

# GUJARAT TECHNOLOGICAL UNIVERSITY

## CIVIL (TRANSPORTATION ENGINEERING) (13)

### URBAN TRANSPORTATION SYSTEM PLANNING

SUBJECT CODE: 2711301

M.E. 1<sup>st</sup> SEMESTER

**Type of course:** Core Course

**Prerequisite:** Nil

**Rationale:** The Urban Transportation planning is most important area in the field of transportation. Looking to the present scenario, suitable transportation planning is the backbone of the urbanization. Urbanization is going on at alarming rate in developing countries like India. After studying the subject, the student will be able to understand the importance of the transportation and systematic planning in urban area. The subject covers various types of transportation systems and its characteristics. It is necessary to coordinate each mode for optimizing transportation system and reducing congestion and environmental pollution. It is important to carry out thorough study of travel demand and fulfillment. The subject is useful for estimating Trip Generation, Trip Distribution, Modal Split and Trip Assignments. Land use planning models and their suitability should be studied for designing of suitable transportation systems. As urbanization increases, it is necessary to identify the freight corridor to provide efficient service. The subject covers the study of urban goods movement with case studies.

#### Teaching and Examination Scheme:

Teaching Scheme			Credits C	Examination Marks						Total Marks
L	T	P		Theory Marks		Practical Marks				
			ESE (E)	PA (M)	PA (V)		PA (I)			
		ESE			OEP	PA	RP			
3	2#	2	5	70	30	20	10	10	10	150

#### Content:

Sr. No.	Topics	Teaching Hrs.	Module Weightage
1	Introduction to transportation systems planning, various modes of transportation and comparisons, urban transportation system planning process, use an evaluation of various models	2	10
2	Planning methodologies, modeling techniques in planning, problem solving techniques	4	10
3	Urban Mass transportation Systems: Urban transit problems, travel demand, types of transit systems, public, private, para-transit transport, mass and rapid transit systems, coordination, types of coordination	8	15
4	Travel demand modeling: Trip generation, trip distribution, modal split analysis, trip assignment techniques, and various models, transportation compact study methodologies	18	30
5	Network assignment methods, connectivity, strategies for the evaluation of ultimate transportation framework and case studies. Strategies for the evaluation of alternate transportation plans and plan implementation	5	15
6	Land use planning models and their suitability. Transportation impacts study methodologies	5	15

7	Urban goods movement, framework and case studies	3	5
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**Reference Books:**

1. B.G.Hutchinson, Principles of urban transportation system planning- McGraw- Hill, New York, 1974
2. Edward K.Morlok, Transportation Engg. and Planning
3. W.Dickey, Metropolitan Transportation Planning Tata McGraw-Hill, New Delhi, 1975
4. Blunder and Black, Land useTtransportation System J.Ortuzer and L.G. Willumsen, Modelling Transport, Johan Wiley and Sons Chincester,1994
5. Vukan R. Vuchic, Urban Transit : Operations, Planning and Economics, Wiley Sons Publishers.
6. Peter White, Public Transport, UCL Press
7. Kadiyali L.R., Traffic Engineering and Transport Planning, Khanna Publishers
8. Khisty, C J., Transportation Engineering – An Introduction, Prentice-Hall, NJ
9. TCRP Report 30, TCRP Report 95, TCRP Report 100
10. S.C. Saxena, Traffic Planning and Design, Dhanpat Rai Pub., New Delhi.
11. Partho Chakraborty and Animesh Das, Principles of Transportation Engineering, PHI
12. C. S. Papacostas, Fundamentals of Transportation System Analysis, PHI.
13. James H. Banks, Introduction to Transportation Engineering, WCB-McGraw Hill, New York

**List of Experiments:**

1. Modal split analysis.
2. Study of Urban Goods movement
3. Computer application for solving transportation problem using various models

**Open Ended Problems:**

1. A case study of planning for any Urban area

**Course Outcome:**

1. To cover concepts of Transportation planning, various modes, transit systems and their suitability.
2. To give idea of modeling in planning, to develop the methodology of travel demand modeling for Urban Transportation Systems.
3. To provide knowledge of Land use planning and transportation interaction

**Tutorials:**

Problems based on:

4. Trip generation: Linear Regression and Cross Category analysis.
5. Trip distribution: Growth Factor Methods, Gravity Model.
6. Modal split analysis.
7. Trip assignment: Shortest path analysis and network-assignment, connectivity.
8. Land use planning model (Lowery and Garin Lowery model).
9. Computer application for solving the above mentioned problems.

**Field work:** Collection of Home – Interview data. Presentation with group discussion on its analysis and interpretations.

**Field Visit:** Visit to Urban Mass Transportation System Service - Depot, Terminals, Offices.