IDENTIFY THE TRANSPORT INFRASTRUCTURE IMPROVEMENT PROJECTS IN SALEM CITY – CASE STUDY

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Abstract

Salem is the fifth largest city with a population of 7.54 lakhs (2011) in Tamil Nadu. Fast growth in population and vehicles in these centre have caused congestion in roads for movement of passengers and goods affecting economic development. Local Authorities faced with great difficulties to identify required various road improvement projects. Local authorities have inadequate funds to improve these road networks from all angles at any point of time. Repair or improvement works may have to be undertaken on a basis which has to be decided based on socio-economic, administrative, technical, political factors etc. Serious considerations are required to be given to the transportation problem of urban centres, since they are growing very fast in population, area and putting great pressure on the limited transport infrastructure facilities. An efficient transportation network is the need of the present urban scenario to tackle the discussed problems. The identified road network selected for the study comprises 162 road links in Salem Corporation. Existing traffic condition, surface condition of carriageway, street lighting, footpath condition and drainage condition in the Salem Corporation area has been studied in detail. Traffic volume count survey was conducted on the identified 162 road links in Salem Corporation to identify the type of transport facilities required for the road links. In Salem Corporation area 44 road links required removal of onstreet parking and encroachment, 52 road links required widening of carriageway, 23 road links required traffic management measures with widening of carriageway, 2 road links required removing of onstreet parking and encroachment, 52 road links required widening of carriageway. 23 road links required traffic management measures with widening to carry the existing traffic flow efficiently.

Keywords: Transport, Infrastructure, Projects, Case Study

I. IMPORTANCE OF TRANSPORTATION IN URBAN DEVELOPMENT

Transportation contributes to the economic, industrial, social and cultural development of any country. It is well recognized that transport performs a key role in achieving fast economic growth of developing countries. Growth of urban areas and nature extent of availability of various classes of labour force are influenced by the extent of development of transport facilities. This growth in term has a cause and effect impact on transport services. Since increase in urban population demands better transportation facilities and a

services. It may be necessary in the case of a country of India’s vastness to provide transportation facilities in anticipation of demand, so that the transportation acts as a catalytic agent in development of different sectors.

II. OBJECTIVES OF THE PRESENT STUDY

1. To conduct Traffic volume survey on the selected 162 road links in Salem Corporation
2. To identify the required road improvement projects in the selected urban centre.
3. To identify number of road links required removal of onstreet parking and encroachment, widening of carriageway, required road links and the roads which require traffic management measures with widening of carriageway.

III. METHODOLOGY

1. Summarize the findings and recommendations of various previous studies.
2. Identify and collect an relevant information required from local agencies such as demographic trends, map showing the existing land-use and growth trends, income and expenditure, road network details – physical condition, traffic information.
3. Conduct traffic volume survey on identified 162 road links.
4. Analysis the data to identify the magnitude and complexity of the problems.
5. Finally identify the type of road improvement projects required to meet the existing traffic.

IV. STUDY OF PAST AND PRESENT CONDITIONS IN SALEM CITY

Salem is the fifth largest city in Tamil Nadu over an area of 91.34 Sq.kms. Salem city is located at distance of 350 kms from a Chennai on the west, and 160 kms from Coimbatore and it got the fifth largest population of 7.54 lakhs as per
2011 census in Tamil Nadu. It is situated at the trijunction of Bangalore, Trichirappalli and Chennai roads. The City is located at 11° 40’ North and 78° 10’ on the East. The general topography is plain. The city is surrounded by the hills viz. the shervarous and Nagarmalai on the North, the Kanjamalai on the west, the Goodamalai on the East.

V. POPULATION GROWTH

The population in Salem has grown at a rate of 23 percent per decade between 1951 and 1971, the rate has been lower for the decade 1971 – 1981 at 17 percent and 14 percent per decade between 1991 and 2011.

VI. EXISTING LAND-USE STRUCTURES

The extent of Salem town is 91.34 Sq.km of this the developed area is 4648 Hectares i.e. 48.71 percent of the total area and undeveloped area is 4894 hectares i.e. 51.29 per cent of the total area. Figure. 1. is showing the existing land use details of Salem City Corporation area.

VII. IDENTIFIED ROAD NETWORK FOR THE PRESENT STUDY

Salem district as a whole has only 10,133.7 km. of road, out of which 214.6 km are cement concrete roads, 5098.1 kms. are bituminous surfaced road and the remaining 4821 kms. are water Bound Macadam roads. The unsurfaced road of 2352.7 kms. also exist in the district.

Salem Corporation has about 748.13kms. of surfaced roads under its control and maintenance as detailed below. The width of road ranges from 3.5 m to 14.0m in the major road network excluding the lanes and small roads. Fig.2. shows the identified road network selected for the present study.

VIII. FIELD STUDIES TRAFFIC VOLUME SURVEY

One of the fundamental measures of traffic on a road system is the volume of traffic using the road in a given interval of time. It is also termed as flow and is expressed in vehicles per hour. When the traffic is composed of number of types of vehicles, it is the normal practice to convert the flow into equivalent passenger car units (PCU), by using certain equivalence factors. The flow is then expressed as PCU per hour.

