

How do you tell if a regional area may support an on-demand service?

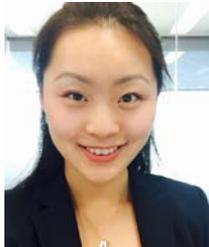
Presented by Loan Ho

Institute of Transport and Logistics Studies, The University of Sydney

Co-authors: Prof. Corinne Mulley^a, Helen Lin^b and David Royle^b

^a *Institute of Transport and Logistics Studies, The University of Sydney,*

^b *David Royle Bus Holdings*



Overview

1. Review the location of this project, estimating demand, looking at supply in theory
2. How it has been applied in reality to show how the theoretical development has been successful in practice
3. Conclusions
 - The theory can be applied to tell how a regional on-demand service could be successful
 - Transferable to other areas

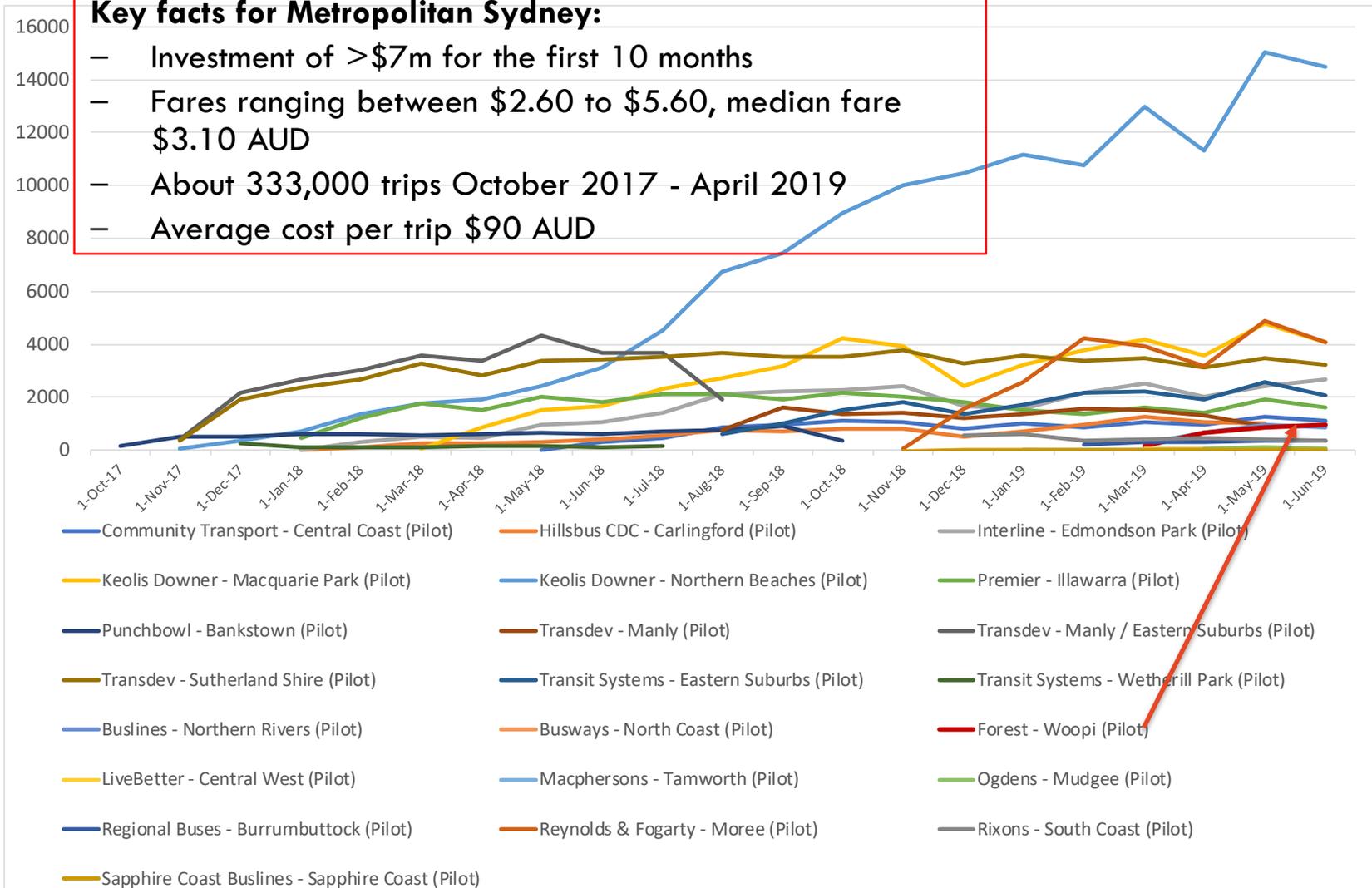
Why on-demand transport in Australia?

