Background and Aims

This unit is designed to lay important foundations of traffic engineering knowledge. It is designed to develop students’ understanding of traffic flow theory as well as the analysis of signalised and unsignalised intersections. The course is designed to provide a rigorous and practical coverage of the collection of traffic data. The traffic surveys component of the course will cover traditional techniques for counting, classification and origin-destination surveys and we will also consider the capabilities of new traffic data collection equipment.

After completing this unit participants will be:

- familiar with the basic parameters and theories of traffic flow
- able to design, undertake and analyse traffic surveys
- able to apply basic traffic flow theory to the analysis of unsignalised intersection capacity
- able to design timing plans for isolated traffic signals
- aware of the importance of traffic engineering and its relationship with broader transport issues

Details of the structure of the unit are provided over the page.

Off-Campus Study Mode

The program is taught by off-campus learning which means you can balance your work and study while attaining your qualification with Monash University. There are no classes to attend so you can study where and when you like. Students from all over the world study in the postgraduate program, thanks to its flexible off-campus learning mode. Students and graduates can be found throughout Australia, New Zealand, the Middle East, Europe, North America and Africa.

A combination of printed study material and electronic communications are used in the delivery of the program. Academic assistance can be obtained by email or telephone. Discussion groups and other forms of on-line communication are also available for communicating with staff and other students.

Unit Leader

Euan Ramsay is a Senior Transport Policy Analyst with the Victorian Government’s Department of Transport. He holds a PhD in Transportation Engineering from Queensland University of Technology (QUT) and a Bachelor of Mechanical Engineering from the University of Melbourne

Enrolment Options

Enrol in either the Master of Transport or Master of Traffic or as a single unit. Exit options are also available for the Graduate Certificate in Transport and Traffic or the Graduate Diploma in Transport and Traffic.

Offered through The Institute of Transport Studies, Department of Civil Engineering Faculty of Engineering, Monash University

ABN 12 377 614 012
### Structure

The unit is structured around 12 topics which are generally associated with one week of study

<table>
<thead>
<tr>
<th>Topic</th>
<th>After completing this topic, participants will:</th>
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| 1. An Introduction to Traffic Engineering | • appreciate emerging issues which are impacting on the traffic engineering profession, and  
• understand the components of the ‘Traffic System’. |
| 2. Traffic Surveys: A Systems Framework | • understand the steps involved in a systems approach to traffic studies, and  
• appreciate the tradeoffs associated with the allocation of survey resources. |
| 3. Vehicle Volume and Classification Surveys | • understand the terminology used in the context of traffic volume studies,  
• be aware of the issues which we need to be considered when designing and running a counting survey, and  
• understand the features and capabilities of different automatic equipment used in vehicle counting and classification studies. |
| 4. Speed, Travel Time and Origin-Destination Surveys | • appreciate the advantages and disadvantages of different speed measuring approaches,  
• understand the different methods used to collect travel time data, and  
• be able to distinguish direct from indirect methods for undertaking origin-destination surveys. |
| 5. Traffic Generation and Parking Surveys | • appreciate the alternative techniques available for collecting traffic generation data,  
• appreciate the distinction between parking supply and demand surveys, and  
• understand the different survey techniques which can be employed in parking supply and demand surveys. |
| 6. Basic Traffic Variables and Relationships | • define the basic variables used to describe traffic flow, and  
• understand the relationships between those variables. |
| 7. Shock Waves in Traffic | • understand the types of events which produce shock waves in traffic, and  
• be able to analyse shock wave propagation in traffic to predict queue lengths and clearance times. |
| 8. Foundations of Unsignalised Intersection Analysis | • predict the length of queues and the delays caused by the queue, and  
• understand the standard statistical distributions used to represent traffic headways and the circumstances where each statistical distribution may or may not be applicable. |
| 9. Analysis of Unsignalised Intersection Capacity | • be able to apply the standard gap acceptance and absorption formulas to the analysis of unsignalised intersections in order to determine the capacities for particular approaches, the delays likely to be experienced by road users and the extent of queueing on the approaches to the intersection. |
| 10. Analysis of Roundabout Capacity | • be able to understand the advantages and disadvantages of roundabouts as intersection control treatments, and  
• understand the steps involved in calculating the capacity and delay at roundabout approaches. |
| 11. Principles of Traffic Signal Timing | • understand the reasons for signalising an intersection,  
• be able to analyse simple signalised intersections, and  
• understand the basic elements of signal hardware. |
| 12. Traffic Signal Timing Analysis | • be able to determine the cycle time and phasing for an intersection with unopposed turns and the complexity introduced with opposed turns, and  
• understand the elementary concepts in traffic signal linking. |

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