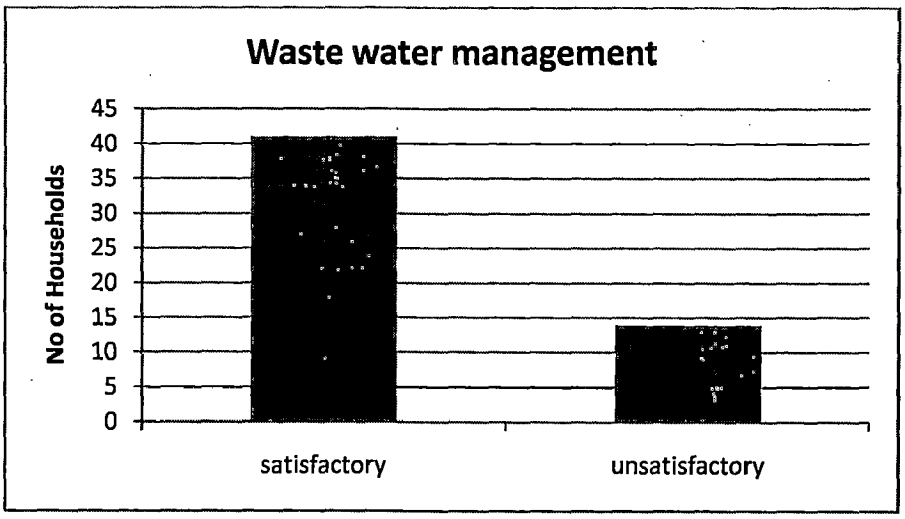


Fig 5.3.7.1 Condition of Waste Water Management (Source: Primary Survey)

Analysis:

Though the condition of sewers is bad, but people are satisfied with it. The repair work has been started by the Municipal Corporation.

5.3.8. Solid Waste Management:

Waste is collected from all over the walled city by private or by government arrangement. 76% households have public/ government arrangement while 24% have private arrangement (Table 5.3.8.1). Public arrangement is observed in wards 41, 42, and 45 which lie at southern side of the walled city and were recently redeveloped.

Table 5.3.8.1Solid wated Management (Source: Primary Survey)

Solid waste managed by	No of households	percentage
public arrangement	42	76%
private arrangement	13	24%

In interior parts of the city due to narrow roads/streets, garbage cart cannot penetrate; mules are used to manage the solid waste. The expenditure for the management for public arrangement is nil but for private arrangement people pay around 40 rs for per month (Figure 5.3.8.2).

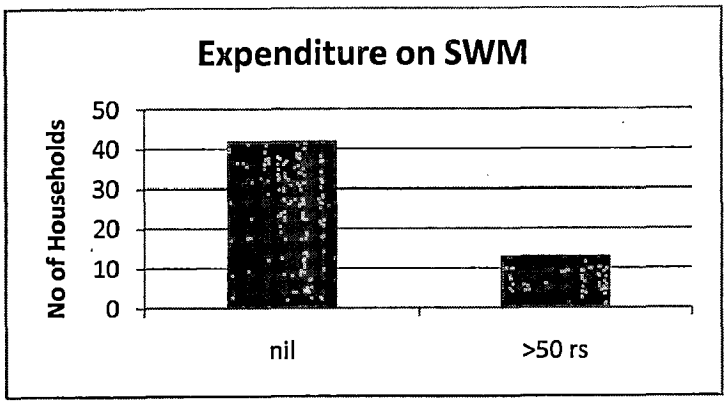


Figure 5.3.8.1 Expenditure on SWM (Source: Primary Survey)

Analysis:

Although the solid waste is collected from the walled city but the condition of solid waste management in the north and central part is bad due to commercial and tourist activity. 33 household consider solid waste management unsatisfactory and 3 consider it as poor(Figure 5.3.8.2).

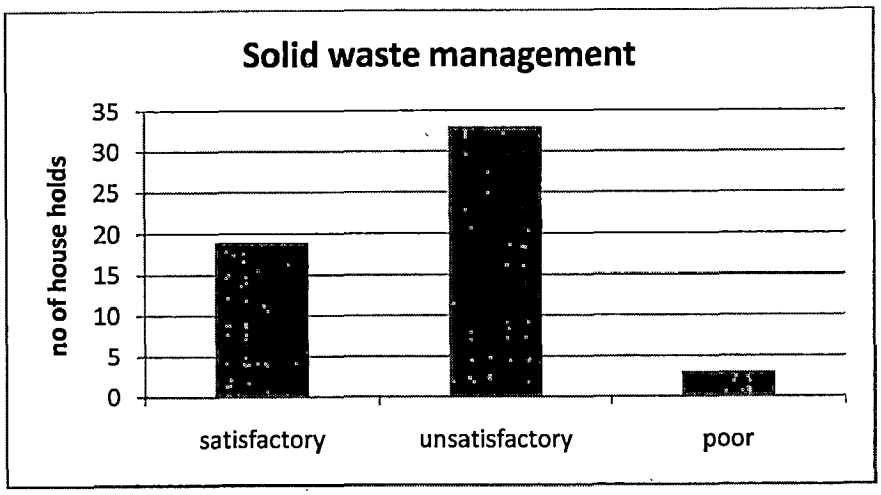


Figure 5.3.8.2 Condition of Solid Waste Management (Source: Primary Survey)

5.3.9. Transportation:

All the 55 households had 2 wheelers and 40 households had cycle and 35 households had cars, out of which 21 households had cycle and 2- wheeler while 18 had all three cycle 2 -wheeler and 4 -wheeler. 2 wheelers form major mode of transport (Figure 5.3.2.9.1 , Table 5.3.9.1).

Table 5.3.9.1 Vehicle Ownership (Source: Primary survey)

vehicle ownership	No of households	Percentage
cycle	40	72%
2 wheeler	55	100%
4- wheeler	35	63%

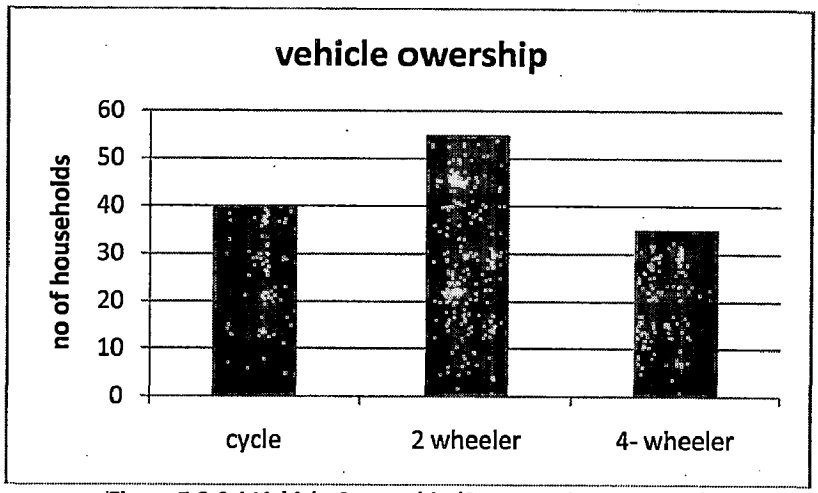


Figure 5.3.9.1 Vehicle Ownership (Source: Primary survey)

Table 5.3.9.2 Vehicle Ownership in Combination (Source: Primary survey)

vehicle ownership in combination	no of households	Percentage
cycle+2 wheeler	21	38%
cycle+2 wheeler+4- wheeler	18	32%
2 wheeler+4- wheeler	9	16%
2- wheeler	6	14%

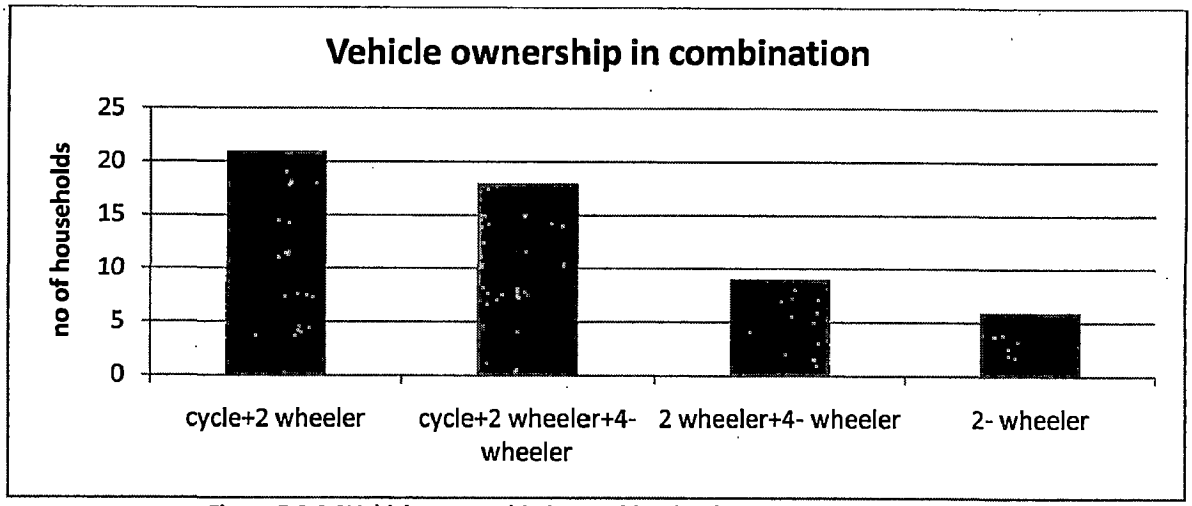


Figure 5.3.9.2Vehicle Ownership in Combination (Source: Primary survey)

No of household having both Cycle and 2-wheelers is highest (21) and no of households having all three modes of transport are 18. None of the households have only cycle or only 4-wheeler (Figure 5.3.2.9.2, Table 5.3.9.2).

53% of people use 2-wheelers as mode of transport to work and 4-wheeler comprise of 31% and very few 5% people walk (Figure 5.3.2.9.3, Table 5.3.9.3).

Table 5.3.9.3 Mode of Transport for Work (Source: Primary survey)

Mode of Transport for Work	No of households	Percentage
walk	3	5%
cycle	6	11%
2- wheeler	29	53%
4- wheeler	17	31%

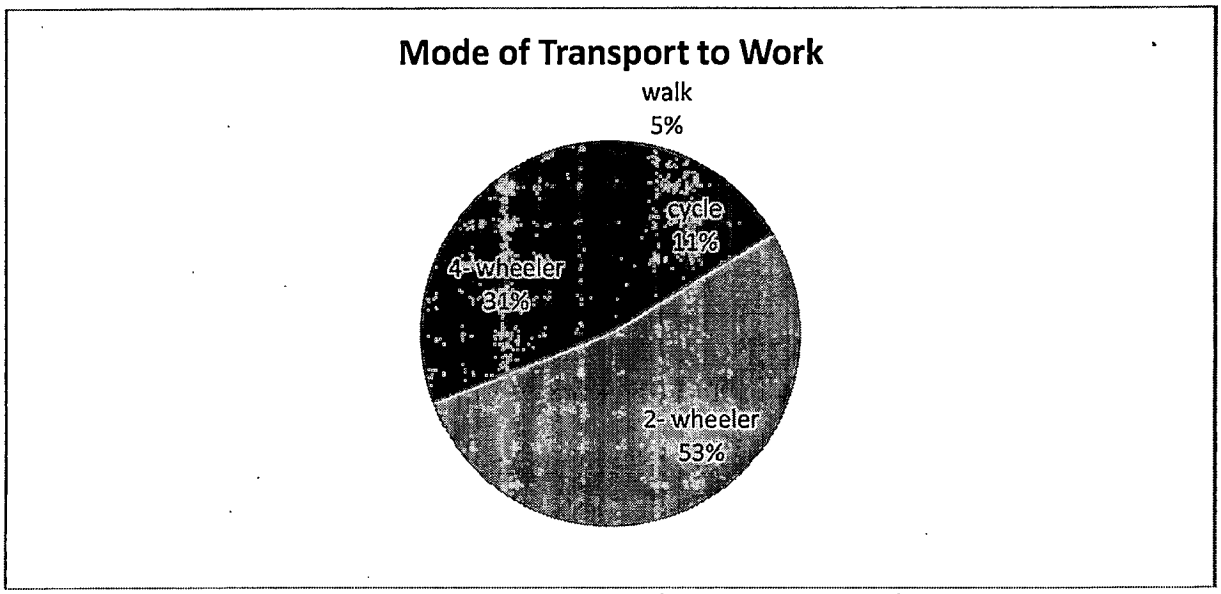


Figure 5.3.9.3Mode of Transport for Work (Source: Primary survey)

Mode of transport for going to school was survey. According to the survey 41% of the children go to school by auto and 36% by bus, 21% children use cycle and only 2%of the children go to school by walk (Figure 5.3.2.9.4, Table 5.3.9.4).

Table 5.3.9.4 Mode of transport for school (Source: Primary survey)

Mode of transport for school	No of households	Percentage
walk	1	2%
cycle	10	21%
bus	17	36%
auto	19	41%

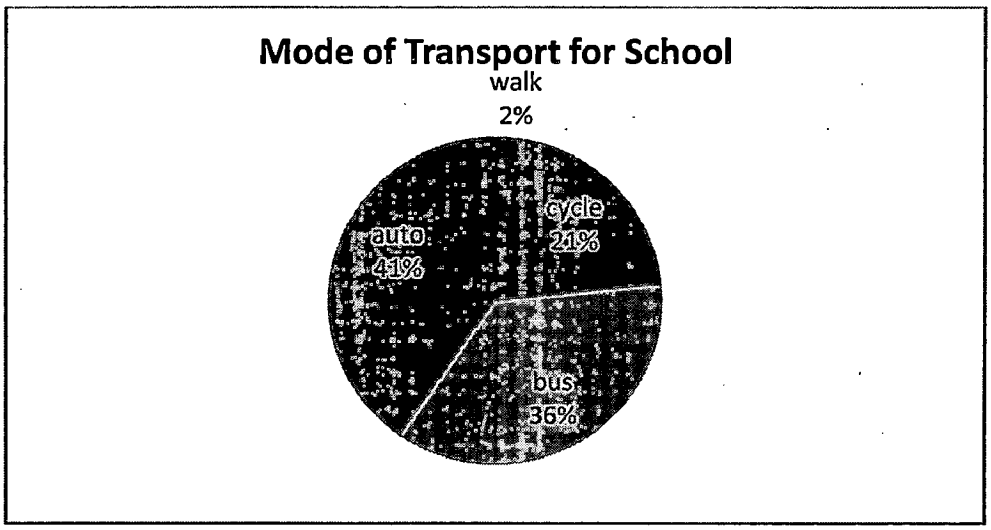


Figure 5.3.9.4Mode of transport for school (Source: Primary survey)

Para transport used most in the walled city is rickshaw and auto. 71% of para transportation is done by rickshaw and 25% by autos and only 4 % by taxi (Figure 5.3.2.9.5, Table 5.3.9.5).

Table 5.3.9.5 Para-transport most used (Source: Primary survey)

Para-transport most used	No of house holds	Percentage
Auto	14	25%
Taxi	2	4%
Rickshaw	39	71%

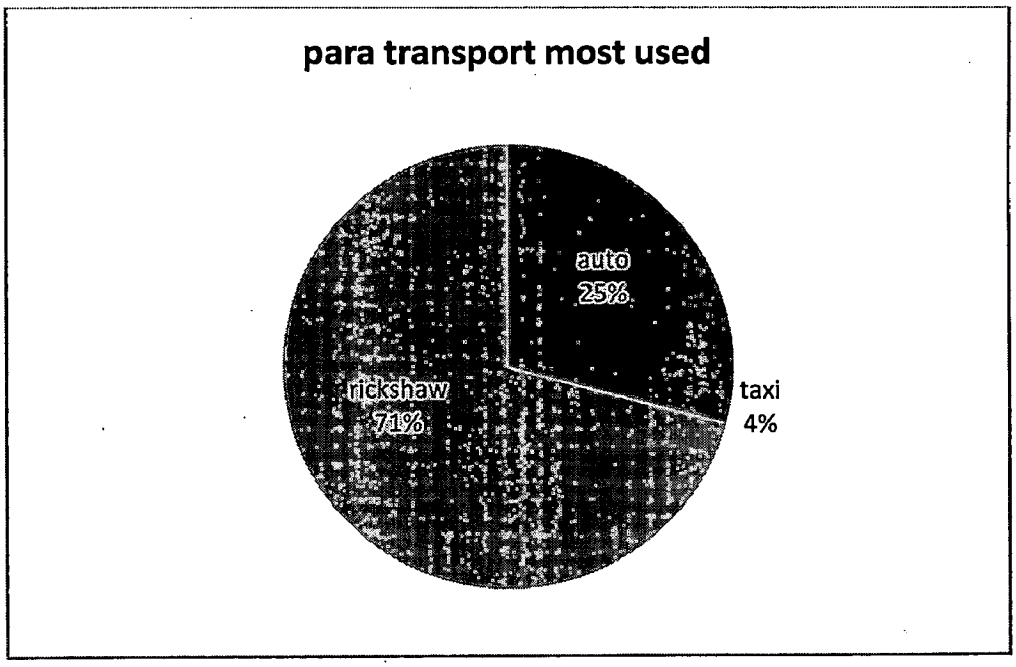


Figure 5.3.9.5 Para-transport most used (Source: Primary survey)

29% of households spend 1500-2000 on transportation, 27% spend 1000-1500 and 32% spend 500-1000 rs on transportation while only 9% spend less than 500 rs on transportation and 3% spend 2000-2500 (Figure 5.3.2.9.5, Table 5.3.9.5).

Table 5.3.9.6 Expenditure on Transport (Source: Primary survey)

Expenditure on Transport	No of households	percentage
<500	5	9%
500-1000	18	32%
1000-1500	15	27%
1500-2000	16	29%
2000-2500	1	3%

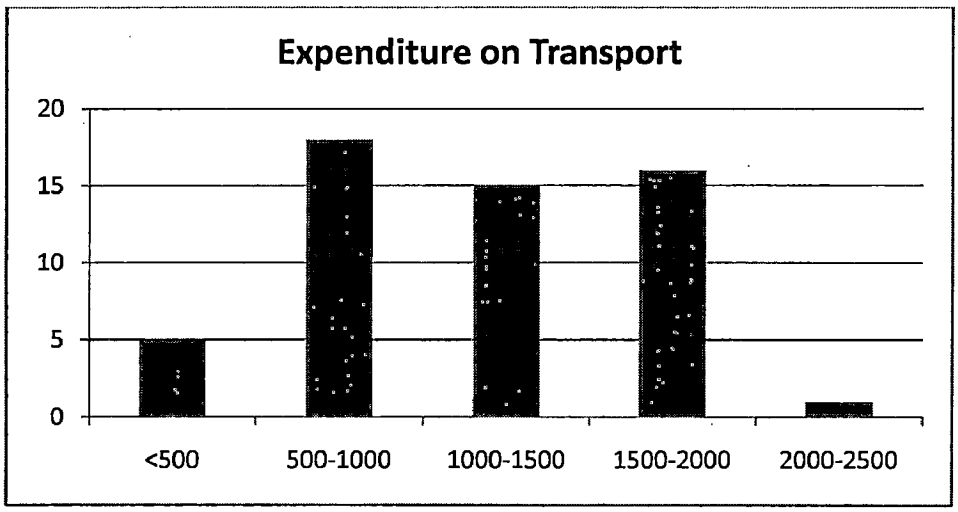


Figure 5.3.9.6 Expenditure on Transport (Source: Primary survey)

Analysis:

Rickshaw is most common para- transport used in walled city, as the size of walled city is 350 hectares and the maximum distance from one end to another is 3 km, and maximum markets are present in the walled city itself, hence rickshaw solves the purpose easy transport. The city lacks public transport hence the number of 2-wheelers is highest as they have no option.

5.3.10. Priority of the problems

According to the priority people were asked to rate the problems of walled city area.

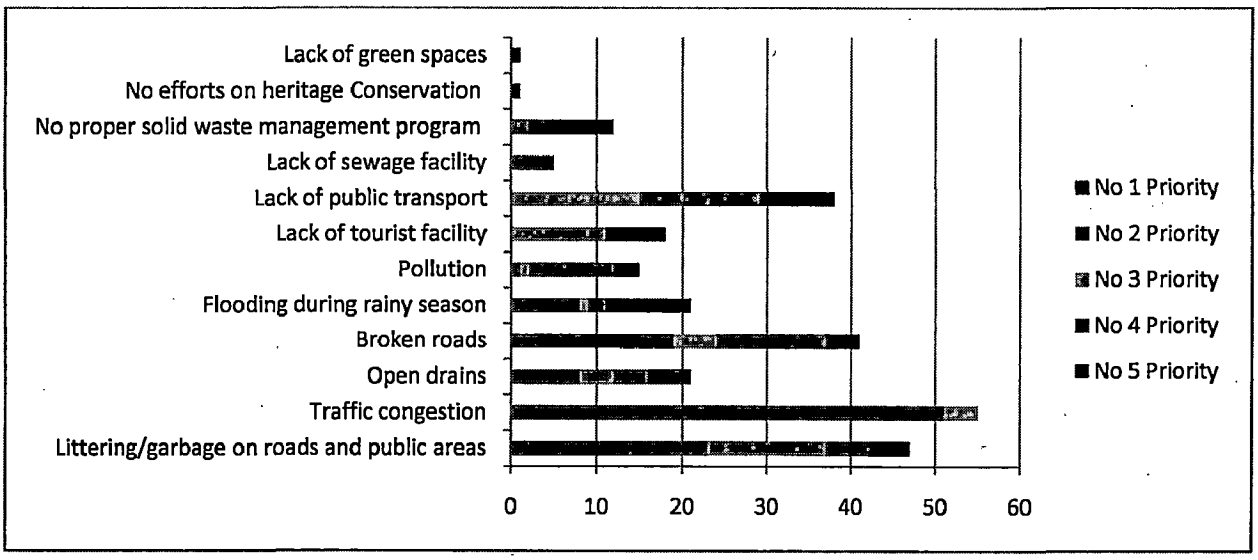


Figure 5.3.10.1 Priority of the problems (Source: Primary survey)

Table 5.3.10.1 Top 5 Priorities (Source: Primary survey)

Problems of the walled city	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	Total	%age
Littering/garbage on roads and public areas	6	17	14	5	5	47	17%
Traffic congestion	43	8	4	0	0	55	20%
Open drains	3	5	4	4	5	21	7.6%
Broken roads	3	16	5	13	4	41	15%
Flooding during rainy season		8	1	2	10	21	7.6%
Pollution		1	1	10	3	15	5.5%
Lack of tourist facility			11		7	18	6.5%
Lack of public transport			15	14	9	38	14%
Lack of sewage facility				5		5	1.8%
No proper solid waste management program				2	10	12	4.4%
No efforts on heritage Conservation					1	1	0.4%
Lack of green spaces					1	1	0.4%

According to the survey, traffic congestion is ranked as no 1 problem, littering on roads and broken roads follow next. Though there is lack of green open spaces, but day to day facilities form the first of priorities(Figure 5.3.10.1, Table5.3.10.1,2).

Table 5.3.10.2 Priority of the problems (Source: Primary survey)

Priority of problems	
1	Traffic congestion
2	Littering/garbage on roads and public areas
3	Broken roads
4	Lack of public transport
5	Flooding during rainy season Open drains
6	Lack of tourist facility
7	Pollution No proper solid waste management program
8	Lack of sewage facility
9	No efforts on heritage Conservation Lack of green spaces

Analysis:

Traffic management is difficult due to high no of 2-wheelers and rickshaws on roads, there are no public transport facilities, and every household tend to use their own vehicle. Children usually use autos and mini-buses as mode of transport for school. Along with these tourists who come to Golden Temple also use rickshaws from bus-stand and autos from railway station. The hall bazaar area is main road connecting the inner city to Ring road. This road has high amount of traffic during peek hours and on street parking creates even bigger problem.

PRT system is new system that is being implemented on Amritsar and 91% people feel that it will provide easy transportation and will be a solution to the congested roads and traffic problem in the city(Figure 5.3.10.2, Table5.3.10.3).

Table 5.3.10.3 Opinion on PRT System (Source: Primary survey)

How will PRT (Personal Rapid Transit) system affect the Walled City		
Will provide easy transport to tourist and residents	50	91%
Too costly for everyday use	5	9%

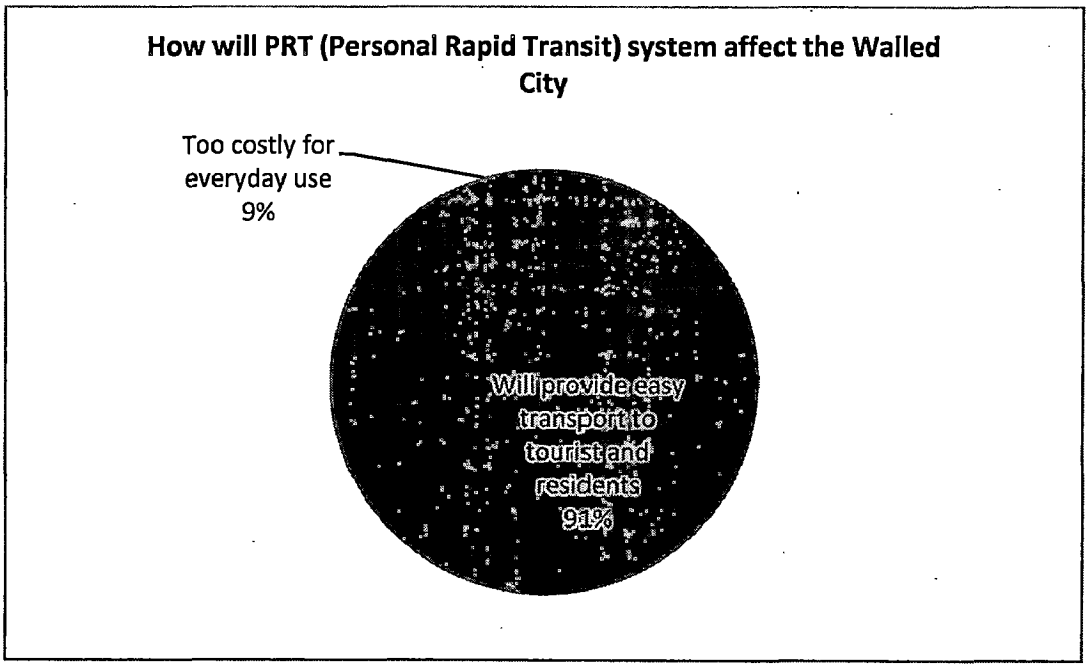


Figure 5.3.10.2 Opinion on PRT System (Source: Primary survey)

It is difficult to give opinion on PRT for general public before it is implemented, although people are satisfied with the fact that some efforts are being put to solve the traffic problem of the city.

5.3.11. Condition of Walled City

The condition of walled city according to survey have improved in last 20 years but the improvement is not satisfactory new projects have been launched but implementation is awaited. Respondents were asked to rate the infrastructure of the walled city as excellent, very good, good, satisfactory, unsatisfactory and poor. According to the survey traffic management is most unsatisfactory. Public transportation, solid waste management, pollution, public sanitation is in bad condition (Figure 5.3.11.1, Table 5.3.11.1).

