✚IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY
OPTIMISING THE TRAFFIC MOBILITY FOR SUSTAINABLE DEVELOPMENT FOR SALEM CITY

Mr.A.Asokan*, Dr. N.Balasundaram
Department of Civil Engineering, Karpagam University, Coimbatore, Tamilnadu, India.

ABSTRACT
Urban traffic congestion is a recurring problem in large cities which has a negative impact on mobility, environment, local economy and quality of life. An efficient infrastructure for urban mobility is essential for maintaining and improving the quality of life within cities and ensuring sustainable development. Traffic congestion and air pollution due to vehicular emission are two challenges caused by rapid urbanization. The aim of this thesis is to develop a long term strategy for the desirable mobility pattern of the city's population. The sustainable development of the city aims to get the efficient transport system with better accessibility to the residents and for the commuters. The roads should be clean with walk able footpaths, designated parking stretches, well designed junctions, safe pedestrian crossings and proper access to bus stands, railway stations and other transit stations. New road links and ring roads for better connectivity with the newly developing areas reduce pollution and improved road safety. The Salem City Corporation is divided into four zones namely, Suramangalam, Hasthampatty, Ammapettai and Kondalampatti. The total length of the road is 748km and total area of the city is 91.34 Sq kms. The population as per 2011 census is 8,31,038 there are two bus stations which includes 295 TNSTC buses and 86 private buses are running in the city as per 2013 statistics. Apart from this, the city traffic constitute 38,890 four wheelers 5,98,822 two wheelers 6,016 auto-rickshaws and 889 stage carriages. A detailed comprehensive traffic and transportation planning study for Salem city is not carried out in the past. Hence optimizing the traffic mobility for sustainable development is necessary.

KEYWORDS: Sustainable Development, Urban mobility, modal shift

INTRODUCTION
Cities are located at a high level of accumulation and concentration of economic activities which are supported by transport systems. Most important transport problems are often related to urban areas. The larger the city, complexity and the potential for disruptions is greater which cannot be managed properly by the numerous requirements of urban mobility. Urban productivity mainly depends on the efficiency of its transport system between multiple origins and destinations. Additionally, other transport terminals like railyards are located within urban areas contribute to the problems. AlsoTraffic congestion has also led to an increase in the number of accidents on the roads.

STUDY AREA
Salem city is the second largest city Tamil Nadu. It is an commercial, marketing, Industrial and transportation hub of Tamil Nadu. It is centrally located at 11°4' N latitude and 78°10' E long. The NH7 from Kashmir to Kanyakumari passes through the city. NH47 to Calicut and NH68 Ulundurpet originates from salem. The overall density of the city is 7628 persons/Sq. km. during the year 2001 and 9098 persons/Sq. km. in the year 2011. The city is surrounded by a natural amphitheatre of hills formed by the vaparamalai to the North, the Jarugumalai to the south, the

Kanjamalai to the west and Godumli to the east. It is also located on either banks of river Thirumanimutharu at an altitude of 280m above mean sea level. The river Thirumanimutharu runs through the city and divides the city into two parts. The salem city corporation is divided into four zones namely, Suramangalam, Hasthampatti, Ammapettai and Kondalampatty

OBJECTIVES

The objective of the study is to improve the present highway system by encourage travelling in more sustainable ways (modes of transport) and to reduce external impacts on the transport network (land use) by planning new facilities for transportation. To assess the adequacy of parking facilities, public cycle sharing systems, separate track for cycle users, fly over's and pedestrian crossing.

MATERIALS AND METHODS

Step 1. Rate of population
The rate of population of the city as per census for the year 1991-2011.

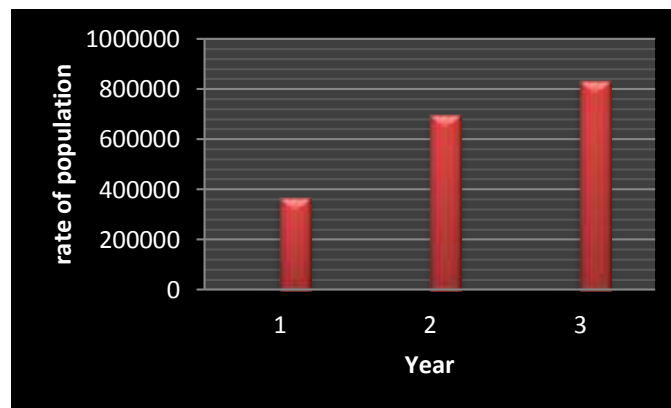| S.No.	YEAR	RATE OF POPULATION (in Lakhs)
1	1991	3,66,712
2	2001	6,96,760
3	2011	8,31,038

