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ABSTRACT

The demand of transportation infrastructure arises when the supply of transportation service become increases. The free flow accessibility of transportation is a big challenge in the fast growing cities depends on the intensity of the traffic density, existing street layout pattern and adjacent land use. It describes that increase in demand of infrastructure alerts change in alteration of land-use pattern and community lives for future transportation routings and planning for public transit. This paper deals with the study of planning a transportation infrastructure in a pre-defined path for future transportation scenario through Comprehensive Mobility Plan (CMP) along with the design of green vegetation for specified sight distance specified in the past papers.

Keywords : Public transit, CMP, Transportation infrastructure, Pollution, Land use pattern.

I. INTRODUCTION

Erode is the administrative headquarters of Erode District and 7th largest city located in the western parts of Tamilnadu with the population of seven lakhs. It is one among 99 smart cities proposed in India. Erode is an important textile hub of South India due to its locality on the banks of Cauvery & Bhavani and an industrialized district with rapid increase in economical and industrial activities, population growth and per capita income. Erode city is surrounded by many large and small scale industries, this results in compulsion of the development of city limit by including the Municipalities/ Panchayat of the neighbour districts into its jurisdiction. The population density as per 2011 census for Erode city is 4548 persons per sq.kms with an average house hold size of 3.3. The study plans a city's vision for long term sustainable urban development with the adjacent land-use for next two decades.

Table 1.1 Growth rate of ECMC

Year	Area (Km ²)
1991	8.45
2001	8.45
2008	109.52

Table 1.2 Demographic Indicators of Erode

Year	Population	NH size
2001	4.03L	3.9
2011	4.98L	3.6

II. CMP VISION

Development of transportation services for Erode city towards increasing the sustainable transportation infrastructure through various policies, strategies and planning public transportation systems with reduction in pollution and congestion by considering the national importance of the city.

III. CITY PROFILE

In the past three decades, what action has been taken to improve transportation routing and road networks is the primary task to consider the factors for sustainable transport development in the city. Walk/Cycle trips is approximately 31% which is highest among TN cities. The average trip distance is 6 km and daily traffic status on arterial roads in Erode is between 12000 PCU/hr to 35000 PCU/hr. The projects include 22 km ring road section between Kokkarayanpettai - Thindal. Alignment of new NH from Perundurai to Pollachi with the formation of outer bypass to Tiruppur city. Upgrading of SH into NH of roads connecting Erode with various destinations. Improving the uncontrolled intersections by regularizing the traffic movements. In order to achieve the smart city vision in infrastructure of Erode city, identification of feasible traffic management measures is of prime factor by ensuring cost effective implementation program.

Table 3.1 Category wise road length

Surface Type	Length (km)	Percentage
Concrete (P.C.C)	88	10.86%
Bituminous Topped	500	61.88%
WBM roads	9.5	1.21%
Earthen roads	100	12.80%
State Highways	110	13.67%

Table 3.2 Traffic observed on Major roads

Sl.No	Road (Kms)	Length in kms	CW width (m)	PCU/hr
1	KNK road	0.51	10	1450
2	RKV road	2.43	15	2080
3	Bhavani Road	0.62	18	1506
4	Park road	1.0	18	1248
5	Shandy	0.42	12.7	1837
6	Park approaching	0.33	12.0	789
7	Sathy road	1.66	12.2	4285
8	EVN road	2.42	10.7	2658
9	China Mettur road	0.83	8.0	1804
10	Perundurair road	0.82	18	1808
11	Brough road	1.47	18	2813
12	Gandhiji road	1.02	15	1946
13	Cutcherry road	0.34	15.5	1762
14	Chennimalai road	1.51	17.5	1998
15	Kumarapalayam	13.6	12	1625
16	Karur by-pass	8.2	12.2	2813

Table 3.3 Per Capita Trip rate

Parameter	City
Average Household size	3.30
Overall PCTR	1.15
Overall PCTR	0.72

IV. SWOT ANALYSIS

A SWOT has been prepared by analyzing the present status of the Erode city,

Strength: High rate of trade and presence of SSI, LSI and VLSI, Good Connectivity of Road and Rail and Erode categorized under high urbanization level (52%).