Table 5.3.11.1 Condition of walled city (Source: Primary survey)

Condition of walled city	satisfactory	unsatisfactory	poor
Water Supply	41	14	
Waste water management	41	14	
Solid waste management	19	33	3
Public transport	12	29	14
Traffic management	1	42	12
Pedestrinization	29	23	3
Pollution control	14	35	6
Public sanitation	12	25	18
Tourist facility	24	31	
Power/ electricity	36	19	

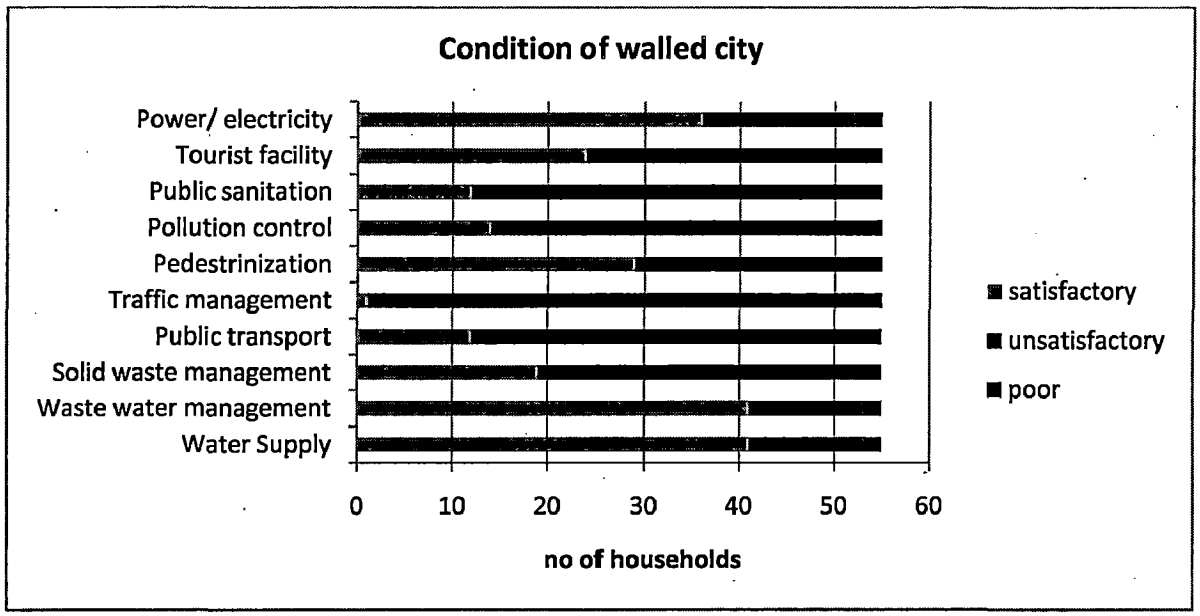


Figure 5.3.11.1Condition of walled city (Source: Primary survey)

Analysis

- Expectations of people are very low and that is why they are satisfied with a minimum level of services that are provided to them for example the quality of water or the management of solid waste etc.
- Flooding during the rainy season occupies no 5 in priority list but 41 out of 55 households consider waste water management as satisfactory. This is due to the fact that people ignore the hazardous impact of lack of proper sewerage system as it affects indirectly and does not affect the day to day life in major extent in comparison to other major concerns.
- The rain water pipes directly open in open drains on street which are clogged and flooding on roads create unhygienic condition.
- All the households have solid waste collected but still littering and garbage on the roads is observed. This is mainly due to high influx of tourists and bad solid waste management by government authorities.

5.4.Opinion of Experts:

Opinion of 10 experts was taken in form of survey as they deal with government services and problems in implementation. These experts belong to government organizations such as, Amritsar Municipal Corporation, Punjab Urban Development Authority (Amritsar Branch), Punjab Tourism Department, Guru Nanak Dev University.

5.4.1. Aim of the survey

Aim of the survey is to find the present condition of infrastructure of various parts of walled city and to determine the priority of the problems of the walled city according to the experts and to get their opinion and recommendation to solve these problems.

5.4.2. Objective of Survey

- To determine the present state of physical infrastructure of walled city
- To determine the priority of the problems of walled city
- To gather inputs and recommendations from the experts

5.4.3. Methodology

The survey was conducted from 21.12.2011 to 24.12.2011. the survey was in form of questionnaire with multiple choices. The experts were from various departments of Municipal Corporation, Punjab Urban Development Authority (Amritsar Branch), Punjab Tourism Department, Guru Nanak Dev University. Details of the experts, their organization, designation and remarks on the walled city infrastructure are given below

Table 5.4.3.1 Details of Experts (Source: Primary survey)

S.n	Name	Organization	Designation	Remarks
1	SS Bhatia	Town planning	Chief town planner	Better traffic management
2	Lavleen Sharma	Census dept	Superintendent	
3	Mukhtiyar Singh	ADA/PUDA	Superintendent	Separate housing for tourist outside city
4	Narinder Shrma	Town planning	Planner	Improvement is not sufficient
5	Deepinder Singh	Tourism	Planner	Heritage walk is not successful due to lack of awareness
6	Jatinder Singh	Civil works	SE(civil)	Pollution is biggest problem of city
7	Yogesh Gupta	Health and sanitation	MHO	
8	Harpreet Kaur	Punjab Tourism Department	Heritage walk superintendent	
9	Ravinder Mahajan	PWSSB	SE(civil)	New projects of water supply and sewerage will highly benefit city
10	Balvinder Singh	GNDU(planning dept)	HOD	PRT is suicidal

5.4.4. Condition of Walled City

According to the experts the condition of the walled city has improved but improvement is not satisfactory. The condition of traffic management, public transport and solid waste management, public sanitation is unsatisfactory (Table 5.4.4.1, Figure5.4.4.1).

Table 5.4.4.1 Condition of Walled City by Experts (Source: Primary survey)

Condition of Walled City	satisfactory	unsatisfactory	poor
Water Supply	10		
Waste water management	2	7	1
Solid waste management		5	5
Public transport		4	6
Traffic management		4	6
Pedestrinization	3	3	4
Pollution control	3	4	3
Public sanitation		8	2
Tourist facility	8	1	1

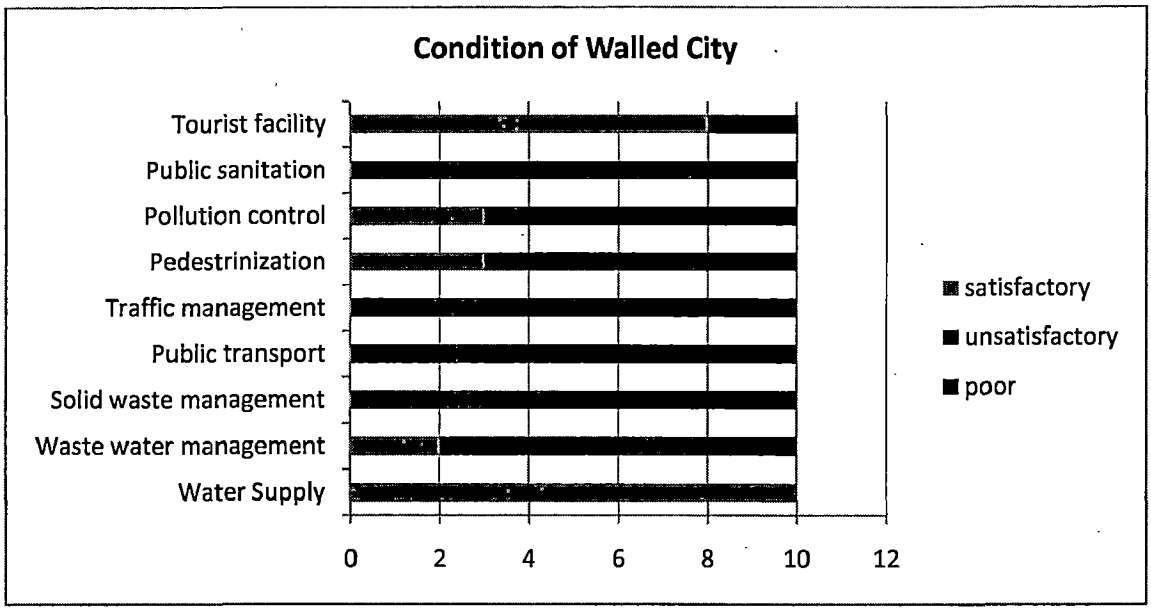


Figure 5.4.4.1Condition of Walled City by Experts (Source: Primary survey)

5.4.5. Priority of problems

According to the experts traffic congestion is biggest problem of the city. Lack of public transport is another major problem, lack of sewerage facility and broken roads are other problems of higher priority (Table 5.4.5.1, Figure5.4.5.1).

Table 5.4.5.1Top 5 Priorities by Experts (Source: Primary survey)

Priority of Problems	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	Total	%age
Open drains		1	3			4	8%
Broken roads				1	4	5	10%
Traffic congestion	7	1	2			10	20%
Lack of sewage facility	1	3			1	5	10%
Lack of tourist facility			1			1	2%
Flooding during rainy season			3			3	6%
Littering/garbage on roads and public areas		1	1			2	4%
No proper solid waste management program		1		3	1	5	10%
Pollution	1	2		2	1	6	12%
Lack of public transport		1		3	3	7	14%
Lack of green spaces				1		1	2%
No efforts on heritage Conservation	1					1	2%

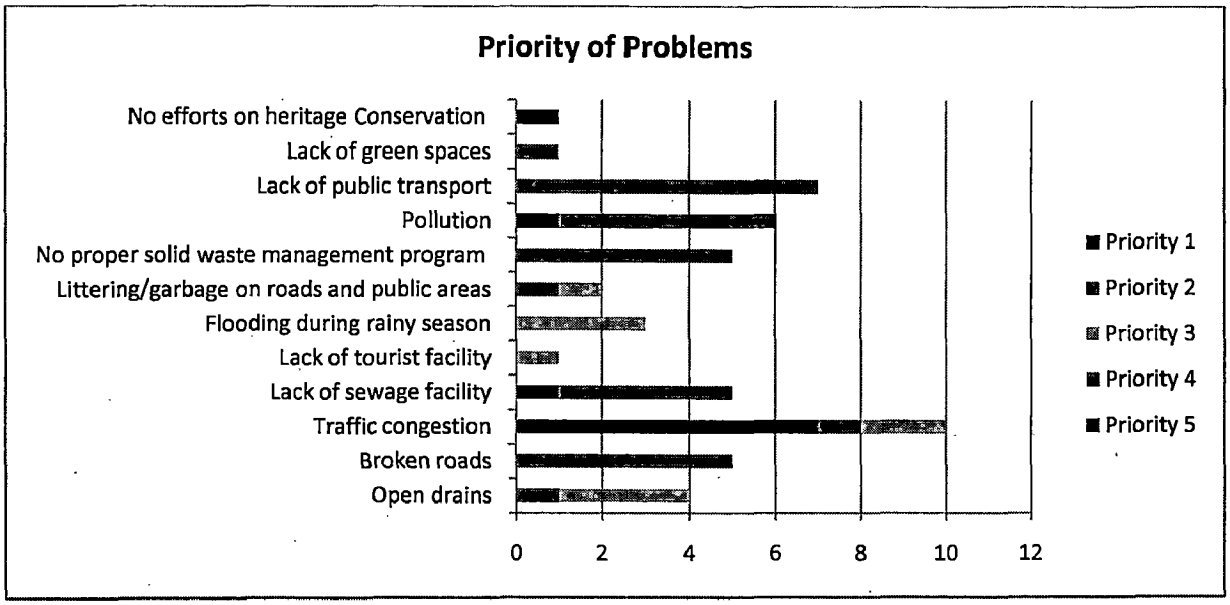


Fig 5.4.5.1 Priority of Problems by Experts (Source: Primary survey)

According to experts PRT will provide fast and easy transport but according to Prof. Balvinder Singh the HOD of GNDU, Planning Department, PRT will hamper the heritage character of the city(Table 5.4.5.2, Figure5.4.5.2).

Table 5.4.5.2 Opinion of Experts on PRT (Source: Primary survey)

Opinion on PRT	no of people	percentage
Will provide easy transport to tourist and residents	8	80%
Hamper heritage character of walled city	1	10%
Too costly for everyday use	1	10%

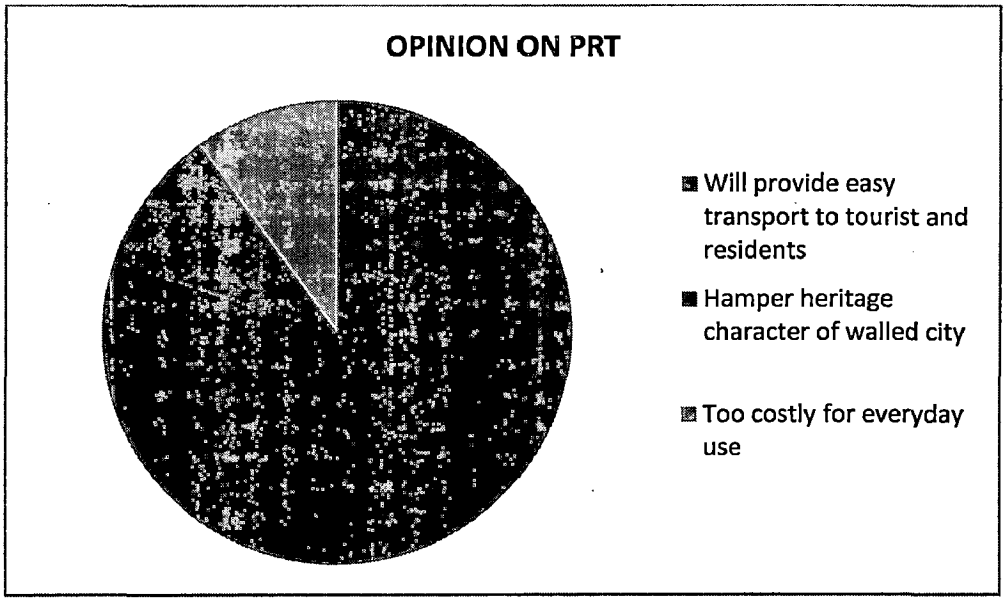


Fig 5.4.5.2Opinion of Experts on PRT (Source: Primary survey)

According to the experts and residents the traffic congestion is the top priority of Walled city. Lack of public transport and littering on streets are other important priorities

Table 5.4.5.3 Comparison of Priorities by Experts and Residents (Source: Primary survey)

Priority of problems		
	Opinion of Experts	**Opinion of Residents**
1	Traffic congestion	Traffic congestion
2	Lack of public transport	Littering/garbage on roads and public areas
3	Pollution	Broken roads
4	No proper solid waste management program Lack of sewage facility Broken roads	Lack of public transport
5	Open drains	Flooding during rainy season Open drains
6	Flooding during rainy season	Lack of tourist facility
7	Littering/garbage on roads and public areas	Pollution No proper solid waste management program
8	No efforts on heritage Conservation Lack of green spaces Lack of tourist facility	Lack of sewage facility
		No efforts on heritage Conservation Lack of green spaces

5.5. Vehicular survey

Vehicular survey was conducted on two major roads of Walled City i.e. Jalian Wala Bagh Road and Jaimal Singh Road. The Jalian Wala road is the main road that leads to the Golden Temple and to the Jalian Wala Bagh. Jaimal singh road is the main market for garments and is most crowded area. Seven types of vehicles were observed on these roads. Aim of the survey is to find the vehicular count at different intervals of the day

5.5.1. Methodology

The survey was conducted during weekday and weekend on 16.2.2012 and 18.2.2012. . Vehicular count was taken at three peek hours at 9.00 AM , at 1.00 PM and at 6.00 PM for interval of 15 minutes.

5.5.2. Vehicular count on Jallianwala Bhag Road

Jallianwala Bhag road is major road which leads to golden temple as well as Jallianwala Bhag. the road was widened under Galiara project. The width of the road varies from 14m to 16m. The road has high amount of pedestrian activity along with various modes of transport. The vehicular count during weekday and weekend at different intervals of time for the Jalianwala bagh road is given below

Table 5.5.2.1 Vehicular count at Jallianwala Bagh road (Source: Primary survey)

Vehicular count at Jalian Wala Bag Road on weekend for 15 min time interval										
Mode	at 9.00 AM			at 1 PM			at 6 PM			Average
	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	
Car	8	10	18	20	22	42	18	9	27	29
Electric Jeep	3	2	5	4	3	7	5	1	6	6
Rickshaw	20	82	102	117	102	219	105	60	165	162
Cycle	6	10	16	22	24	46	18	6	22	28
2- Wheeler	54	96	150	115	82	197	107	74	181	176
3- Wheeler	4	6	10	10	6	16	14	2	16	14
Carriage	10	8	18	12	6	18	4	2	6	14
Total vehicles on road			319			545			423	
Vehicular count at Jalian Wala Bag Road on weekday for 15 min time interval										
Mode	at 9.00 AM			at 1 PM			at 6 PM			Average
	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	
Car	3	4	7	11	10	21	12	5	17	15
Jeep	1	2	3	2	1	3	3	0	3	3
Rickshaw	12	30	42	46	50	96	65	37	102	80
Cycle	8	9	17	10	10	20	12	17	29	22
2- Wheeler	16	30	46	52	28	80	62	34	96	74
3- Wheeler	2	2	4	4	1	5	10	2	12	7
Carriage	8	6	14	5	2	7	2	1	3	8
Total vehicles on road			133			232			262	

5.5.2.1. Inferences

- No of vehicles on weekdays is higher(42%) in evening and no of vehicles on weekends is higher (41%) in afternoon as given in Table 5.5.2.1.1 , Figure 5.5.2.1.1

Table 5.5.2.1.1 No of Vehicles on JaliyanWala Bagh Road (Source: Primary survey)

No of Vehicles on JaliyanWala Bagh Road				
TIME	WEEKEND	Percentage	WEEKDAY	Percentage
9.00 AM	320	24%	133	21%
1.00 PM	546	41%	233	37%
6.00 PM	454	35%	261	42%

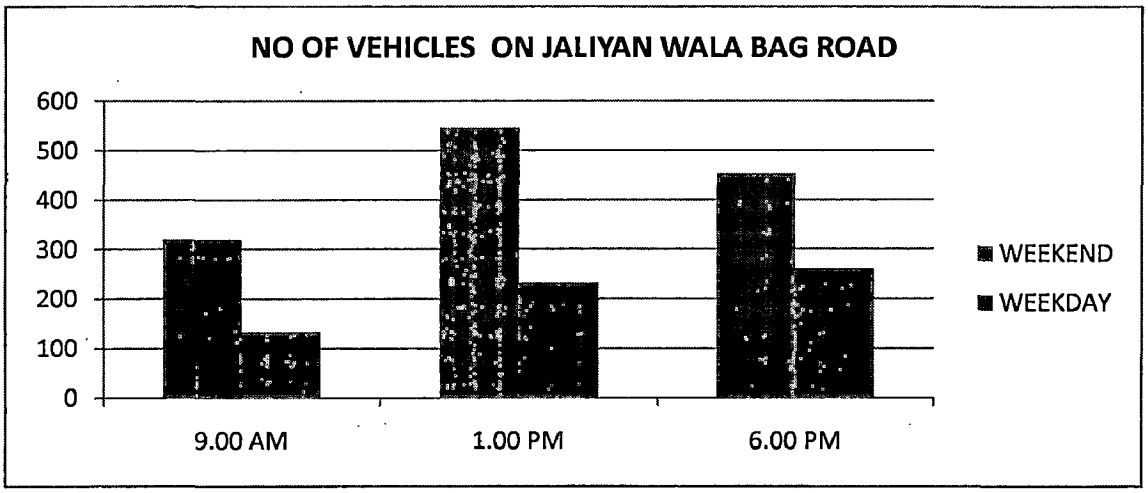


Fig 5.5.2.1.1 No of Vehicles on JaliyanWala Bagh Road (Source: Primary survey)

- Rickshaw and 2 wheelers formulate maximum no of vehicles on road. During weekend rickshaw form 37.7% and during weekday it formulates 38.2% of the total volume of traffic. The count of 2-wheelers is also highest with 41% during weekend and 35.4% during weekday as shown in Table 5.5.2.1.2 , Figure 5.5.2.1.2

Table 5.5.2.1.2 Mode of Transport on JaliyanWala Bagh Road (Source: Primary survey)

Mode Of Transport During Weekend And Weekday On Jaliyanwala Bagh Road				
	WEEKEND	Percentage	WEEKDAY	Percentage
Car	29	6.7%	15	7.1%
Jeep	6	1.4%	3	1.4%
Rickshaw	162	37.7%	80	38.2%
Cycle	28	6.5%	22	10.5%
2- Wheeler	176	41%	74	35.4%
3- Wheeler	14	3.35%	7	3.34%
Carriage	14	3.35%	8	4.06%

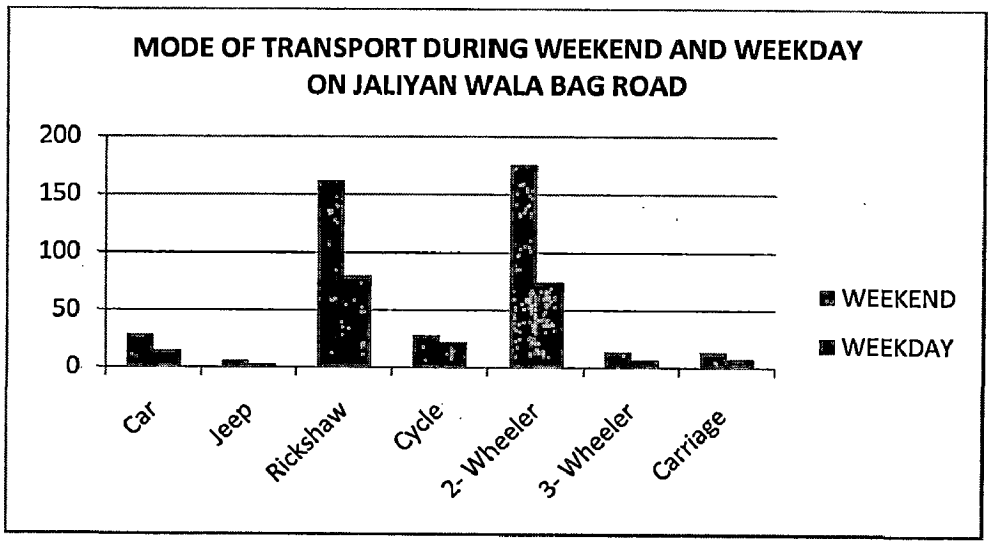


Fig 5.5.2.1.2Mode of Transport on JaliyanWala Bagh Road (Source: Primary survey)

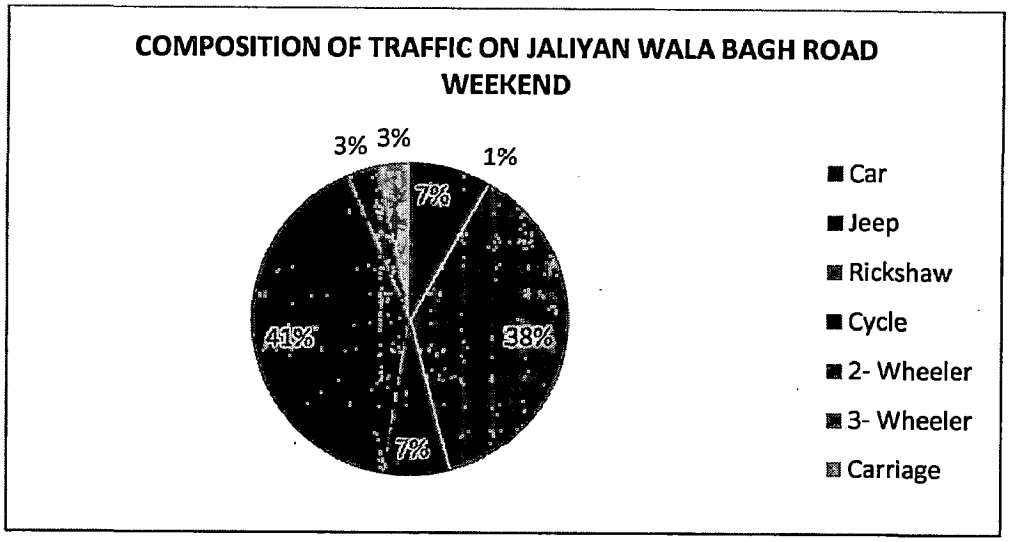


Fig 5.5.2.1.3 Composition of Traffic on Jaliyan Wala Bagh Road Weekend (Source: Primary survey)

- During weekend the volume of traffic is higher in afternoon than during morning and evening due to high tourist movement. Again rickshaws and 2-wheelres form major volume of traffic Table 5.5.2.1.3 , Figure 5.5.2.1.4

Table 5.5.2.1.3 Mode of Transport on Jaliyan Wala Bagh Road at Peak Hours (Source: Primary survey)

Mode Of Transport at Peek Hours During Weekend on Jaliyanwala Bagh Road			
	9.00 AM	1.00 PM	6.00 PM
Car	18	42	27
Jeep	5	7	6
Rickshaw	102	219	165
Cycle	16	46	22
2- Wheeler	150	197	181
3- Wheeler	10	16	16
Carriage	18	18	6

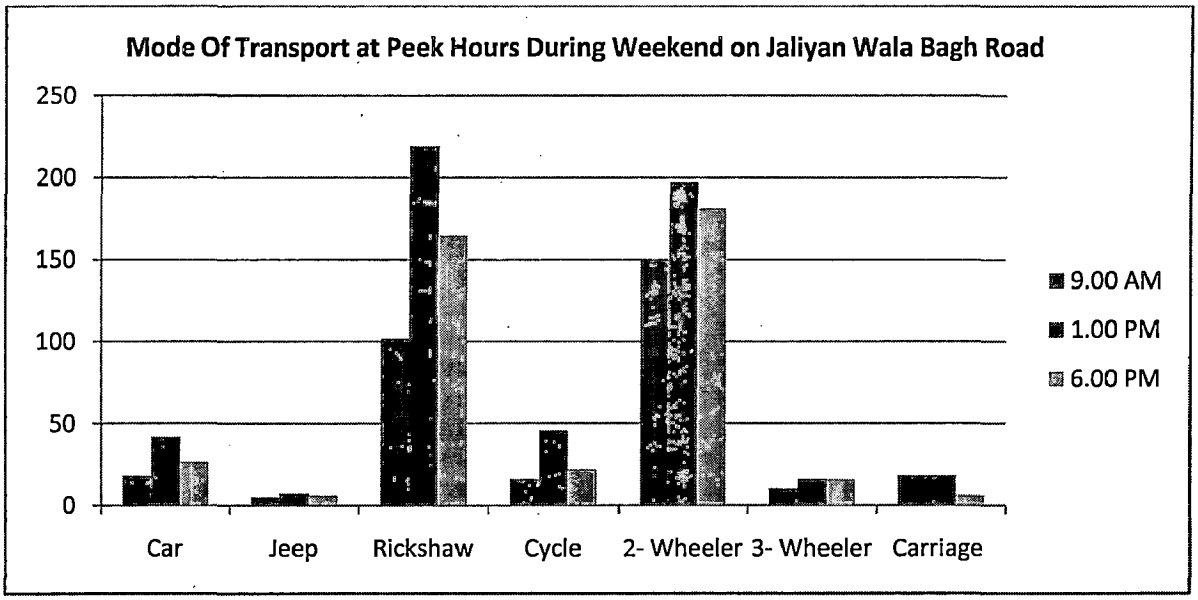


Fig 5.5.2.1.4 Mode of Transport on Jaliyan Wala Bagh Road at Peak Hours (Source: Primary survey)

- During weekday the vehicular count is highest during evening due to higher movement of local population Table 5.5.2.1.4, Figure 5.5.2.1.5.

