# Introduction

## Project summary

As part of the UNSW Canberra City Vision, the university is seeking to expand its presence in through the establishment of a new multi-precinct campus in Reid, Canberra. The proposed site is situated inside Canberra’s CBD and within proximity the Parliamentary Triangle, as such the transport network that will service the site is already prone to high levels of congestion during peak periods. The aim of this project is to estimate future demand for parking spaces.

The development will include designated car parks, however the number of spaces required will depend what alternatives are available to commuters. As part of the proposal the university is considering the following three options,

#### Free parking

Parking facilities at the nearby ADFA Campus are currently free for all staff and students. Under this proposal, parking would be free for the new Reid campus in order to maintain fairness.

#### Flat-rate parking

This proposal attempts to discourage private car use by charging commuters a daily flat rate of $5.00 per a parking space. Fewer parking spaces would be required, and in turn generate less additional congestion. The income stream would (presumably) be reinvested into providing efficient transport alternatives (such as on demand transport).

#### On Demand Transport

On Demand Transport (ODT) is a flexible public transport service designed to improve connections to transport hubs, town centres and other institutions. This proposal looks to provide ODT for the new Reid Campus.

The aim of this project is to estimate future demand for parking spaces in each of the above three proposals.

## Progress report

Discuss progress made (1 paragraph)

* Identified useful data
* Drawn links between useful data
* Created model
* Defined parameters
* Coded a prototype and have started to feed it data
* Started working on evaluation criteria to assess model outputs

# Modelling Framework

We chose to adapt the first three steps standard four step travel demand model, mainly for its simplicity, to forecast the required number of parking spaces. In this case, the fourth step can be ignored since we are not concerned about route congestion when designing a car park (at least not yet).

## Relevant sample data

What can we learn/take from this that can be fed into our model?

**Student** - currently enrolled in the course

**ID**: The identification of each individual student

**Career**: Which academic level are they at

**Gender**: The gender of the student (either male or female)

**~~Admit Term~~**~~: When the student started their program~~

**School**: What type of degree the student is studying

**Day**: Day of the week the student is exiting/entering

**Entrance/Exit**: Time when the student is exiting/entering

**Staff** - currently working at the university

**ID**: The identification of each individual staff member

**Job Title**: What role is the staff member fulling

**Full/Part Time**: whether the staff member is working full/part time

**~~Position Title~~**~~: The Specific roll of each staff member~~

**Level**: the employment level according to the contract

**School**: What type of degree the staff member is working with

**Day** of the week the staff member is exiting/entering

**Entrance/Exit**: Time when the staff member is exiting/entering

**Free Parking**: Establishing free parking areas for the campus

**Active mode of Transport**: walking or cycling to finial destination

**Parking Pricing**: Establishing paid parking which will be a daily flat rate of $5 per entry

**OnDemand Transport (ODT)**: A flexible public transport service which aims to improve connections to transport hubs and popular destinations. The cost is covered by selling tickets at 50% higher than traditional public transport.

**Time**: time taken to reach end destination (either university or home)

**Cost**: The cost to the end-user

**Capital Cost:** The initial cost to have transport operational

**Operating Cost:** The cost to maintain the transport

## High-level flow diagram

Diagram

Description automatically generated

## Trip generation

Insert low level flow here

## Trip distribution

Insert low level flow here

## Mode choice

Insert low level flow here

## Model parameters

**Given parameters**

* Number of students and staff
* Proportion of students/staff based on their school (percentages)
* Proportion of Postgraduate and Undergraduate students (percentages)
* Proportion of Fulltime and Parttime staff (percentages)
* Proportion of staff by job role / level (percentages)
* Trip duration increase in target year over base year
* Costs
  1. Public transport fares (students, teachers)
  2. Automobile cost / km
  3. Automobile parking rate / day

**Parameters derived from supplementary data (Tables 2-5)**

* Proportion of trips by zone to ADFA campus – table 2
* Zone to city campus
  + Travel times (min, max, mean)
  + Travel distances
* Travel

**Parameters derived from ADFA attendance data**

* Average number of weekly trips per student – categorised by School, UG/PG
* Average number of weekly trips per staff member - categorised by School, FT/PT, Job Level

# Data Analysis

Need to summarise key findings from R script here.

Insert tables and graphs here

Problems encountered? Missing data?

# Criteria

Not required but should start a rough list to help refine model

To evaluate each proposal, its important need to first understand how it impacts stakeholders. Three main stakeholders have been identified, the End user, the University, and the surrounding community. The following table lists the key requirements and interests for each stakeholder and how they will be assessed for each proposal.

What are we using as a baseline??? Current data?

|  |  |
| --- | --- |
| **Students and Staff (customer)** | |
| Travel time | Lower is better |
| Convenience/Practicality | Rank them  Cars are more convenient but then assumes you’re not looking for parking space. |
| Cost (to end-user) | Cost needs to be low enough to make a difference  Running cost for ICE expected to be massively higher we transition to electric/hydrogen |
| **University (supplier)** | |
| Capital cost | Lower upfront is better but depends on potential benefits in longrun |
| Operating cost | Measure of the expected ongoing cost to main |
| Land use/displacement | Measure of the amount of land required. |
| **Community** | |
| Potential for congestion | Measure of how many additional vehicles on the road at peak   1 car is 1 car, 1 bus is 10+ cars |
| Noise pollution | ?? not sure how we compare that  Car decibel < bus decibel |
| Energy footprint | Compare energy per km travelled in each scenario. Obviously cars will be worst. |
| Safety | Cars are statistically more dangerous. Would we tally the likelihood of one person being in a n |