City of Bayside: social needs, gaps in transit

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In Victoria, public transport is managed by the state government, although Local Government Authorities (LGAs) may have some influence on service levels through planning processes, advocacy etc. However, not much is known about how much transit is supplied or whether social needs for transport are being met within each LGA's boundaries. This note explores social needs-gaps in the City of Bayside, using the Currie and Sendbergs (2007) methodology[1]. It is part of a series examining each LGA in Greater Melbourne[2].

Methods

This note maps public transport supply and a composite needs indicator based on Australian Bureau of Statistics (ABS) data. The methodology is as per Reynolds, Currie and Qu (in drafting)[3]. The Transit Supply Indication (SI) scores are based on the frequency of service and how much of an area is within walking distance of stops/stations[4], are reported for the ABS' Statistical Area 1s (SA1s), and are categorized into seven groups based on the average scores for SA1s across the Melbourne Greater Capital City Statistical Area (GCCSA).

Results

In 2021 most of the City of Bayside's population lived in SA1s with Very High levels of transit (Figure 1, left)[5]. However, as shown in Figure 2[6], the coverage and frequency of transit service appears to have reduced by 2024 more for those in the City of Bayside.

Social needs for transport in the City of Bayside in 2021 were High or Very High for more than half the population (Figure 3, left), more than for other parts of Melbourne[7]. Figure 3 (right) shows how transit service levels changed between 2021 and 2024 for those who were living in SA1s with needs above, but supply below the GCCSA average[8]. Those SA1s with the largest gaps in the City of Bayside in 2021 mostly have similar levels of, or more, transit in 2024.

Overall, the City of Bayside appears well supplied with transit and, compared to other parts of Greater Melbourne, has lower gaps between social needs and transit supply[9]. Those with the largest needs-gaps in 2021 appear to have similar or more transit in 2024.

```
##  transit_supply City of Bayside Rest of Inner South SA4
```

[1] 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.

[2] See `https://github.com/James-Reynolds/gtfssupplyindex_melbounre_LGA_2024` but lookout, I misspelled "Melbourne"

[3] Forthcoming hopefully, but using the *gtfssupplyindex* R package (see `https://github.com/James-Reynolds/gtfssupplyindex`) to process the Victoria GTFS feed. Note that results represent what is in the GTFS feed for August 2021 and October 2024, which may not match services provided.

[4] 400m for tram and bus, 800m for train.

[5] Differences between the City of Bayside and the Rest of the Inner South SA4, by SA1, are statistically significant in 2021 ($\chi^2(6) = 30.51$, $p < .001$) and 2024 ($\chi^2(9) = 51.12$, $p < .001$). Differences with the rest of Melbourne are also statistically significant (2021: $\chi^2(6) = 181.73$, $p < .001$, 2024:$\chi^2(10) = 56.16$, $p < .001$).

[6] Differences are statistically significant (rest of the Inner South SA4: $\chi^2(9) = 51.12$, $p < .001$, & rest of GCCSA: $\chi^2(10) = 56.16$, $p < .001$)

[7] Statistically significant for City of Bayside vs rest of Inner South:$\chi^2(5) = 13.98$, $p = .016$, and vs rest of GCCSA $\chi^2(5) = 40.35$, $p < .001$).

[8] Fisher's tests show no significant differences between the City of Bayside and the rest of the Inner South SA4 (p = NaN) or the Rest of the GCCSA (p = 0.108).

[9] Only 50.8% of residents in SA1s in the City of Bayside had above average social needs for transport but below average transit supply, compared with 32.8% in the rest of the Inner South SA4 and 41.8% across the rest of Melbourne.