Table 5.5.2.1.4 Mode of Transport at Peak Hours Jalliyanwala Bagh Road (Source: Primary survey)

Mode of Transport at Peak Hours During Weekday Jaliyanwala Bagh Road			
	9.00 AM	1.00 PM	6.00 PM
Car	7	21	17
Jeep	3	3	3
Rickshaw	42	96	102
Cycle	17	20	29
2- Wheeler	46	80	96
3- Wheeler	4	5	12
Carriage	14	7	3

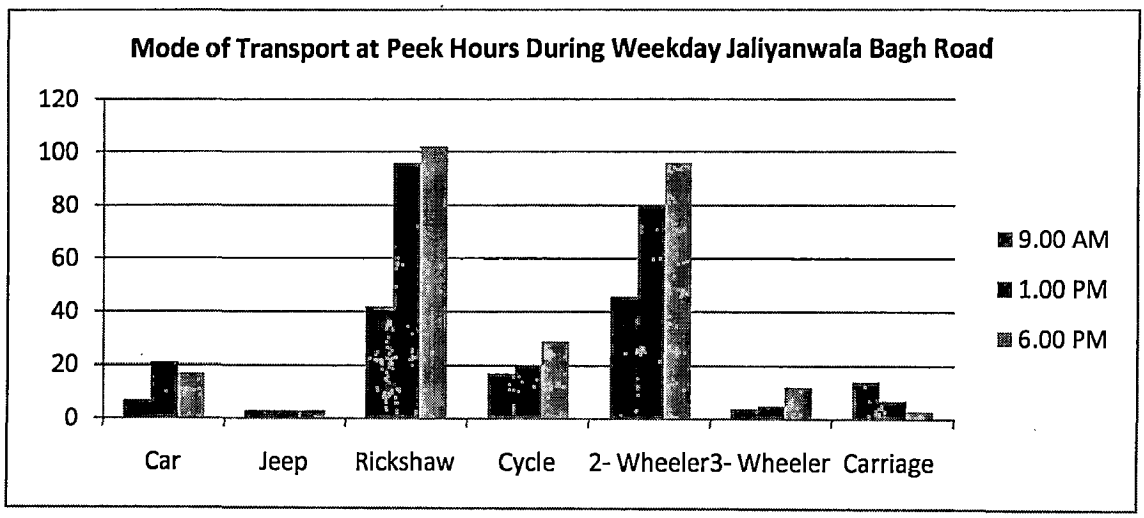


Fig 5.5.2.1.5Mode of Transport at Peak Hours Jalliyanwala Bagh Road (Source: Primary survey)

- The movement of carriages during evening is low as loading and unloading is usually done in morning

5.5.3. Vehicular count on Jaimal Singh Road

Jaimal Singh Road is major commercial road of Walled City Amritsar. It is specialized market for garments. Tourist and local population visit this market in high numbers. As a result this road has on street parking which extend to the middle of the road leaving very little carriage way for vehicles and pedestrian. Summary of vehicular count on this road is given below:

Table 5.5.3.1 Vehicular count at Jaimal Road (Source: Primary survey)

Vehicular count at Jaimal Road on weekend for 15 min time interval										
Mode	at 9.00 AM			at 1 PM			at 6 PM			Average
	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	
Car	1	3	4	3	4	7	6	7	13	8
Rickshaw	40	36	76	60	67	127	102	94	196	133
Cycle	24	40	64	11	24	35	20	37	57	52
2- Wheeler	35	42	77	68	85	153	106	99	205	145
3- Wheeler	2	3	5	4	5	9	10	12	22	12
Carriage	20	30	50	10	15	25	3	6	9	28
Total vehicles on road			276			356			502	
Vehicular count at Jaimal Road on weekday for 15 min time interval										
Mode	at 9.00 AM			at 1 PM			at 6 PM			Average
	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	Right to Left	Left to Right	Total	
Car	1	1	2	1	1	2	3	5	8	4
Rickshaw	18	19	37	28	34	62	51	48	99	66
Cycle	22	35	57	8	12	20	10	15	25	34
2- Wheeler	20	34	54	30	40	70	55	52	107	77
3- Wheeler	1	1	2	2	1	3	5	5	10	5
Carriage	15	24	39	4	8	12	1	2	3	18
Total vehicles on road			191			169			252	

5.5.3.1. Inferences

- No of vehicles during weekend is higher than during weekdays. The vehicular count is highest in evening as shown in Table 5.5.3.1.1, Figure5.5.3.1.1.

Table 5.5.3.1.1 No of Vehicles on Jaimal Singh Road (Source: Primary survey)

No of Vehicles on Jaimal Singh Road		
TIME	WEEKEND	WEEKDAY
9.00 AM	276	191
1.00 PM	356	170
6.00 PM	503	253

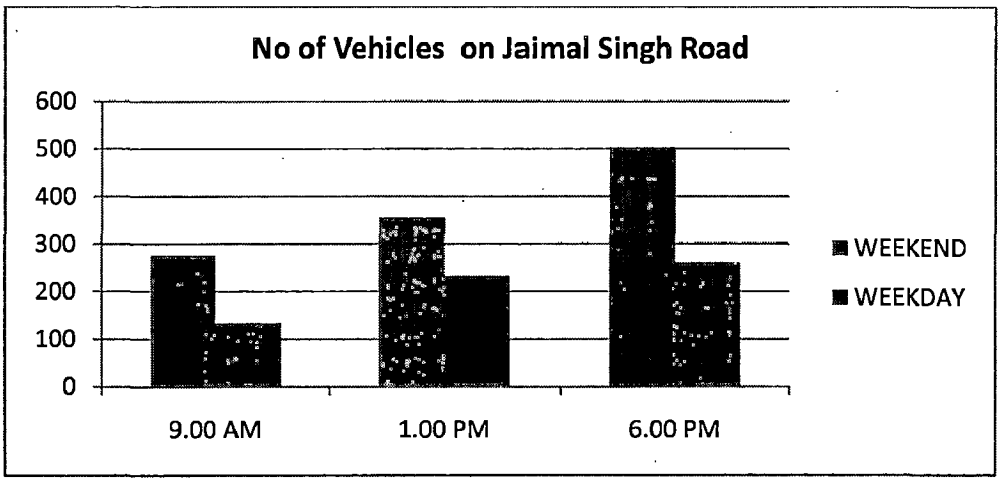


Fig 5.5.3.1.1No of Vehicles on Jaimal Singh Road (Source: Primary survey)

- Rickshaw and 2wheeler have higher vehicular count than any other mode of transport. Percentage of rickshaw during weekend is 35.2% and during weekday is 32.3 while that of 2 wheeler during weekend is 38.3% and during weekday is 37.7%. as shown in Table 5.5.3.1.2, Figure5.5.3.1.2.

Table 5.5.3.1.2 Mode of Transport on Jaimal Singh Road (Source: Primary survey)

Mode of Transport During Weekend and Weekday on Jaimal Singh Road				
	WEEKEND	Percentage	WEEKDAY	Percentage
Car	8	2.1	4	1.9
Rickshaw	133	35.2	66	32.3
Cycle	52	13.7	34	16.6
2- Wheeler	145	38.3	77	37.7
3- Wheeler	12	3.2	5	2.4
Carriage	28	7.5	18	9.1

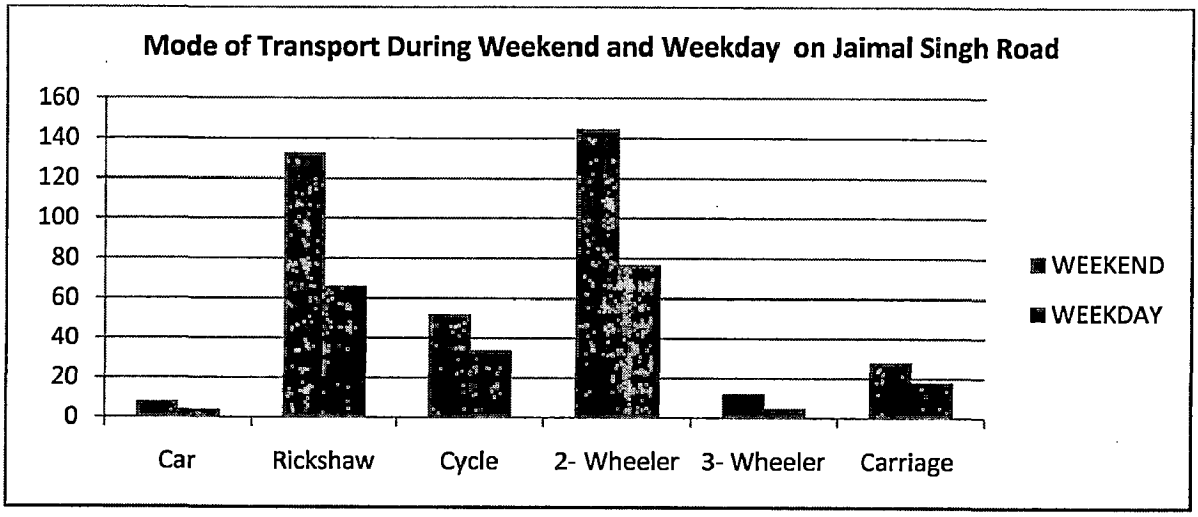


Fig 5.5.3.1.2 of Transport on Jaimal Singh Road (Source: Primary survey)

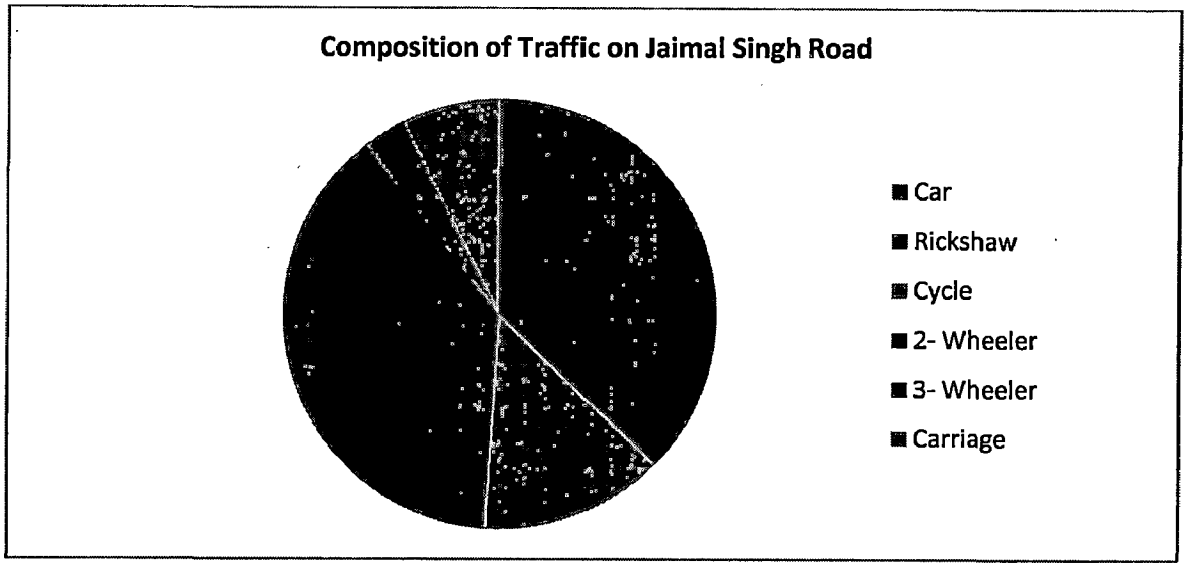


Fig 5.5.3.1.3 Composition of Traffic on Jaimal Singh Road (Source: Primary survey)

- Vehicular count in evening is highest from any other time during day. Vehicular count for carriage is highest in morning as loading and unloading is done at that time. Vehicular count for all the vehicles at different time of day is given in Table 5.5.3.1.3, Figure5.5.3.1.4.

Table 5.5.3.1.3 Mode of Transport at Peak Hours on Jaimal Singh Road (Source: Primary survey)

Mode of Transport at Peak Hours During Weekend on Jaimal Singh Road			
	9.00 AM	1.00 PM	6.00 PM
Car	4	7	13
Rickshaw	76	127	196
Cycle	64	35	57
2- Wheeler	77	153	205
3- Wheeler	5	9	22
Carriage	50	25	9

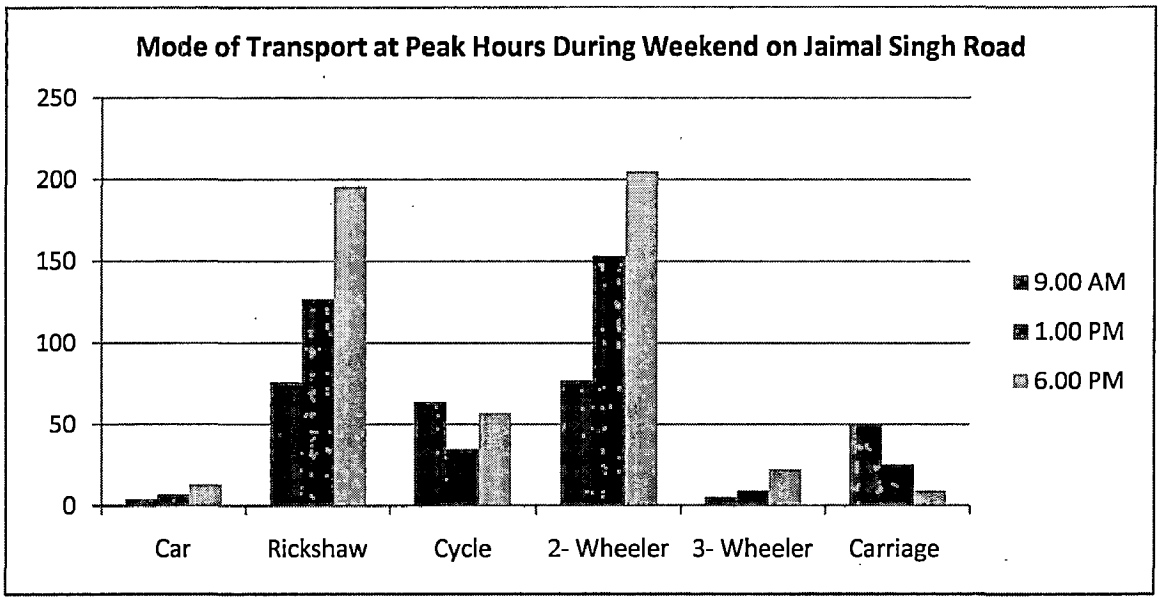


Fig 5.5.3.1.4 Mode of Transport at Peak Hours on Jaimal Singh Road (Source: Primary survey)

5.6.Survey by Ministry of Urban Development

The field surveys for Amritsar city were conducted on 8th, 9th, 15th, 16th, 17th of September, 2011 which includes the walled city, the city centre and the periphery areas which doesn't have any sewerage and water connection provided by the Municipal Corporation are taken for the study. Total of 40 samples were collected from all the above areas. (Localities include Naun Kari Colony, Valla, Walled city Gandhi gate area, Ranjit Avenue B & C blocks and Khankot).

Total 10 households were survey from walled city. The analysis of the survey for walled city area is given in Table 5.6.1

Table 5.6.1 Analysis by Ministry of Urban Development (Source: http://www.asci.org.in/sslb/amrit_7.htm)

Service	Analysis
Water Supply	Quality issues found. Turbidity issues are high (Seven out of ten samples). (Lab technician records supports this)
Sewerage and Drainage	Very narrow roads (range of 1m to 3 m) and open drains. So at rainy days high problem of contamination
Solid Waste Management	Not very frequent collection. Charges up to Rs. 20 per month. ULB Collects the Waste. (i,e Mohalla Sudhar Committee)
Others (if any)	Localities are very unhygienic to live. Special Plan is prepared by the PWSSB for Walled city.

5.7. Visual Survey

The in order to suggest recommendation and proposals for urban regeneration visual tour of the walled city is required to identify the existing facilities and conditions of infrastructure. The survey has been categorized according to the various infrastructure facilities in walled city.

5.7.1. Important land marks

Important Landmarks in walled city are Golden Temple, Jalian wala Bagh, Town hall, Gurudwara Santoksar, Gurudwara Shahedan. Golden temple complex forms a significant part of Walled city.

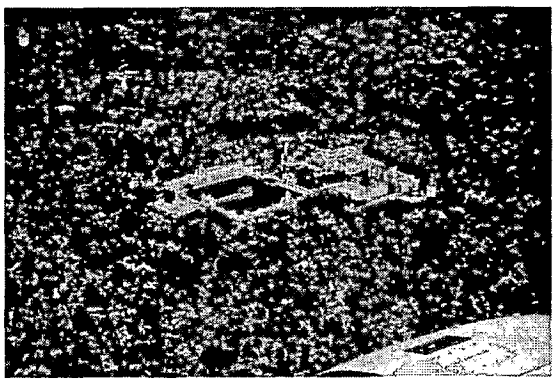


Figure 5.7.1.4 Aerial view of Golden Temple
(Source: http://sikhgurusandgurdwaras.info)

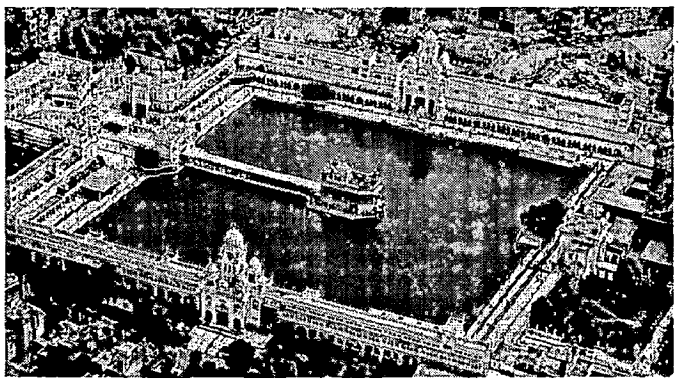


Figure 5.7.1.3 Golden Temple Complex
(Source: http://forum.sikhsangeet.com)

Figure 5.7.1.2 Jallianwala Bagh Martyr's Memorial
(Source: Ay Buthor)

Figure 5.7.1.1 Town Hall Building presently has MCA office
(Source: By Author)

5.7.2. Heritage structures

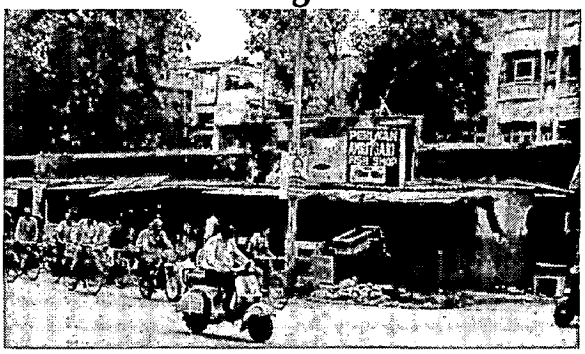


Figure 5.7.2.2 Old Wall of Walled City behind temporary shops. (Source: By Author)

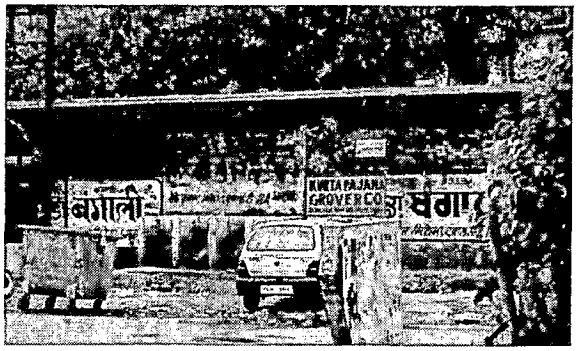


Figure 5.7.2.1 Urinal and Dustbin in front of the Wall (Source: By Author)

Figure 5.7.2.6 Remains of Old Wall near Mahan Singh Gate(Source: By Author)

Figure 5.7.2.5 Hoardings on Lohgarh Gate (Source: By Author)

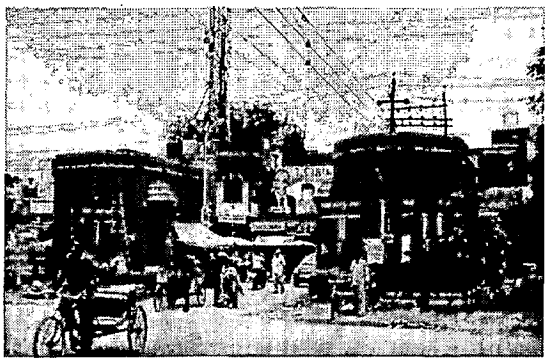


Figure 5.7.2.3 Hakiman Gate

Figure 5.7.2.4 Urinals on both sides of Rambhag Gate (Source: by Author)

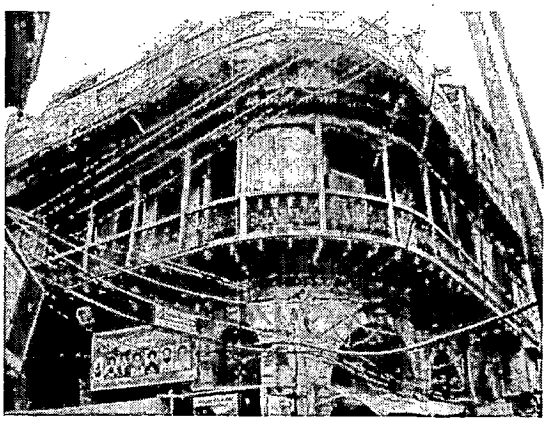


Figure 5.7.2.8 Electric wires destroying beauty of Qila Ahluwalia (Source: By Author)

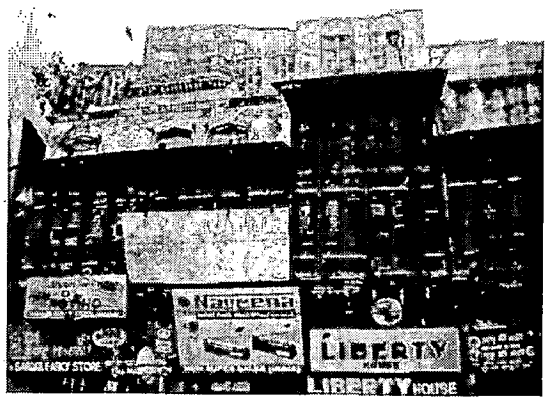


Figure 5.7.2.7 Old building in Hall Bazra in dilapidated condition (Source: By Author)

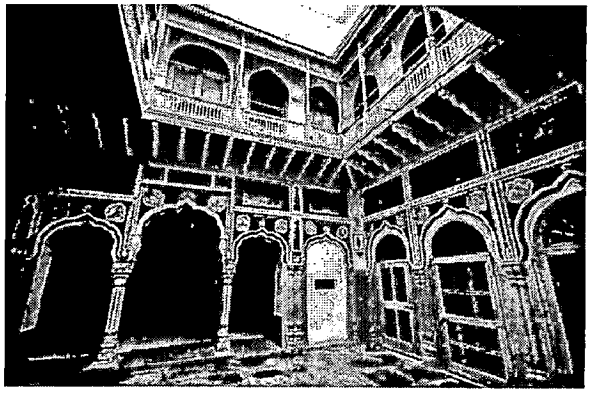


Figure 5.7.3.2 Inside Chitta Akhara, Heritage Buiddings (Source: by Author)

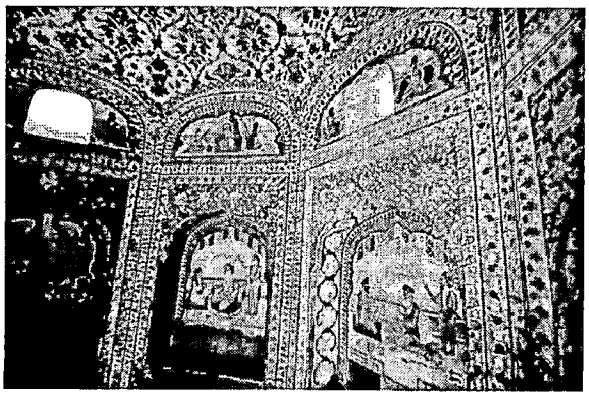


Figure 5.7.2.1 Inside of Tharurdwara, Heritage Building (Source: By Author)

5.7.3. Transportation

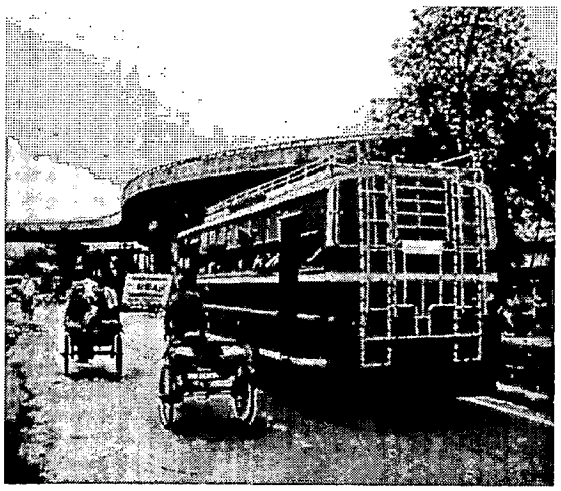


Figure 5.7.3.4 Elevated Road Project at Outer Circular Road (Source: By Author)

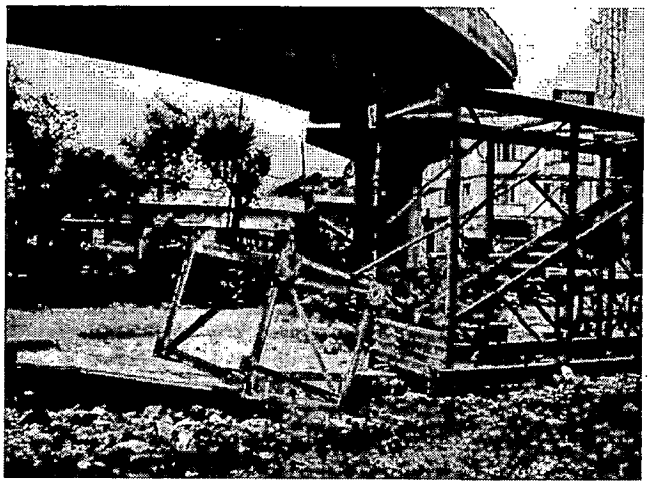


Figure 5.7.3.3 Elevated Road entering the Walled city through Sheran Wala Gate (Source: By Author)

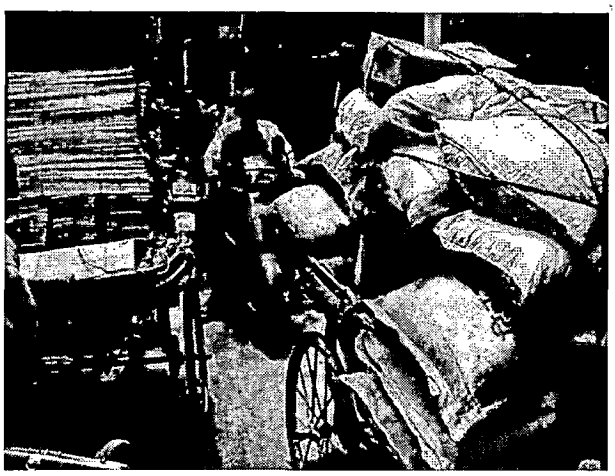


Figure 5.7.3.5 Traffic Jam in Guru Bazar of Walled City (Source: By Author)

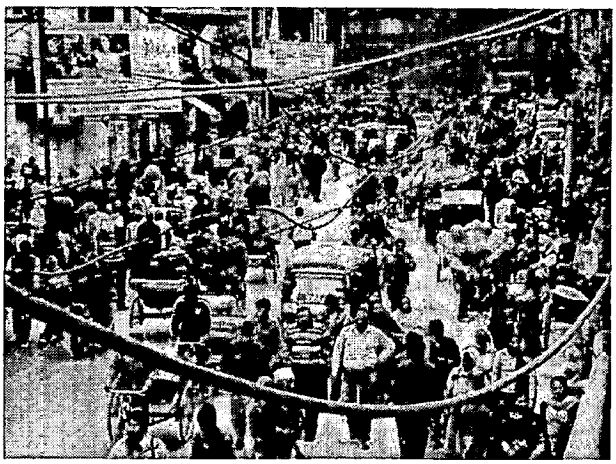


Figure 5.7.3.6 Encroachments, 3-wheelers, rickshaws create difficulty for pedestrians on Jallianwala Bagh Road (Source: by Author)

5.7.4. Traffic management

Figure 5.7.4.1 Cars parked at No Vehicle Zone at entrance of the Golden Temple (Source: By Author)

