

# **TRAINS, TRENDS, AND TURBULENCE: TRACKING SYDNEY'S RAIL RIDERSHIP (2020-25)**

Winter Data Analysis Challenge – 2025

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# PROBLEM STATEMENT

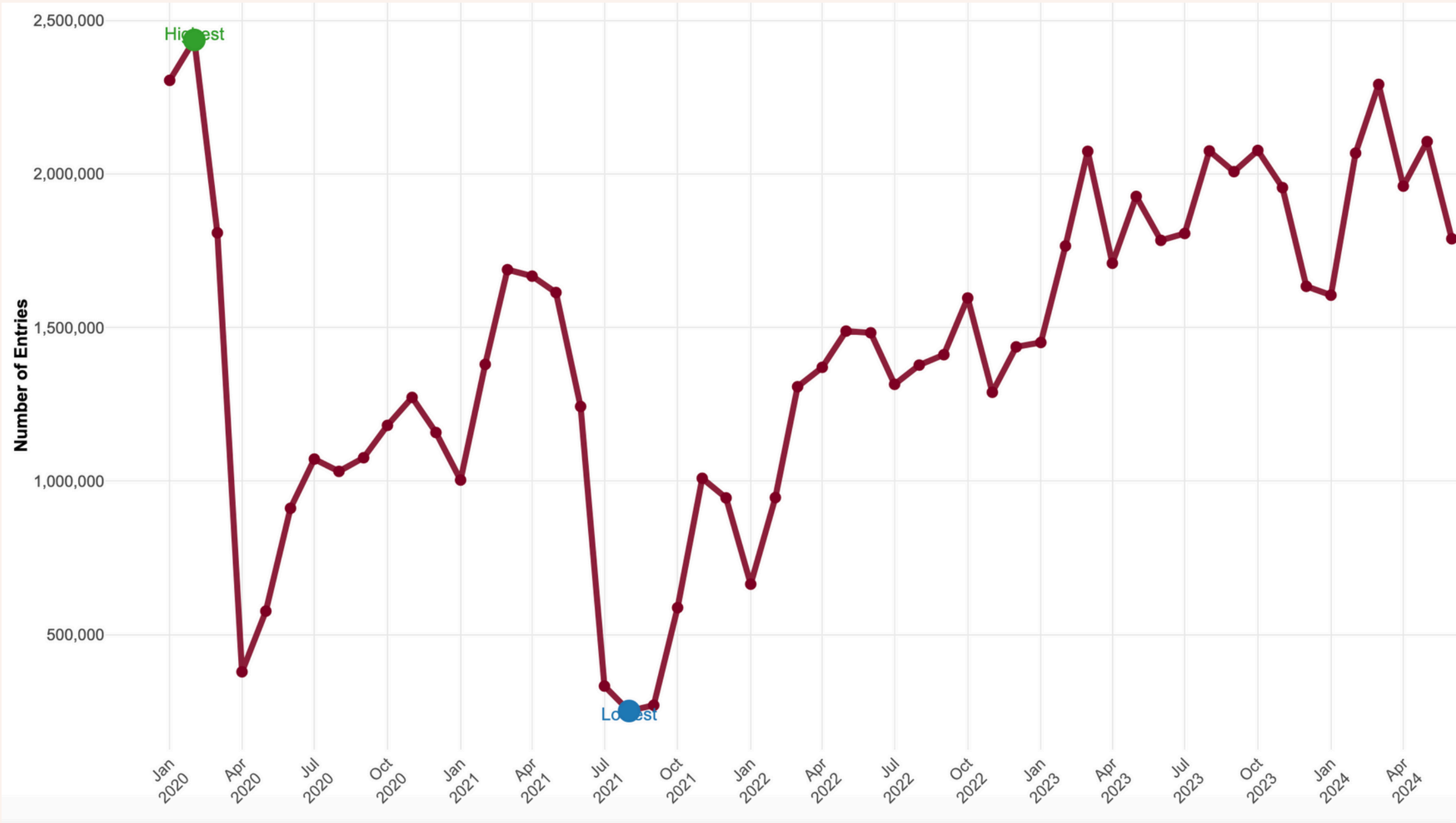
When a city is hit by a pandemic, scorched by heatwaves, or lit up by large-scale events, the way people move changes but how much, and for how long?