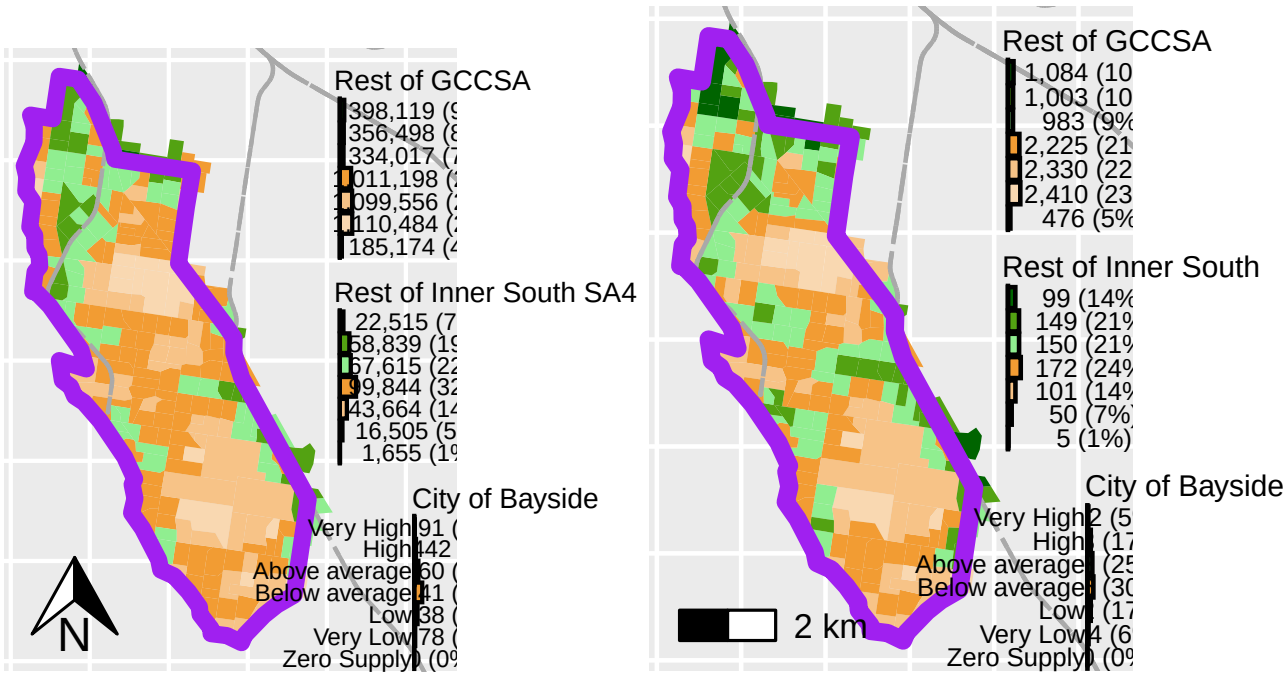

Figure 1: Transport Supply 2021 (left, by population) and 2024 (right, by SA1)

```
##     Zero Supply                0                    5
##        Very Low               15                   48
##             Low               45                  102
##   Below average              106                  227
##   Above average               55                  155
##            High               26                  135
##       Very High                3                   54

##  transit_supply City of Bayside Rest of Inner South SA4
##     Zero Supply        1.280738                3.719262
##        Very Low       16.137295               46.862705
##             Low       37.653689              109.346311
##   Below average       85.297131              247.702869
##   Above average       53.790984              156.209016
##            High       41.239754              119.760246
##       Very High       14.600410               42.399590

##  transit_supply City of Bayside Rest of Greater Melbourne
##     Zero Supply                0                      484
##        Very Low               15                     2629
##             Low               45                     2544
##   Below average              106                     2358
##   Above average               55                      765
##            High               26                      813
```