Weakness: Improper Traffic and Transport system, ineffective drainage system and the absence of underground sewerage system.

Opportunity: Introducing new infrastructural projects such as AIIM's, new road network pattern, balance projects for environmental and climate change by revising the Master plan's strategy. Guide to develop the land-use pattern by strengthen the city's framework planning on the mixed use.

Threat: Lack of sustainable infrastructure, Unplanned development in the expanded city areas and climate change impacts.

V. ERODE AS SMART CITY

This area covers the CWP for Erode city and organised along the following sections: Section 1: Preparation of city-wide concept plan for Erode city

Section 2: City Background

Section 3: City's Baseline Assessment Section 4:

Details of citizen Engagement Section 5: Vision statement for Erode city

Section 6: Components of smart city proposal and implementation program.

VI. PROJECTION OF PLANNING PARAMETERS

Planning a structure of a city in future purely based on the development of economic activities and concerned improvement parameters. The development of new LPA of Erode City includes the extent of boundaries from core to the boundary. In the view of extending a city limit, new Municipality/Town Panchayat has to be considered for improvement (if in the case of influenced of city arises in nearby districts). There are many factors deciding the extent of city limit such as Population, Business, Developments, Economy and Connectivity.

6.1 Roads and Highways

The development of new bypass road/Ring roads in circular pattern for a distance of 108.4 kms connecting Tiruchengode — Anaikalpalayam – Chittode - Bhavani – Tiruchengode is a long term pending work to promote the usage of transport and reduce the travel time and also to avoid the traffic congestion inside the city areas especially bus traffic in core place. Connecting outer roads (NH&SH) to Erode with Outer bypass/Ring roads for avoiding the vehicle movements unnecessarily inside the city limit. Planning a new NH for the roads connecting with Erode to various cities for making smooth and efficient handling of traffic along bypass. Planning an industrial corridor between Thoppur-Erode-Karur stretch of 170kms and a new industrial green corridor between Erode-Sathy-Ooty road. Development of new alignment between inner roads connectivity and identify the new roads for smooth road pattern for future growth and economic development for the city. Developing new road pattern along narrow roads especially runs over 10kms distance and widening/strengthening an existing narrow road as multi-lane roads Aligning and improving an intersection, grader separator and bridges at necessary locations. Planning a flyovers, bridges, underpasses and overpasses at various critical intersections with high pedestrian and motor vehicle traffic. CMP lays a comprehensive emphasis on NMV transport proposal including sub ways at 14 locations and 35 km of bicycle track. Developing a new road pattern between Vellakoil- Sankari and also new NH alignment between Perundurai to Pollachi.

6.2 Railways

Design of new railway line between Erode-Palani, Erode-Chamarajanagar, Erode- Namakkal and Erode-Karur stretches. The construction of new Railway Station at Solar, Bhavani, Kumarapalayam and Tiruchengode

6.3 Airport

As per AAI specifications 85kms exactly between Coimbatore and Salem airports the new airport has to be planned with all the required facilities.

6.4 Satellite township

Development of a Satellite towns and green field at Chittode - Bhavani stretch and development of industrial growth based communities

6.5 Transport operations

Shifting of bus terminus to outer area of the city + Wayside terminals and operation of Mini-buses on select identified narrow roads and routes

6.6 Implementation Program

Implementation of a new transport strategy to achieve the objective of the project with ultimate transportation technologies like ITS. Planning a short , medium and long term strategies for even and orderly development. Defining a new vision, based on new growth pattern and economic development.

VII. SUSTAINABLE URBAN TRANSPORT STRATEGIES

The strategies are assigned for improving the mobility of Erode. These strategies while implemented through the specified projects, full-fill the goals of the CMP.