- Sydney's train network is a pulse of the city, and between 2020 and 2025, that pulse shifted dramatically.
- This project investigates how health crises, climate extremes, and public events impacted ridership.
- We aim to quantify these disruptions, compare their scale and duration, and find and explain changes in how people used trains during big events and disruptions.



# PANDEMIC'S IMPACT ON TRAVEL BEHAVIOR

Central Station Monthly Entries (2020-2024)

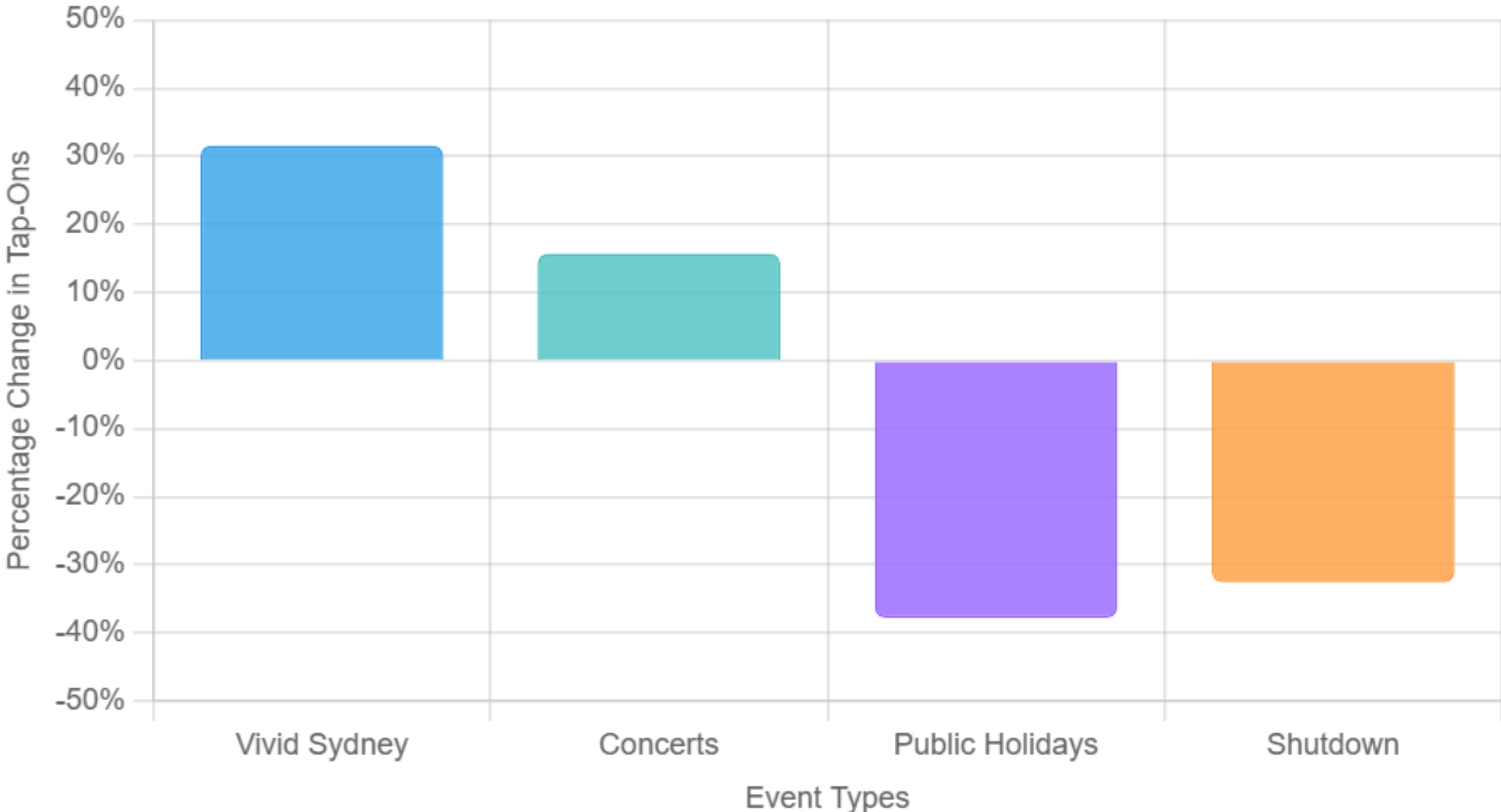


Highest Recorded : 24,361,80t  
Lowest Recorded : 251,810  
Average Drop : 85.7%  
Average Recover : 1377.4%

Strict lockdowns, work-from-home mandates, and travel restrictions emptied stations for months.

