

SIDRA MODEL FUNDAMENTALS

WORKSHOP CONTENTS

Traffic Models - An Introduction

- Model Benefits / Objectives
- Data - Information - Knowledge - Wisdom
- Model Consistency
- Movement Classes
- Level of Model Detail
- Traffic Models - Analytical and Microsimulation
- About Microsimulation Models
- Model Complexity vs Model Error
- Importance of Lane-Based Modelling
- Understanding Traffic Models

Fundamentals of Traffic Flow

- Uninterrupted and Interrupted Flows
- Where Do We Start?
- Three Key Parameters

Uninterrupted Flows

- Spacing - Speed - Flow
- Other Fundamental Relationships
- Speed-Flow Models
- Spot Speed, Travel Speed and Travel Time
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- Extra Bunching for Upstream Signal Effects

Traffic Signals - Saturation Flow

- Queue Discharge Surveys for Saturation Flow and Saturation Speed
- Saturation Headway Model
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- Saturation Flow Survey
- Short Lane Saturation Flows
- PCUs and TCUs: Movement Class and Turning Vehicle Effects
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Capacity, Degree of Saturation, Lane Flows

- Demand Flows
- Capacity, Degree of Saturation, Practical Capacity
- Lane Flows and Unequal Lane Use

Traffic Signals - Timing and Coordination

- Basic Elements of Signal Phasing
- Variable Phase Sequence Analysis
- Signal Timing
- Displayed and Effective Green Times
- Common Control Groups
- Critical Movement Diagram
- Basic Parameters in Actuated Signal Operation
- Signal Platoon Patterns
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- Signal Coordination

Roundabouts

- Roundabout Capacity Models
- Modelling issues observed at UK Roundabouts
- SIDRA Roundabout Capacity Model
- Capacity model with roundabout approach interactions
- Other features of SIDRA Roundabout Model
- Bunched Headway Model of Circulating Flow
- Geometry parameters in the SIDRA Roundabout Capacity Model
- Entry Radius and Entry Angle
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- Circulating and Exiting Flows
- Capacity Constraint
- Unbalanced Flows
- Roundabout Metering Signals

Sign Control

- Gap Acceptance Model
- Gap Acceptance Parameters (Driver Focus in Model)
- Movement Class (Heavy Vehicle, etc) Effects
- Reduction in Follow-up Headway and Critical Gap with Opposing Flow Rate "SIDRA Standard" and "SIDRA HCM" model parameters
- Gap Acceptance Survey Method
- Rule of Thumb for Gap Acceptance Parameters

Pedestrians

- Pedestrians Crossing Types
- About Pedestrians
- Pedestrian Crossing Speeds
- Pedestrians at Signals
- Pedestrian Minimum Time
- Pedestrian Actuation

Intersection Performance

- Delay, Back of Queue, Stop Rate.
- Overflow Concept
- Acceleration - Deceleration
- Fuel consumption, Emissions, Operating Cost

Model Calibration

- Key parameters
- Principle for software model calibration: adjust basic parameters
- Signal saturation flow example

Network Modelling

- Lane Blockage and Capacity Constraint
- Special Movement Classes
- Lane Movement Flow Proportions
- Midblock Lane Changes

Discussion

End of SIDRA MODEL Fundamentals Workshop