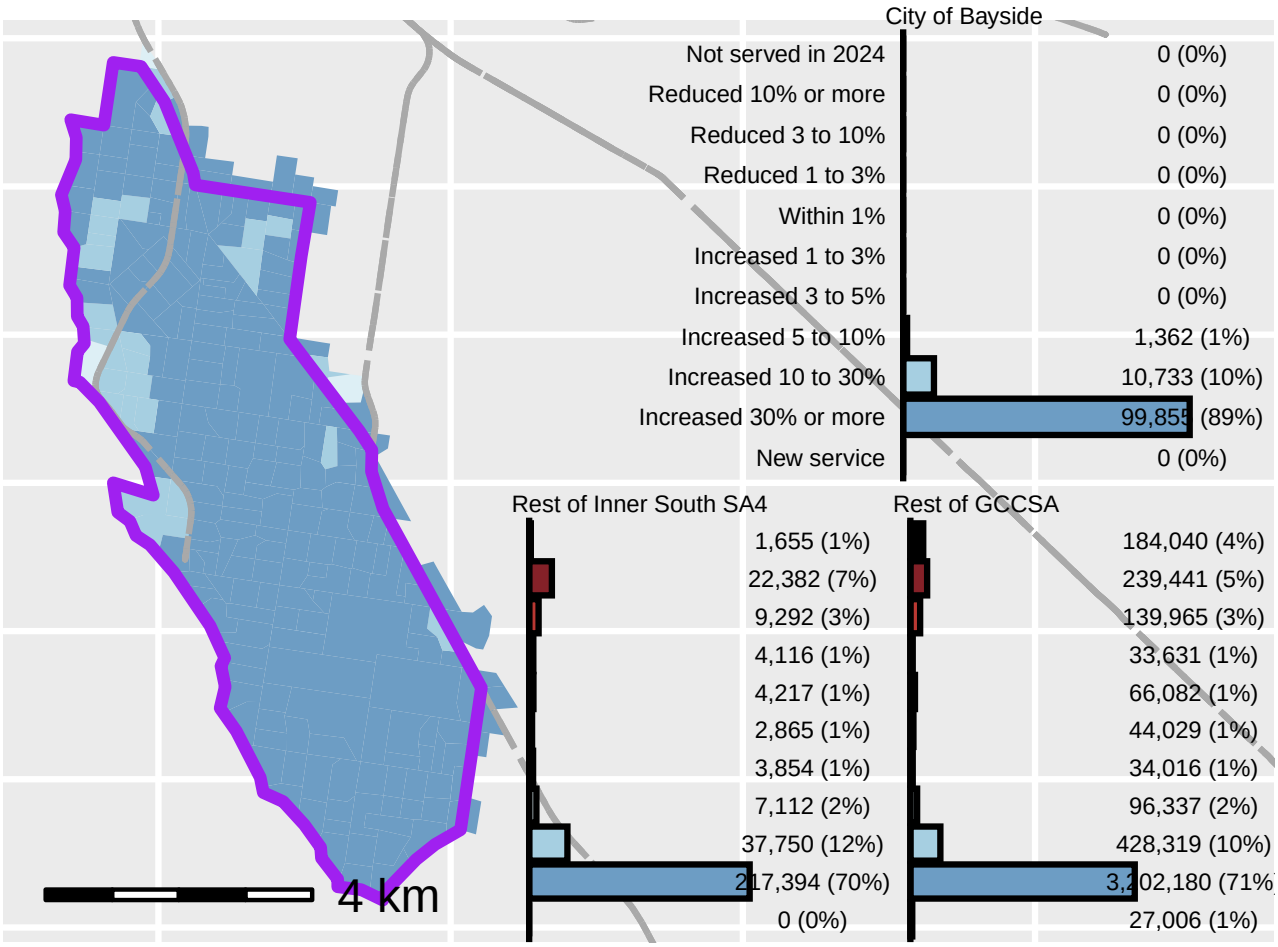

Figure 2: Change in SI score between 2021 and 2024 by SA1 and population

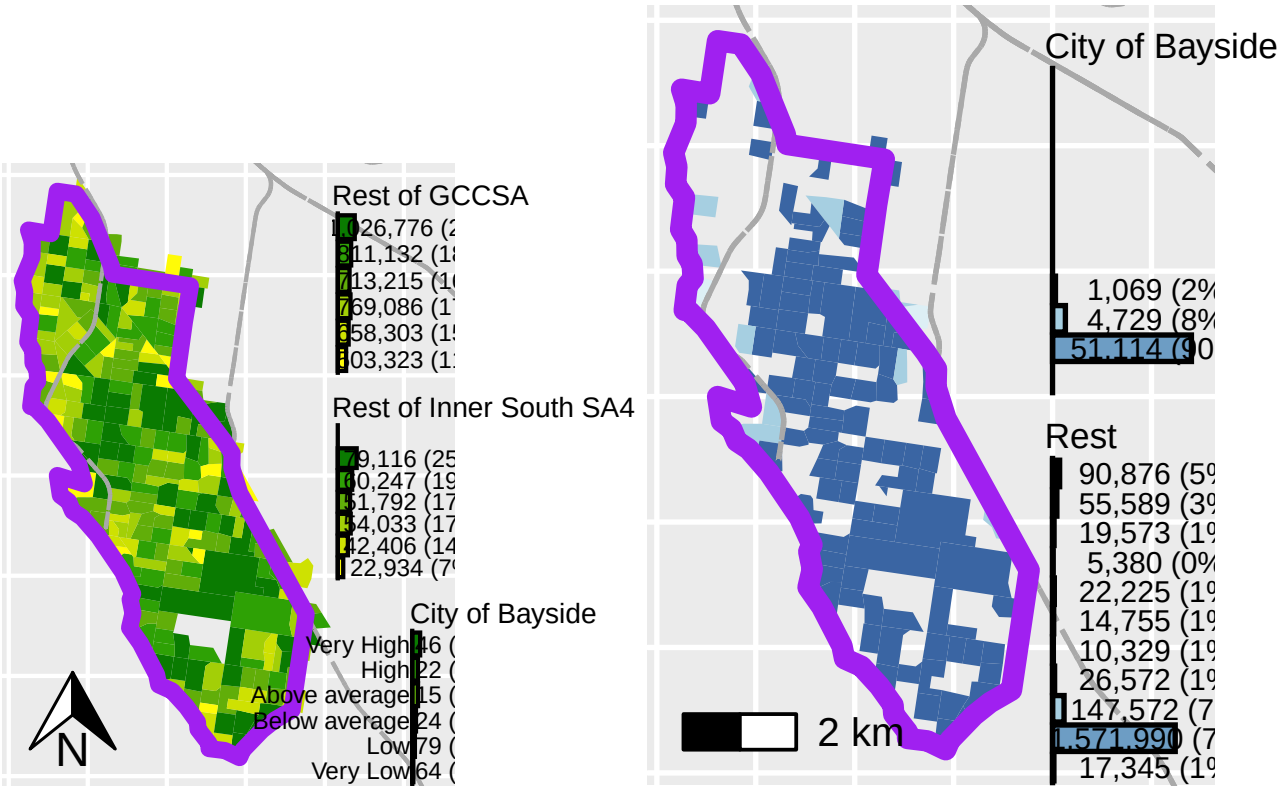

Figure 3: 2021 needs (left) and change in SI to 2024 for those SA1s with needs above average, but below average supply (by 2021 populations, right)

```
##       Very High              3                       918
```

```
##  transit_supply City of Bayside Rest of Greater Melbourne
##     Zero Supply        11.24431                  472.7557
##        Very Low        61.42552                 2582.5745
##             Low        60.14776                 2528.8522
##   Below average        57.24375                 2406.7562
##   Above average        19.05027                  800.9497
##           High        19.49168                  819.5083
##       Very High        21.39671                  899.6033
```

```
##  transit_supply City of Bayside Rest of Inner South SA4
##     Zero Supply               0                       5
##        Very Low              14                      50
##             Low              42                     101
##   Below average              76                     172
##   Above average              63                     150
##           High              43                     149
##       Very High              12                      99
```

```
##  transit_supply City of Bayside Rest of Inner South SA4
##     Zero Supply        1.280738                3.719262
##        Very Low       16.393443               47.606557
##             Low       36.629098              106.370902
##   Below average       63.524590              184.475410
##   Above average       54.559426              158.440574
##           High       49.180328              142.819672
##       Very High       28.432377               82.567623
```

```
##  transit_supply City of Bayside Rest of Greater Melbourne
##     Zero Supply               0                       476
##        Very Low              14                      2410
##             Low              42                      2330
##   Below average              76                      2225
##   Above average              63                       983
##           High              43                      1003
##       Very High              12                      1084
```

```
##  transit_supply City of Bayside Rest of Greater Melbourne
##     Zero Supply        11.05845                  464.9415
##        Very Low        56.31447                 2367.6855
##             Low        55.10640                 2316.8936
##   Below average        53.45693                 2247.5431
##   Above average        24.30072                 1021.6993
##           High        24.30072                 1021.6993
##       Very High        25.46232                 1070.5377
```

```
##           ratio_binned City of Bayside Rest of Inner South SA4
##  Increased 30% or more             221                     506
##    Increased 10 to 30%              26                      84
##     Increased 5 to 10%               3                      17
##      Increased 3 to 5%               0                       9
##      Increased 1 to 3%               0                       7
##              Within 1%               0                      11
##        Reduced 1 to 3%               0                       9
##       Reduced 3 to 10%               0                      23
##    Reduced 10% or more               0                      55
##     Not served in 2024               0                       5
```

```