- Originally on-demand introduced for special needs travellers but now more frequently ‘open for all’.
 - Mainly in the rural or low density areas
 - More successful tend to provide connections to fixed route services on main corridors
 - Mainland Europe shows large scale on-demand services which are overlays - and primarily support disabled access – are expensive
- Few examples of long-lived open access on-demand in Australia despite the low-density nature of Australian urban areas.
 - Telebus in Melbourne Victoria
 - Roam Zone in Adelaide South Australia
 - Flexibus in Canberra ACT
 - Deane’s Buslines operate ‘Locallink’ in both Queanbeyan, NSW and on the South Coast

Latest update of on demand monthly patronage of metropolitan and regional New South Wales pilots from October 2017 to June 2019

Key facts for Metropolitan Sydney:

- Investment of >\$7m for the first 10 months
- Fares ranging between \$2.60 to \$5.60, median fare \$3.10 AUD
- About 333,000 trips October 2017 - April 2019
- Average cost per trip \$90 AUD



Why Coffs Harbour?

Originally the area was chosen as a result of a more general scoring system to evaluate areas of potential on demand transport demand

Level of Demand	Density (pp/sqkm)	Remoteness Areas (index)	SEIFA IRSD	Dwellings with 0-1 car (%)	ATSI Population (%)	Population Unemployed (%)	Score
High potential demand 	<3.2	Very remote	<340	>=0.64	>=0.4	>=0.5	5
	<9.2	Remote	<800	<0.64	<0.4	<0.5	4
	<15.6	Outer Regional	<930	<0.5	<0.2	<0.15	3
	<23	Inner Regional	<1015	<0.37	<0.09	<0.05	2
	>=23	Major Cities	>=1015	<0.23	<0.04	<0.02	1
Low potential demand	no population	-	No score	0	0	0	0

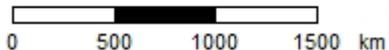
- ATSI: Aboriginal or Torres Strait Islander
- SEIFA: Socio-Economic Indexes for Areas
- IRSD: Index of Relative Socio-economic Disadvantage

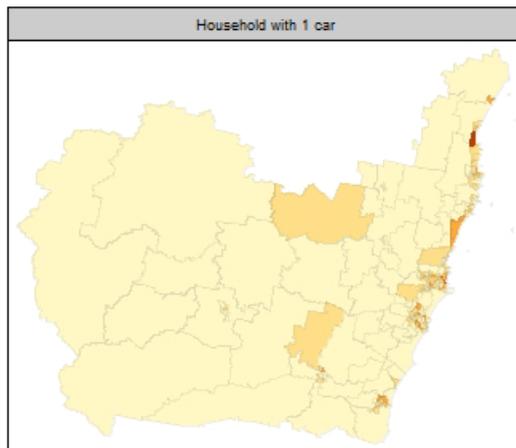
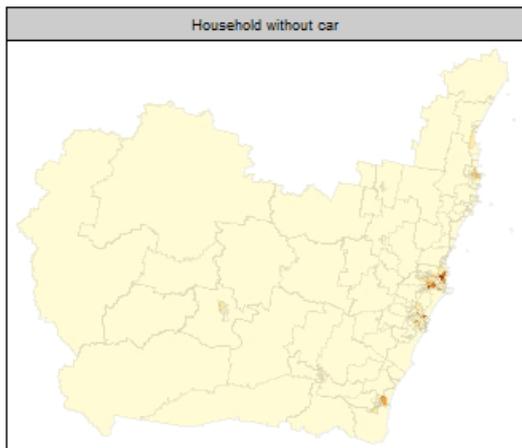
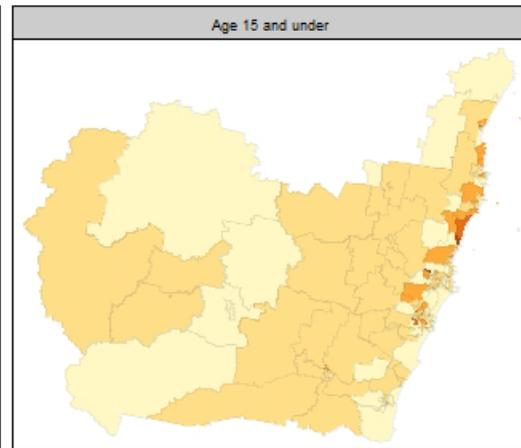
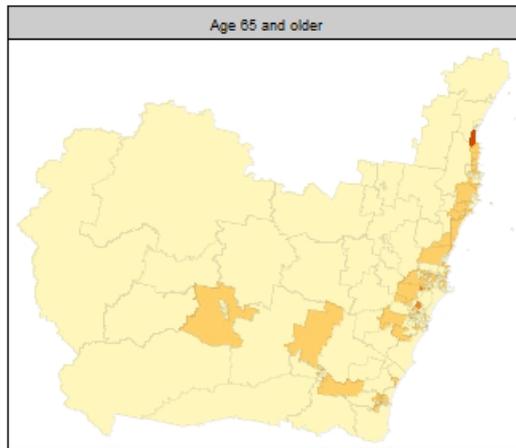
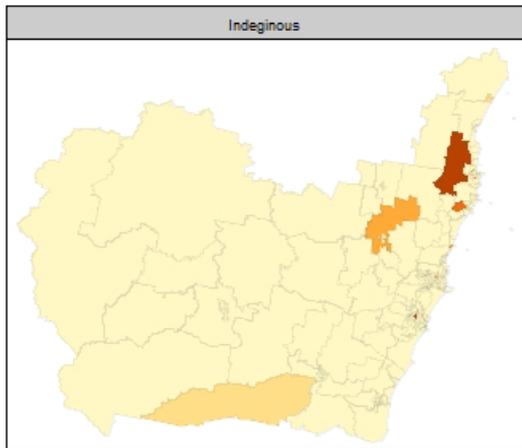
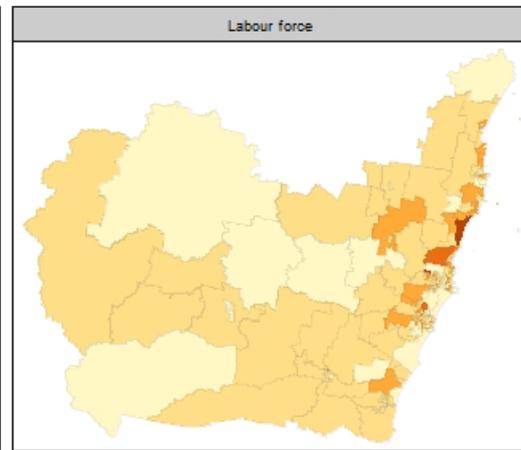
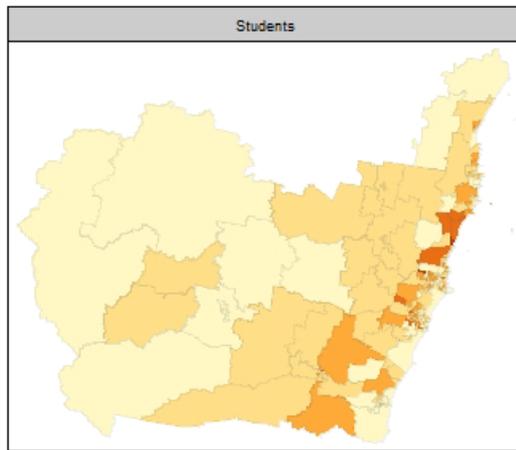
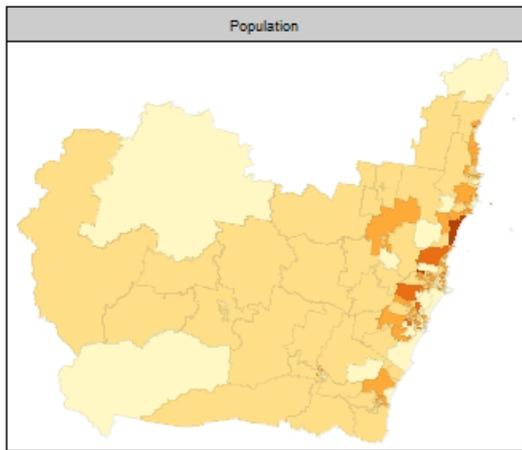
Coffs Harbour and its hinterland