Table. 1 Rate of Population
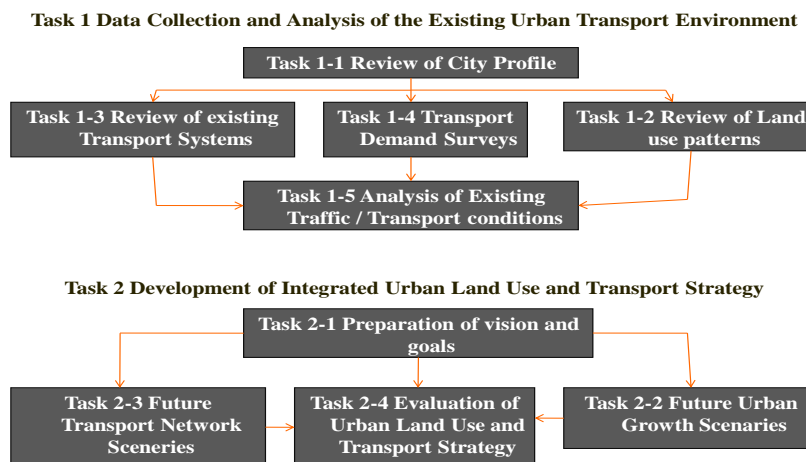

Fig.1 Graphical representation of Population

Step 2. Types of roads
The data collection was done from both primary and secondary data sources. The data collected were the Survey on the types of roads in Salem city which includes Cement concrete super roads; Black topped roads, WBM roads, earthen roads and Others. The following table shows the length of the various roads

S.No.	TYPE OF ROAD	TOTAL LENGTH (in kms)
1	Cement concrete super roads	54.47
2	Black topped roads	628.17
3	WBM roads	17.04
4	Earthen roads	23.46
5	Others	24.66
TOTAL LENGTH OF MUNICIPAL ROADS – 747.80kms		

Table. 2 Length of roads

Step 3. Data Collection and Analysis of the existing urban transport Environment
Step 4. Development of Integrated Urban Land Use and Transport Strategy
Step 5. Development of Urban Mobility Plan
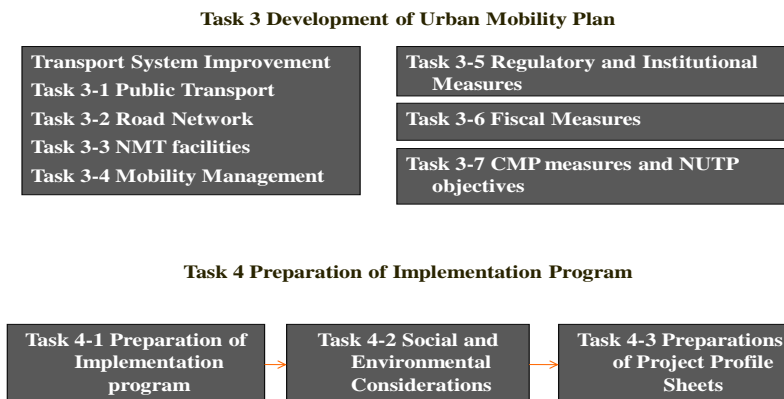Step 6. Preparation of Implementation program

Task 1 Data Collection and Analysis of the Existing Urban Transport Environment

Task 1-1 Review of City Profile

Task 1-3 Review of existing Transport Systems   Task 1-4 Transport Demand Surveys   Task 1-2 Review of Land use patterns

Task 1-5 Analysis of Existing Traffic / Transport conditions

Task 2 Development of Integrated Urban Land Use and Transport Strategy

Task 2-1 Preparation of vision and goals

Task 2-3 Future Transport Network Sceneries   Task 2-4 Evaluation of Urban Land Use and Transport Strategy   Task 2-2 Future Urban Growth Scenarios

Task 3 Development of Urban Mobility Plan

Transport System Improvement Task 3-1 Public Transport Task 3-2 Road Network Task 3-3 NMT facilities Task 3-4 Mobility Management	Task 3-5 Regulatory and Institutional Measures
	Task 3-6 Fiscal Measures
	Task 3-7 CMP measures and NUTP objectives

Task 4 Preparation of Implementation Program

Task 4-1 Preparation of Implementation program → Task 4-2 Social and Environmental Considerations → Task 4-3 Preparations of Project Profile Sheets

Fig.2 Schematic diagram of methodology (Step 3-6)

Step 7. Vehicle Census

Newly generated two wheelers, four wheelers, Auto Rickshaws, and stage Carriage vehicles in salem city for the year 2008,2009,2010,2011,2012.