##           ratio_binned City of Bayside Rest of Inner South SA4
##  Increased 30% or more      186.219262              540.780738
##    Increased 10 to 30%       28.176230               81.823770
##     Increased 5 to 10%        5.122951               14.877049
##      Increased 3 to 5%        2.305328                6.694672
##      Increased 1 to 3%        1.793033                5.206967
##              Within 1%        2.817623                8.182377
##        Reduced 1 to 3%        2.305328                6.694672
##       Reduced 3 to 10%        5.891393               17.108607
##    Reduced 10% or more       14.088115               40.911885
##     Not served in 2024        1.280738                3.719262
```

```
##           ratio_binned City of Bayside Rest of Greater Melbourne
##            New service               0                       66
##  Increased 30% or more             221                     7417
##    Increased 10 to 30%              26                     1015
##     Increased 5 to 10%               3                      231
##      Increased 3 to 5%               0                       83
##      Increased 1 to 3%               0                      100
##              Within 1%               0                      175
##        Reduced 1 to 3%               0                       80
##       Reduced 3 to 10%               0                      326
##    Reduced 10% or more               0                      542
##     Not served in 2024               0                      476
```

```
##           ratio_binned City of Bayside Rest of Greater Melbourne
##            New service        1.533315                 64.46669
##  Increased 30% or more      177.446334               7460.55367
##    Increased 10 to 30%       24.184555               1016.81544
##     Increased 5 to 10%        5.436298                228.56370
##      Increased 3 to 5%        1.928259                 81.07174
##      Increased 1 to 3%        2.323204                 97.67680
##              Within 1%        4.065607                170.93439
```

```
##        Reduced 1 to 3%        1.858563                 78.14144
##       Reduced 3 to 10%        7.573646                318.42635
##    Reduced 10% or more       12.591767                529.40823
##     Not served in 2024       11.058452                464.94155
```

```
##  composite_needs City of Bayside Rest of Inner South SA4
##         Very Low              18                       89
##              Low              34                      129
##    Below average              41                      140
##    Above average              55                      115
##             High              47                      118
##        Very High              54                      123
##               NA               1                       12
```

```
##   City of Bayside Rest of Inner South SA4
## 1        27.66667                79.33333
## 2        42.14642               120.85358
## 3        46.80062               134.19938
## 4        43.95639               126.04361
## 5        42.66355               122.33645
## 6        45.76636               131.23364
```

```
##  composite_needs City of Bayside Rest of Greater Melbourne
##         Very Low              18                      1929
##              Low              34                      1872
##    Below average              41                      1854
##    Above average              55                      1508
##             High              47                      1512
##        Very High              54                      1500
##               NA               1                       336
```