- Total population: 74,641 (forecast to increase to 96,087 by 2036) (Australian Bureau of Statistics, 2016)
- Attracts >1.5 million tourists every year

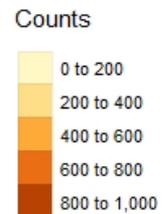


Geographical local of major regional centres in NSW

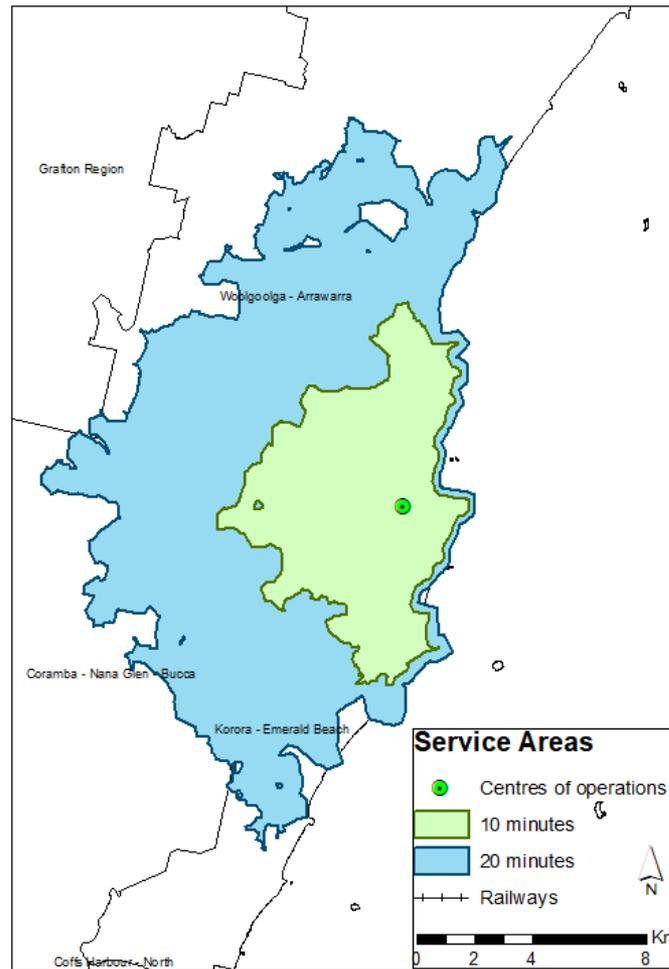




Identifying demand for the potential on-demand service: Vulnerable people



10 mins and 20 mins (donut) catchment areas from Woolgoolga with service speed (45 km/h)