# TRANSIT DEMAND DURING PUBLIC CELEBRATIONS AND EVENTS

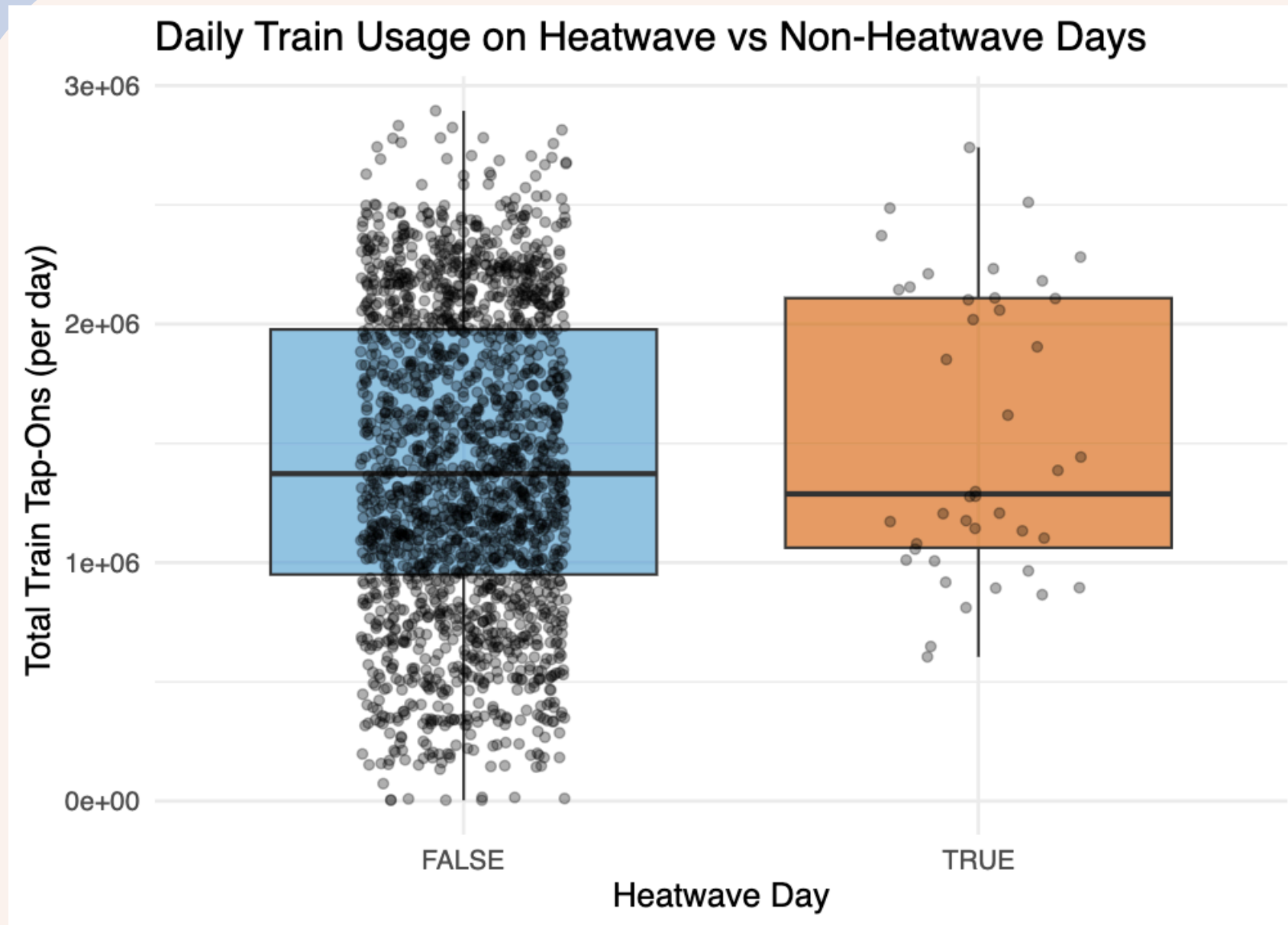
Impact of Events on Train Ridership vs. Normal Days (2024)



