Caulfield (Southern Metropolitan) State Electoral Division: social needs, gaps in transit

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This note is part of a series examining transit social needs-gaps in Greater Melbourne[1]. In Victoria, public transport is the responsibility of the state government, which is formed from among Members of Parliament elected to represent individual State Electoral Divisions (seats). However, it is unclear how much transit is supplied or how well social needs for transport are met within each seat. Using the Currie and Sendbergs (2007) methodology[2], this note explores social needs for transport, and transit provision in 2021 and 2023, in the Caulfield (Southern Metropolitan) State Electoral Division.

[1] See `https://tinyurl.com/4rctaxfc`

[2] Graham Currie and Zed Senbergs, "Identifying Spatial Gaps in Public Transport Provision for Socially Disadvantaged Australians: The Melbourne 'Needs Gap' Study," 2007; Graham Currie, "Quantifying Spatial Gaps in Public Transport Supply Based on Social Needs," *Journal of Transport Geography* 18, no. 1 (2010): 31–41.

Methods:

Scores for transit supply and transport needs were calculated based on the Victorian GTFS feed[3] and Australian Bureau of Statistics (ABS) data using the *gtfssupplyindex* R package[4] as per Reynolds, Currie and Qu (in drafting)[5]. Results are shown for the ABS' Statistical Area 1s (SA1s), categorized based on averages across the Melbourne Greater Capital City Statistical Area (GCCSA).

[3] Results are based on GTFS feeds for August 2021 and 2023, so may not match services run.

[4] See `https://github.com/James-Reynolds/gtfssupplyindex`

[5] James Reynolds, Graham Currie, and Yanda Qu, "Social Needs for Transport and Gaps in Transit Service: New GTFS Tools," *In Drafting*, 2024.

Results: Figure 1 compares social needs for similarly located seats[6], and for the rest of Greater Melbourne with those for the Caulfield (Southern Metropolitan) State Electoral Division.

[6] Prahran, Albert Park, Brighton, Malvern, Oakleigh, Bentleigh, Clarinda, Sandringham and Mordialloc

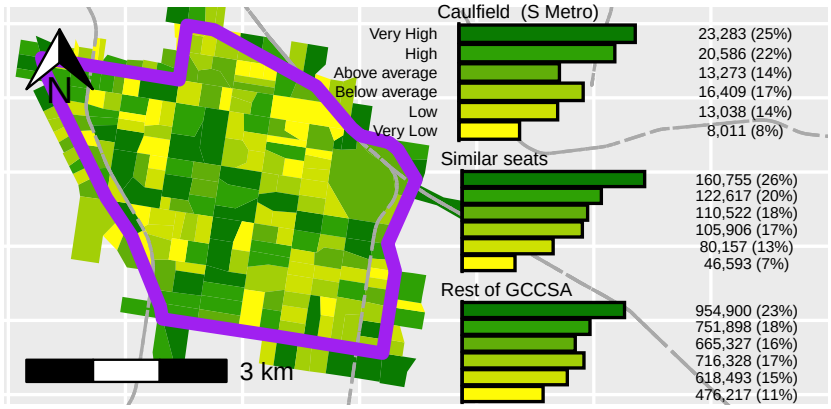

Figure 1: Needs in 2021 by population, with suburban railways shown in grey

Needs were higher than the Melbourne average for 60% of Caulfield's population in 2021, which is a higher proportion than for elsewhere in Melbourne, beyond the similarly located seats (57%)[7].

[7] Differences between Caulfield and the surrounding seats were not statistically significant ($\chi^2(5) = 2.63$, $p = .756$), nor were differences between Caulfield and other parts of Greater Melbourne ($\chi^2(5) = 5.54$, $p = .354$).