Building the demand profile

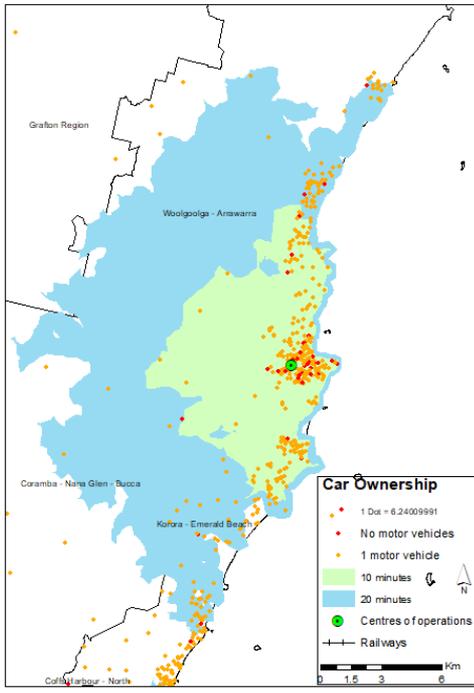
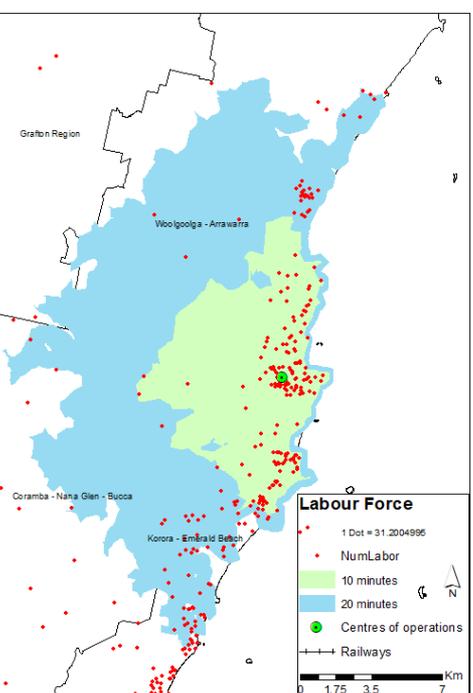
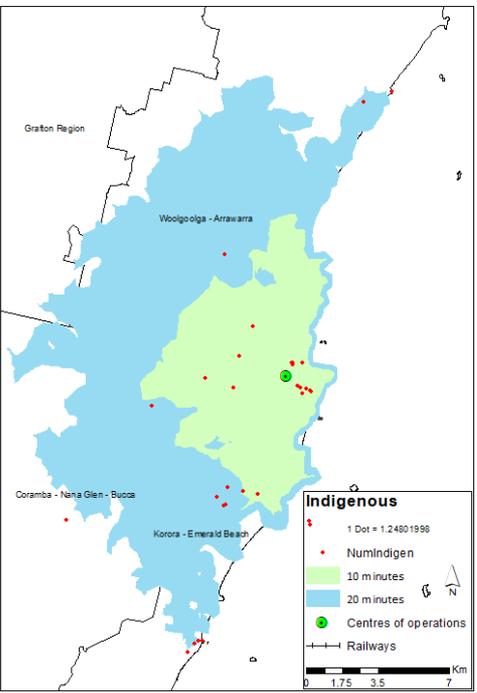
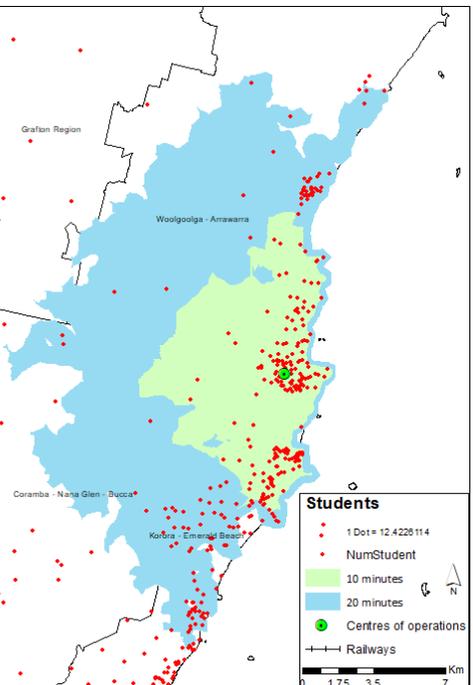
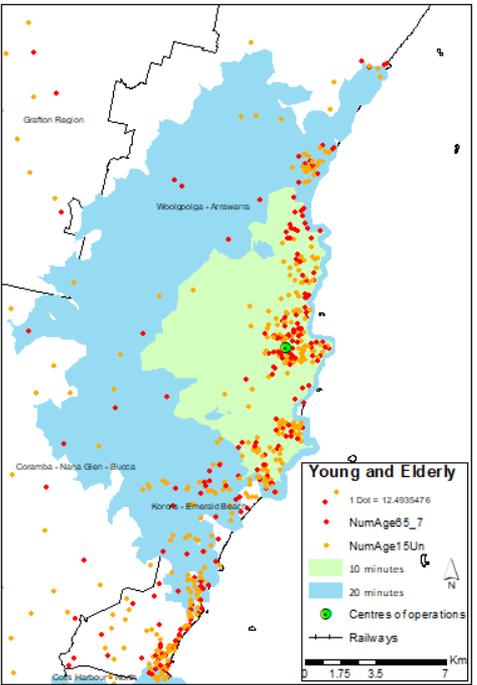
Total vulnerable population in Woolgoolga 10min and 20min catchment area