Category refers to the census year

1-2008, 2-2009, 3-2010, 4-2011, 5-2012
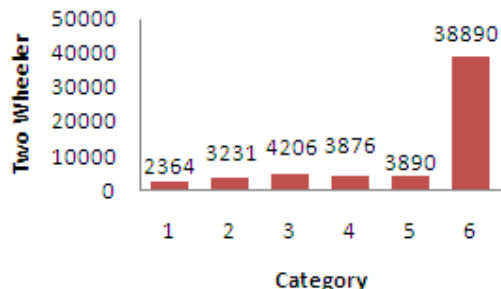
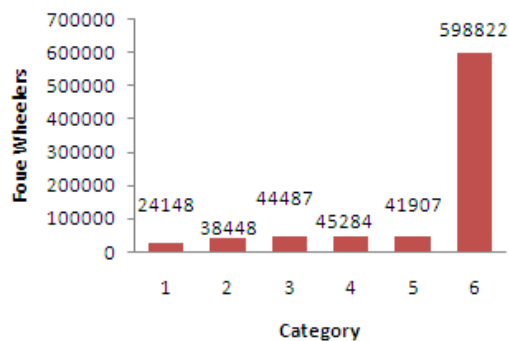Fig.3 Graphical representation of Two wheelers census

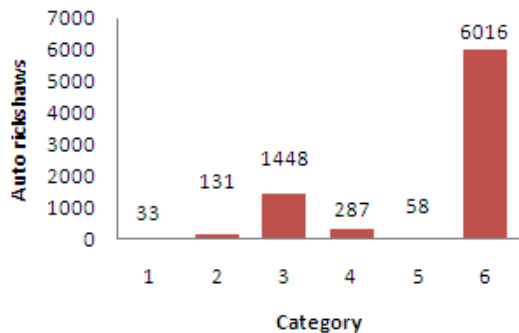Fig.4 Graphical representation of Four wheelers census

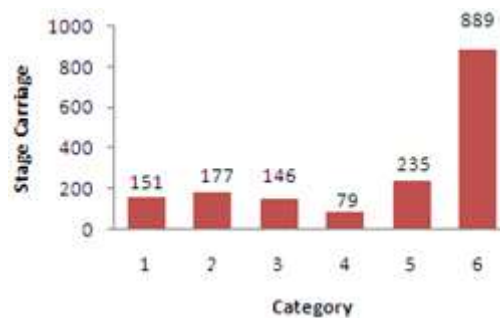Fig.5 Graphical representation of Auto Rickshaws census

Fig.6 Graphical representation of Stage Carraige census

SALEM CITY – GROWTH DIRECTION
Prospective Corridors
* Omalur road
* Trichy road
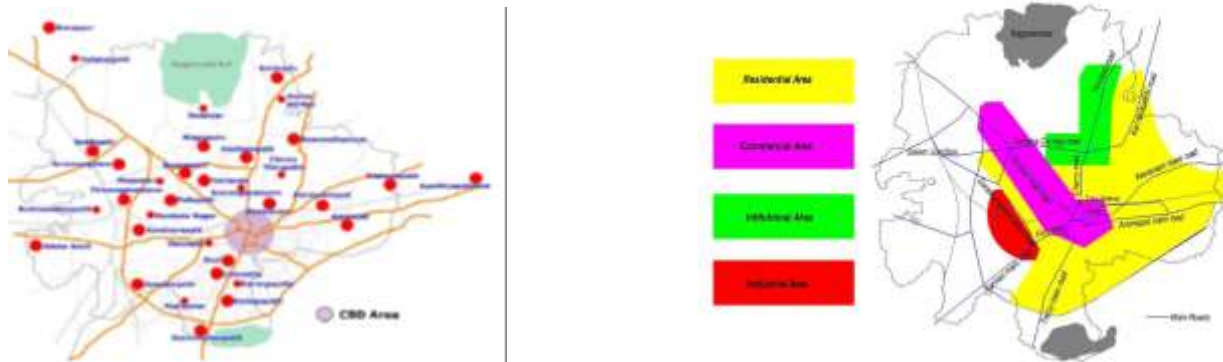* Ammapet road
* Yercaud road
* Sidharkoil road