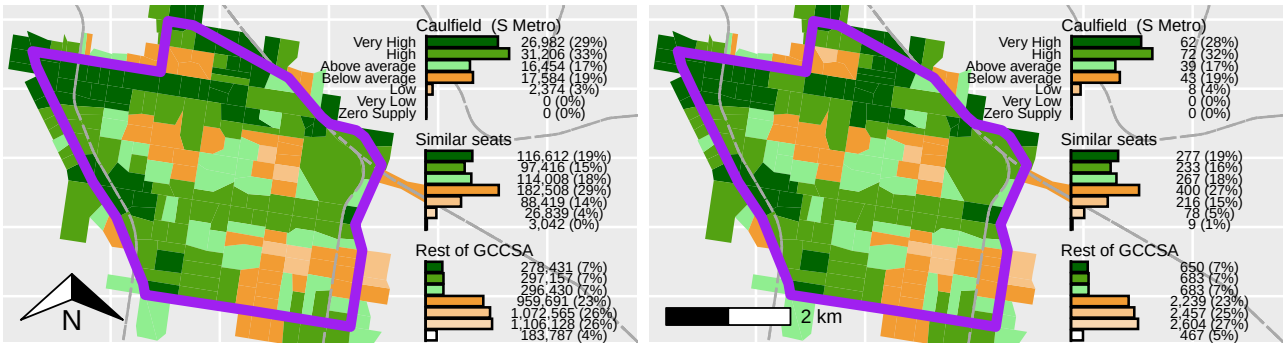

Figure 2: Transport Supply 2021 (left, by population) and 2023 (right, by SA1)

Figure 2 shows the distribution of transit service in 2021 and 2023. Service levels were below the Melbourne average for 21% of Caulfield (S Metro) residents in 2021, which is a lower proportion than for the surrounding seats (48%)[8] or than for the rest of Melbourne (79%)[9]. The distribution of transit supply, categorised with respect to the Melbourne average, appears similar in 2023 (Figure 2, right). Figure 3 directly compares 2021 and 2023 service levels.

[8] Differences were statistically significant ($\chi^2(6) = 72.87$, $p < .001$

[9] Differences were statistically significant ($\chi^2(6) = 481.01$, $p < .001$).

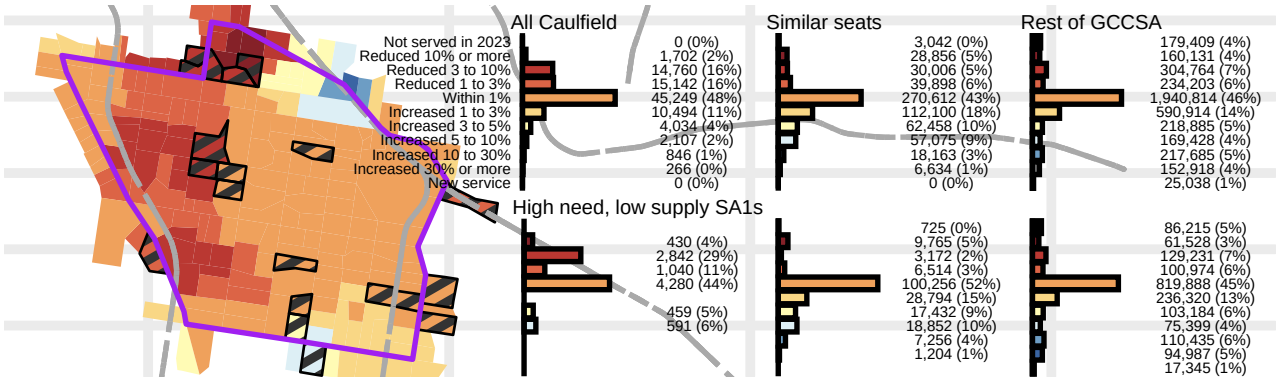

Figure 3: Transit service change 2021 to 2023 by population. SA1s with needs above, but supply below, average highlighted in black.

Transit levels increased by 1% or more by 2023 in SA1s that were home to 19% of Caulfield residents in 2021, which is a lower share than for similarly located seats (41%)[10] or the rest of Melbourne (33%)[11]. 10% of the Caulfield population lived in SA1s with *needs above, but supply below* the Melbourne averages in 2021[12]. However, for 11% of this cohort service levels increased 1% or more by 2023[13].

Overall, residents of the seat of Caulfield appear to have been less likely to have less transit supply than Melbourne's average than elsewhere, but also less likely to have seen service increases between 2021 and 2023.

[10] Differences were statistically significant ($\chi^2(9) = 94.44$, $p < .001$).

[11] Differences were statistically significant ($\chi^2(10) = 94.26$, $p < .001$).

[12] Shown with black in Figure 3. This compares to 31% of residents of similarly located seats and 44% of those elsewhere in Melbourne.

[13] Differences were not statistically significant with the similar cohorts across similarly located seats (Fisher test p = 0.76) or the rest of Greater Melbourne (Fisher test p = 0.35).