



METRANS FALL 2023

SPEAKER SERIES

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September 21, 2023
12- 1 PM PST



Emily Moylan

Dr Emily Moylan is a Senior Lecturer in Transport at the School of Civil Engineering, University of Sydney, where she is leading a research program in the stochasticity of transport system performance. Emily's research builds on data from many sources including road traffic counters, pedestrian delays, Google Maps API, and transit smart cards to understand the complexity and variability in the way that people move around urban spaces. After completing her PhD in Astrophysics at ANU in 2011, she studied Transport Planning (Master of City Planning) and Engineering (Master of Science) at University of California, Berkeley.

LUNCH WILL BE SERVED



Zoom

<https://usc.zoom.us/j/98793874966pwd=WndiVFFFZ2hySOsxeGdBSUdxbEtCQT09>



Ralph and Goldy Lewis Hall (RGL) 100

WHAT DOES ONLINE SHOPPING HAVE IN COMMON WITH SURVIVING A HEART ATTACK?

Getting your online purchases from the warehouse to your front door requires a careful design of warehouse and depot locations, vehicle capacity, scheduling and routing. Logistics companies and researchers work on novel ways to represent and solve these problems to optimise cost, profit and delivery time.

Ambulance services are in the business of patient logistics. Their goal is to get medical help to patients and patients to hospital to maximize survival. More than 350,00 cardiac arrests occur outside of hospitals in the US annually, and with a survival rate of about 10% there is potential to design a system to get those patients treated more quickly to improve their chances of staying alive. A promising development is using heart-and-lung bypass as a stopgap while waiting definitive treatment-- this is called extracorporeal membrane oxygenation cardiopulmonary resuscitation or ECPR.

In this work, we frame ECPR planning as an optimisation borrowing concepts from parcel logistics and accessibility analysis. We explore alternative delivery strategies where the patient travels to the treatment, the treatment travels to the patient or the treatment and patient rendezvous at an intermediate point. We demonstrate that survival benefits from alternative strategies outperform the more costly solution of providing more facilities. These findings have been used to inform the next phase of deployment of ECPR in Sydney, Australia.