Service speed (45 km/h)	0 car HH	Elderly	Young	Labour force	Students	Indigenous	Total population
10 mins	204	1527	2334	5485	2645	27	12741
20 mins donut	97	1549	2735	5985	2995	19	13356

Weekly trips assumption of each type of population group

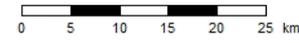
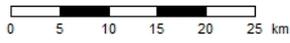
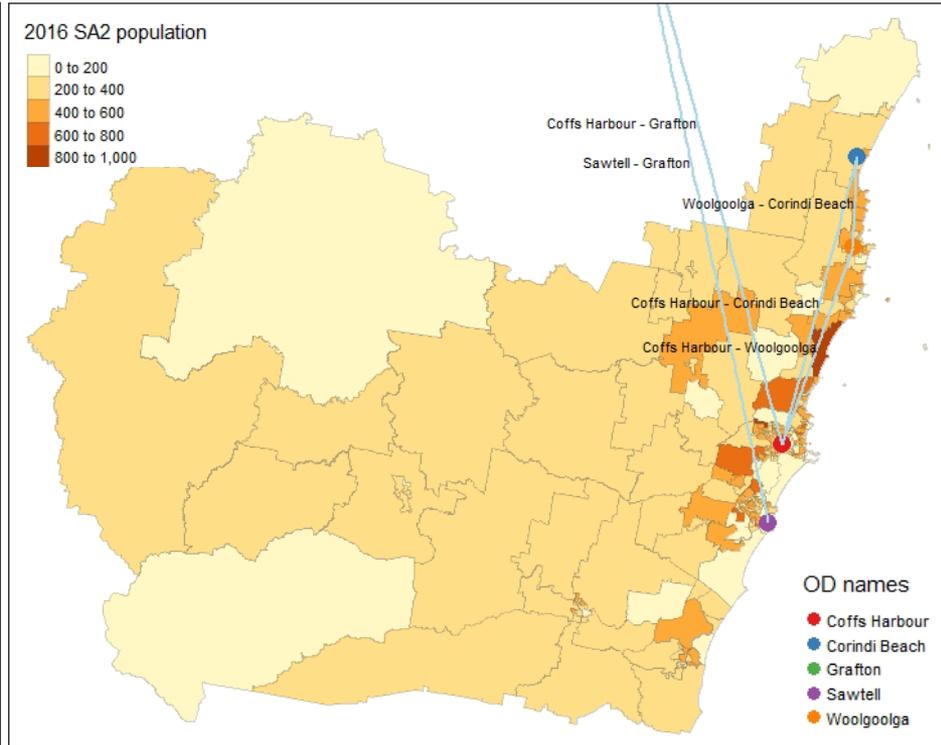
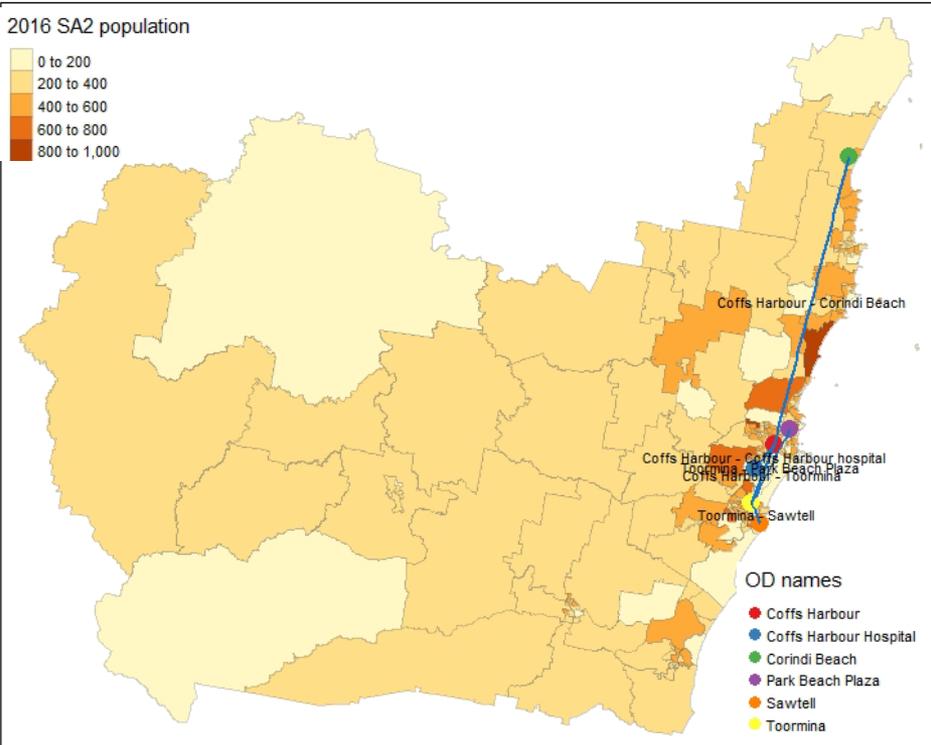
Assumptions	Elderly	Young	Labour Force	Students	Indigenous
Proportion with access to car	0.7	0.85	0.9	0.5	0.01
Trips per week with access to car	0	2	0	0	0
Trips per week with no access to car	6	3	10	6	2