Figure 5.7.4.2 Vehicles Parked in No Parking Areas in Hall Bazar (Source: By Author)

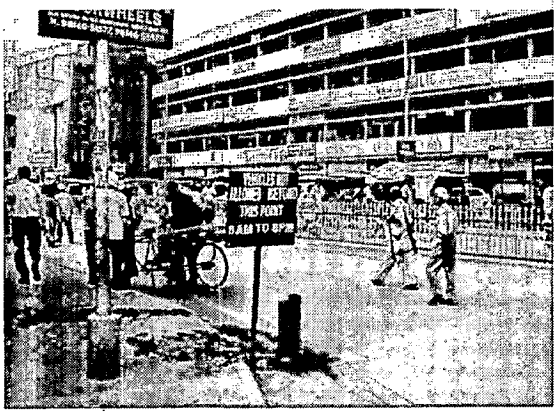


Figure 5.7.4.1 Restricted Entry at Jallianwala Bagh Road (Source: By Author)

Figure 5.7.4.3 Traffic at Approach Road to Golden Temple (Source: by Author)

5.7.5. Parking

Figure 5.7.5.2 Jaimal Singh Road (12 m wide) filled with hawkers, on-street parking of 2-wheelers only 4m effective road width left for pedestrians and vehicles. (Source: By Author)

Figure 5.7.5.3 at Chowk Farid, looking at Jaimal Singh Road (Source: By Author)

Figure 5.7.5.4 Gallira Parking Chowk Phowara (Source: By Author)

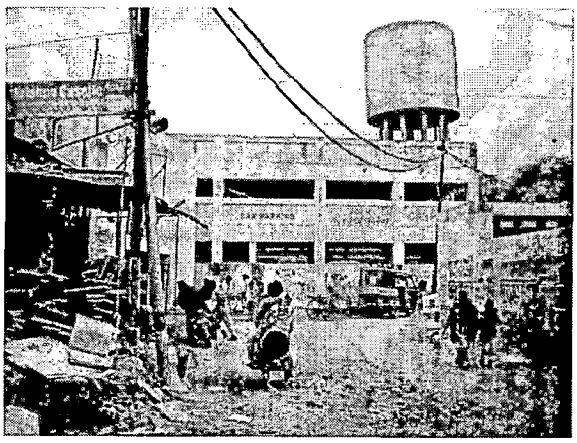


Figure 5.7.5.5 Municipal Parking opposite Shastri Market (Source: By Author)

5.7.6. Drainage

Figure 5.7.6.1 Open Drains at Guru Bazar (Source: By Author)

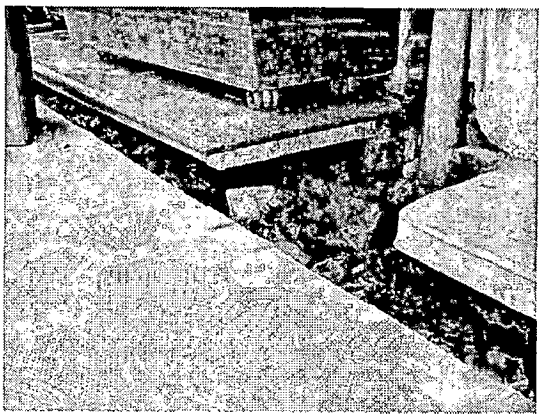


Figure 5.7.6.2 Clogged Drains at Hall Bazar (Source: By Author)

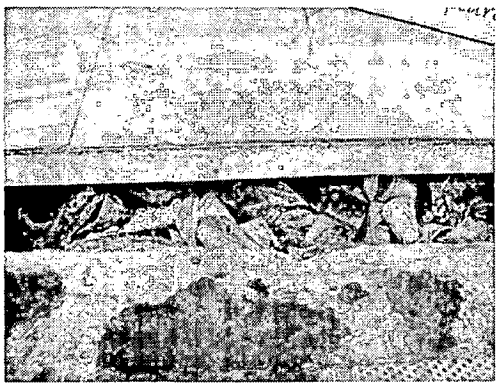


Figure 5.7.6.3 Drains Clogged with Plastic bags, cups, disposable plats, food packets (Source: By Author)

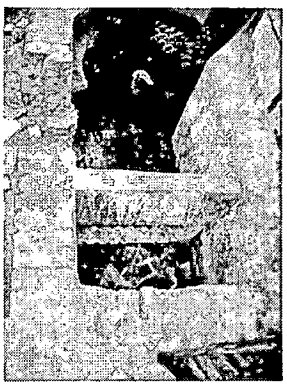


Figure 5.7.6.5 Drains falling into sewer which is clogged (Source: By Author)

Figure 5.7.6.4 Clogged drains at Katra Ahluwalia (Source: By Author)

Figure 5.7.6.6 Clogged drains cleaned but debris left in street (Source: By Author)

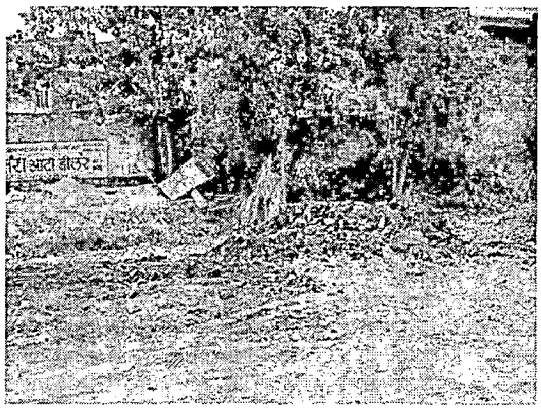


Figure 5.7.6.7 Ganda Nala outside Walled city which receives the waste water from it (Source: By Author)

5.7.7. Solid waste management

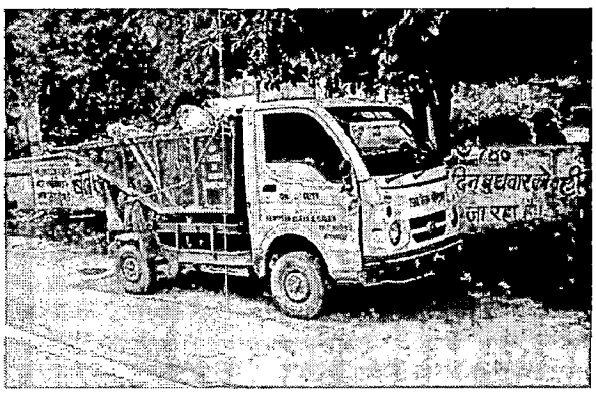


Figure 5.7.7.2 Municipal Solid waste Management Truck , no segregation of waste is taking place

Figure 5.7.7.3 Temporary Storage of Garbage collected from house holds

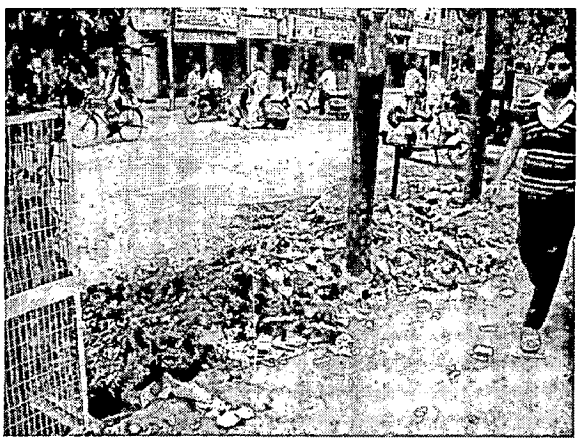


Figure 5.7.7.4 Garbage being burnt at Hall Bazar (Source: By Author)

Figure 5.7.7.1 Garbage collected from narrow streets stored in municipal bin (Source: By Author)

Figure 5.7.7.6 Garbage at Hall Bazaar near dust bin (Source: By Author)

Figure 5.7.7.5 Garbage in middle of road at Jallianwala Bagh Road (Source: By Author)

5.7.8. Encroachments

Figure 5.7.8.4 Effective width of footpath reduced by encroachments at Hall Bazar (Source: By Author)

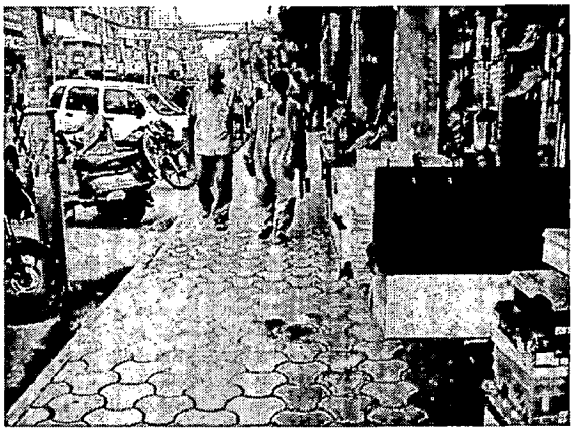


Figure 5.7.8.1 Encroachment by private sitting of shops (Source: By Author)

Figure 5.7.8.3 Shop covering two thirds of the footpath (Source: By Author)

Figure 5.7.8.2 2-wheeler parked on footpath at Jallianwala Bagh Road (Source: By Author)

5.8. Inferences

Inferences from Master Plan 2031, City Development plan 2025, Primary survey and visual survey are given below.

Master Plan

- Decongestion of walled city is proposed by shifting wholesale markets and fish market outside. But that means shifting almost 40% of market area outside. Due to high congestion and failing infrastructure situation demands such measures.
- The master plan contradicts itself, in one hat it proposes to conserve heritage buildings and on other hand it proposed to demolish areas around Golden Temple by expanding the boundary of Galliara Project.
- Heritage walk was launched but it has failed to generate interest of public.
- On one hand pedestrianization of walled city is proposed and on other hand more multi story parking are being constructed inside the walled city, inviting the traffic in.
- Time regulation has been implemented but is not followed by public. Strict measures are required.
- The heritage zone proposed by the master plan does not coincide by the heritage walk launched in 2011

City Development Plan

- Conservation of heritage buildings is proposed by CDP but efforts from the municipal corporation are inadequate.
- The second phase of Elevated road project under JNNURM connects the elevated national highway 1 to Galliara parking. If the parking is full then vehicles will have to return back to national highway.

Primary survey

- Transportation and traffic are main problems to walled city. Due to Absence of public transport people tend to drive private vehicles creating congestion and traffic jams.
- The narrow roads to walled city do not allow vehicles to move through without being stuck in jam.
- Littering on streets improper disposal of garbage has created unhygienic atmosphere.
- Open drain clogged with litter is another grave problem.
- Vehicular survey depict that the 2-wheelers and cycle rickshaws are frequently used as mode of transport.

Visual survey:

- Visual survey depicts sad state of solid waste management. Garbage lying around on roads creates uncomfort to tourists and to residents.
- Heritage structures are hogged by hoardings, posters, and electric wires. Urinals have been constructed in front of the structures.
- Encroachments are not checked by the government. At portions whole of the footpath is covered by shop owners.
- Traffic management have been implemented but it is not strictly followed.
- Huge no of 2 wheelers are parked on roads reducing the road width to nearly half.
- Open drains are clogged with garbage and the waste water flows to the streets creating unhealthy atmosphere.

6. Proposals

This chapter deals with proposals for regeneration plan of the walled city of Amritsar. The proposals are based on detailed field surveys executed and analysis carried out to understand the priorities of the problems faced by people. These proposals focus on planning and design alternatives to bring about remarkable changes in Walled city of Amritsar. According to the field surveys problems forming the top priority are transportation, solid waste management, tourism facilities, drainage, preserving heritage character

Regeneration

The concept of regeneration include planning for resolution of problems of an area with participation of residents and stake holders to generate an effective plan for social, cultural, economic and environmental upliftment

The Amritsar walled city has 20% area under commercial and mixed land use. The southern side of the walled city is mainly residential area. Golden temple is the main focus of the city. The stake holders of the walled city will include,

- Residents,
- Shopkeepers,
- Hotel and restaurant owners
- SGPC,
- Municipal Corporation,
- Department of Tourism and heritage of Punjab

A public private partnership will be required for implementation of the program. Various stake holders have been consulted and their opinion taken through surveys. Community participation in discussion n and implementation is very important.

The objectives of the program: According to analysis of the problems, and dialogue with various stakeholders the objective of the regeneration program have been derived.

- **Transportation and traffic management**: To create a advanced public transport system for the city and develop local public transport for the walled city for better connectivity. To develop a better traffic management system with advanced technologies.
- **Economic up-gradation**: To improve tourism of walled city for effective revenue gains.
- **Socio-cultural up-gradation**: To improve the heritage value of the walled city and conduct heritage walks

- **Environmental concern:** To develop advanced solid waste management program for clean and green city and environment friendly transport for city. To improve pedestrian facilities and discourage use private vehicles.

6.1. Proposal for Transportation Improvement and Traffic Management

The state of transport for intra city services is in very bad condition. Transport services forms top priority according to surveys and analysis. The city of Amritsar does not have public transport in any form; people are let at mercy of taxis and autos which charge high rates due to scarcity. Due to absence of public transport the no of vehicles have increased considerable specially 3 wheelers and 2 wheelers. As a result roads have high volume of traffic and no regard for pedestrians. For improvement of transportation city bus service has been proposed. For better transportation within walled city mini bus service have been proposed. A Mass transit system has been proposed by Punjab Government which has been critically analyzed and has been extended. The proposals for the improvement of transportation are given below

- Introduction of city bus service
- Introduction of mini bus service in walled city
- Construction of bridge
- Extension of PRT System
- Traffic management
- Proposal for better pedestrian environment

6.1.1. Introduction of City Bus Service

City bus service has been proposed by City Development Plan 2025 under JNNURM. Under this project 150 busses have been sanctioned by the government. But no plan has been prepared for better function of the bus service.

Aim of the project: To is connect important places within the city by bus service for better public transport

6.1.1.1. Implementation Strategy

- A specialized agency should be created to regulate, monitor and maintain city bus service
- A support system such as, bus stops, pedestrian walkways, subway crossing, , footpaths, tree plantations, information booths should be created for improving transport infrastructure

- Provide premium services for regular passenger so that they shift from personal vehicles to public transport.
- Ticketing should be done with hi tech electronic machines
- Passenger information system should be installed at every bus stop.
- Special facility should be adopted for handicapped and disabled passengers
- Busses should be equipped with global position system for better service.
- Important locations to be connected by the city bus service which include Railway Station, Bus Stand, Airport, Gol Bagh, Crcular Road, Ranjit Avenue, Khalsa College , Guru Nanak Dev University, Government Medical College , Ram Bagh (Figure 6.1.1.1.1, Figure 6.1.1.1.2.)

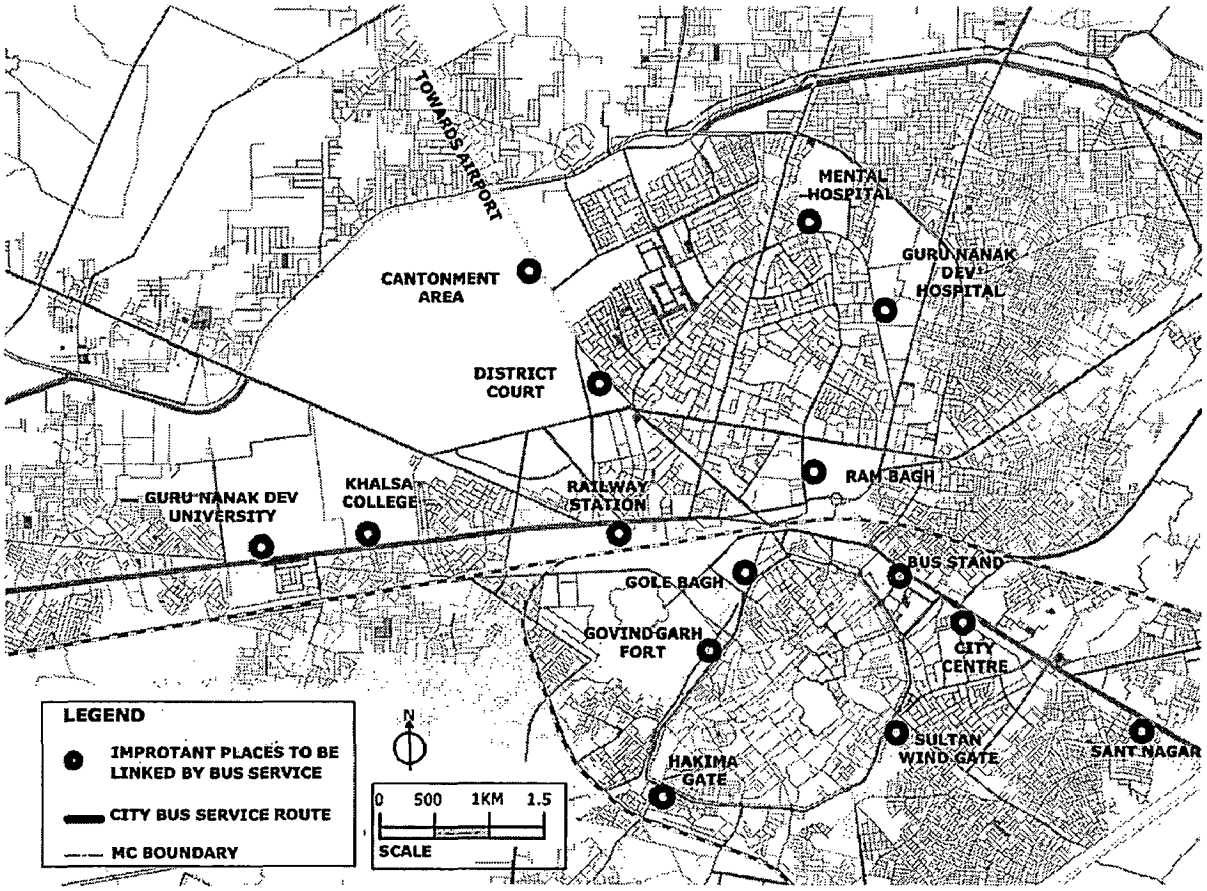


Figure 6.1.1.1.1 Important locations to be connected by Bus Service (Source: By Author)

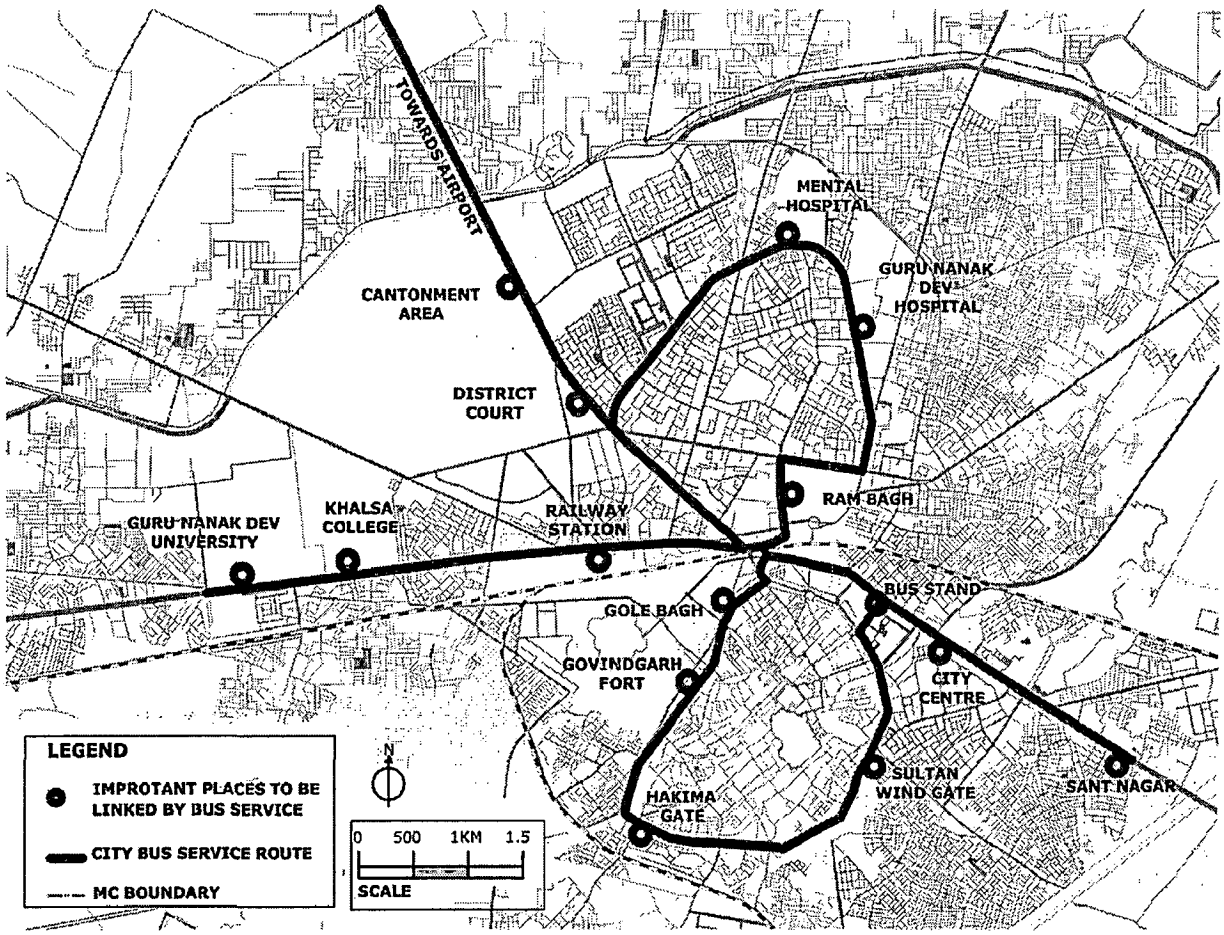
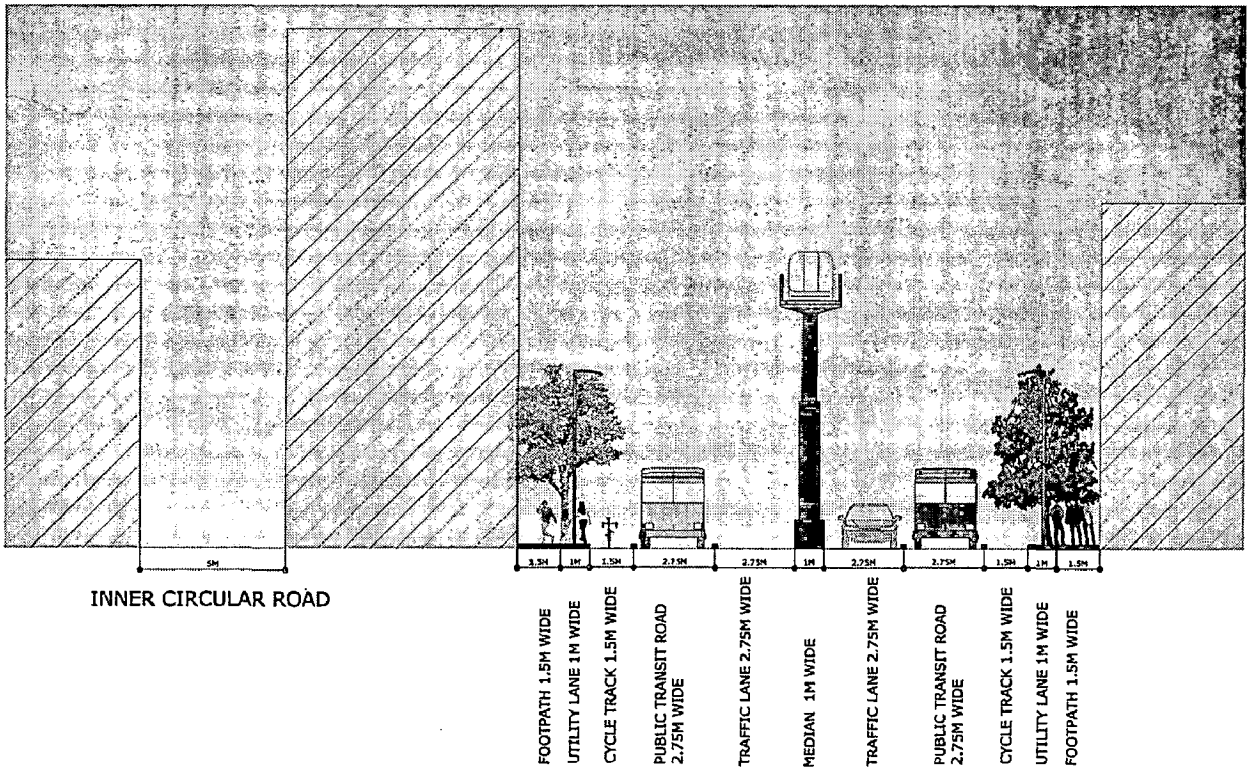
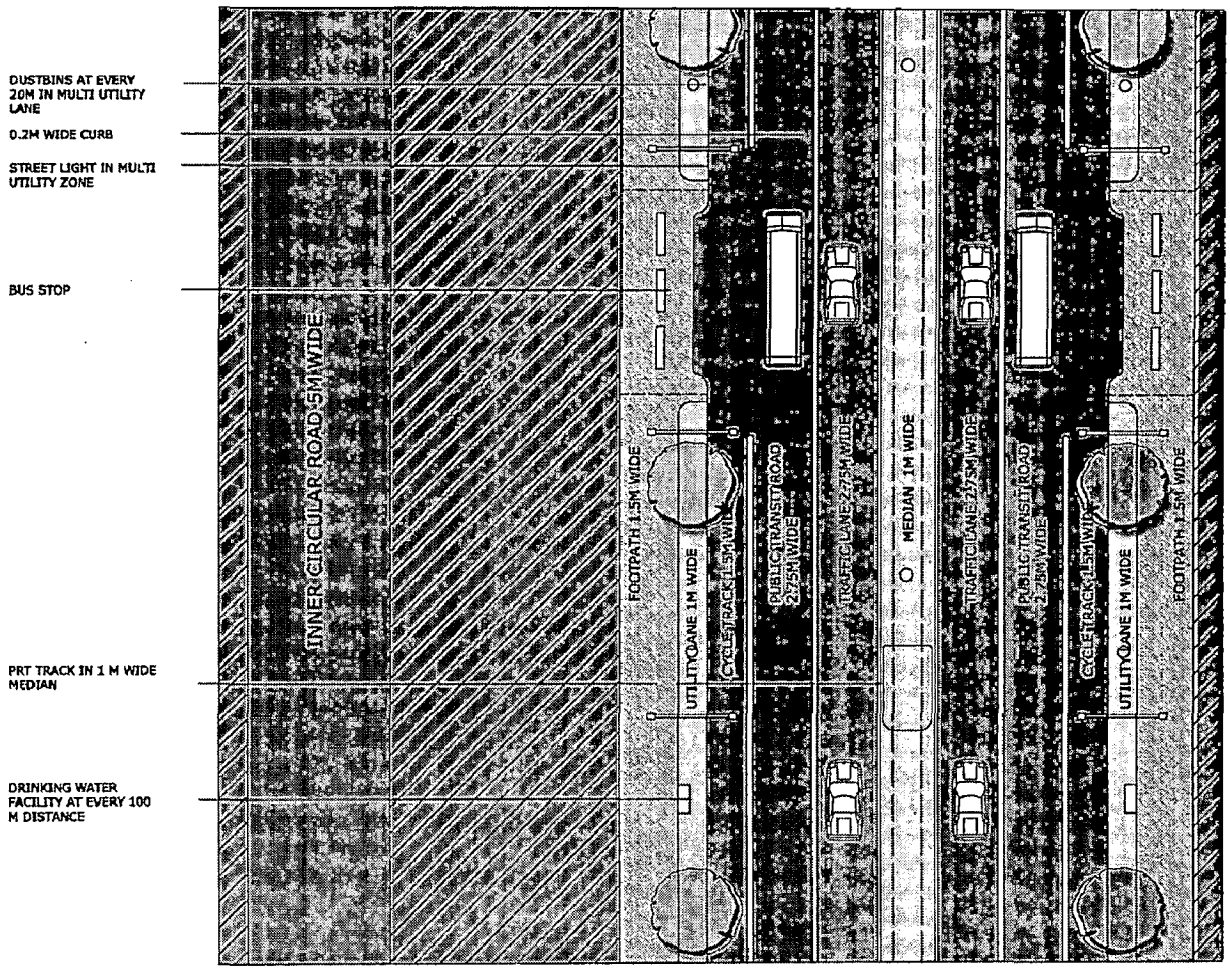


Figure 6.1.1.1.2 City Bus Route Connecting Important Parts of Amritsar (Source: By Author)

- Environment friendly, Low floor busses running on CNG should be adopted.
- Bus service cannot enter the walled city due to high level of congestion and narrow roads. City bus service can be employed for circular road around walled city (Figure 6.1.1.1.3).
- Six bus stops have been proposed around the walled city according to locations of tourist attractions, high density wards and important landmarks(Figure 6.1.1.1.4).
- Heavy amount of traffic is observed at junctions due to which it becomes very difficult for pedestrians to cross it.
- Subway at two locations is required: at hall gate and at Mahan Singh gate. The width of the hall gate junction is 45m and width of Mahan Singh Gate junction is 35 m. Subway or under pass below these junctions have been proposed.



