IMPACT OF THE $9.20 DAILY FARE CAP ON REGIONAL TRAIN USER BEHAVIOUR

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Background

In March 2023, a $9.20 daily fare cap was introduced to all regional train lines in Victoria, Melbourne, reducing prices by an average of 84% and aligning costs with metropolitan fares.

We aim to understand how this fare reduction altered train users' behaviour. Our unique data allow us to distinguish between train usage during

- Commute during work days
- School holiday travel on weekdays
- Weekends and public holidays

Data

The data used is between March 2022 – March 2024 for each hour, day of the week, month, year, and disaggregated by public holidays, school holidays, train direction, train lines.

We investigate other V/Line services (including Bacchus Marsh, Ballarat, Geelong, and Maryborough) and. metropolitan lines. However, this poster focuses on the Seymour line.

Model

A Bayesian predictive model where we train the model using **one-year pre-policy data** and predict for **one year pre- and post-policy.**

$$Y_i \mid Z_i = 0, \mu_i, \sigma \sim \text{Normal}(\mu_i, \sigma)$$

$$E\left(\hat{Y}_i^{(b)} \mid Z_i = 1\right) = \hat{\mu}_i^{(b)}$$

$$Y_i - \hat{\mu}_i^{(b)}$$

i — a specific hour on a given train line, direction of travel (to or from the city), year, month, day (and whether it is a school or public holiday).

Y — i) expected hourly total boardings
ii) expected hourly seat availability
iii) utilisation ratio -- the ratio of boardings to available seats

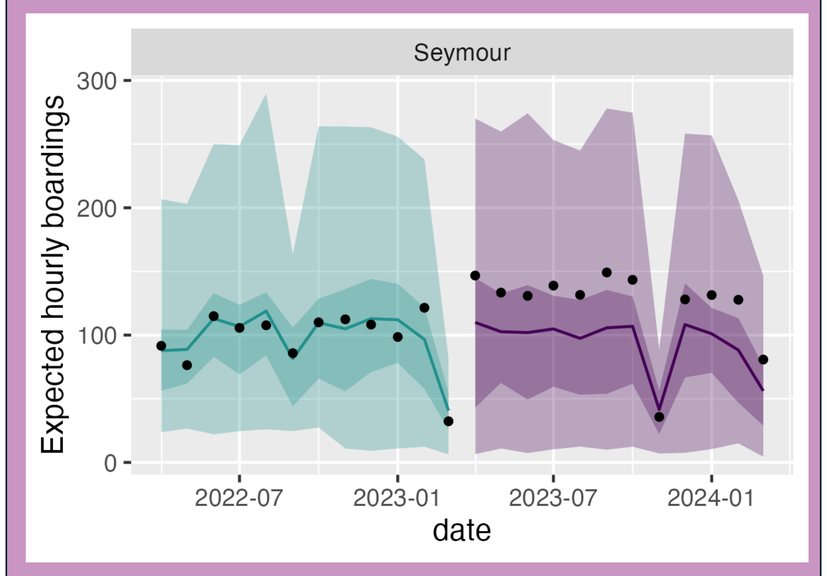
Z — $\begin{cases} 1 \text{ policy has been implemented} \\ 0 \text{ policy has not been implemented} \end{cases}$

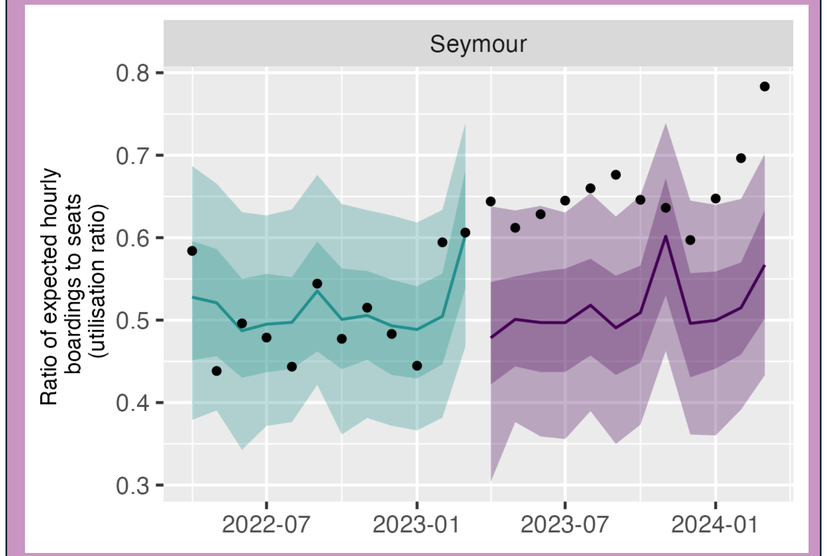
b — each posterior draw

Each figure shows
- solid dots -- the observed data
- coloured lines -- the predicted values
- dark-shaded interval -- 50% credible interval
- lighter-shaded interval -- 90% credible interval

Weekday Commuter Hours

Line	Δ Seats available	Δ Utilisation ratio	Δ Boardings
Seymour	-3.96 (-71.79, 61.24)	**0.15 (0.12, 0.17)**	**31.76 (8.75, 55.04)**

