TCCS ANU Internship

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Light Rail Operations Analytics

Project Overview

Background

Light Rail is a modern version of a tram that can operate at low speeds on streets and at high speeds in dedicated corridors. Light Rail in Canberra first started operation in April 2019 and it has been a huge success with wider economic benefits and spur public transport use. That being said, we need to understand a few aspects of Light Rail operation to optimise the service delivery for better customer experience. This project aims to build decision making tools for understanding the Light Rail patronage growth and visualisation tools with analytics to gain insights into Light Rail boarding trends and patterns. We build dashboards using Light Rail patronage data to achieve those objectives.

Approach

TCCS has been publishing the Light Rail patronage data on the ACT Open Data Portal to align with ACT Government Proactive Open Data Release policy. We used this data to build dashboards. ACT public holidays data was also used for the understanding of the patronage patterns by day type. The open data used for the project are summarised in table 1.

Dataset	Source	Usage
Light Rail patronage (daily)	ACT Open Data portal	Daily Light rail patronage analysis
Light Rail patronage (15 minutes interval)	ACT Open Data portal	Intraday Light rail patronage analysis
Australian public holidays	Federal Government Open Data portal	Light rail patronage analysis by data type

Table 1 Summary of datasets

We publish the dashboards to the Power BI Service. This enables automatic update of the dataset to provide the most up-to-date dashboard. It also allows us to share the dashboards to the internal and external stakeholders.

Results

Ten Power BI dashboards were published using daily and 15 minutes interval Light rail patronage data. It includes daily and 15 minutes interval LR patronage charts, projection charts, average charts and tables with key metrics. Features such as drop-down filtering, checkbox and slicer were provided as user needs. The user acceptance testing (UAT) was also performed to publish the dashboards.

These dashboards help stakeholders quickly identify the Light Rail patronage trends, patterns and anomalies. For example, the daily LR patronage chart (figure 1) shows the sharply decreasing patronage trend in March 2020 which was caused by COVID-19. A documentation was also produced for further understanding of the dashboards and future maintenance.
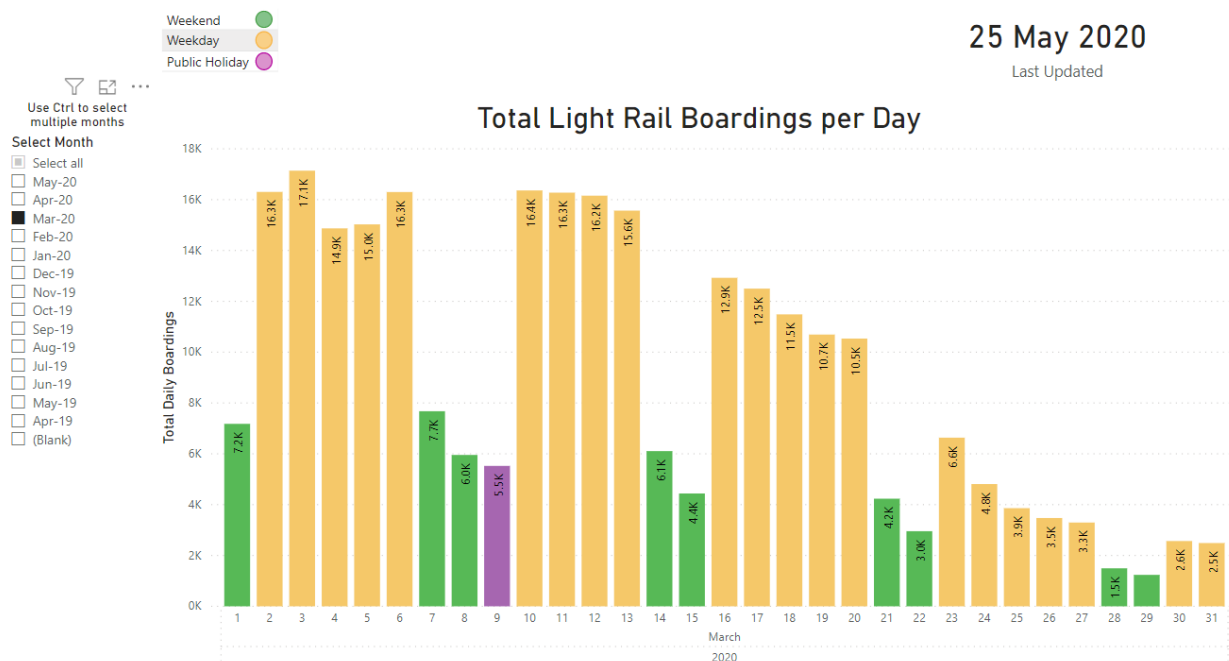

Figure 1 Power BI dashboard

Conclusion

Dashboards based on Light Rail patronage open data were published. With the daily refreshing dashboards, stakeholders can quickly identify trends, patterns and anomalies of the number of Light Rail passengers. The dashboards are intuitive tools which help decision makers make key decisions.