Distribution of vulnerable people within 10 mins and 20 mins donut from proposed service area



Extra information: most frequently travel origin – destination

Bus user ODs (OD) in a survey by FCL Non bus user ODs



	Bus users		Non-bus users	
Rank	Origin - Destination		Origin - Destination	
1	Coffs Harbour	Toormina	Coffs Harbour	Woolgoolga
2	Coffs Harbour	Hospital	Coffs Harbour	Grafton
3	Coffs Harbour	Corindi Beach	Sawtell	Grafton
4	Toormina	Sawtell	Woolgoolga	Corindi Beach
5	Toormina	Park Beach Plaza	Coffs Harbour	Corindi Beach

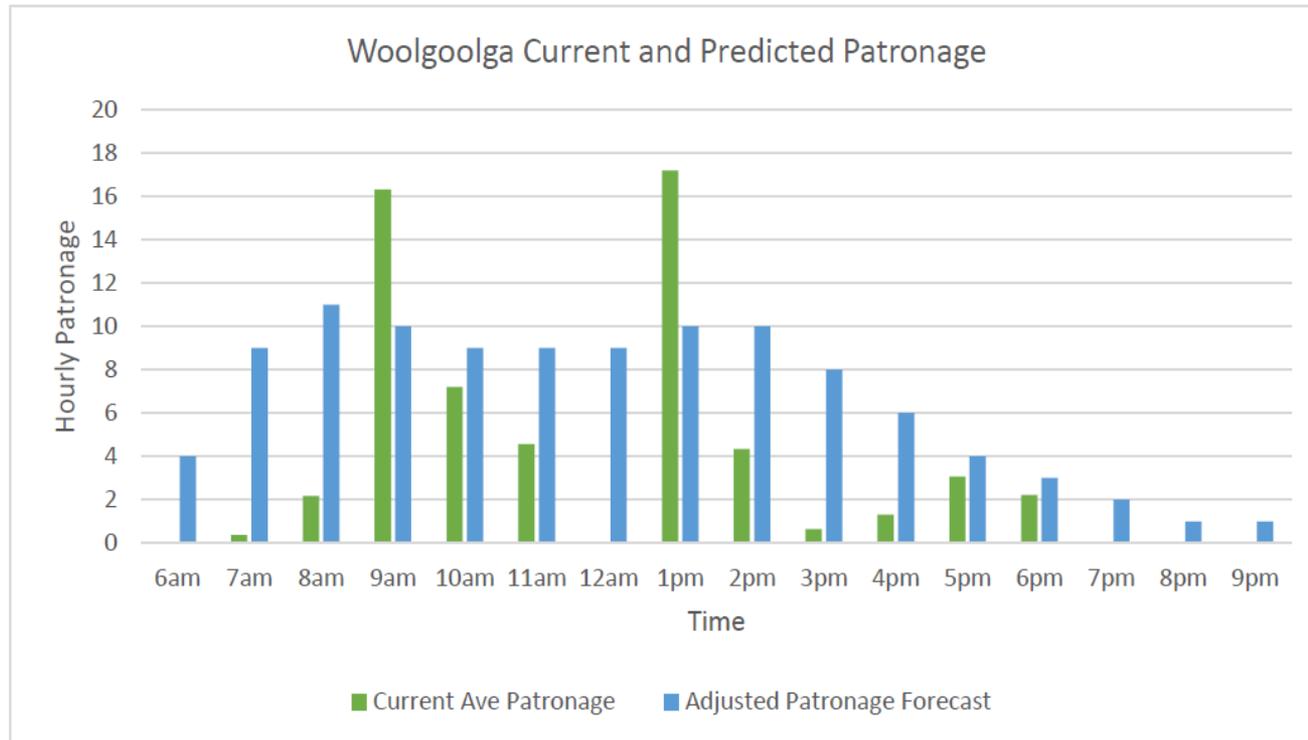
The survey showed only 16% of bus customers were satisfied with current connections across routes making up the network in Coffs Harbour.