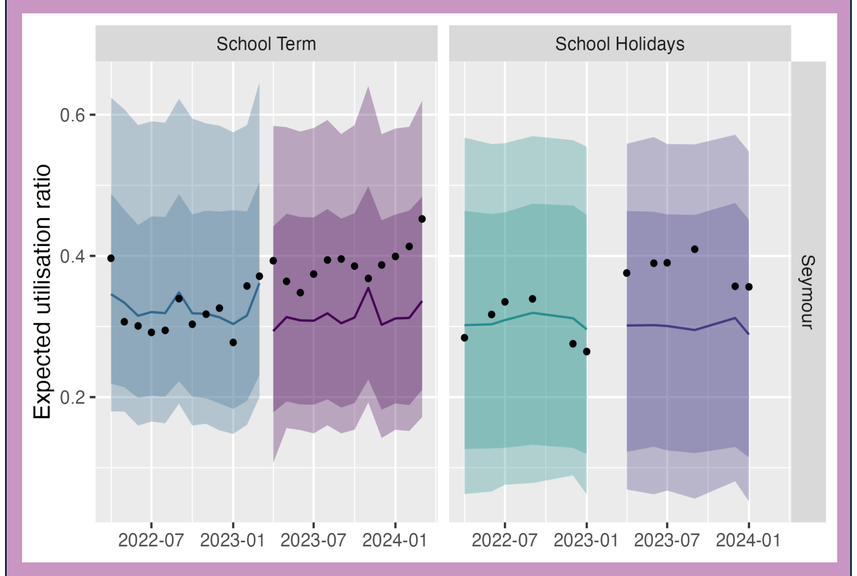




*Travels during weekdays and non-public-holidays, 6-10 am (Up), 3-7pm (Down)

Weekdays In The School Holidays

Line	Δ Seats available	Δ Utilisation ratio	Δ Boardings
Seymour (School term)	0.63 (-31.56, 35.45)	**0.08 (0.06, 0.09)**	**16.50 (3.40, 30.82)**
Seymour (School holidays)	-1.53 (-36.42, 34.19)	**0.08 (0.07, 0.10)**	**16.10 (2.86, 30.33)**



*Travels during weekdays, school holidays, 6am – 8pm

Key Assumption

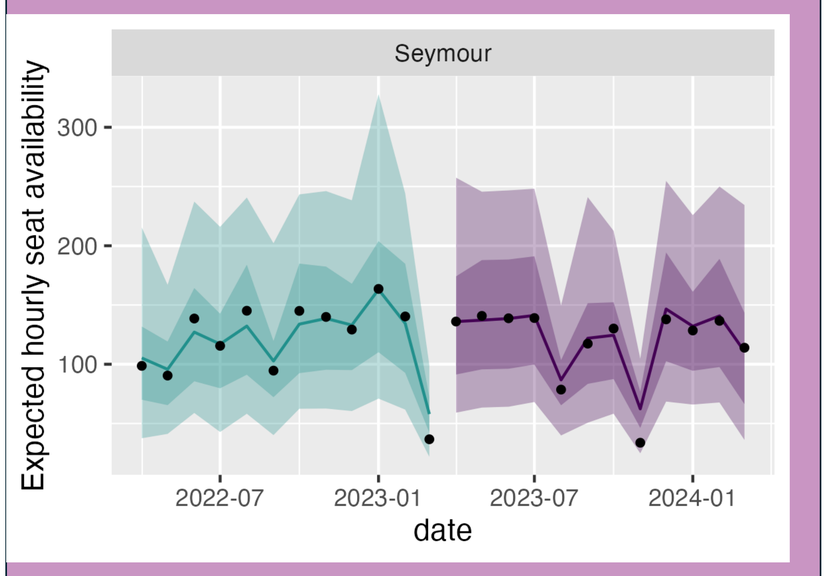
Train patronage trends in post period are captured by the model, which are trained on the pre period data.

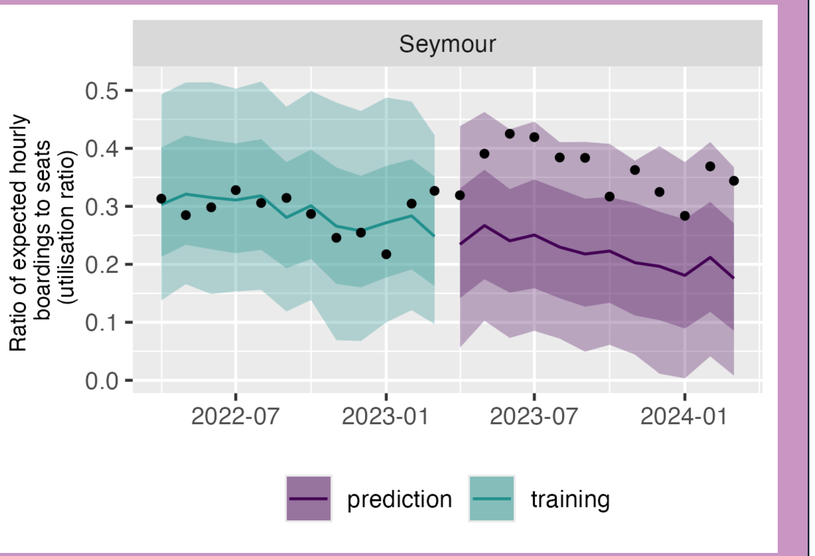
Future Work

Relax the above assumption by using metro lines to eliminate changes in trends between pre and post periods.

Weekends And Public Holidays

Line	Δ Seats available	Δ Utilisation ratio	Δ Boardings
Seymour	-2.62 (-26.16, 20.65)	**0.14 (0.10, 0.17)**	**20.30 (2.70, 38.32)**





*Travels during weekends and public holidays, 6am – 8pm

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