Fig.7 Salem City Municipal Corporation – Land Use

Footpath Availability

* Generally absent
* Available on Omalur road & Cherry road (2.0 Kms)
* Not as per standard

Fig.8 Footpath at salem city

Bicycle facilities and Intersections of roads

Benefits : Health, Environmental & Sustainable
* Bi-cycle trips vary about 5% - 8% total trips
* Cycle traffic observed – on sarada college road, military road, omalur road, ammapet road, ring road etc.
* No exclusive cycle lane
* Cycle path mandotory on urban road as per National Urban Transport Policy

Fig.9 Bicycle Facilities and Intersections of roads at salem city

Parking Facilities

Important Parking stretches
- Omalur main road
- Arunachalam street
- Bazaar street and Cherry road
- Chinnakkadai veedhi
- Sarada college road
- Trichy main road
- 1st and 2nd Agraharam
- River side road

Off street parking facilities (Paid parking)
- Near Five road Junction (Area about 2 Acres)
- Truck parking facility at Shevapet market
- Area opposite to City Bus Stand for parking LCV's
- Near railway junction a small compound near the railway station for TW and Cycle parking Railway station and New Bus Stand premises

Fig.10 Parking Facilities at salem city

PROPOSALS FOR SALEM CITY

- ➢ Transportation system planned for Salem should be able to meet social, economic and environmental sustainability goals
- ➢ The Transport solutions should be framing a quick, affordable, safe, reliable, comfortable, energy efficient environmentally sustainable systems
- ➢ All sustainable mobility elements and achieve sustainable mobility objectives for the city

CONCLUSION

Nowadays, transportation systems, is entirely for the benefit of driving people. In these terms, there's more expectation to create better conditions for driving people. Footpath availability, Bicycle facilities, intersections, parking facilities, off street parking facilities (paid parking) is included in the construction to fulfilled again traffic mobility. This system has many advantages such as improving health, reducing household spending; reducing the cost of transportation, construction of infrastructure, reducing air pollution and dependence on non-renewable resources that will be usable for a wide range of social classes and it has significant economic benefits for the city as well. Since the old texture of Salem is formed on the principles of sustainable living, including pedestrians so it is better that the responsible take a better look to this section in order to take a major step forward to human oriented transports. City hall projects must be in the form of urban development plans, programs and strategies that that walking-orientation systems and biking and ultimately human-orientation transportation.

REFERENCE

1. Manjunath K.R. and Lohith R.M " Orgin – Destination Studies – A Case Study of Junction Improvements in Bangalore City" *International Journal of Engineering Research & Technology (IJERT)* e-ISSN: 2278-0181 Vol.2-Issue 7 July-2013.
2. Harish H.S. and Suresha S.N "Studies on mobility Indicators and the effect of congestion reduction measures on the movement of vehicular traffic in Bangalore city using micro simulation software" *The International Journal of Engineering And Science (IJES)* ISSN: 2319-1813 ISBN: 2319 - 1805 Volume-2 Issue 1 June-2013.
3. Evangelos Mitsakis, Iraklis Stamos, et. al. *"Urban mobility Indicators for Thessaloniki, Greece"* Journal of Traffic and Logistics Engineering (JTLE) Vol, 1, No. 2 December 2013.
4. Robert Ebihart Msigwa and Kembo M.Bwana "*Parking challenges facing urban cities in Tanzania, China*" Mathematical Theory and Modeling ISSN 2224-5804 (Paper) ISSN 2225-0522 (Online) Vol.3, No.5, 2013.
5. Ashish kumer saha, Md. Rashedul haque, et. al., "*Application of traffic management plan a sustainable solution of traffic congestions in pabna city, Bangladesh*" International Journal of Recent Development in Engineering and Technology ISSN 2347-6435(Online), Volume 1, Issue 3, December 2013.
6. Takyi Harriet, Kofi Poku. et. al., "*An assessment of traffic congestion and its effect on productivity in urban Ghana*" International Journal of Business and Social Science Vol. 4 Issue 3, March 2013.
7. Olusina, J.O. and Samson, A.P. "*Determination of predictive models for traffic congestion in lagos metropolis*" International Journal of Engineering and Applied Sciences ISSN2305-8269 Vol. 5 Issue 2, July 2014.