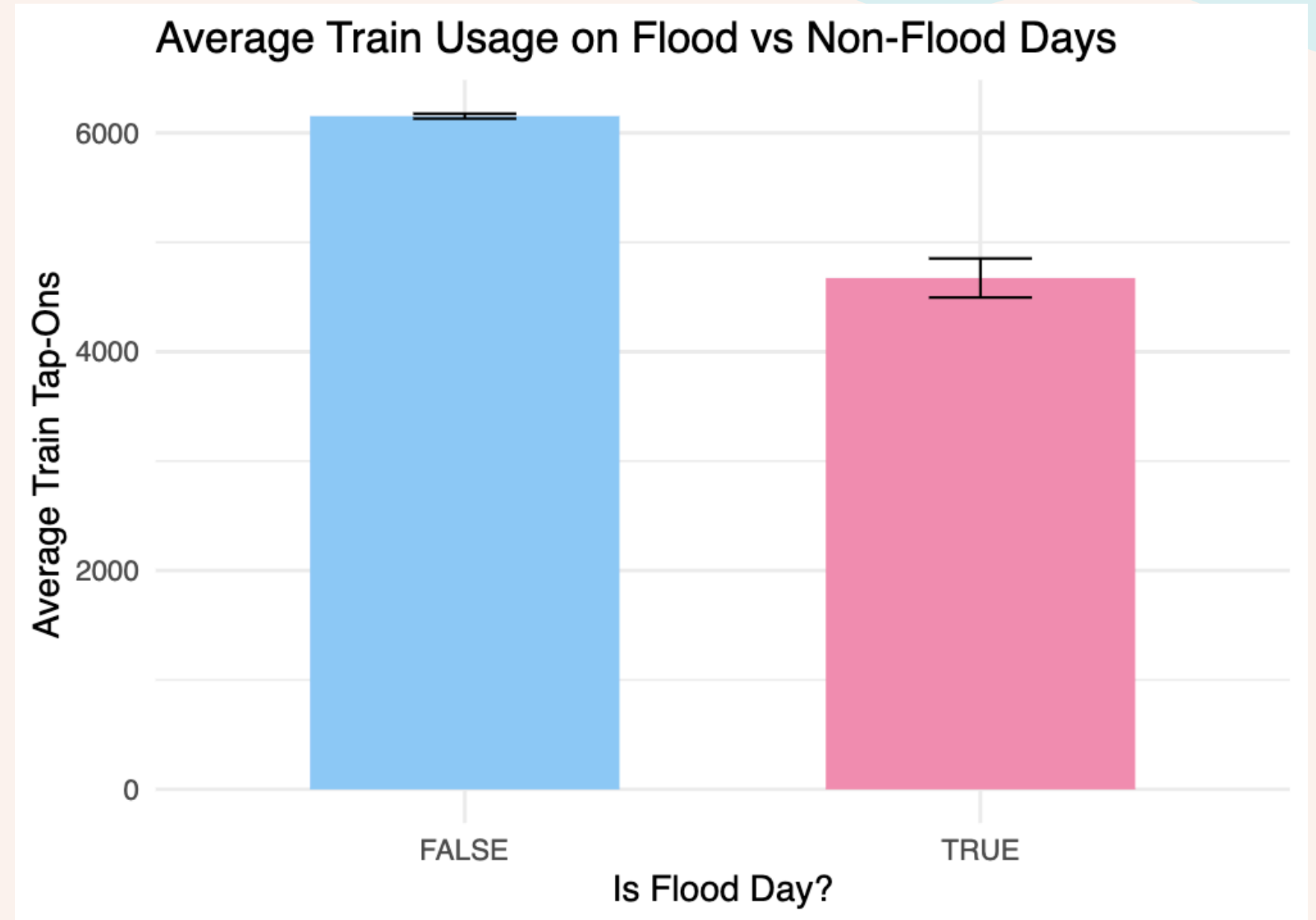
● Percentage Change vs. Normal Days (2024)

- Vivid Sydney - 32% Increase
- Concerts - 16% Increase
- Public Holidays - 38% Decrease
- Annual Shutdown - 32% Decrease

# TRAIN USAGE DURING EXTREME WEATHERS



- Tap-ons rise from 6,130 to 6,605 per station during heatwaves.
- Median tap-ons also increase (600 → 700) → consistent demand.
- Network not disrupted → shows adaptability to extreme heat.



- Usage drops from 6,153 to 4,674 Tap-Ons per station.
- Median tap-ons fall from 600 to 500



# LIMITATIONS

