

Public Works Foundations Program



Course Outline

Road Engineering Foundations

What is the Road Engineering Foundations course?

This course is one of eight **Public Works Foundations Program** courses curated by IPWEA Victoria to develop the skills of public works professionals in key responsibility areas. Each course comprises four 4-hour online sessions presented over consecutive weeks.

Course Overview

Roads connect our communities and public works professionals play a vital role in their design, construction and maintenance. This course outlines the principles, people and processes supporting best-practice road management.

Modules

Session 1: **Introduction to Road Management**

Session 2: **Geometric Road Design**

Session 3: **Pavement Design and Construction**

Session 4: **Road Network Maintenance**

Learning Objectives

Introduction to Road Management: Delegates will gain an understanding of the overall concepts and principles of the road industry in Australia, including the language used, the people involved and the steps needed to design, build, manage and maintain a road.

- Importance of roads in the Australian economy.
 - Language of the roads sector (including components of a typical cross-section).
 - People and Associations of the roads sector (Austroads, AfPA, AustStab, ASCP, NATSPEC, AUS-SPEC, Tyre Stewardship Australia, NATA etc.)
 - Types of pavements
 - Flexible (sprayed seal)
 - Bound (Stabilisation, Asphalt)
 - Rigid (Concrete)
 - How does council get a road built?
 - Planning approvals
 - Environmental approvals (EES, EIS etc)
 - Budget estimates & approval
 - Survey
 - Design
 - Project delivery models
 - Some construction considerations
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- Legislative requirements
 - Names of the various Acts of Parliament
 - Where does State responsibility end and Council responsibility start?
- Asset management
 - Aim of asset management
 - Use of pavement maintenance and rehabilitation techniques
- Using recycled materials

Geometric Road Design: Delegates will gain a broad understanding of some practical elements relating to geometric road design.

- Introduction & Objectives
- Fundamentals Considerations: location, road classification, traffic volumes, environment considerations
- Speed Parameters: terminology, speed factors, local & rural roads
- Cross-section: crossfall, crowns, lane widths, shoulders, roadside drainage
- Sight Distance
- Coordination of Horizontal & Vertical Alignment
- Horizontal Alignment and Vertical Alignment
- Optimising Design
- Austroads Guide/s: Guide to Road Design - Part 3: Geometric Design

Pavement Design and Construction: After this session, delegates will have a broad understanding of the various factors affecting pavement design and the methods used in Australia to undertake a pavement design.

- Introduction to APGT02-17 & pavement design systems
- Road environment
- Subgrade evaluation
- Design traffic
- Pavement materials & tests
- Structural thickness of unbound flexible pavements
- Mechanistic design of bound pavements
- Various State Supplements to Austroads APGT02-17
- Pavement construction

Road Network Maintenance: After this session, delegates will have an understanding of the investigation of sealed road pavements and the selection and design of pavement strategies and treatments for roads carrying normal loadings with a focus on flexible pavements.

- Refresher on road pavements
- Modes & mechanisms of pavement distress
- Pavement evaluation techniques
- Preventative maintenance
- Periodic maintenance

Delivery

The course is presented online to maximise accessibility for regional & interstate participants.

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Facilitators

Madeleine McManus

Madeleine McManus OAM, FIEAust, NER, CPEng, EngExec is a distinguished engineer and leader with over 25 years of experience. She is currently the CEO of CPEE – the Centre for Pavement Engineering Education and the Centre for Professional Engineering Education (CPEE), Global Director of Robogals, member of the National Pavement Taskforce, co-chairs with the CEO of NTRO the industry advisory board for national Pavement research, known as the SPARC HUB and has recently been made the independent Chair of Yarra Trams operated by JV with Transdev and John Holland. Madeleine also serves on various government, academic and industry committees/boards, including the Victorian Government's Construction Leadership Group and the Australian Regenerative Medicine Institute (ARMI).

Peter Gibbings

Dr Peter Gibbings is an Honorary Associate Professor and recently retired after 25 years in academia where he was the Associate Dean (Learning, Teaching and Student Success) in the Faculty of Health, Engineering and Sciences at the University of Southern Queensland. His professional background is in land surveying having spent 20 years in private practice, including many years designing engineering infrastructure including roads.

Dr Kym Neaylon

Kym is a Civil Engineer with well over 40 years' experience in road maintenance and surfacings. Over this time, he has worked in mining, Local Government, State Government, The Australian Road Research Board, an International Technical Services Consultancy, and most recently at the Centre for Pavement Engineering Education, where he still teaches. Concurrent with this he has also been a member of the Austroads Pavement Task Force where he contributed to the content of many Austroads publications, Guides, technical reports and research reports. Kym is also an Independent Consulting Expert and has written several expert witness examinations and reports for use in legal disputes regarding pavement and surfacing failures. He is a past Chair of the Standards Australia committee for bitumen and related materials, and has received an Outstanding Service Award from the Austroads Board. His PhD thesis was the first (and only) in Australia on the topic of sprayed sealing, where he researched the implications of increased road trains and their effect on sprayed seal performance and design.

Who should enrol?

This course has been developed for public works engineers, technical officers, coordinators and supervisors engaged with the design, construction & maintenance of road infrastructure.

CPD and Badge

The course provides 16 hours of Continuing Professional Development (CPD) and a digital badge is provided on successful completion for social media use.

Course Partner

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**Centre for
Pavement
Engineering
Education**