TRAFFIC FLOW PRINCIPLES FOR PRACTITIONERS (TE-27)

COURSE OVERVIEW

The course will focus primarily on the "link and node" level of traffic systems. It will explore three themes for designing, evaluating, and controlling traffic systems:

1. Basic Assessment Tools (time-space & queuing diagrams)
2. Flow Theory (fundamental diagrams & dynamic models)
3. Applications (using the above ideas to solve problems involving traffic signals, freeway systems, and street networks)

COURSE OUTLINE

DAY 1

    Chapter 1 Introduction

    Chapter 2 Vehicle Trajectories
        a. Time-space diagrams: graphical tool for displaying data about vehicle motion
        b. Definitions of traffic stream properties
    Chapter 3 Links (e.g., road segments)
        a. Fundamental diagrams: flow-density relations
        b. Link dynamics: Kinematic Wave (KW) theory

DAY 2

    Chapter 3 Links (cont.)
    Chapter 4 Nodes (e.g., intersections, terminals, etc.)
        a. Queuing diagrams
        b. Delay and queue length at bottlenecks

DAY 3

    Chapter 5 Applications
        a. Traffic signals (timing, vehicle delay, arterials)
        b. Freeway management (on-ramp metering)
        c. Simple networks and complications due to route choice

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