SECTION OF OUTER CIRCULAR ROAD 20 M WIDE



PLAN OF OUTER CIRCULAR ROAD 20 M WIDE

Figure 6.1.1.1.3 Plan and section of Outer Circular Road (Source: by Author)

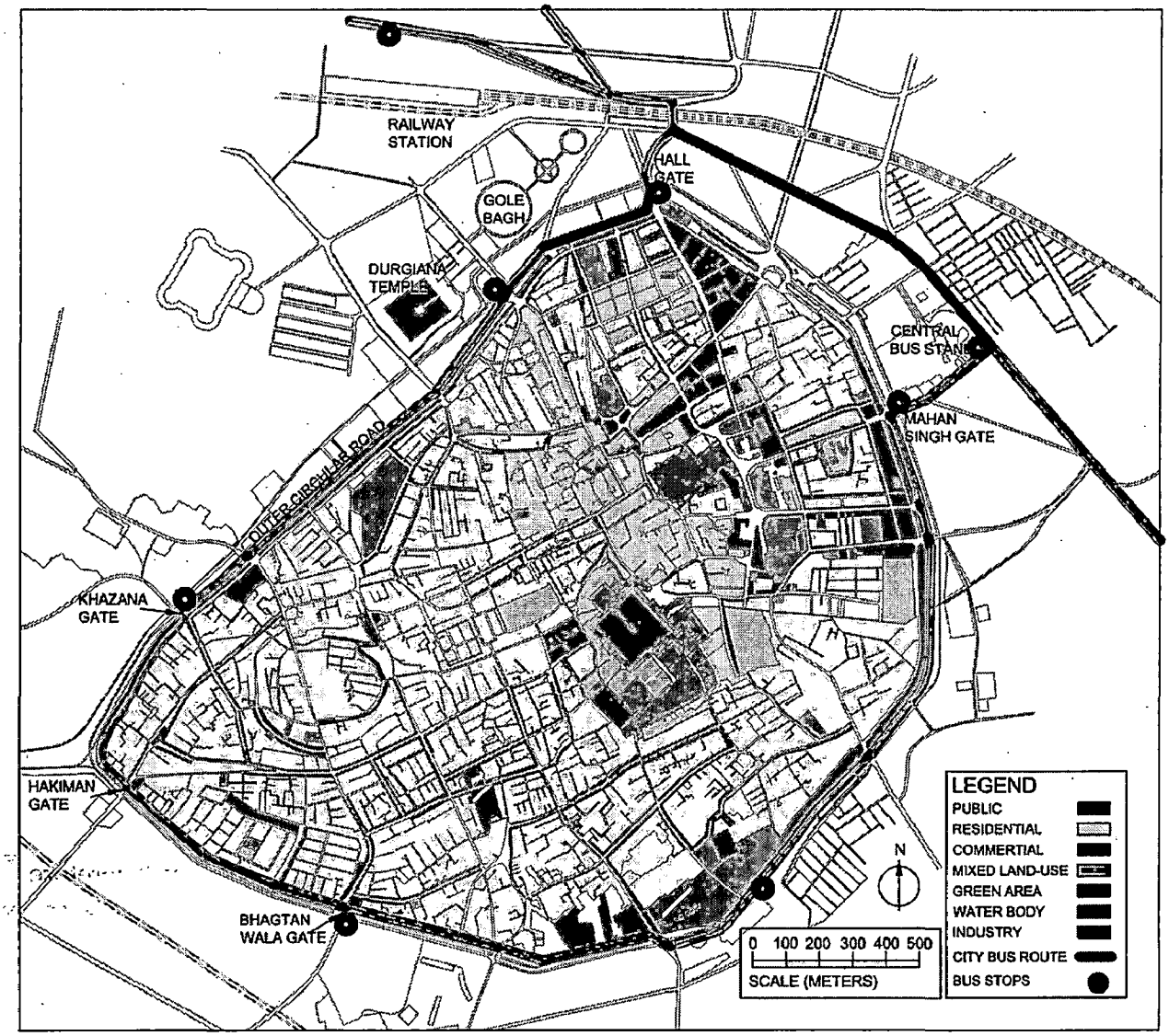


Figure 6.1.1.1.4 City Bus Service Route along Walled City (Source: By Author)

6.1.1.2. Cost of the project

The total cost of the project as established by JNNURM plan is 34.4 crore. Total cost of purchase of busses is 18 crore @ 12 lakh for each bus.

6.1.1.3. No of people benefiting

People that will be benefiting from the project will be tourist, local population and people getting employed. In year 2010 the no of tourist visiting Amritsar was 10720631 and approximately 30,000 people visit Amritsar every day. Total worker population of Amritsar is 308197 according to census 2001. Employment generated by the city bus service is approximately 400 people.

6.1.1.4. Management

Management of the project should be under transportation department of Municipal Corporation. A separate wing under this department can be created for the successful working of the project. Project should be implemented in public private partnership.

6.1.1.5. Revenue generated

Revenue will be generated through ticketing and through advertisement. The minimum fare per person should be 10 rs for 2km and should increase at rate of 5 rs for every km.

6.1.1.6. Limitation:

City bus service can be employed at major roads connecting important places. The inner parts of the city cannot be serviced by city buses. For better penetration mini busses has to be employed in second phase of the project.

6.1.2. Introduction of Mini Bus Service in Walled City

Walled city has narrow winding roads and most of the markets of Amritsar are located in it. It acts as CBD of Amritsar city. Walled city generates heavy amount of traffic. Due to absence of public transport, personal vehicles flood the roads of city. Therefore a sustainable mode of transport is required for this area.

Aim of the project: To connect various markets and tourist places within walled city to reduce traffic.

6.1.2.1. Implementation Strategy

- According to vehicular survey on an average during weekend 160 rickshaws are used in 15 minutes interval. Total people travelling through them are 320 in 15 minutes.10 seater mini busses are proposed and 32 buses are required to be purchased.
- Bus stops have to be constructed with shed, and amenities such as street furniture, information panel, dustbins and street lighting.
- Total 9 stops has been identified within walled city connecting main tourist attractions and market places (Figure 6.1.3.1.1)
- Two other stops have been identified on Outer Circular Road connecting the city bus service AND Mini bus service for convince of people.
- Electronic ticketing system has to be adopted for quick service.
- Special provision with universal accessibility for disabled people should be provided

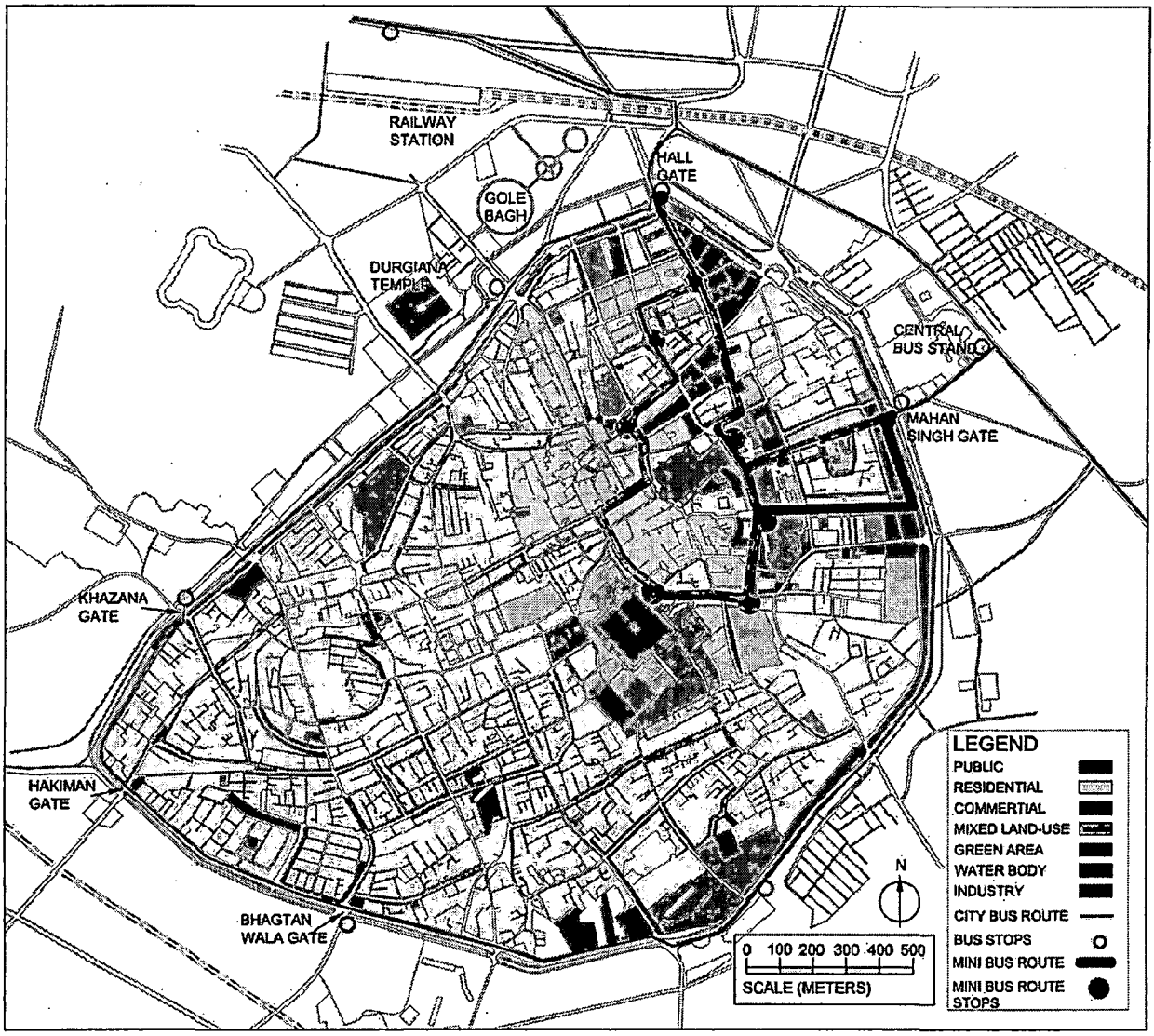


Figure 6.1.2.1.1 Mini Bus service Route within Walled city (Source: By Author)

6.1.2.2. Location of Stops

In total 11 stops have been identified, Hall gate, Mahan Singh Gate, Hall Bazaar, Shastri market, Jaimal Singh Road, Jallianwala bagh and Golden Temple.

6.1.2.3. No of people benefiting

This project will benefit residents of walled city, tourist and worker population. The total tourist population of the walled city is 135260 people. Tourist population visiting walled city in 2010 is estimated to be approximately 30,000 tourists per day. The worker population in year 2001 working under commercial and retail sector was 79033. Total population benefiting from the project is 244293.

6.1.2.4. Management

The management of the project should be directly under transportation department of Amritsar Municipal Corporation. The project should be implemented in public private partnership.

6.1.2.5. Limitation

There are mainly two approaches to walled city, one from hall gate and another from Mahan Singh road. Most of roads the city are narrow. Width of inner roads varies from 3-5 m. Public bus service cannot be implemented on these narrow roads.

6.1.3. Extension of PRT System

Personal Rapid Transit system has been proposed by the government for better connectivity of Golden Temple with railway station and bus stand. PRT system uses elevated tack to move 4-6 seater vehicles. The vehicle is battery operated and is charged at the stations. It is a low cost on demand system, which works similar to car pooling method. The total cost of the project has been estimated to be 198 crores. The system uses elevated track guide ways over which small vehicle moves.

6.1.3.1. Proposal by Government

Total 7 stations have been proposed at route length of 3.3 km, connecting railway station, bus stand and Golden Temple. The total cost of the project is estimated to be 198 crores. Total 80 vehicles are to be employed. Average speed of the vehicles is 28km/hr. Proposed operating hours for PRTS is from 6.00 am to 10pm operating 7 days a week. One maintenance yard and control room has been proposed. Fare of 45 rs per pod per km has been realized by the government.

6.1.3.2. Limitation

The proposal connects railway station, bus stand with Golden Temple. The proposed PRT will only serve tourist population coming by road and rail. The system will not connect Airport. Tourist normally carry luggage and like to find place of say rather than going to a tourist attraction. This proposal does not take into account basic factors of journey. This proposal will not benefit the residents of the city. It mainly focuses on tourism of the city.

6.1.3.3. Proposal for Extension of Route

- Taking into account the above stated problems, extension of the PRT system has been proposed. The extended route should be along the circular road for which median of 2 m already exists along the route.

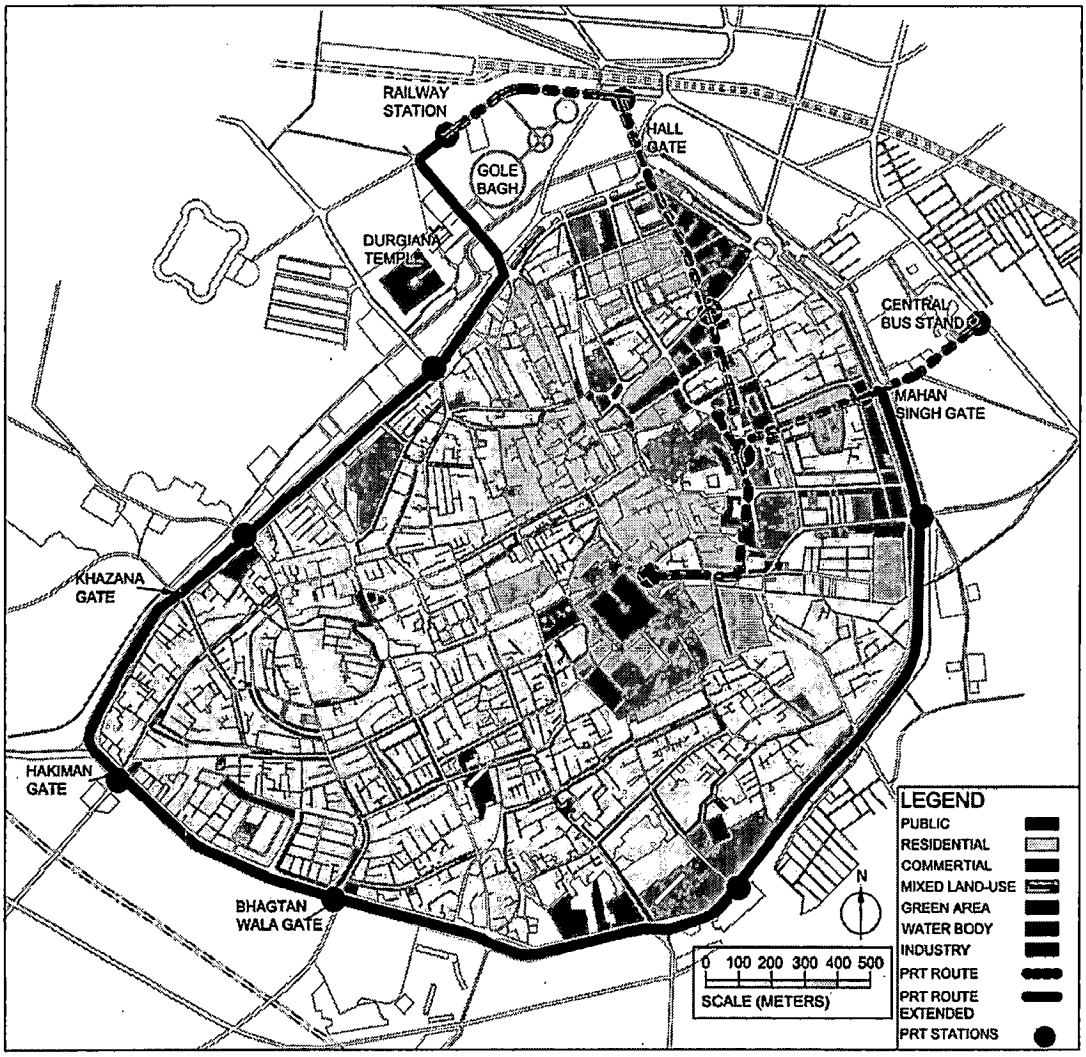


Figure 6.1.3.3.1 Extension of PRT system (Source: By Author)

- PRT system being low cost and sleek in design can be easily taken up through this road. The extension will start from Jagat Jyoti School station along the outer circular road and will join railway station as shown in Figure 6.1.3.3.1.
- In addition to 7 stations, 6 more stations have been proposed along the route at important places. These stations are: Ghee Mandi, Gurudwara Ramsar Sahib, Bhagtan Gate, Hakiman Gate, Lahori Gate, Lohgarh Gate as shown in figure.
- The proposal will connect market places near Ghee Mandi, high density southern area of walled city near Bhagtan Gate and Hakiman Gate and important tourist destinations such as Gurudwara Ramsar and Gurdwara Shaheed Ganj, Durgain Temple and Gol Bagh, public buildings near Lohgarh Gate.
- All the stations are elevated hence elevators and lifts will be installed for universal connectivity.
- Total route length of the system works out to be 9.6 km. No of vehicles should also be increased to 150 to cope up with extended route.

- Fare of 45 rs per pod per km is very high. Subsidizing of the fare is necessary. 20 rs per pod per km fare is proposed instead of 45 rs per pod per km.

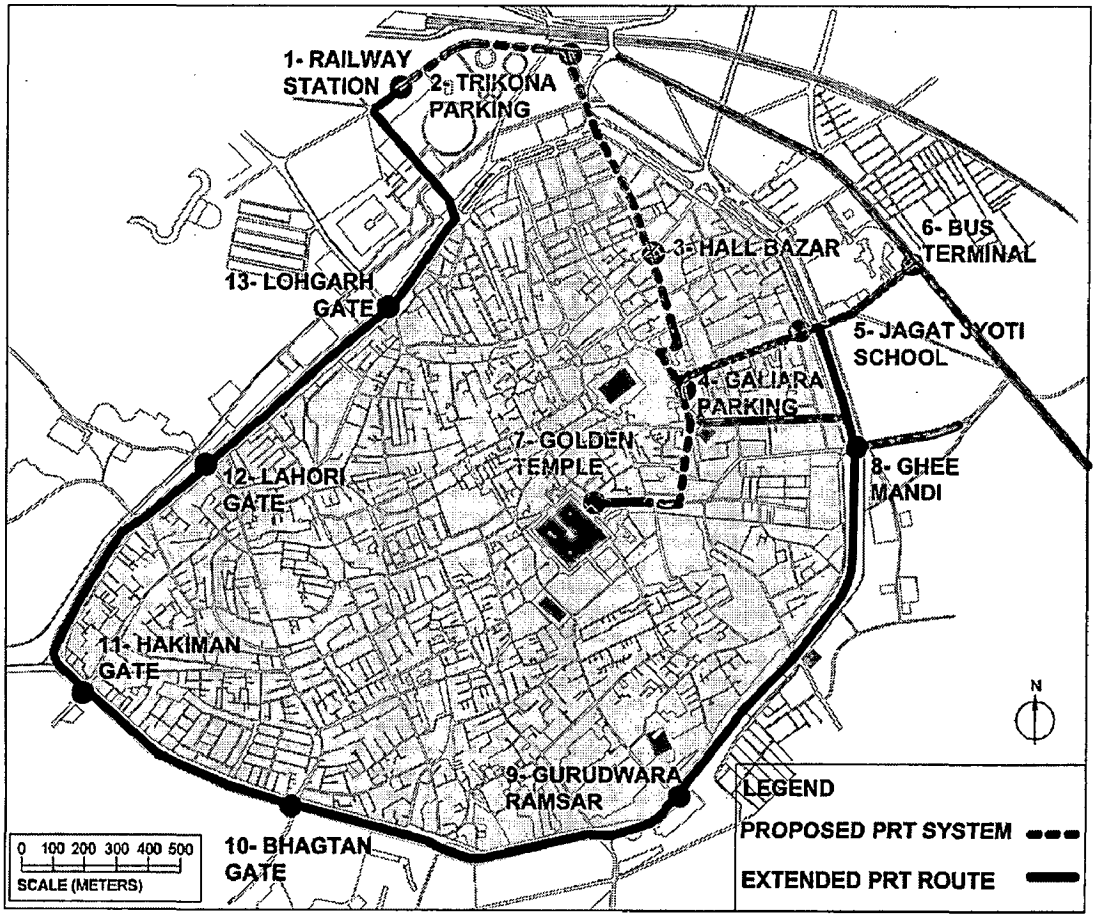


Figure 6.1.3.3.2 Proposed Extension of PRT system and location of stations (Source: By Author

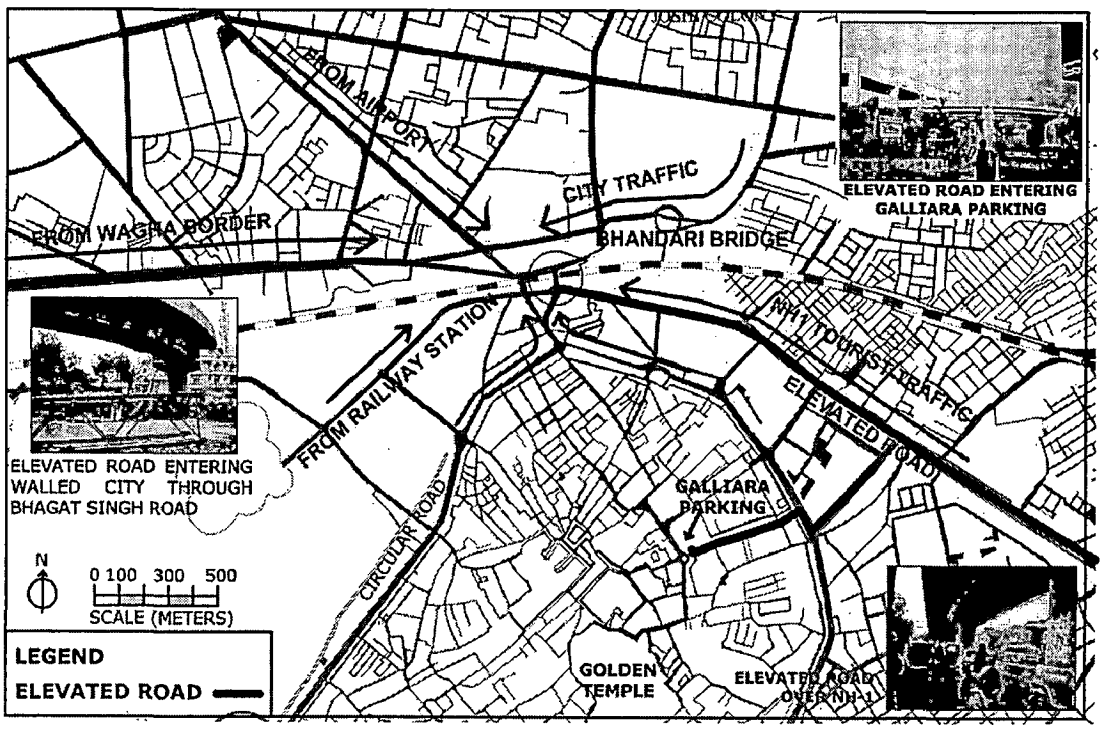


Figure 6.1.3.3.3 Converging Traffic at Bhandari Bridge (Source: By Author)

6.1.4. Construction of bridge

Bhandari Bridge receives traffic from six roads of Amritsar. The road network of Amritsar is such that all major roads converge at one point. Heavy traffic is observed from NH1, from airport road and from Wagha borde (Figure 5.1.2.1). There is always huge traffic jam at this point. A new bridge should be constructed to distribute load on Bhandari Bridge.

6.1.5. Traffic Management

Condition of traffic management is bad. According to the surveys, it is one of the crucial problems of walled city area. The traffic has to be regulated for smooth functioning of area. Many problems of conflict can be solved through proper traffic management

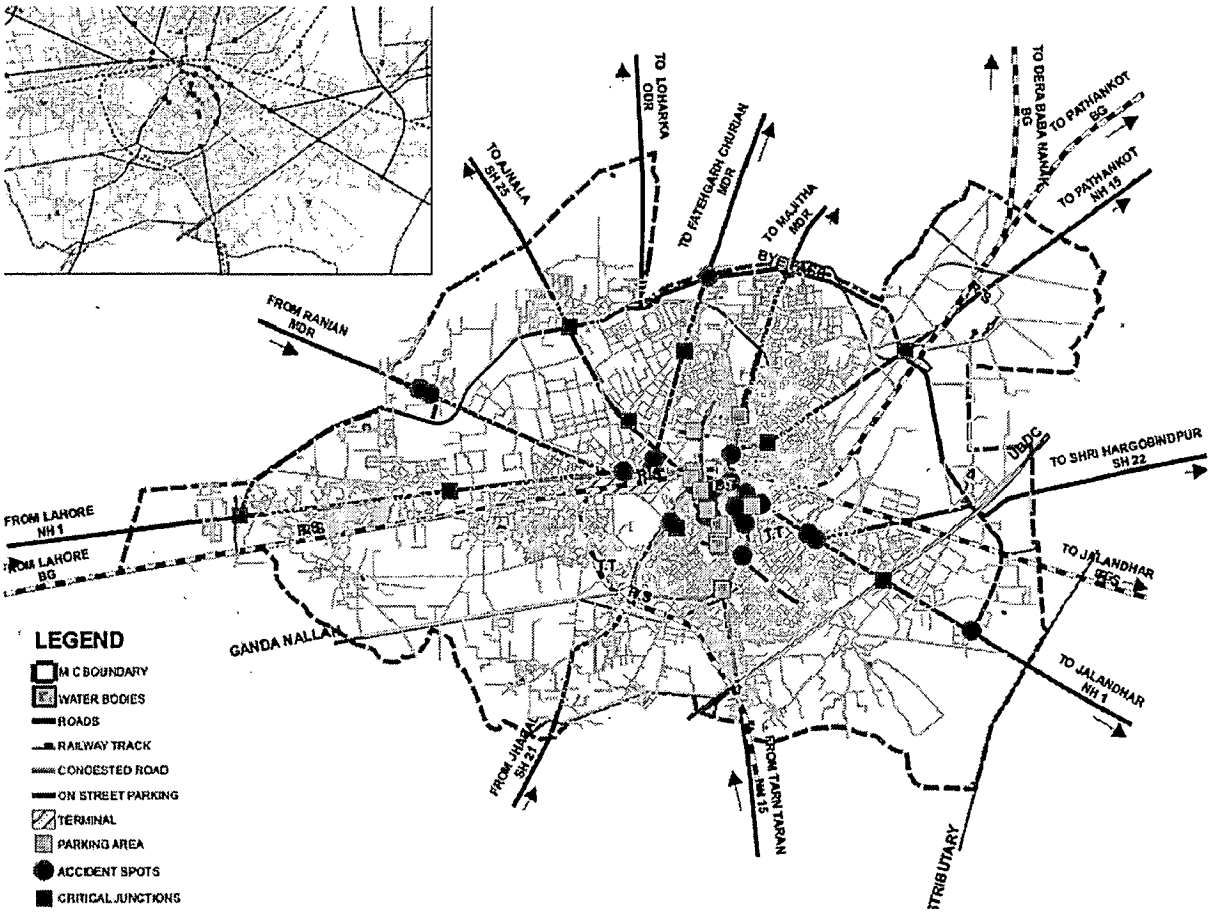


Figure 6.1.5.1 Accident Prone Areas and Critical Junctions of Amritsar city (Source: Mater Plan Report)

- According to the observation and literature study of walled city traffic conflict areas are accident prone areas have been identified (Figure 6.1.6.1).
- Hall gate has been identified as accident prone area by CDP as it acts as important entrance to Walled city
- Bandari bridge caries traffic of all the roads approaching Amritsar.

