

FIT3179 Data Visualisation II

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Github link: <https://ncha0085.github.io/FIT3179/>

i) Domain, why, who

The domain of **“Australian Aviation Analytics: Exploring Two Decades of Flight Performance & Network Dynamics”** is domestic aviation (within Australia), focused on airline routes, punctuality, cancellations, and network structure over time. This dashboard enables users to explore how geography, economics, and external shocks (e.g. COVID-19) have shaped Australia’s domestic air network — which routes are busiest, how performance (on-time, delays, cancellations) evolve, and how airlines compare. The main targeted audience for this matter comprises several segments: general public or travellers interested in Australian airline reliability; analysts or aviation planners wanting to understand route dynamics; and students or researchers interested in aviation network behaviour. The website offers a narrative that appeals to both expert and non-expert users (through visual storytelling of major routes and COVID effects).

ii) What: The Data

The 2 datasets used on the website are:

- Australian Domestic Airline On-Time Performance Data:
 - <https://www.data.gov.au/data/dataset/domestic-airline-on-time-performance/resource/cf663ed1-0c5e-497f-aea9-e74bfda9cf44>
- Australian Domestic Airlines – Top Routes Data:
 - <https://data.gov.au/data/dataset/domestic-airlines-top-routes-and-totals/resource/677d307f-6a1f-4de4-9b85-5e1aa7074423>

Both are provided by the Australian Government. Between the 2 datasets, it includes information such as counts of aircraft and passenger trips, city pairs that comprise the domestic routes, airline statistics (I.E Available Seat Kilometres (ASK), Revenue Passenger Kilometres (RPK), etc.), domestic carriers and more. Moreover, a timeseries for both were included datasets enabling tracking and analysis of airline performance over time. The datasets did not have latitude and longitude coordinates, so these were added manually to include each city’s coordinates.

iii) How

Route network map (arc/line map): routes shown as lines (thicker for busier) connecting cities — this effectively encodes spatial relationships and traffic intensity. Hover interactivity gives specific flight counts. This idiom is intuitive for geographic networks and helps users immediately see which corridors dominate.

Proportional circles on cities: circle size encodes the total outgoing departures per city in a given year — helps compare hubs visually.

Temporal slider / year selector allows users to animate or step through years to see how network and performance evolve over time. This supports exploring changes (e.g. decline during COVID, recovery) rather than just static snapshots.

Stacked bar (or stacked area) charts for on-time vs delayed: to compare proportions of on-time vs delayed across routes or years — stacking helps users see the share of delays relative to total.

Scatter / performance vs distance plots: to examine relationships (e.g. route distance vs punctuality) — useful for uncovering non-linear or counterintuitive patterns (e.g. very short routes sometimes underperform).

Airline performance ranking / heatmaps (seasonal patterns): to compare carriers across time and seasons, using color intensity to convey performance levels and differences.

Cancellation trend charts: time series of cancellation rates to show reliability disruptions (especially during COVID).

Other special features / custom-built elements in this dashboard include hover interactions (tooltips on routes, cities) to help with highlighting and focusing on details; the city highlight or selection mechanism lets users isolate a particular node to see its outgoing routes.