

CIV5304: Intelligent Transport Systems

Background and Aims

The term Intelligent Transport Systems (ITS) is now commonly used to cover the application of advanced technology to the surface transport system. This subject introduces participants to the field of ITS, examines component technologies and explores how those component technologies are brought together in applications or products.

After completing this unit participants will:

- understand the role that technology plays in addressing transport problems and the technological building blocks which underlie ITS applications,
- appreciate the functional areas of ITS and the characteristics of the technology in those areas,
- understand how ITS applications are built from component technologies and how they can be evaluated,
- be aware of the broader societal issues associated with the application of ITS technology, and
- appreciate contemporary issues in the application of advanced technology in transport including the roles of the public and private sectors.

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

Enrolment Options

Enrol as a single unit or as part of either the Graduate Certificate in Transport and Traffic, Postgraduate Diploma in Transport and Traffic, or Masters in Transport and Traffic.

Off-Campus Study Mode

This unit is offered by Off-Campus (distance education) and there is no requirement for participants to attend lectures. Study guides, comprising a comprehensive set of course notes, are sent following enrolment. Further support is provided through a unit web site and via e-mail. The lecturer is available to answer questions and to provide assistance as necessary throughout the semester. Assistance can be arranged by email, facsimile, mail, telephone or through the discussion groups on the unit web site. Assessment comprises two assignments and an examination (worldwide exam venues are available).

Unit Co-ordinator



Geoff Rose is the Director of the Institute of Transport Studies and an Associate Professor of Civil Engineering at Monash University. Prior to joining Monash in 1994 he was a partner in a consulting practice, lectured at the

University of Melbourne and worked in the Commonwealth Departments of Transport and Aviation. Geoff holds a Bachelor of Civil Engineering Degree from the Queensland Institute of Technology and a Master of Science and PhD from Northwestern University in the USA. His research interests cover Intelligent Transport Systems and Travel Behaviour.

Enrolment or General Course Enquiries:

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Structure

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

Topic	<i>After completing this topic, participants will:</i>
1. Introduction to Intelligent Transport Systems	<ul style="list-style-type: none"> understand what is meant by the term 'Intelligent Transport Systems' appreciate the goals of ITS and the main functional areas within ITS appreciate the relationship of ITS to the solution of transport problems
2. Architecture and Standards	<ul style="list-style-type: none"> understand what an architecture is as well as how and why are they used in ITS; appreciate how standards fit in with architectures and why standards are desirable; be ware of the arguments behind the debate about the most appropriate role of architectures and standards in ITS.
3. Communications Systems	<ul style="list-style-type: none"> understand the role of communications and appreciate choices to be made in applying communications to ITS applications. broadly understand technologies and techniques applied to optimise wireline and wireless communications
4. Computers Systems and Artificial Intelligence	<ul style="list-style-type: none"> appreciate the relevance of hardware and software innovations in ITS applications appreciate the fundamental concepts and applications of fuzzy logic, knowledge-based systems, neural networks, and genetic algorithms
5. Detectors, Positioning Systems and Variable Message Signs	<ul style="list-style-type: none"> appreciate the range of sensors and detectors which can be deployed in an ITS application understand the alternative technologies available for locating vehicles understand the alternative sign technologies and relevant human factors issues
6. Advanced Traveller Information Systems	<ul style="list-style-type: none"> understand the components of the ATIS information chain appreciate the component technologies and capabilities of in-vehicle navigation systems be aware of current issues likely to shape future developments in the ATIS area
7. Advanced Traffic Management Systems – Freeways	<ul style="list-style-type: none"> appreciate the range of options available for the management and control of motorway traffic have gained insight into the operation and performance issues associated with automated incident detection systems, motorway variable speed control systems and ramp metering
8. Advanced Traffic Management Systems – Arterials	<ul style="list-style-type: none"> understand the essential elements of adaptive traffic signal systems understand how selective vehicle priority is implemented, and appreciate how ITS technology is being used to assist non-motorised transport users
9. Advanced Vehicle Control and Safety Systems	<ul style="list-style-type: none"> appreciate the context of AVCSS and its associated technologies along with human factor issues be aware of the broader societal issues associated with the implementation of this technology.
10. Electronic payment	<ul style="list-style-type: none"> appreciate the component technologies for electronically collecting tolls or user fees on roads and public transport, understand the different types of electronic tolling technologies, appreciate the economic and social arguments regarding electronic road pricing, and the distinction between Electronic Toll Collection (ETC), Electronic Road Pricing (ERP) and value pricing,
11. ITS Evaluation	<ul style="list-style-type: none"> understand the general principles of evaluation and different categories of evaluation relevant in an ITS context including benefit-cost analysis (BCA), multicriteria analysis (MCA) and cost-effectiveness analysis (CEA) understand current Australian and overseas initiatives relating to evaluation of ITS investments
12. Implementation and Societal Issues	<ul style="list-style-type: none"> appreciate liability, privacy and equity issues associated with the implementation of ITS technology.