7.1 Public Transit Strategy

Erode local bus service has to be introduced by emerging urban nodes in the outer areas of the city and separate Mofussil bus services from central BS to various locations and central BS to be retained for City bus services. Erode Junction is the south India's central point and the passenger train running between Erode and places such as Salem, Coimbatore and Karur stations provide intercity mobility to extent. The proposed strategy is to develop railway stations along the city limit for attracting people with more stoppages. This also helps to link more areas of the city and indirectly helps to increase the growth of the city.

7.2 Non-Motorized Transport Strategy

Design of aligned and well maintained footpath with hand rails at junctions on the urban roads . A Cycle path of width 2m is designed where cycle traffic is observed as high.

7.3 Parking Management Strategy

Regularizing on-street parking by designing parking bays with markings. Introducing parking fee at CBD areas where the parking demand is high. Development of off street at areas where the width of the traffic lane is small with high vehicle movement.

7.4 Goods Vehicle Management Strategy

Restriction of commercial vehicle movements in the city core area, Segregation of long distance commercial vehicles, Shifting of warehouses, go downs and yard away from Erode Junction and developing truck terminals at outer areas of the city

7.5 Traffic Management Strategy

Road Improvements, Intersection Improvements: Signalization, Re-timing of signals, Intersection Channelization and Geometric, Improvements, etc. Policy Related (Parking management, Enforcement and Regulation of Auto rickshaws)

7.6 Regulatory framework

For the effective development of urban land use and transport systems in Erode, the following regulatory mechanism is proposed.

7.6.1 Public Transport Improvement

Privatization of bus transport is found to be successful in many cities. It is suggested that framing an economically rational regulatory framework addresses the potential market such as privatization, concession, etc., Priority of lanes by regulations such as bus and high occupancy vehicle lanes, achieving their effect by reducing the road space available for cars Concession for physically challenged people, senior citizens, etc.

7.6.2 Safety Improvement

Ban of vehicles which is aged above 15 years.. This helps to reduce the accidents, air pollution and offers fuel savings consumption. The training programme awareness training on traffic rules, regulations and safety aspects for drivers, traffic police and common people.

7.6.3 Transport Demand Management Measures

Parking regulation by time limitings and specifying places for various modes and allocating exemption for senior citizens and physically challenged peoples. Land Use Control and trip minimization. Staggering working hours of schools, colleges, offices and other commercial/industrial establishments.

7.7 Institutional framework

Development of institutions has multiplicity which has resulted in lack resources such as both financial and local resources. Therefore, a vision for intergrated transport management system has to be made to develop and maintain by an appropriate authority.

7.7.1 Unified Metropolitan in Transport Authority

Specifying norms, Setting Standards or Guidelines, Land-use transport integration as well as QA/QC for CMP, Project Approval and State or Central fund sanctioning and channelizing and Co-ordinate with various Urban Infrastructure departments

7.7.2 Integration of Public Transport

UMTA is the supreme authority to integrate the city, Mofussil and interstate bus services and coordination between TNSTC, private operators and RTO.

VIII. Green Vegetation

Plantation of trees on the road sides directly helps to reduce the pollution due to traffic congestion occurs. Selection of sampling is a primary factor, deciding the required sight distance. The maximum width of 2m with 10m length should be provided for each sample.

IX. CONCLUSION

A complete study was made on infrastructure of Erode city using existing CMP and found out the gaps involved to rectify the problems occur in future. This study describes the results of a generic framework for evaluating the mobility plans for Erode city from sustainable mobility parameters. The parameters made with respect to the current transportation sectors gives better suggestions to improve the mobility of sustainable transportation infrastructure in near future. It guides to help the CMP planner to avoid the gaps in the proposed study of Erode CMP in future and helps to rectify the problems included. Therefore, the problems involved in the existing CMP and Proposed can be generalized.

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