Monitoring and Evaluation

Team Neo

EBAC (Mixed Group), Institute of Systems Science, NUS

[Aastha Arora (A0178188L), Anusuya Manickavasagam (A0163300Y), Chetna Gupta (A0178260A), Kesavan Sridhar (A0163207M), Muni Ranjan (A0163382E), Pradeep Kumar (A0163453H)]

**Abstract**

*This work is part of assignment to evaluate the On-Demand Service announced by LTA last year. The first phase award was given to Via Transportation and Ministry of Movement Pte Ltd (SWAT). Upon successful demonstration of dynamic routing algorithm, the second phase of contract has been awarded to the same companies. Currently LTA has decided to run the tests for 6 months. By December 2018, they would like to pilot the tests with 3 areas namely Joo Koon, Marina/Shenton, Punggol.*

*As a problem statement, we would like to develop and propose a monitoring and evaluation framework to help LTA evaluate the impact of the service and establish limits of viability.*

# Abbreviation

**ODPB –** On demand public bus

# Executive Summary

# KPIs, Data Features, Data Gathering

|  |  |
| --- | --- |
|  |  |
| MTTP (Mean time to Pick up) | MTTP (old) |
| MTTT (Mean time to travel for any A->B) | MTTT (Mean time to travel for any A->B) |
| Average Vehicle miles run/day before | Average Vehicle miles/day after |
|  |  |
| Average Cancellation/day | Na |
| Customer smiley feedback | Na |
| Proportion demand/total |  |
|  |  |
| Average load per day in the regular service |  |
| Traveler volume on demand | Traveler volume regular |
| Average expense/traveler | Average expense/traveler |
| Average revenue/traveler | Average revenue/traveler |
| Old average cost/traveler |  |
|  |  |
|  |  |
| MTTB (Mean Time to booking) | n/a |
| MTTW (Mean Time to wait) | n/a |
|  |  |

**Tap in passengers regular:** Tap in details of passengers of passengers in Bus stops near Punggol area were taken. The distribution of the of arrival time was found to be Poisson distribution. So a similar dataset of 1000 data points was simulated using the Poisson Distribution in R.

**Tap in passengers for regular (absolute):** The integer value of the column “Tap in passengers regular”

**Traveler Volume On demand:** The ‘Traveler Volume On demand’ is assumed to be 30% of the Regular Passengers.

**Traveler Volume On demand(absolute):** The integer value of the column Traveler Volume On demand is taken.

**Mean time of travel between 2 stops:** Based on the personal experience the minimum time of travel between 2 stops is assumed to be between 40 seconds and 2 minutes and data was generated.

**MTTP(Mean time to pickup):** Based on the data gathered, inter time bus arrivals between two buses, the least interarrival time is 7 minutes. So the mean time to pickup is assumed to be between 2 to 7 minutes.

**KM traveled-** Since our on demand bus service caters to transport between 2 or 3 bus stops we took the distance each passenger could travel to be between 0.4 to 2.5 KM.

**Cancellation rate:** Based on information analyzed, we have kept the cancellation rate to be between 5 to 7%

**Average cancellation per day:** Average cancellation per day is calculated by (Traveler Volume On demand(absolute))\* Cancellation rate

**Average cancellation(absolute):** This is obtained by taking the integer value of Average cancellation per day.

**Proportion demand/total:** This is obtained by Traveler Volume On demand(absolute)/( Traveler Volume On demand(absolute)+ Tap in passengers for regular (absolute))

**Average expense /traveler:** This is assumed to be a constant figure of ……

**MTTB:** Mean time for Booking is assumed to be between 30 seconds to 6 minutes

**MTTW:** Mean time to wait is assumed to be between 30 seconds and 7 minutes( 7 minutes is the minimum interarrival time of regular buses)

The following metrics and assumptions were done to arrive at the customer satisfaction index

|  |  |
| --- | --- |
| **Metrics** | **Assumption** |
| Traveler Volume On demand(absolute) | Can’t be taken for Customer satisfaction |
| Mean time of travel between 2 stops: | 40 seconds to 1 minute: Satisfied  1 to 2 minutes: Not satisfied |
| MTTP(Mean time to pickup): | 2 minutes to 4 minutes: Satisfied  4 to 7 minutes: Not satisfied |
| KM traveled | 0.4 to 1.5 KM: Satisfied  1.5 to 2.5 KM : Not satisfied |
| Average cancellation per day(absolute): | 0 to 10 :Satisfied  10 to 28: Not satisfied |
| Proportion demand/total | 0 to 0.1: Not satisfied  0.1 to 0.25 Satisfied |
| MTTB: | 0.3 to 3 minutes: Satisfied  3 to 6 minutes: Not satisfied |
| MTTW: | 0.3 to 3 minutes : Satisfied  3 to 7 minutes: Not satisifed |
| Customer satisfaction index | 0 or 1 Metrics Satisfied: rating 1  2 Satisfied: rating 2  3 or 4 Satisfied: rating 3  5 or 6 Satisfied : rating 4  7 Satisfied: rating 5 |

## Framework

What will be evaluated? (i.e. what is "the program" and in what context does it exist) • What aspects of the program will be considered when judging program performance? • What standards must be reached for the program to be considered successful? • What evidence will be used to indicate how the program has performed? • What conclusions regarding program performance are justified by comparing the available evidence to the selected standards? • How will lessons learned from the inquiry be used to improve program effectiveness?

## 3.2 Tools

## 3.3 Data Processing

# Model Building

# Model Performance

# Appendix

### 

# References

* IVLE Notes