- Mahan Singh gate road is very narrow but it forms important link from bus stand to walled city are. The width of the road varies from 4 m to 6 m at certain areas.

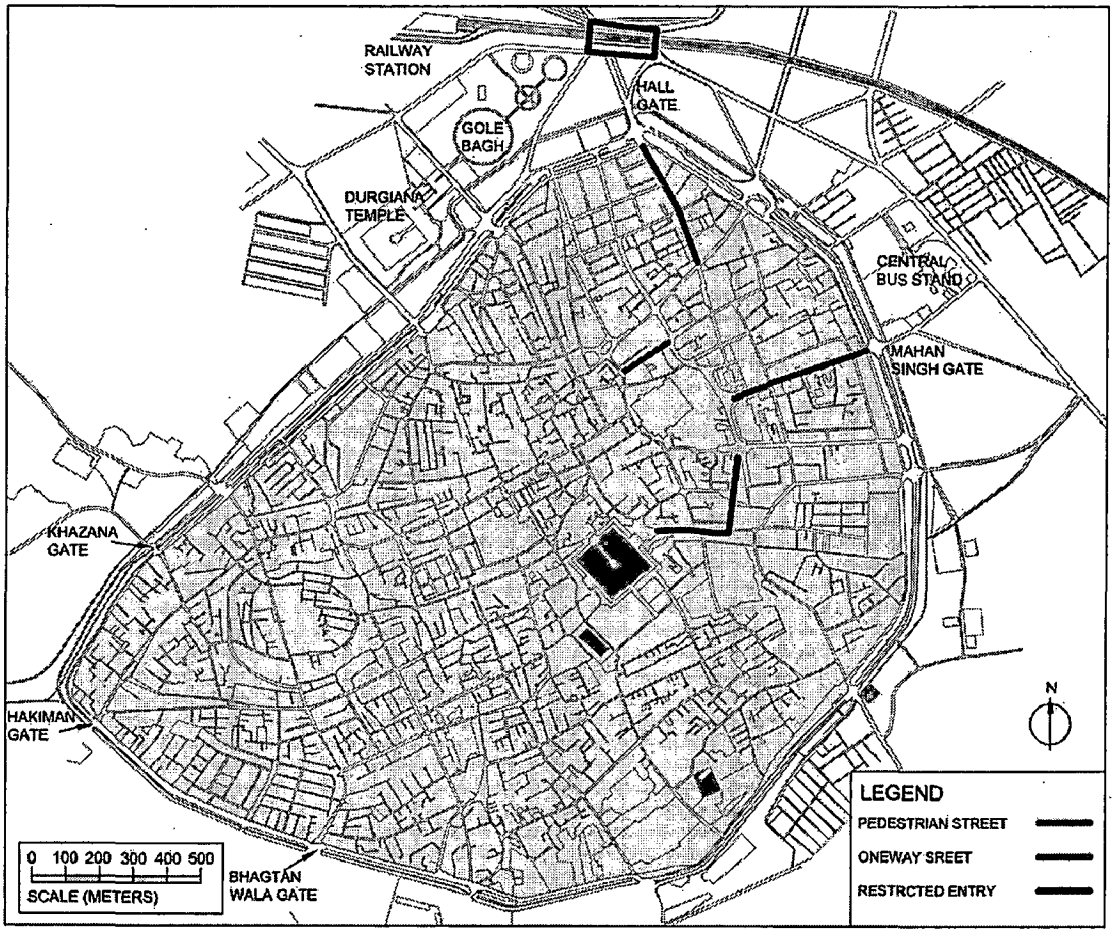
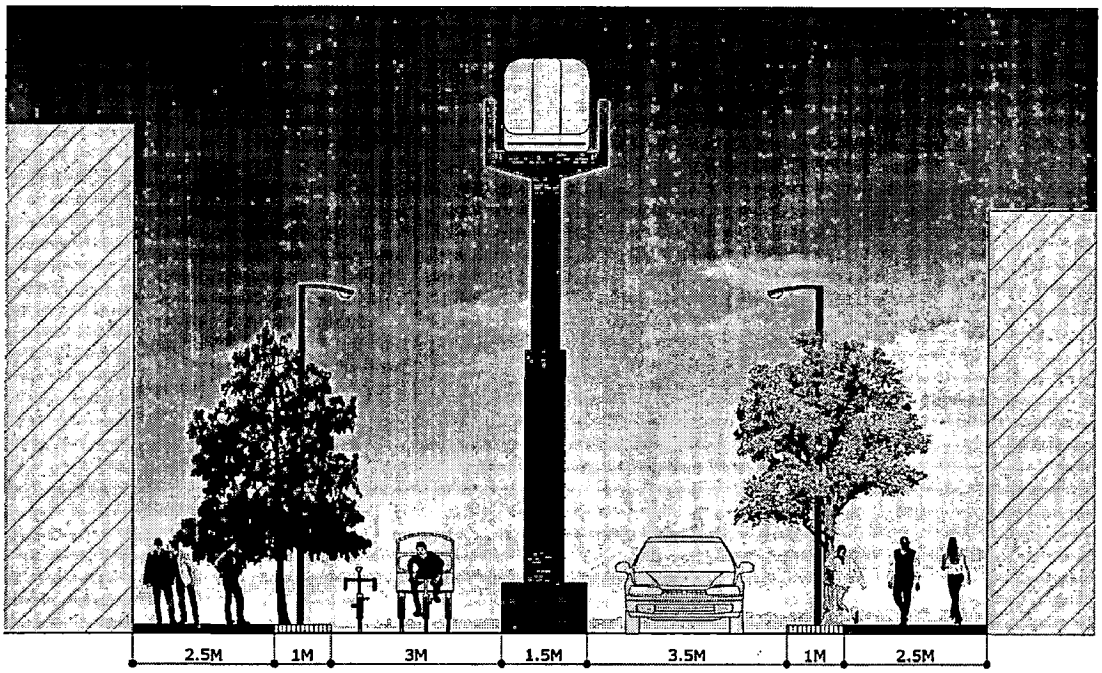
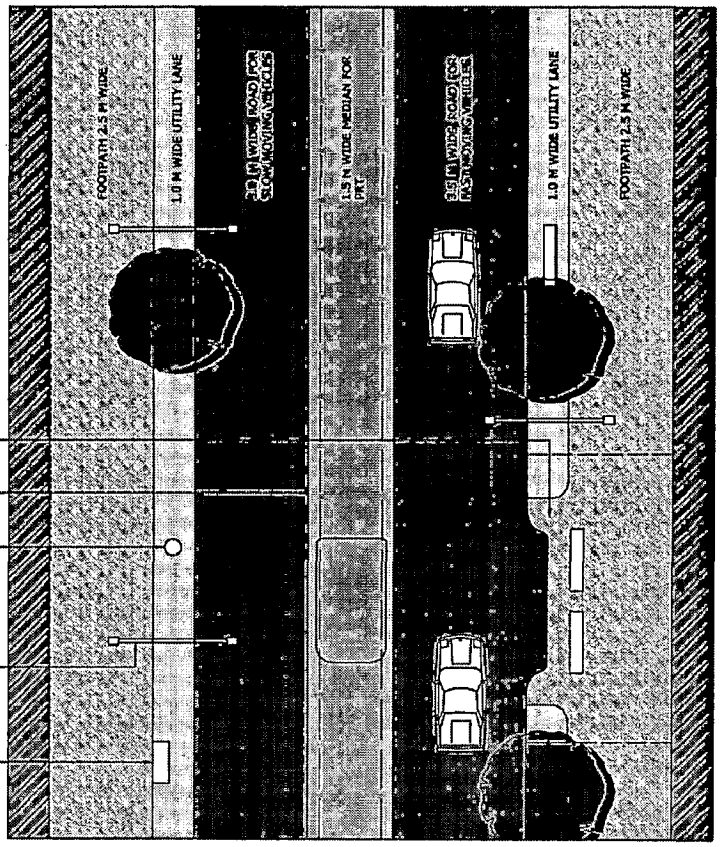


Figure 6.1.5.2 Traffic Management - one way roads and restricted entry roads (Source: By Author)

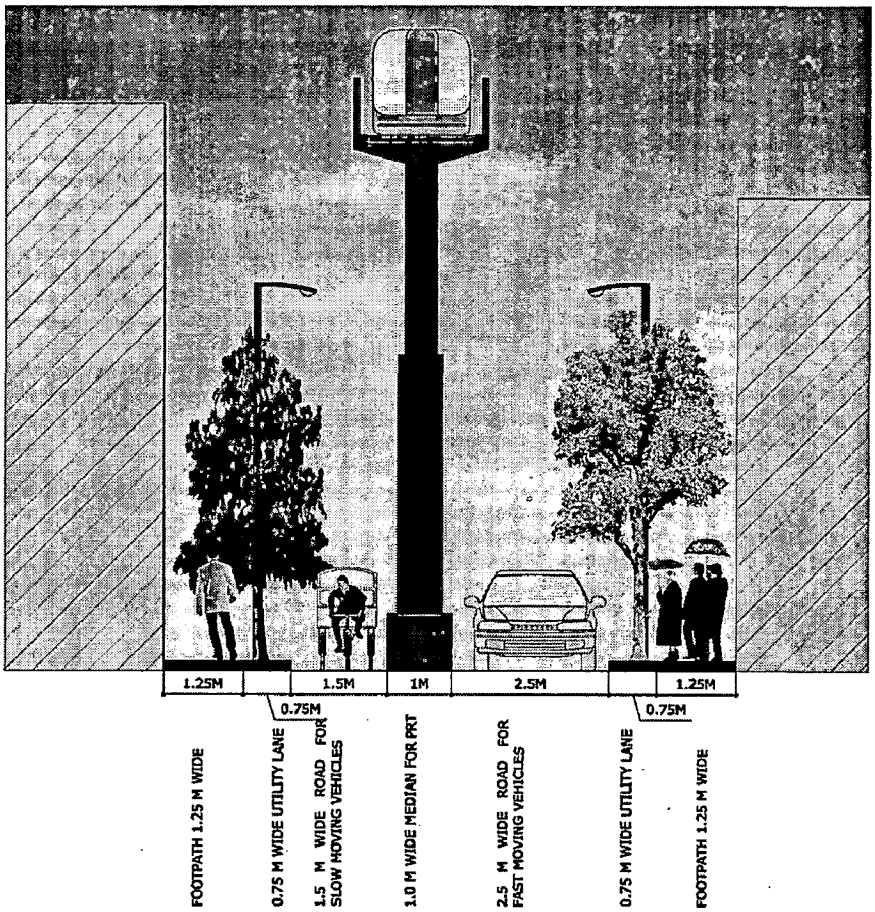
6.1.5.1. Implementation strategy

- Restricted entry: Jallianwala Bagh road (Shasti market to golden temple) should have restricted entry area. Vehicles should only be allowed from before 8.00 am and after 9pm. The length of the road is 400 m. and width of the road is 15 m (Figure 6.1.6.2)
- One way street: Hall Bazaar and Mahan sigh road is identified as one way streets (Figure 6.1.6.2). Length of one way road at hall bazaar is 400 m. The traffic at hall gate will get distributed due to one way entry. The length of one at Mahan Singh Road is 450m
- 5 multi storied parking have been proposed around walled city so that traffic can be managed.
- Electronic ticketing system should be adapted to for vehicles violating traffic rules.
- CCTV cameras should be installed at all major junctions to keel check on the traffic management.

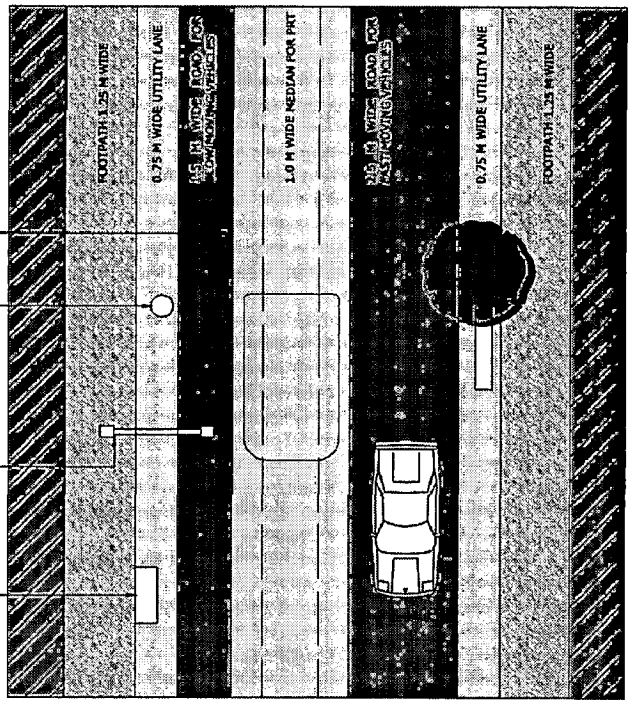




PLAN OF HALL BAZAR ROAD 15 M WIDE (ONE WAY)



SECTION OF MAHAN SINGH ROAD 9 M WIDE (ONE WAY)



PLAN OF MAHAN SINGH ROAD 9 M WIDE (ONE WAY)

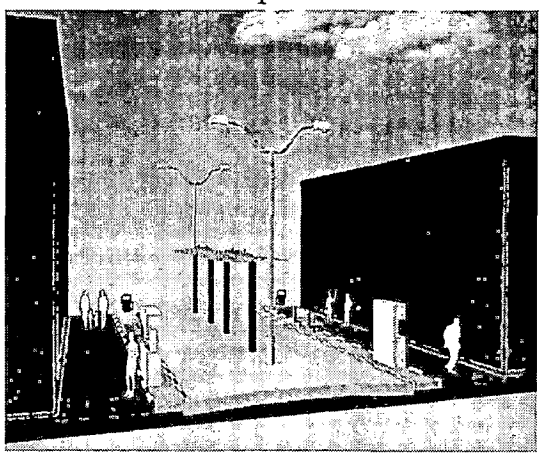
- Helmet should be worn by all the people driving 2-wheelrs
- Heavy vehicles are strictly prohibited. For loading and unload purposes only carrier is allowed for restricted amount of time
- Loading and unloading should be done before 8.00 am or after 10pm.
- Level of penetration

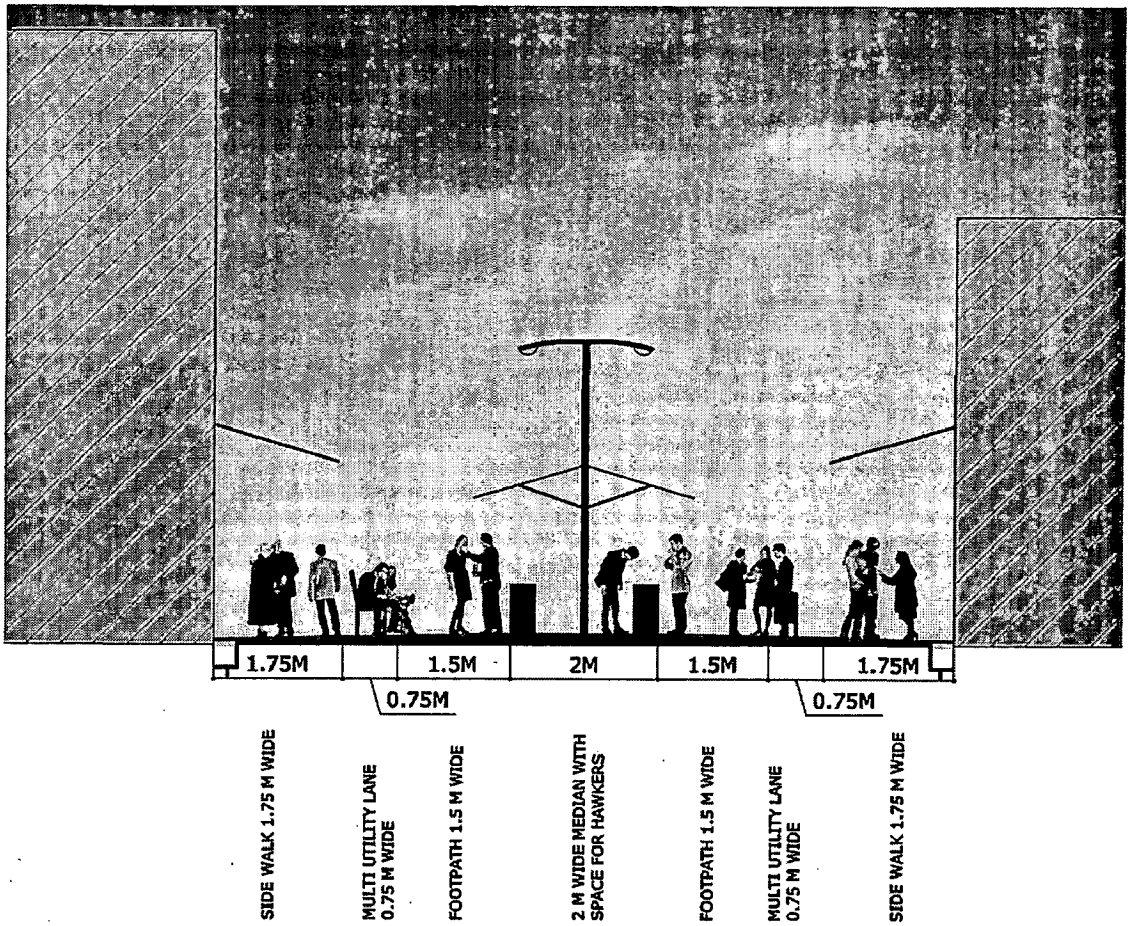
Sr no	Width of road	Types of vehicles allowed
1	3m wide	Only cycle, 2 wheeler, 4-wheelers completely banned
2	5m wide	Cycle , 2wheeler, and public transport 4-wheelers completely banned
3	9 m wide	Public transport, 4 wheeler, 2 wheelers, and cycles
4	12 m wide	Public transport, 4 wheeler, 2 wheelers, and cycles

6.1.5.2. Pedestrianization of Jaimal Singh Road

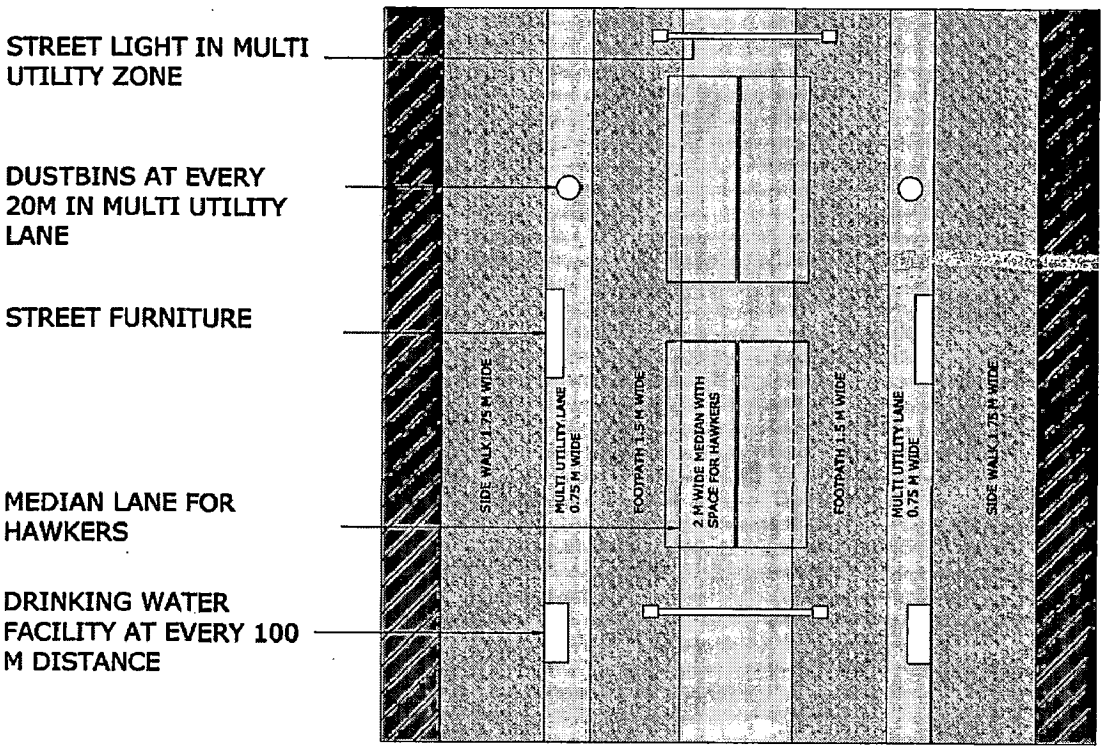
Pedestrianization means removal of all motorized traffic from the shopping street and turning it into a pedestrian way. This can bring in major environmental benefits at a relatively little cost. Users of pedestrianized streets benefit from clean air, free from traffic fumes. Pedestrianization can increase overall productivity by reducing total transportation cost including costs to consumers, businesses and governments of for vehicles, parking and roads. It can be a catalyst for more clustered development patterns that provide economies of agglomeration, which can reduce the costs of providing public services and increase productivity due to improved accessibility and network effects.

- Jaimal Singh road is one of the busiest roads of walled city. This road receives heavy amount of traffic as well as pedestrian activity. On street parking of 2-wheeres Hawkers, pedestrian activity, movement of cars, autos, and carriages all lead to chaotic atmosphere. The width of the road is 10m and length of the road is 150 m.
- Vehicular activity can be considerably decreased with help of mini bus service and PRT system
- Economic activity shall increase as residents and visitors enjoy shopping experience
- Pavement of road should be changed and space for hawkers designated,
- Complete ban of vehicles on this road. Carriage vehicles for loading and unloading should by allowed before 8 am and after 10 pm
- Street furniture with shade and lighting should be installed

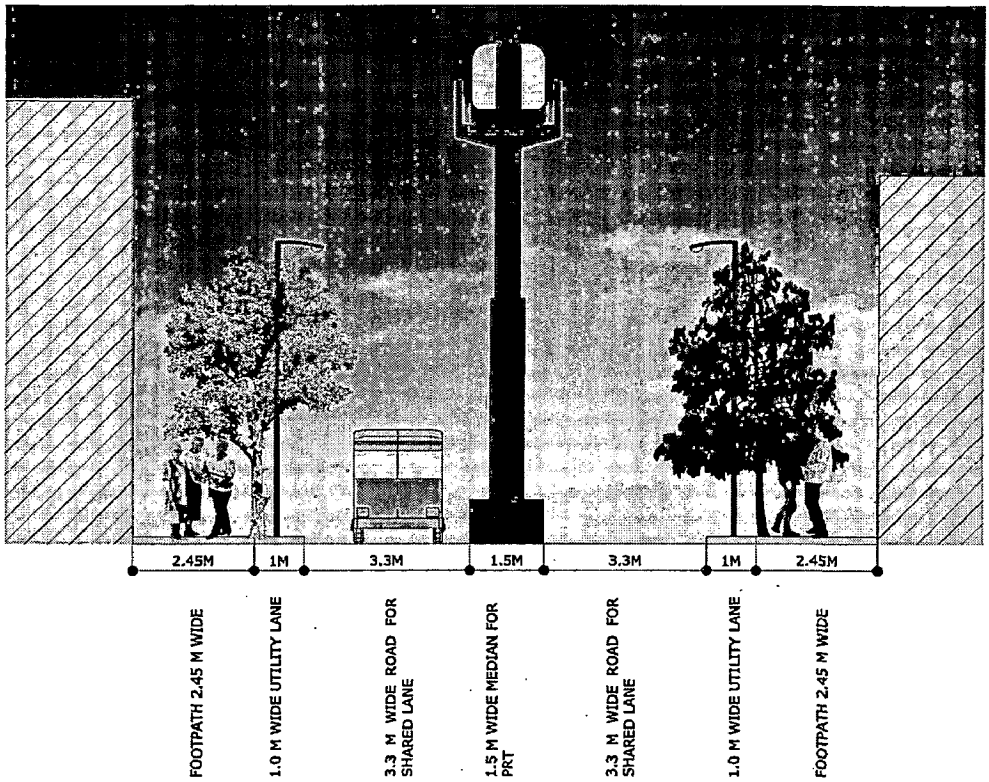




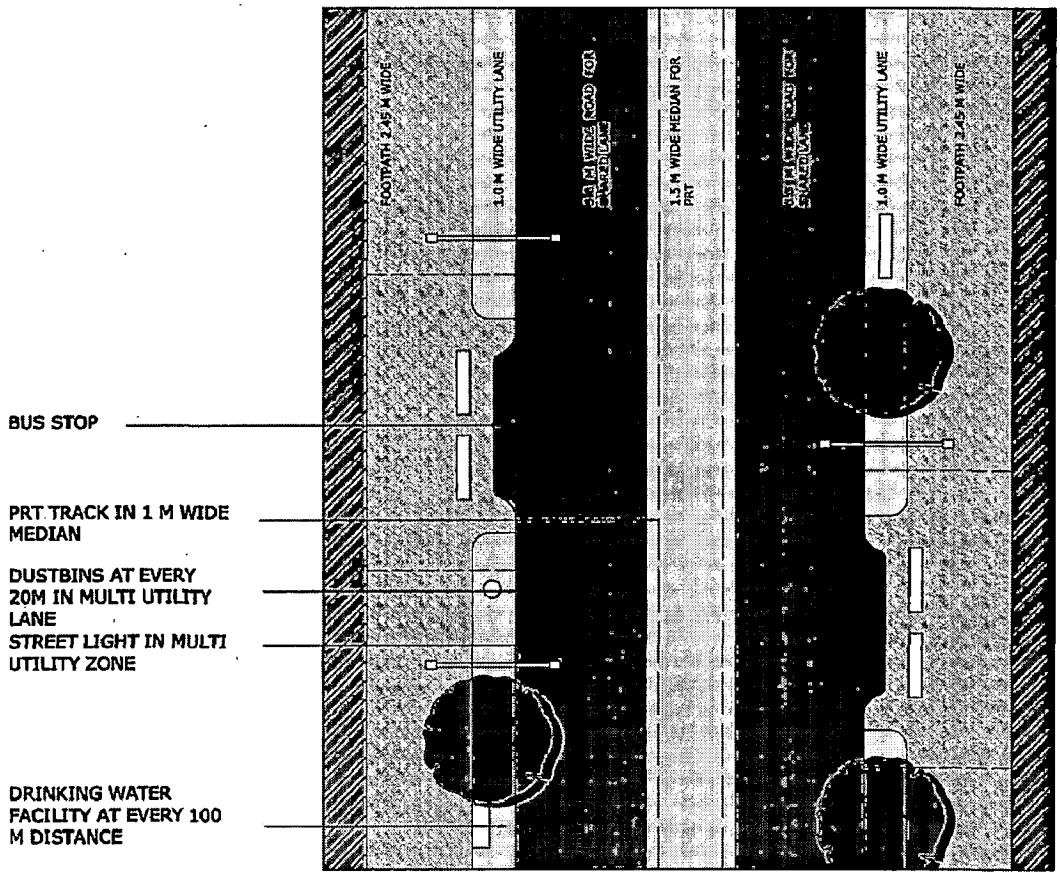
SECTION OF JAIMAL SINGH ROAD 10 M WIDE (PEDESTRIAN ROAD)



PLAN OF JAIMAL SINGH ROAD 10 M WIDE (PEDESTRIAN ROAD)



SECTION OF JALLIANWALA BAGH ROAD 15 M WIDE
(RESTRICTED ENTRY)



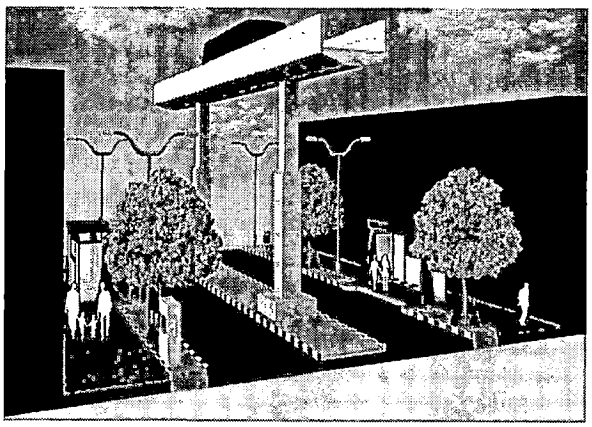
PLAN OF JALLIANWALA BAGH ROAD 15 M WIDE
(RESTRICTED ENTRY)

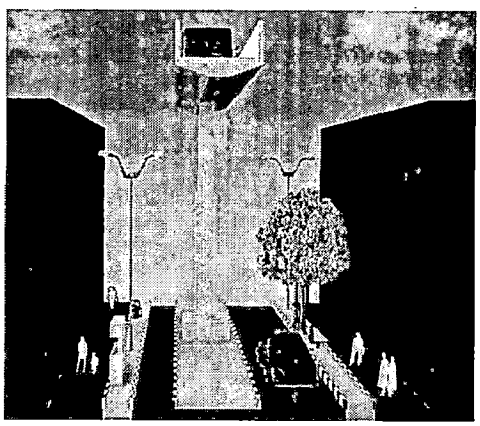
6.1.5.3. Restricted entry at Jallianwala Bagh road

- Jallianwala Bagh Road is approach road to Golden Temple and also Jallianwala bagh (landmark) is situated on this road.it receives high pedestrian movement as well as vehicular movement.
- Presently electric vehicles run from galliara parking to Golden Temple
- Vehicles should be allowed before 9.00 am and after 8pm. There are 5 parking spaces around Chowk Phowara where vehicles can be parked and road will be clear for pedestrian movement
- Dedicated pedestrian walkway is suggested. the width of the road varies from 15m to 12 m . 4 m pathway for pedestrian movement is required on both the sides of road. The remaining road can be used of battery operated vehicles.
- The footpath should be of 15 cm height with universal accessibility
- Only vehicles of the residents should be allowed to go though the road at indicated time through passes or special identification card.