Current daily patronage and estimated future demand

Comparing our estimate to current patronage shows the estimate to be very big. In fact it was about 2% of the existing fixed route patronage. So we used 2% as our starting point.

Woolgoolga - Catchment Area	Current Daily Patronage	2% Demand	5% Demand	8% Demand	10% Demand
10 minutes	<u>59.4</u>	61.1	152.7	244.2	305.3
20 minutes donut		68.1	170.2	272.3	340.3
20 minutes total		129.1	322.8	516.5	645.7

Comparing current fixed route patronage with our demand



Current patronage and predicted patronage by time of day in Woolgoolga

Identifying scenarios for supply

Vehicle size, carrying capacity and trip duration trade-off

Passengers per hr by vehicle size, cycle time and length of maximum length of journey

	Car (4 seats)		Medium Car (8 seats)		Mini bus (12 seats)		Mini bus (16 seats)	
								
	Max number of passenger trips	Max length of journey	Max number of passenger trips	Max length of journey	Max number of passenger trips	Max length of journey	Max number of passengers	Max length of journey
30 mins cycle = 10 mins driving	9.0	20 km	18.4	20 km	27	17.5 km	36	17.5 km
60 minute cycle = 20 mins driving	4.5	40 km	9.8	40 km	13.5	35 km	18	35 km

Source: Adapted from Bertocchi (2009), p 68.

Vehicle requirement and spare capacity of each type of vehicle in Woolgoolga 20-minute donut catchment area

The 2% demand for Woolgoolga - 20 min donut catchment	6am	7am	8am	9am	10am	11am	12am	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm
Demand																
Demand estimated	2.5	5.7	7.0	6.4	6.1	5.7	5.7	6.4	6.4	5.1	3.8	2.5	1.9	1.3	0.6	0.6
Estimated patronage	3.0	6.0	8.0	7.0	7.0	6.0	6.0	7.0	7.0	6.0	4.0	3.0	2.0	2.0	1.0	1.0
Supply																
1 Small Car (4 seats)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Spare capacity	1.5	-1.5	-3.5	-2.5	-2.5	-1.5	-1.5	-2.5	-2.5	-1.5	0.5	1.5	2.5	2.5	3.5	3.5
1 Medium Car (8 seats)	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.8	9.
Spare capacity	6.7	4.1	2.8	3.4	3.7	4.1	4.1	3.4	3.4	4.7	6.0	7.3	7.9	8.5	9.2	9.2
1 Minibus (16 seats)	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18
Spare capacity	15.0	12.0	10.0	11.0	11.0	12.0	12.0	11.0	11.0	12.0	14.0	15.0	16.0	16.0	17.0	17.0
1 Minibus (12 seats)	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
Spare capacity	10.5	7.5	5.5	6.5	6.5	7.5	7.5	6.5	6.5	7.5	9.5	10.5	11.5	11.5	12.5	12.5

Theory into practice - the operational case



WoopiConnect App logo

- Demand: 600 service kms/day
- Cost: \$3.3AUD/ vehicle km(including insurance, fuel cost, leasing, marketing, excluding depot costs) → daily cost: \$2000AUD
- Estimated potential demand: 130 passengers/day → \$15.4AUD/ passenger

Travel type	Adult	Concession
Single-zone travel	\$4.3	\$2.1
Cross-zone travel	\$6.4	\$3.3



The first passenger on 18 March 2019

(Photo source:

https://www.facebook.com/pg/woopiconnect/community/?ref=page_internal)