In order to update the data base of the present existing traffic conditions, Traffic volume counts on selected road links in the urban centre were conducted. The detailed field survey programme was organized for 14 hours between 6 AM -8 PM. The block period is 15 minutes. Traffic volume count survey was conducted on the 162 road links and shown in Figure 3. With the help of these data the peak hour of traffic flow on each road link has been identified.
IX. PHYSICAL CHARACTERISTICS

Physical Characteristics of road links in the network studied by field visits during the study and updated to the present existing condition. The study of physical characteristics comprises of surface condition, lighting condition footpath condition and drainage condition.

X. ROAD NETWORK DETAILS

Road network details collected from directorate of Town and Country Planning, Salem Corporation & Salem Local Planning Authority.

List of Data collected

The following data have been collected for Salem city

i. Linkwise – road name details

The arterial road network which has been studied is broken into number of links. A link is defined as one-way part of the route between two intersections. The number of road links analyzed in the study is 162. The road links studied in the urban centres are given in Fig.3.

ii. Linkwise – Physical informations.

Following Physical information are collected for 162 road links. The following details of overall road links were collected for the study, Length of road links, Carriageway width, Footpath width, Right of way, Onstreet parking and encroached area.

iii. Linkwise Traffic Informations

Linkwise peak hour traffic flow in road links are calculated from the Traffic volume count survey

iv. Linkwise – Existing physical conditions

Linkwise existing physical conditions, surface condition, lighting condition, footpath condition and drainage condition in 162 road links are collected. Details of existing landuse along the roadside, type of encroachment and onstreet parking on all road links are observed.

XI. PROCEDURE ADOPTED TO IDENTIFY THE CONGESTED ROAD LINKS

The extent of the traffic volume on the road links determined from the traffic volume survey conducted at different locations. The equivalent PCU value of the peak hour traffic volume on the road links has been calculated.

Road Link Capacity

The step by step procedure adopted for calculating road link capacity is as follows.

1. The absolute capacity of a road link is assumed to be between 1300 and 1500 PCU Per hour per lane. Adopting the average of 1400 PCU per land width of 3.5 m, the absolute capacity is taken as 400 PCU per hour per metre width of carriageway.

2. The absolute capacity (400 PCU per metre) multiplied by the “effective” carriageway width gives the actual capacity of the road link. The effective carriageway width has been calculated by reducing the actual width of the carriageway due to different factors affecting the capacity.

3. The factors affecting the capacity are parking, encroachment and landuse

Calculated the effective width of carriageway considering the above three factors (Parking, encroachment, landuse). The capacity of each road link has been calculated by using the physical information’s (width of carriageway, parking space, encroachment) is follows.

Effective width of of carriageway = Actual width of carriageway x (1-landuse/ 100) - Parking space - Encroachment

Capacity of road link = Effective width of carriageway x 400 PCU

XII. LEVEL OF SERVICE OF ROAD LINKS

According to the volume capacity ratio the level of service of the road links are identified. The road link with Volume Capacity ratio more than 0.8 are classified as congested links. The effective width of carriageway, capacity, volume capacity ratio and Level of Service of all road links in Salem City corporation area were calculated.

XIII. IDENTIFY THE SHORT TERM TRANSPORT INFRASTRUCTURE IMPROVEMENT PROJECTS IN SALEM

Road links which are having volume capacity ratio more than 0.8 are considered as congested links and these road links required improvements to carry existing traffic volume. The following procedure is adopted to identify the required improvement.

Road links which are having volume capacity ratio more than 0.8 reflect that road link will have insufficient width of carriageway to carry existing traffic. Instead of providing extra widening of carriageway it has been assumed that to prohibit the existing on street parking and remove the encroachment. After removing on street parking and encroachment the effective width of carriageway, capacity and volume capacity ratio have been calculated. If the volume capacity ratio is less than 0.8 then that road link required only removal of on street parking and encroachment to carry existing traffic flow.

If the volume capacity ratio after removing the on street parking and encroachment is more than 0.8 then that road links required a widening of carriageway. For providing extra widening the available extra width has been calculated from right-of-way. If right of way have space then widen the carriageway up to its full width leaving one metre on each side for pedestrian movements. Again the effective width of carriageway and volume capacity ratio has been calculated. If
the volume capacity ratio more than 0.8 then that road link required traffic management measure with extra widening.

**XIV. CONCLUSION**

An important product of the analysis is the development of a program which outlines the improvements to be carried out. From the study made, following short term transport infrastructure facility improvement projects required to the road links to carry the existing traffic flow has been identified. In Salem Corporation area 44 road links required removal of onstreet parking and encroachment, 52 road links identified. In Salem Corporation area 44 road links required widening of carriageway , 23 road links required traffic management measures with extrawidening to carry the existing traffic flow efficiently.

**XV. REFERENCES**

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