ABOUT US

The Australian Centre for Commercial Mathematics (ACCM) is an Industry-Oriented Consulting Centre within the School of Mathematics and Statistics at the University of New South Wales. We deliver practical solutions to our clients through the use of advanced mathematics and statistics. Our research team has a proven track record of delivering results in a diverse range of sectors including transport infrastructure, mining, biotechnology and advanced manufacturing.

CONTACT US

Please contact us if you have any inquiries with regards to our services. You can also visit us on the web at: www.maths.unsw.edu.au/industry/accm

Australian Centre of Commercial Mathematics
School of Mathematics and Statistics
The University of New South Wales
Ph:  +61 2 9385 7117
Email:  accm@unsw.edu.au

OUR CLIENTS

Our clients include The NSW Roads and Maritime Services, Vicroads, Brisbane City Council, Cochlear, The Defence Science and Technology Organisation (DSTO) and The Australian Nuclear Science and Technology Organisation (ANSTO).

OUR SUCCESS

Our success is based on our ability to provide a bridge between practical industry requirements and the wealth of knowledge, experience and academic expertise within the UNSW School of Mathematics and Statistics. Our industry researchers all have extensive experience in providing solutions to industry through the application of advanced mathematical and statistical techniques. They work closely with UNSW academic mathematicians and statisticians to provide best-practice solutions that meet our clients’ business goals.
Developing Control Methods

Our research is focused on developing network flow-control methods that are appropriate for the arterial networks found in Australian cities and that can be implemented using the successful Urban Traffic Control system SCATS.

Robust Data Processing and Analysis Methods

ACCM has developed robust methods for processing and analysing SCATS data. These methods allow us to present our clients with an in-depth numerical and graphical understanding of their traffic network. There are many practical traffic engineering questions that can be answered using our methodology. For example ACCM has used this methodology to assess and quantify network traffic flow changes following road infrastructure improvements.

CASE STUDY

TRAVEL TIME ESTIMATION & CONGESTION DETECTION

Accurate estimation of travel times and the early detection of congestion events is an important task for Road Authorities. While technologies are available to make travel time estimation possible, the task is made difficult by the complexity of traffic data. Most traffic flows, even in relatively simple motorway systems are multi-modal, with vehicles naturally belonging to one of several groups displaying particular features. Simple travel time estimation and congestion detection systems can miss this complexity, resulting in inaccurate travel time estimates and incorrect detection of congestion events.

ACCM has developed computational statistical methods that allow Road Authorities to provide road users with accurate real-time travel estimates and congestion information that is based on robust statistical techniques.

CASE STUDY — TRAFFIC CONGESTION REDUCTION THROUGH AREA NETWORK CONTROL

Increasing traffic congestion due to an increase in traffic demand over time is a major issue for Australian Transport Authorities. Increasing traffic demand leads to an increase in the probability that a road network will experience serious network-scale congestion. ACCM is working closely with the New South Wales Roads and Maritime Services (NSW RMS) and the University École Polytechnique Fédérale de Lausanne (EPFL) to develop a method of altering traffic flow patterns to reduce the incidence of network congestion events.

Constructing control functions for arterial network control

ACCM has developed robust methods for processing and analysing SCATS data. These methods allow us to present our clients with an in-depth numerical and graphical understanding of their traffic network. There are many practical traffic engineering questions that can be answered using our methodology. For example ACCM has used this methodology to assess and quantify network traffic flow changes following road infrastructure improvements.

Developing Control Methods

Our research is focused on developing network flow-control methods that are appropriate for the arterial networks found in Australian cities and that can be implemented using the successful Urban Traffic Control system SCATS.

CASE STUDY

STATISTICAL ASSESSMENT OF PINCH POINT TRAFFIC ENGINEERING

A Pinch Point in a traffic network is caused by a constriction of flow at a particular location within a road network. Traffic engineering works such as adding lanes, changing control algorithms and road rules, are often implemented by traffic engineers and planners to improve flow at Pinch Point locations. Traffic engineering works are often very expensive and can result in lengthy disruptions to the network. Consequently it is important for Road Authorities to be able to assess whether the works resulted in a statistically significant improvement and to be able to quantify the improvement for the purpose of economic assessment.

Quantifying traffic flow improvements

The ACCM has developed a Pinch Point assessment methodology that allows Road Authorities to quantify changes that occur following a traffic network improvement project. We have developed a suite of metrics that allow the change in important traffic parameters such as flow efficiency and congestion to be calculated. Changes are estimated using a statistically robust method that allows quantification of change at multiple network scales. The method is used by our clients to assess and quantify change at the lane, intersection, route and network scales.