

04.09.17

# First and Last Leg Benefit Evaluation Framework



# Method of analysing

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Evaluate the benefits of Devonport on-demand car sharing trial from 3 components:

- **Fare revenue**

*Revenue collected from fare*

- **Road traffic reduction**

*Consider wider economic benefit travel time savings (including congestion reduction), vehicle operating cost savings, crash cost savings, and environmental benefits (including CO<sub>2</sub> reduction).*

- **Public transport user benefit**

*Public transport user benefit is based on the cost saving (difference between the willingness to pay amount and the actual charged amount) and value from travel time saving for each user*

# Method of analysing

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The benefit evaluation framework is based on SP9-New public transport service given the following conditions are met:

- Funding gap is less than or equal to \$5 million over the first 3 years of operation
- The new service will serve a geographical area that is not currently served by public transport  
*Although there is an existing bus service in Devonport peninsular, the uptake for the service is low. Moreover, this new service aims to serve the areas which are not covered by the existing bus service and targets road users who are currently driving or being drop off*
- Services will be provided in the peak period, so that commuters change modes from private vehicles to public transport.
- The road traffic reduction benefit values assume that the road corridor has at least one point that operates at greater than 80% capacity during the peak period.
- Most traffic removed from the road network will be light vehicles and will not generate road maintenance, renewal or improvement cost savings.

## Cost - Benefit in year 2

### Benefit calculation in year 2

Travel time saving	Number of passengers/week			
	500	800	1200	1400
5 min	251,035	401,657	602,485	702,899
10 min	295,276	472,442	708,663	826,774
12 min	365,232	584,371	876,556	1,022,649

Values used for calculation	
Proposed charge price	3
Maximum amount user are willing to pay	6
Average travel length (km)	2.5
Variable cost / year (dollars)	854,556

### Benefit Cost Ratio in year 2

Travel time saving	Number of passengers/week			
	500	800	1200	1400
5 min	0.294	0.470	0.705	0.823
10 min	0.346	0.553	0.829	0.967
12 min	0.427	0.684	1.026	1.197

### Assumptions

1. The maximum amount users are willing to pay is based on the amount charged by private services like taxi or Uber. If users currently drive, the willing to pay price will reduce significantly hence reduction in user benefit
2. To calculate value from travel time saving, it is assumed that 60% of passengers who use this on demand service currently drive and 40% are currently dropped off.
3. The variable cost/year figure is estimated based on early quotations from operator and technology vendors. This figure might go up or down when the service is in operation

## Cost - Benefit in year 2

### Benefit calculation break down in year 2

	Number of trip/week			
	500	800	1200	1400
Revenue from fare	77,143	123,429	185,143	216,000
Road traffic reduction benefit	101,121	161,794	242,691	283,139
User benefit from cost saving	47,057	75,291	112,937	131,760
User benefit from time saving				
5 mins	69,955	111,928	167,893	195,875
10 mins	139,911	223,857	335,785	391,750
12 mins	167,893	268,628	402,942	470,100

Values used for calculation	
Proposed charge price	3
Maximum amount user are willing to pay	6
Average travel length (km)	2.5
Variable cost / year (dollars)	854,556

## Success metrics

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By the end of the trial period, the trial would be considered successful if the following metrics are satisfied

- Number of passengers per week : 1200 passengers

*Average 5 trips in AM peak and 5 trips in PM peak*

- Travel time saving per trip per passenger: 12 mins
- Trips growth rate: 10% / month

*Give in the first month of operation, we have 500 passengers/week*

- Retention rate ( user who uses service more than 1 time in a week): 80%
- Customer satisfaction score: 7/10

# Opportunities

On-demand car sharing service also bring long term benefits in few years time. The benefits are listed below

- **Customer satisfaction**

*Customer satisfaction is an important indicator for quality of service. It has a direct impact on the growth of the business. Customer satisfaction can be measured through qualitative method such as customer survey.*

- **Brand impact**

*Positive brand perception can lead to uptake in overall public transport patronage.*

- **Further cost reduction when reach high volume of trips. It leads to a very competitive cost compared to existing bus service.**

*Commission fee/ride and software licensing fee would reduce significant when we reach 12000 rides. The cost/passenger/km in year 2 is below:*

*Passengers/week: 500 - Cost/passenger/km 13.29 .*

*Passenger/week: 800 - Cost/passenger/km 8.31*

*Passenger/week: 1200 - Cost/passenger/km 5.54*

*Passenger/week: 1400 - Cost/passenger/km 4.75*

*This cost is comparable with operating bus service in low population density areas.*

- **Network reach**

*If the service is proven to be desirable and viable, AT can apply this model to serve low population density areas in shorter lead time and improve the network reach*