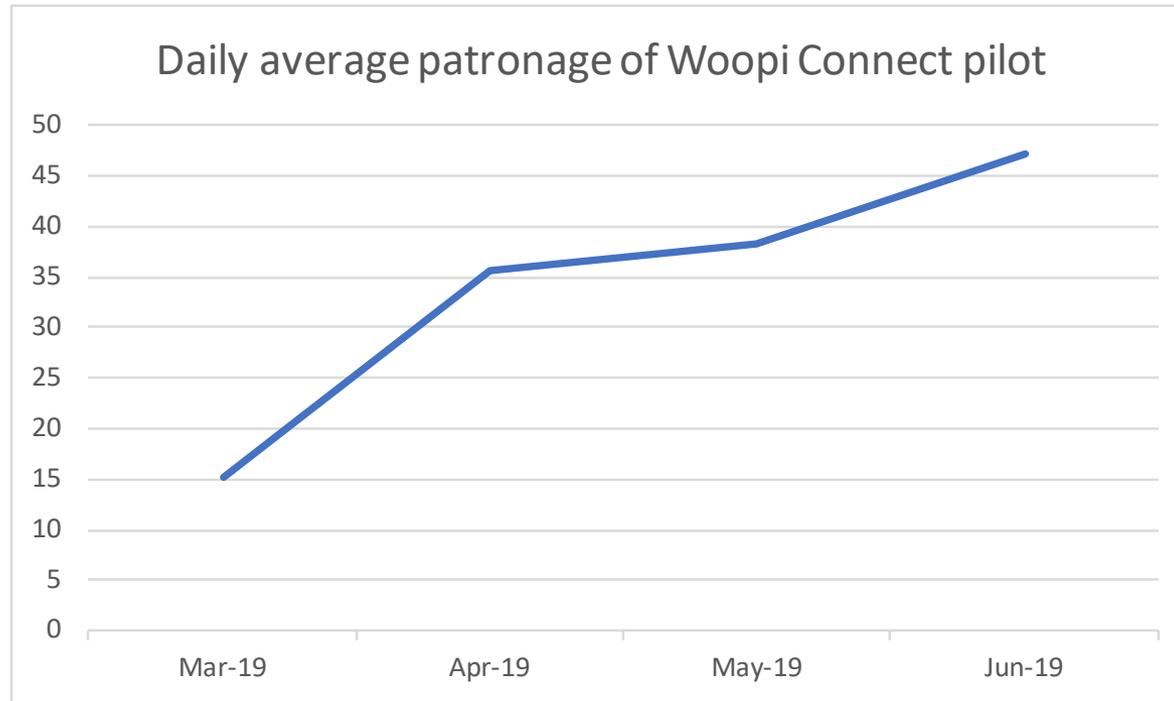
The University of Sydney

Woopi Connect on demand service area commenced in 18 March 2019 as a 6 month pilot (**5 weekdays: Monday – Friday**)

(<https://woopiconnect.com.au/>)

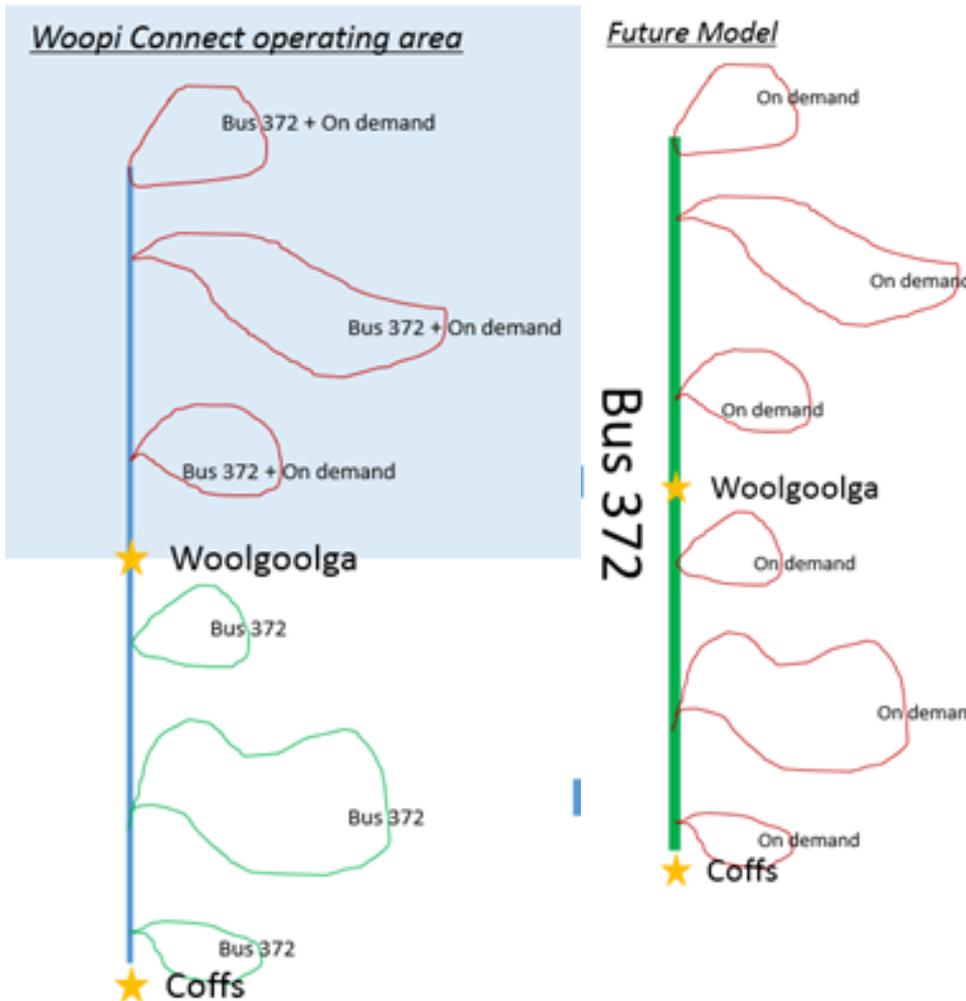
Woopi Connect App

Patronage of Woopi Connect pilot



	Monthly patronage	Daily avg patronage
Mar-19	151	15.1
Apr-19	679	35.74
May-19	883	38.39
Jun-19	942	47.1

The long term plan for Woopi Connect project



- Woopi Connect overlays the existing fixed route – in longer term will be redesigned to link to fixed route
- Main travel purposes: grocery shopping, medical appointments

Conclusions

- Using census information and GIS is a good way to estimate demand
- The real case of Woopi connect shows this
- Current service an overlay with fixed routes
- Marketing penetration to increase the likelihood of success for Woopi Connect

Thank you for your attention!

Q&A