```
##   City of Bayside Rest of Greater Melbourne
## 1        46.50835                  1900.492
## 2        45.52897                  1860.471
## 3        45.26621                  1849.734
## 4        37.33567                  1525.664
## 5        37.24012                  1521.760
## 6        37.12068                  1516.879
```

```
##           ratio_binned City of Bayside Rest of Inner South SA4
##            New service               0                       0
##  Increased 30% or more             100                     153
##    Increased 10 to 30%              10                      22
##     Increased 5 to 10%               2                       3
##      Increased 3 to 5%               0                       1
##      Increased 1 to 3%               0                       0
```

```
##              Within 1%              0                     0
##        Reduced 1 to 3%              0                     2
##       Reduced 3 to 10%              0                     1
##    Reduced 10% or more              0                     7
##     Not served in 2024              0                     1
```

```
##           ratio_binned City of Bayside Rest of Inner South SA4
##            New service       0.0000000              0.0000000
##  Increased 30% or more      93.8278146            159.1721854
##    Increased 10 to 30%      11.8675497             20.1324503
##     Increased 5 to 10%       1.8543046              3.1456954
##      Increased 3 to 5%       0.3708609              0.6291391
##      Increased 1 to 3%       0.0000000              0.0000000
##              Within 1%       0.0000000              0.0000000
##        Reduced 1 to 3%       0.7417219              1.2582781
##       Reduced 3 to 10%       0.3708609              0.6291391
##    Reduced 10% or more       2.5960265              4.4039735
##     Not served in 2024       0.3708609              0.6291391
```

```
##           ratio_binned City of Bayside Rest of Greater Melbourne
##            New service              0                       30
##  Increased 30% or more            100                     2599
##    Increased 10 to 30%             10                      252
##     Increased 5 to 10%              2                       46
##      Increased 3 to 5%              0                       19
##      Increased 1 to 3%              0                       28
##              Within 1%              0                       43
##        Reduced 1 to 3%              0                        8
##       Reduced 3 to 10%              0                       34
##    Reduced 10% or more              0                       86
##     Not served in 2024              0                      159
```

```
##           ratio_binned City of Bayside Rest of Greater Melbourne
##            New service       0.9836066               29.016393
##  Increased 30% or more      88.4918033             2610.508197
##    Increased 10 to 30%       8.5901639              253.409836
##     Increased 5 to 10%       1.5737705               46.426230
##      Increased 3 to 5%       0.6229508               18.377049
##      Increased 1 to 3%       0.9180328               27.081967
##              Within 1%       1.4098361               41.590164
##        Reduced 1 to 3%       0.2622951                7.737705
##       Reduced 3 to 10%       1.1147541               32.885246
##    Reduced 10% or more       2.8196721               83.180328
##     Not served in 2024       5.2131148              153.786885
```