6.1.6. Proposal for Better Pedestrian Environment

- All the main commercial roads should have street furniture such as benches, street light, drinking water facility, public toilets, dustbins, and footpath.
- Benches should be provided at every 50m. Drinking water facility at every 100m, dustbins at every 20m.
- Width of cycle track should be at least 2.5 m wide and width of footpath should be at least 2.5-3m
- Remove all encroachments on the roads and fine should be levied on encroached roads.
- Shading should be provided on all roads through trees and various shading devices.
- Ramps should be provided for universal accessibility.
- Bus stops should be provided with shade and information panel for mini bus and for city bus service.





6.2. Tourism and heritage

Tourism of the city is one of the concerns of the walled city. Amritsar received 30000 tourists each day. This number increases during festival and special occasions. Heritage of the city has been greatly affected by new construction. The master plan has proposed heritage zone with special regulations pertaining to heritage of the city. Heritage walk was introduced in September 2011 but has been a failure due to very few people attending the walk. Beautiful old structures hare hidden behind huge hoarding and advertisements which created visual disturbance. Two areas of concerns have been identified

- Heritage zone and Heritage walk
- Tourist friendly city

6.2.1. Heritage zone and Heritage walk

Heritage zone has been proposed by master plan of Amritsar. The area under the Heritage Zone is approximately 244 acres. All the services laid down in the heritage zone shall be made underground including, electrical, telephone etc. in order to minimize visual pollution. All unauthorized constructions shall be removed; height of the buildings constructed in heritage zone shall be regulated in order to ensure that no buildings are constructed more than the existing height so that the ambience of Heritage building is not diluted. The use of material on the facade shall be brick and wood, concrete and glass not permitted to be used.

Heritage walk has been initiated by Punjab Heritage and Tourism Promotion Board. Two guides have been hired. Total length of the walk is 3 km with total 14 heritage spots. Visitors take guided walk tour of city every morning at 8.00 am. The walk was chalked out by Debashish Nayak.

The heritage walk and heritage zone do not coincide with each other. Three of the heritage spots lie outside heritage zone (Figure 5.2.1.1). Chorasti Atari which housed Guru Ram Das ji during the construction of Golden Temple has not been covered in the Heritage Zone. This area was the first area developed in the city, craftsmen and merchants settled in this area.

Chourasti Atari, Darshini Deorhi, and Tharuk Dwara, have unique heritage character with beautiful wall paintings and marvellous craftsmanship. The area of the heritage zone is proposed to be extended as shown in figure.

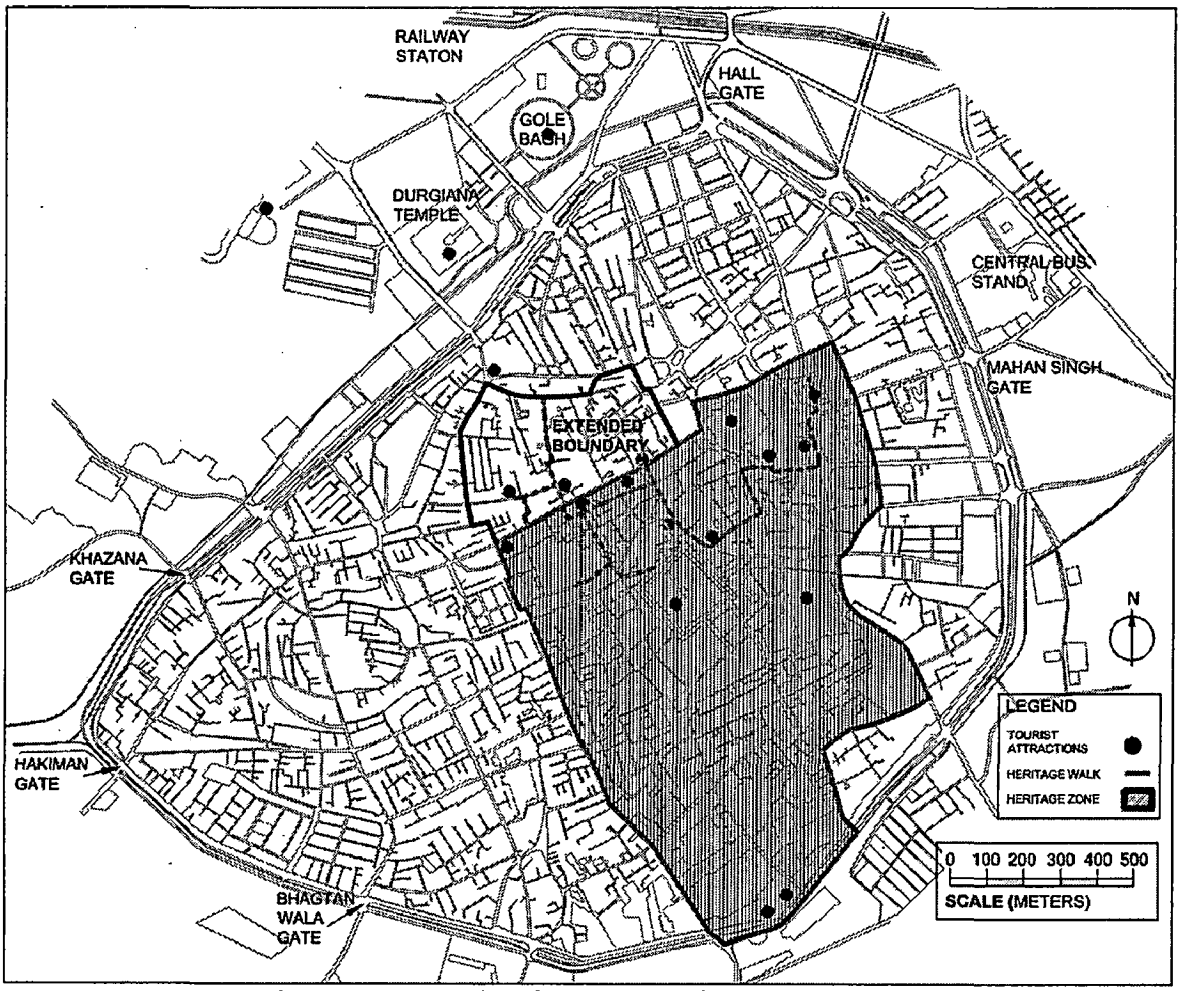


Figure 6.2.1.1 Extension of Heritage Zone (Source: By Author)

To promote heritage walk certain measures are required to be taken as given below:

- Promotion of the Heritage walk by advertisement through written and visual media.
- Heritage walk takes place at 8.00 in morning. There is no consideration for elderly, disabled, and children. The pavements ant the streets through which the walk is conducted should be universally approachable.
- Emphasis on heritage conservation should be given. Facade treatment and conservation of important buildings should be done
- Street furniture , drinking water facility, public toilets, should be provided for comfortable experience
- Schools and colleges should be invited to join the walk at lower rates
- Special vouchers should be distributed among different sections, such as government employees, teachers, students, tourists, etc.
- Awareness among the public is essential. Efforts to promote awareness among the people should be enhanced.

6.2.2. Tourist friendly city

For promotion of tourism, very little efforts have been observed from government. Light and sound effects equipment was installed at Golden Temple and Jallianwala Bagh. The information centers at railway station, airport and at Golden Temple.

- Tourist information centers should be established at airports, railway sation , bus stand and at important tourist locations such as Golden Temple, Jallianwala Bagh, Durgain Mandir, Gol Bagh, Ram Bagh, Gurudwara Shaheed Ganj, Gobindgarh Fort.
- Adoption of audio and visual aids at entrance of every monument explaining , its history, culture and importance in different Indian and foreign languages
- Employing better signage inside monument explain its history and importance in English, Hindi and Punjabi.
- Emergency help desk should be installed at every monument.
- Hoardings and signage should be regulated which create visual discomfort and destroy the character of the walled city.

6.3. Solid Waste Management

Solid waste management of the walled city is in very bad condition, garbage heaps are lying around in front of historic places, market areas and streets. This creates an unpleasant atmosphere for residents as well as for visitors. Solid waste management program has been started by Municipal Corporation. The program has been incomplete and incompetent. Under this program only collection of the garbage, and disposal of garbage to landfill site is done through special solid waste management vans. The limitation of the solid waste management is that roads being narrow, collection is difficult, but mules are being used where cart cannot enter

Aim of the project: to develop a comprehensive solid waste management program for walled city of Amritsar.

6.3.1. Steps for Solid Waste Management

Solid waste management has three steps from waste collection, storage, transportation and finally disposal.

6.3.1.1. Segregation at source

Waste management at source is very important to consider recycling, or reuse of the waste. The waste should be collected in three separate bins for biodegradable, no degradable, and hazardous waste.

- Biodegradable waste include kitchen waste, paper, cloth, garden waste, newspapers,
- Non degradable waste: plastic bottles, tin cans, plastic bags,

- Hazardous waste: dead batteries, and e-waste,

The Solid waste management should be done according to the source, location and activity.

- Household waste: waste should be collected in three bins from household itself. Waste should be collected every day. Waste should be managed in household itself, two dustbins should be used at each household.
- Waste from commercial centers, markets, shops and institutions: collection of waste should be separate in bins for bio degradable and non degradable waste. Provide separate community bins for segregation of waste
- Waste from hotels and restaurants: most of waste from hotels and restaurants is biodegradable. Every restaurant or hotel should be instructed to dispose off their waste at night or early morning into community dustbin.
- Waste from street food vendors: two types of dustbins should be located at important places and instructions should be given not to throw off waste on streets and pavements.

6.3.1.2. Transportation and Storing

Three types of bins should be installed for temporary storage of waste. The bins should be of three different colors, covered with lid and should have handles on either side. The lids should be easily openable. For transportation of waste, special utility vehicles should be used with separate compartments.

6.3.1.3. Disposal

- Biodegradable waste should be converted into manure and separate plants should be installed for this purpose at community level. This manure can be sold to farmers, residents and can be used for community gardens
- Waste that is non degradable should either be disposed into land fill.
- Hazardous waste and hospital waste should be disposed off separately taking care it does not pollute environment

6.3.1.4. Implementation strategy

- Awareness drive should be carried out for residents. Information regarding solid waste management shout be easily available in form of pamphlets. Students should be educated at schools regarding waste management.
- Plastic bags should be banned completely and fine should be levied on people using plastic bag or shopkeepers giving out plastic bags.
- Reuse centers should be created in each locality so that, e-waste or discarded clothes and materials can be reused. Treated manure can be sold at these centers.
- Kabari walas and rag-pickers should also be included in the program and organized.

People should be educated to reduce waste. Educational program should be setup to help residents. A special toll-free hotline "Waste Aware" should be established for people for inquiries.

6.4.Implementation of proposals

The above mentioned proposals can be implemented on public private partnership to ensure speedy implementation. The best way of implementation of the project is through local bodies. Various departments of already established local body i.e. municipal corporation should be envolved.

6.5.Future prospects

The proposals stated above have been suggested to solve the present problems of the city. These proposals deal with the first 4 priorities of the walled city area. Once these proposals are implemented, the second phase of the project can be started. The proposals for the second phase are given below.

- Employ advance technologies such as vehicle detection system for better control and management of traffic.
- Automatic ticketing through CCTV cameras and vehicle detection system can be used.
- Congestion charges should be used for core areas to discourage use of personal vehicles and encourage use of public transport.
- Use of LED based signage and information boards for one ways streets and speed limit.
- Extension of mass transit systems and further improvement in other public transport systems to ensure better accessibility and comfort.
- Pedestrianisation of internal roads to decongest streets.
- Zero waste drive should be initiated so that minimum waste is produced, and waste that is produced should be used to 100%.

6.6.Regeneration Guidelines for Indian cities

Regeneration is a fairly new concept for Indian cities. Revitalization of Jaipur and Redevelopment of Shahjahanabad are few examples of urban development in old areas in India. Old cities were designed to cater pedestrian movement. But with vehicles penetrating the core of these cities, is destroying the pedestrian environment of the area and creating a chaotic atmosphere. Proposals for Jaipur and Shahjahanabad deal with transportation improvement, traffic management and preserving the heritage character of the city. The walled city Amritsar also has similar problems pertaining to lack of feasible public transport, traffic problem, lack of concern for heritage of city, and solid waste management.

Regeneration principles are similar to redevelopment or renewal schemes. In addition it lays importance in opinion of the residents and stake holders and public private partnerships. It also gives importance to social, cultural and environmental issues. Surveys are conducted and analysis for priority of problems is drawn. According to the economic viability and opportunity the proposals are given.

General guidelines for regeneration plan for Indian cities.

- Assessment of present situation through collection of primary and secondary data
- Analysis of plan proposals such as master plan city development plan and other proposed projects. Analysis of primary survey
- Give importance to opinion of stakeholders and experts.
- Give proposals according to economic viability, environmental concern, upliftment of social and cultural situation.
- Encourage public and private partnerships.
- Assessment and monitoring of proposed projects through surveys.

6.7.Conclusion

The study has been worth undertaking to shed some light on grim situation of our historic core areas. The desertion study has helped in evolving certain significant strategies and proposing some valuable and guidelines for regeneration of historic core areas of Indian cities. The study has highlighted the scope of improving traffic management and transportation in these areas. A need to reinvestigate existing street sections has been highlighted. Encouragement of public transport as popular way of travel has been emphasized. The study highlights the need to upgrade pedestrian facilities and pedestrian atmosphere. The study also gives importance to revive historical structures and encourage historic walks. The study gives importance to environmental concerns such as proper segregation of solid waste. Regeneration policy may hold key to transform urban development into sustainable, economically viable and people friendly in future.

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Annexure #1

Survey of Infrastructure of Walled City, Amritsar (For Experts)

Department of Architecture and Planning, IIT, Roorkee.

Name.....

Organization.....

Designation.....

1. Assign priority wise **1-10 nos** to problems in walled city of Amritsar

- ☐ Insufficient water supply
- ☐ Open drains
- ☐ Broken roads
- ☐ Traffic congestion
- ☐ Lack of sewage facility
- ☐ Insufficient power supply
- ☐ Lack of tourist facility
- ☐ Flooding during rainy season
- ☐ Littering/garbage on roads and public areas
- ☐ No proper solid waste management program
- ☐ Pollution
- ☐ Lack of public transport
- ☐ Lack of social infrastructure (schools, dispensary, hospitals etc)
- ☐ Lack of green spaces
- ☐ No efforts on heritage Conservation
- ☐ Other

2. In your opinion whether walled city area have **improved** or **degraded** in last 20 years ?
3. According to you what activities or uses should be **stopped or removed** from walled city area ?

- ☐ Meat shops and fish markets
- ☐ Dairy and cow shelters
- ☐ Vehicular traffic
- ☐ Hoardings
- ☐ Cinema halls
- ☐ Other

4. How do you rate infrastructure conditions in walled city? Use √ for your answer

	Excellent	v. good	good	satisfactory	unsatisfactory	poor
Water Supply						
Waste water management						
Solid waste management						
Power/ electricity						
Public transport						
Traffic management						
Pedestrinization						
Pollution control						
Public sanitation						
Tourist facility						
Other						

5. In your opinion how will PRT (Personal Rapid Transit) system affect the walled city ?

☐ Will provide easy transport to tourist and residents

☐ Hamper heritage character of walled city

☐ Too costly for everyday use

6. According to you what should be done to improve walled city, Amritsar ?

.....

.....

.....

.....

.....

Annexure #2

Survey of Infrastructure of Walled City, Amritsar (For Residents)

Department of Architecture and Planning, IIT, Roorkee.

Name.....Ward No.....

Address.....

No of members in house hold ..... No of members earning ..... No of adults.....

1. **Water Supply**
   What is the source of your water needs? ☐ Govt. Supply ☐ Private Supply ☐ Others
   Frequency of supply ☐ daily ☐ alternate day ☐
   others.....
   Average duration of supply in hrs ☐ 24 ☐ 12-24 ☐ 6-12 ☐ 3-6 ☐ 1-3 ☐ <1
   Quality ☐ good ☐ satisfactory ☐ bad
   Average monthly expenditure on water.....
2. **Electricity**
   Average duration of supply (in hrs) ☐ 24 ☐ 18-24 ☐ 12-18 ☐ <12
   Frequency of power cut ☐ daily ☐ weekly ☐ occasionally ☐ never
   Average monthly expenditure on electricity.....
3. **Waste water management**
   Waste water is managed by ☐ sewerage connection ☐ septic tank
   Average monthly expenditure.....
4. **Solid waste collection and disposal**
   Is waste collected from your resident yes/ no
   If no, how do you dispose of your household
   waste.....
   If yes, by whom ☐ public arrangement ☐ private agency ☐ self
   Frequency ☐ daily ☐ alternate day ☐ others
   Average monthly expenditure.....
5. **Transport**
   No of transport modes your household has: ☐ cycle ☐ 2- wheeler ☐ 4- wheeler
   How do you travel to work: ☐ walk ☐ cycle ☐ scooter ☐ 4- wheeler ☐ bus ☐ other
   How does your child reach to school/college: ☐ walk ☐ cycle ☐ bus ☐ other
   What public transport modes are there in city: ☐ bus ☐ train ☐ other
   What are para-transport modes in city: ☐ auto ☐ taxi ☐ rickshaw ☐ other
   Average monthly household expenditure on travel and transport:.....
6. **Tourism**
   Which places you visit in around walled city.....
   What problem you face any during peek season.....
7. Assign priority wise **1-10 nos** to problems in walled city of Amritsar

   ☐ Insufficient water supply
   ☐ Open drains
   ☐ Broken roads

- ☐ Traffic congestion
- ☐ Lack of sewage facility
- ☐ Insufficient power supply
- ☐ Lack of tourist facility
- ☐ Flooding during rainy season
- ☐ Littering/garbage on roads and public areas
- ☐ No proper solid waste management program
- ☐ Pollution
- ☐ Lack of public transport
- ☐ Lack of social infrastructure (schools, dispensary, hospitals etc)
- ☐ Lack of green spaces
- ☐ No efforts on heritage Conservation

8. In your opinion whether walled city area have **improved** or **degraded** in last 20 years ?
9. According to you what activities or uses should be **stopped or removed** from walled city area?

- ☐ Meat shops and fish markets
- ☐ Dairy and cow shelters
- ☐ Vehicular traffic
- ☐ Hoardings
- ☐ Cinema halls
- ☐ Other

10. How do you rate infrastructure conditions in walled city? Use √ for your answer

	Excellent	v. good	good	satisfactory	unsatisfactory	poor
Water Supply						
Waste water management						
Solid waste management						
Power/ electricity						
Public transport						
Traffic management						
Pedestrinization						
Pollution control						
Public sanitation						
Tourist facility						
Other						

11. In your opinion how will PRT (Personal Rapid Transit) system affect the walled city ?

- ☐ Will provide easy transport to tourist and residents
- ☐ Hamper heritage character of walled city
- ☐ Too costly for everyday use

Annexure #2: Article

Tourism Development of Walled City of Amritsar

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Abstract:

Position of Punjab in terms of tourism is low and it only serves as transit route for nearby tourist potential states of Himachal Pradesh, and Rajasthan. Amritsar is an important city of Punjab where rich heritage and culture still persist. Government has launched projects to boost tourism in Amritsar but the results of these projects are disappointing. This paper analyses the shortcomings in these projects and discusses plan proposals to boost tourism prospects of walled city of Amritsar.

Amritsar: Introduction

Amritsar, second largest city of Punjab, is located in the western side of Punjab bordering Pakistan. Amritsar is located at 31'37"N latitude and 74'55" E latitude. The total population of Amritsar city is 1183705 as per census 2011. The population density is 8314 person per square kilometer (Figure 1). The total area of Amritsar Municipal Corporation is 142.37 square kilometer.

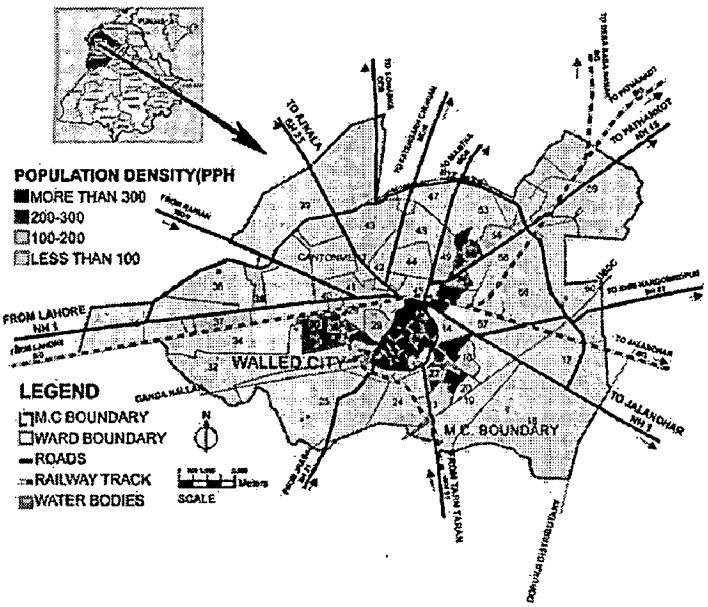


Figure 1 Ward Map of Amritsar City (Source: MCA)

Walled City, Amritsar

Most of the tourist spots and historical buildings are located in and around the Walled city area of Amritsar. It has a history of 433 years and is characterized by narrow winding street pattern. Golden Temple is situated at the centre of the Walled City. The area of walled city is 350 hectares and total population of 135260 (census 2011). The population density of walled city is 38145 person per square kilometer (Figure 2). It constitutes only 2.44 % of Municipal Corporation area but accommodated 11.94% of total city population (Table 1).

Table 1 Population of Amritsar City and Walled city (Source: Census Statistics)

Year	Amritsar MC	Walled City	%age of Walled City Population
1991	708835	116885	16.49
2001	1003917	151769	15.12
2011	1132761	135260	11.94

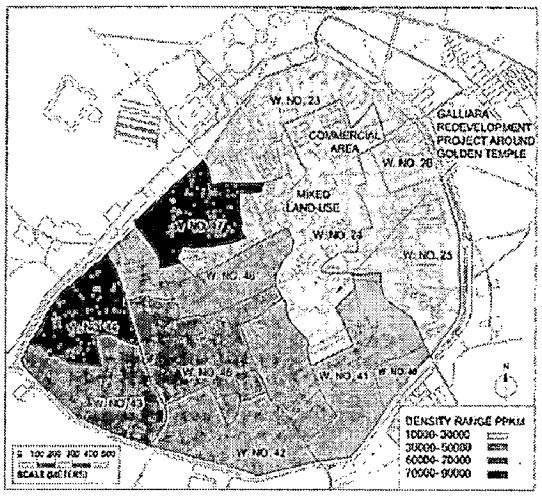


Figure 2 Ward Wise Density of Walled city, Amritsar (Source: by author)

Population of walled city has decreased in recent years. This is partly due to unhygienic and chaotic conditions of the area and demolition of 1761 buildings under Galliara Redevelopment Project (Figure 2).

Table 2 Land-use pattern of Walled City Amritsar in 2010 (Source: Town Planning Department, MCA)

S.n	Land-use	2000	2010
1	Residential	56.15	53.84
2	Commercial	15.3	14.61
3	Institutional	6.06	6.06
4	Mixed use	3	6.0
5	Parks and open spaces	3.44	3.44
6	Water bodies	0.05	0.05
7	Roads and pavements	16	16

The land-use pattern of walled city area has seen increase in mixed land-use and decrease in net residential and commercial area (Table2). The northern part of the walled city has all the important markets of Amritsar and has lower density and maximum mixed land-use (Figure 2, Figure 3).

History of Walled city

The fourth guru, Sri Guru Ram Dass Ji in 1577 AD started the construction of Harimandar Sahib (Golden Temple). Maharaja Ranjit Singh's period is considered as golden period of Amritsar. It was during this period Harmandar Sahib was covered with gold sheets by Maharaja Ranjit Singh and a wall was constructed with 12 gates for its protection. During British period new developments came up namely, railway station, town hall, colleges, schools and hospitals. In post independence period a short term project was undertaken for redevelopment of area within 30 m belt around the Golden Temple complex called Galliara Project in 1988

Landmarks and Heritage of Walled city

Apart from Golden temple, Jallianwala Bagh is an important landmark of walled city area. Other historic and cultural landmarks include Town hall, Gurudwara Shaheed Ganj, and Gurudwara Santoksar (Figure 3). Heritage of the city includes Gates, Wall, Gurudwaras, Akharas (learning centers), and the famous Amritsar bazaars reflecting culture and cuisine.

Tourism Infrastructure of Amritsar

Amritsar stands at the highest score of 4.10 out of 5 in Tourism Destination Prioritization chart in the 20 Year Perspective Plan for Development of Sustainable Tourism in Punjab. But the ground reality of tourism infrastructure of Amritsar is very different.

There is no public transport system in Amritsar. Tourists are left at the mercy of autos and taxis, which charge a lot.

Due to absence of public transport, the population of private vehicles continues to increase, creating congestion on roads. Parking facility is available only around Golden Temple. On street parking on main markets of Walled city has led to traffic chaos and congestion.

Cloak room, and information centers are available for visitors at railway station, bus stand, and Golden Temple. Apart from these small measures, an integrated approach to infrastructure development for boosting tourism is missing.

Tourism Development Issues

- The city has inadequate tourist infrastructure and transport facilities.
- Lack of public transport and congestion on roads have created negative impacts on tourism potential of Amritsar
- There is need for tourist friendly and pedestrian friendly environment to appreciate the cultural heritage of the walled city.
- There is absence of conservation oriented byelaws, conservation plans and development efforts.

Review of Projects Undertaken so far

Many projects have been launched by the government to boost tourism oriented development but these projects have created more problems than resolve them.

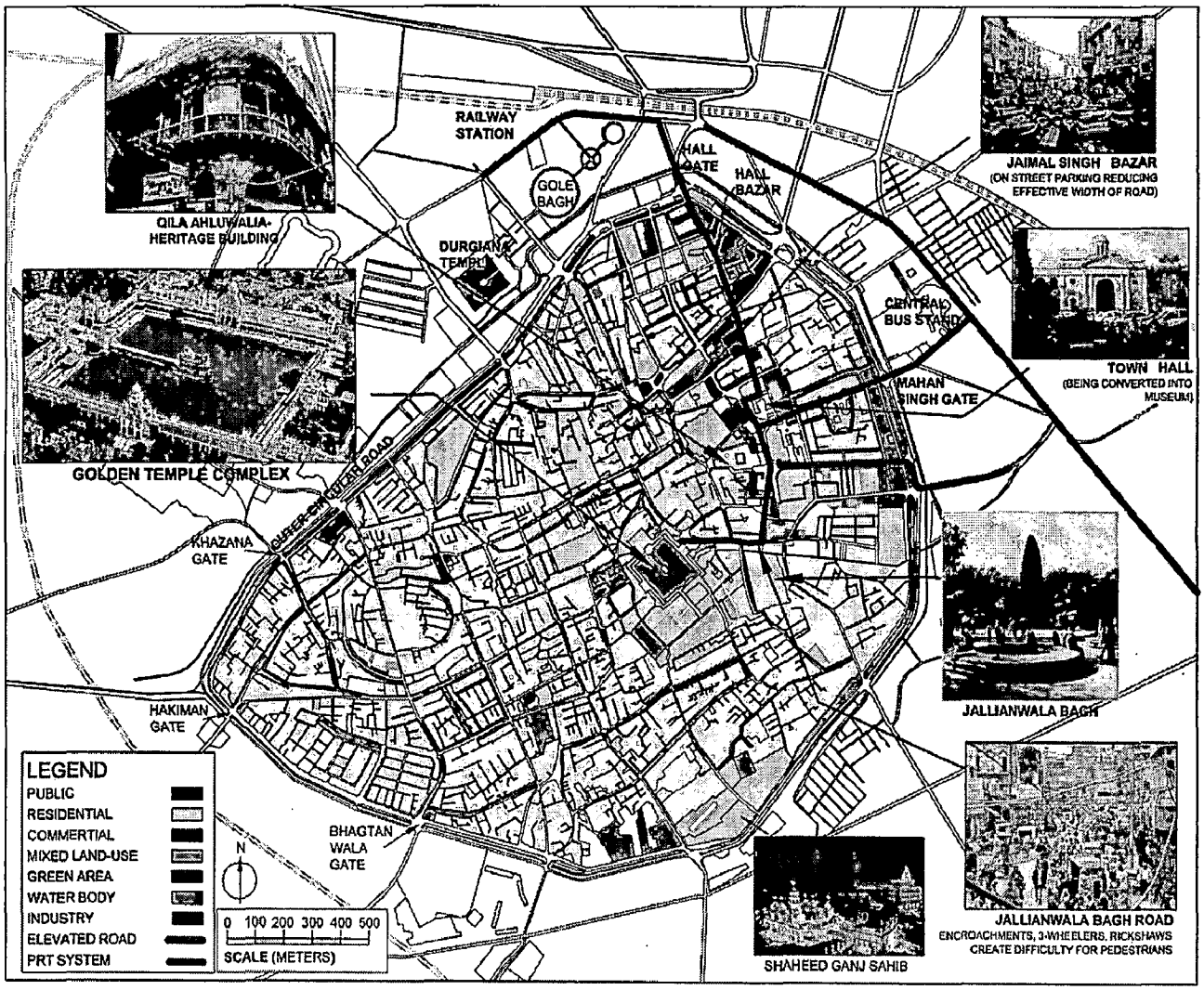


Figure 3 Land-use and Landmarks of Walled city of Amritsar (Source: by Author)

1. Elevated Road Project:

The elevated road project was approved and partly completed by the urban body of Amritsar. The elevated road has two parts one from Maqboolpura to Bhandari Bridge of length 3.25 kms and another elevated road from Ram Talai Chowk to Galliara parking of 0.9 kms length. The project was approved under JNNURM for 210 crore rupees (Figure 3, Figure 4).

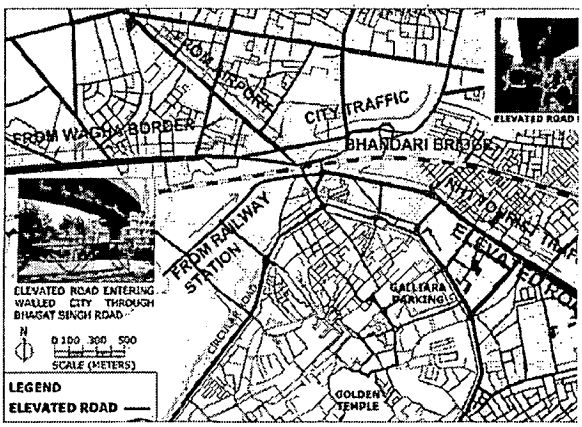


Figure 4 Conversion of Traffic on Bhandari Bridge (Source: By Author)

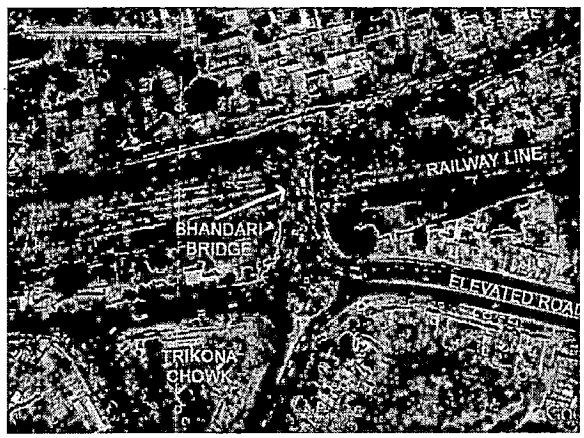


Figure 5 Bhandari Bridge Traffic Congestion (Source: Google earth)

The purpose of the project was to provide traffic free entry for visitors entering Amritsar through National Highway-1 from Jalandhar. But the elevated road on NH-1 bypasses the city traffic only half way and lands the visitors in the middle of the city at Bhandari Bridge where all the city traffic converges.

Bhandari Bridge is already crowded as it is the connection with old walled city and new city. Elevated road has created more traffic problems at this junction (Figure 5).

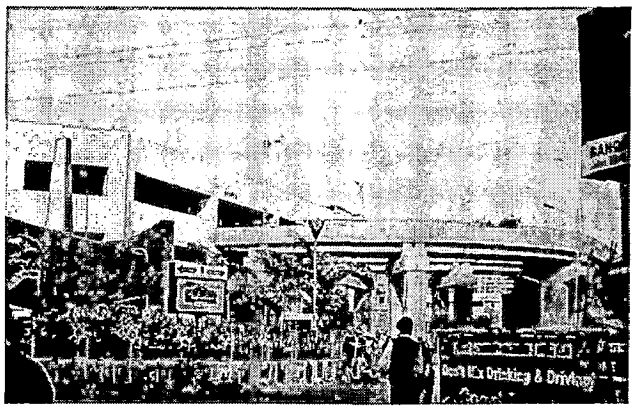


Figure 6 Elevated Entering Galliara Parking (Source: Primary survey)

Tourists visiting Golden Temple in Walled city have to go through a series of traffic jams in congested streets of Walled city. Although there is direct connectivity through 0.9 km elevated road to Galliara Parking having capacity for 1255 cars, there is no indication before entering the flyover if the parking is full or empty (Figure 6). This creates problems for vehicles using elevated road.

2. Heritage Walk:

The Punjab Heritage and Tourism Promotion Board launched the Heritage Walk Project in September 2011. Within 6 months, the project became failure. The walk could not attract even 5 participants daily. The failure of the walk is mainly due to poor tourist friendly and pedestrian friendly infrastructure and lack of any attention

given to conservation of heritage buildings (Figure 7).

3. Personal Rapid Transit System (PRTS):

The PRTS project proposed by the government will connect railway station and bus stand to Golden Temple (Figure 8). The system will run on elevated guide ways, eco-friendly battery operated vehicles with capacity of 4-6 persons. The total length of the route is 3.3 km. The infrastructure cost of the system is estimated to be 198 crores. The cost of the trip will be 45 rupees per person
per km which is very high as compared to 10 rupees per person per km in auto rickshaw. One of the major drawbacks of the system is that it will not connect airport. The passengers willing to pay such high fare travel by air or by air conditioned railway coaches. Hence the ridership of the system will be low.

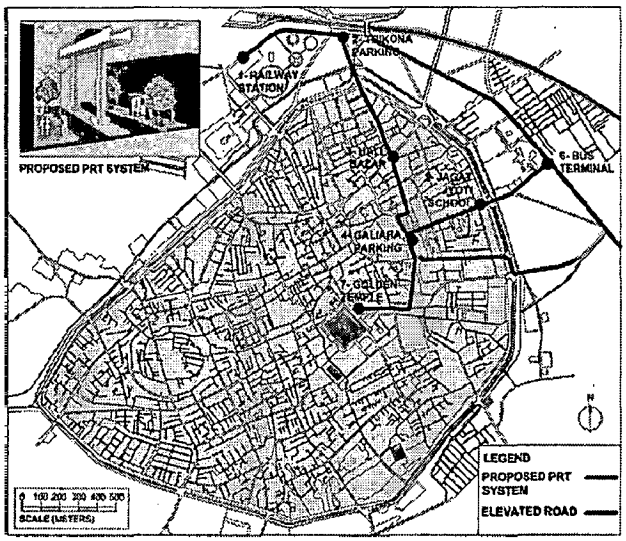
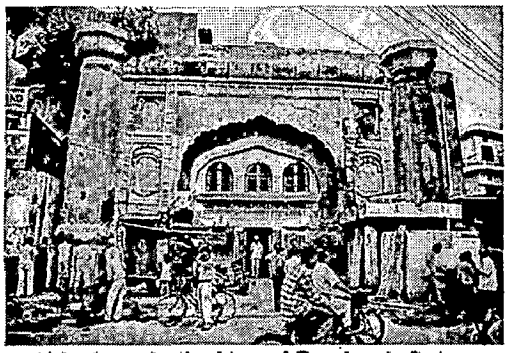


Figure 7 Proposed PRT system (Source: DPR of PRT Amritsar)

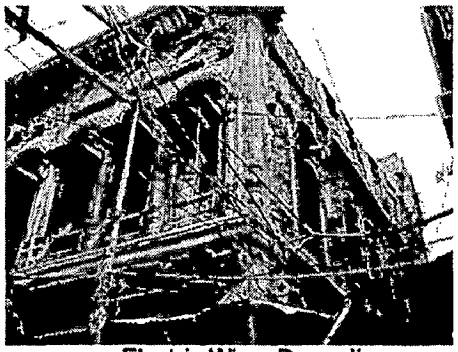
All these proposals were intended to boost the tourism development of the city but due to loopholes and inadequacies the result is not satisfactory. A sincere effort is required to resolve problems faced by people and to promote tourism of the city.

Problems of Walled City

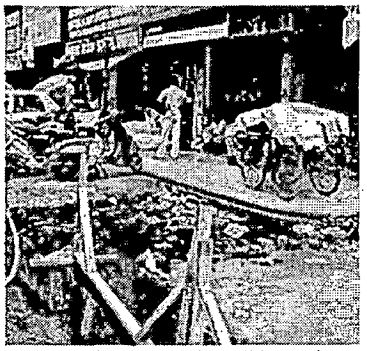
An amount of 345.15 crores is being invested for development of walled city



Urinals on both sides of Rambagh Gate -Heritage structure

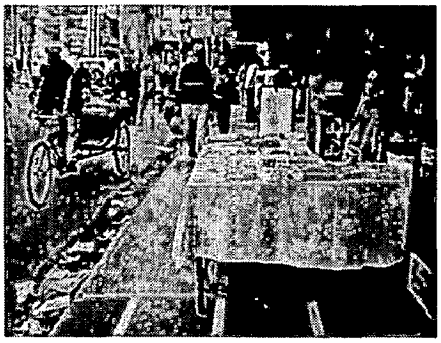


Electric Wires Degrading Heritage of City

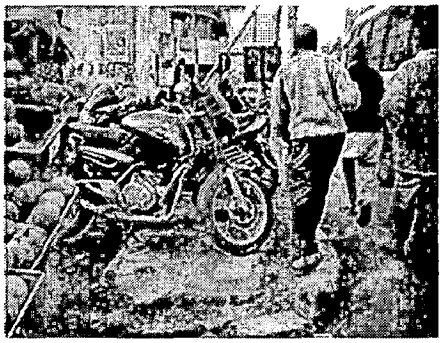


Unhygienic Condition of Hall Gate

Condition of Solid Waste Management



Encroachment by Shopkeepers



Encroachments by Vehicles

Figure 8 Condition of Walled City (Source- Primary survey)

under JnNURM projects but these projects do not address the problems faced by the residents or tourists. The priority of problems indicated by residents and experts through primary survey is given in Table 3

The most critical problem of the walled city is of traffic congestion with little regard for pedestrian and cyclist (Figure 9).

Table 3 Priority of Problems (Source: Primary Survey)

	Priority of problems	
	Opinion of Experts	Opinion of Residents
1	Traffic congestion	Traffic congestion
2	Lack of public transport	Littering/garbage on roads and public areas
3	Pollution	Poor condition of roads
4	Inadequate solid waste management Poor condition of roads	Lack of public transport
5	Lack of sewerage	Lack of sewerage Flooding during rainy season
6	Flooding during rainy season	Lack of tourist facility
7	Littering/garbage on roads and public areas	Pollution Inadequate solid waste management
8	heritage Conservation Lack of green spaces	Lack of sewage facility

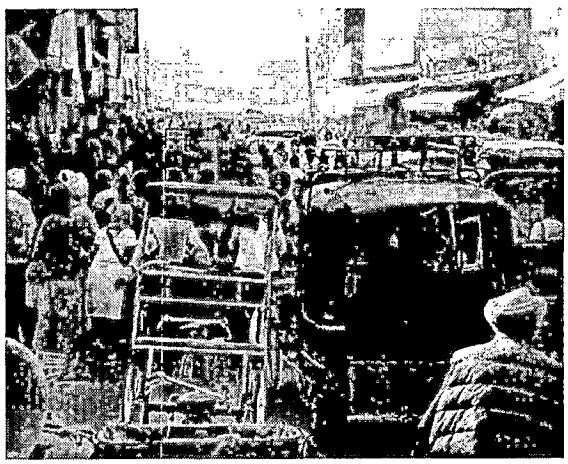


Figure 9 Congestion on Jallianwala Bagh Road (Source: Primary survey)

This contributes to negative impact on the tourism prospects of the city. Instead of pleasant experience of heritage of the city tourist have to struggle to reach Golden Temple.

Recommendations

A set of development proposals to deal comprehensively with the problems of walled city are given below.

1. Traffic Management

Problems of traffic congestion can be solved by effective traffic management. The most critical roads of Walled city are Jallianwwala Bagh road, Hall Bazar, Mahan Singh Road, Jaimal Singh road. The traffic management strategies include:

a. Restricted Vehicular entry: Road from Shastri market to Golden Temple (Jallianwala Bagh road) should be restricted entry road (Figure 10).

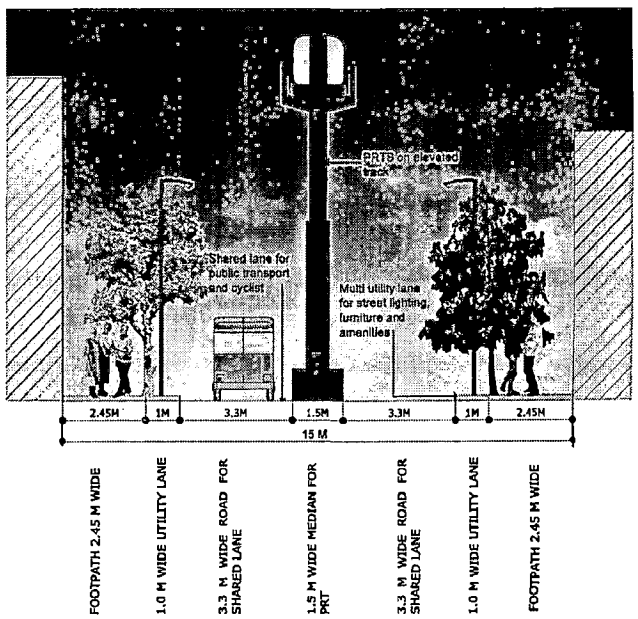


Figure 10 Section of Jallianwala Bagh Road - Restricted Entry Road (Source: by Author)

The length of the road is 400 m. and width of the road is 15 m. Vehicles will only be allowed from before 8.00 am and after 9pm.

b. One way street: Hall Bazaar (Figure 11) and Mahan Singh road (10m wide, 450m length) are identified as one way streets.

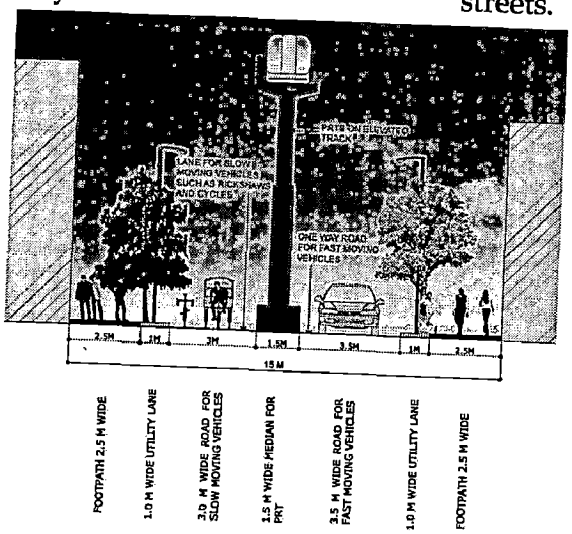


Figure 11 Section of Hall Bazar- one way road (Source: by Author)

Length of one way road at Hall Bazaar is 400 m. The traffic at Hall Gate will get distributed due to one way entry.

c. Pedestrinazation: Jaimal Singh road (10 m wide and 150 m length) is important road with high level of pedestrian activity. Maximum number of on-street parking is observed on this road. To improve pedestrian environment this road should be completely pedestrinized (Figure 12).

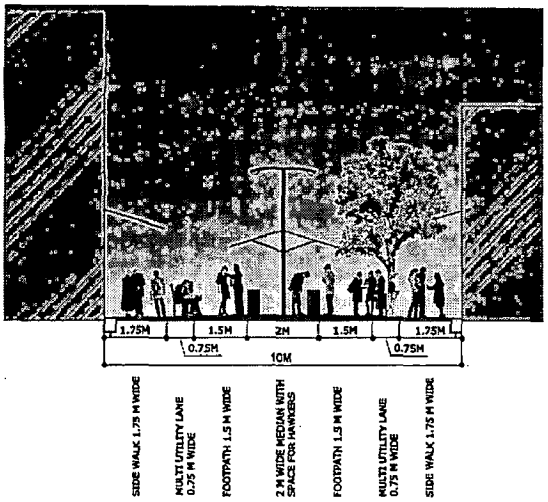


Figure 12 Section of Jaimal Singh Road (Source: by Author)

Heavy vehicles should be strictly prohibited. Vehicles should only be allowed before 8.00 am and after 10pm for loading and unload purposes.

2. **Public Transport:**

Environmental friendly public transport is required at city level as well as at lower community level. City bus service should be introduced connecting important areas (Figure 13).

The total cost of the project as established by JNNURM plan is 34.4 crore. The inner parts of the city cannot be serviced by city buses. For better penetration battery operated environment friendly mini busses need to be employed in second phase of the project.

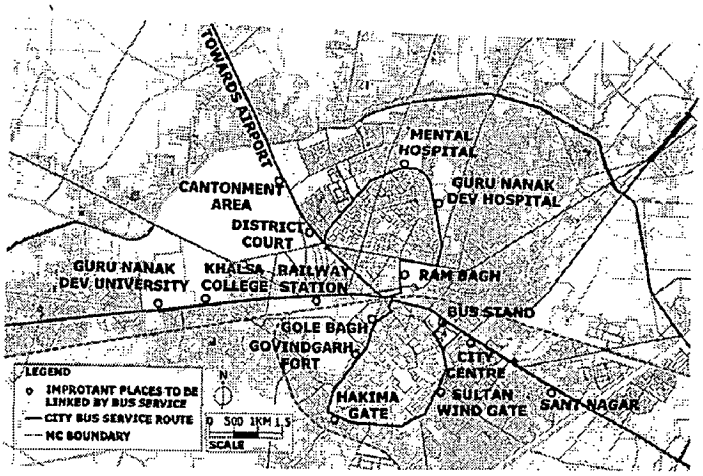


Figure 13 Proposed City Bus Service (Source: by Author)

PRT system should also be extended along the outer circular road of Walled city area (Figure 15). The proposal will connect market places near Ghee Mandi, high density southern area of walled city near Bhagtan

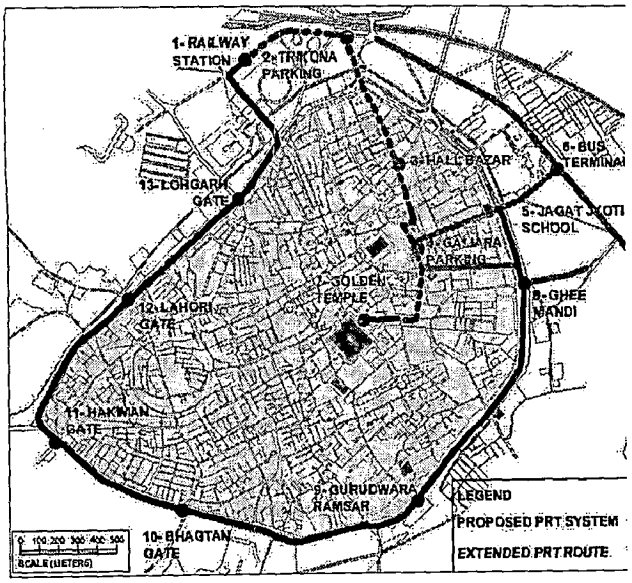


Figure 14 Extended Route of PRT System (Source: by Author)

Shaidan Gurdwara, Durgain Temple and Gate and Hakiman Gate and important tourist destinations such as Gurudwara Ramsar and Gol Bagh, public buildings near Lohgarh Gate (Figure 14).

Total route length of the system will be 9.6 km. and the number of car pods should be increased to 150. Fare should be subsidized to 20 rs per pod per km instead of 45 rs per pod per km.

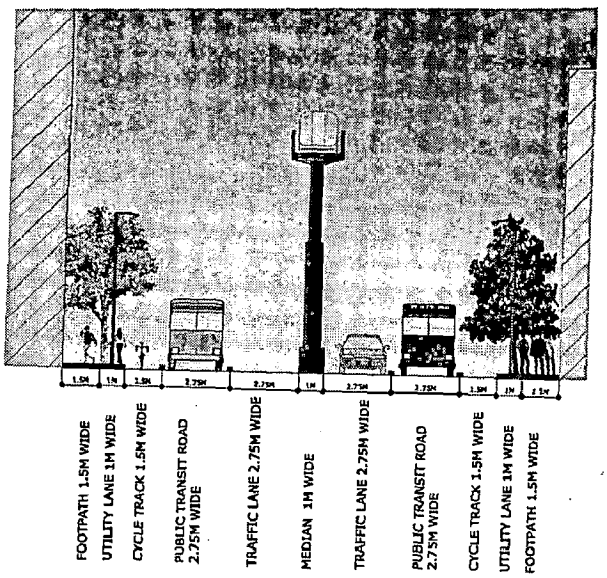


Figure 15 Section of Outer Circular Road 20 m wide (Source: by Author)

3. Tourist and Pedestrian friendly environment:

Pedestrian friendly environment should be encouraged. Encroachments should be heavily fined. Roads and public buildings should be universally accessible.

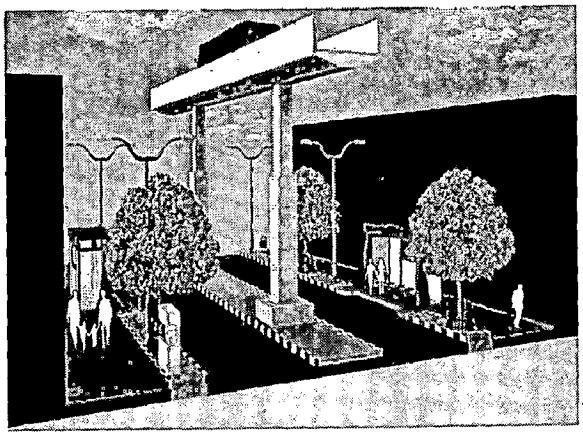


Figure 16 Better Pedestrian Facilities (Source: by Author)

All the main commercial roads should have street furniture such as benches, street light drinking water facility, public toilets, dustbins, and footpath (Figure 16).

Complete or partial pedestrinization of important roads should be implemented which have heavy traffic jams and on-street parking (Figure 17).

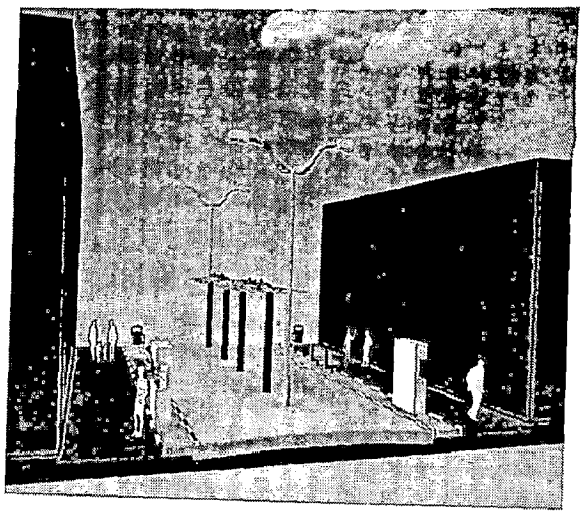


Figure 17 Pedestrinization of Jaimal Singh Road (Source: by Author)

Tourist information centers should be established at important tourist locations such as Golden Temple,Jallian Wala Bagh, Durgain Mandir, Gol Bagh, Ram Bagh, Gurudwara Shadeeh Ganj, Gobindgarh Fort.

Audio - visual aids should be installed at entrance of every monument explaining, its history, culture and importance in Indian and foreign languages.

4. Tourism and heritage

Heritage byelaws should be developed and implemented in heritage zone of the city. Emphasis on heritage conservation should be given. Facade treatment and conservation of important buildings should be done.

Heritage walk should be promoted by advertisement through written and visual media. Schools and colleges should be invited to join the walk at lower rates. Special vouchers should be distributed among different sections, such as government employees, teachers, students, tourists, etc.

In conclusion it must be said that a holistic approach toward environment improvement including urban infrastructure, tourism and pedestrian facility, and conservation of heritage structures will contribute substantially in providing an impetus to tourism

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