City of Stonnington: social needs, gaps in transit

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This note explores social needs for transport, and transit provision in the City of Stonnington, using the Currie and Sendbergs (2007) methodology[1]. In Victoria, public transport is managed by the state government, although Local Government Authorities (LGAs) may have influence through planning processes, advocacy etc. However, it is unclear how much transit is supplied or how well social needs are met for each LGA. This note examines the City of Stonnington in 2021 and 2023, and is part of a series on LGAs in Greater Melbourne[2].

[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"

Methods:

Scores for transit supply and transport needs were calculated based on Australian Bureau of Statistics (ABS) data and the Victorian GTFS feed[3] 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: Social needs for transport in Stonnington in 2021 and comparison with the Rest of the Inner South and South East SA4s[6] and the rest of Greater Melbourne by population are shown in Figure 1.

[6] LGAs: Glen Eira, Stonnington, Dandenong, Kingston, Casey, (almost all of) Cardinia, part of Stonnington.

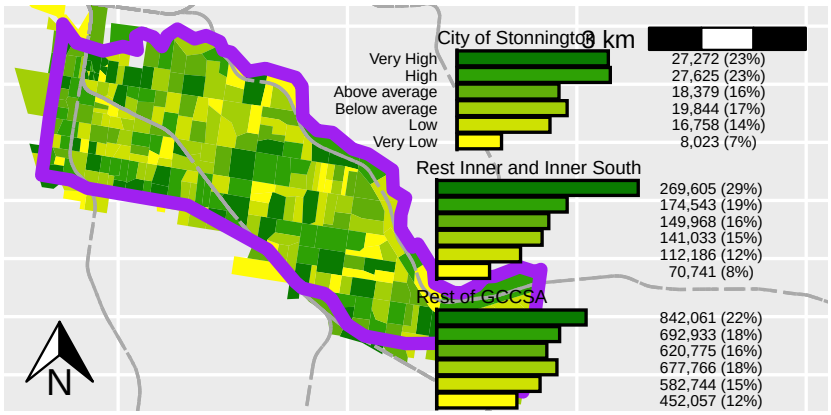

Figure 1: Needs in 2021 by population

Social needs for transport were higher than the Melbourne average for 62.2% of the Stonnington population, a greater share than for rest of the Inner and Inner South SA4s (64.7%)[7] or elsewhere in Melbourne (55.7%)[8].

[7] Differences were statistically significant ($\chi^2(5) = 5.24$, $p = .388$).

[8] Differences were statistically significant ($\chi^2(5) = 14.92$, $p = .011$).

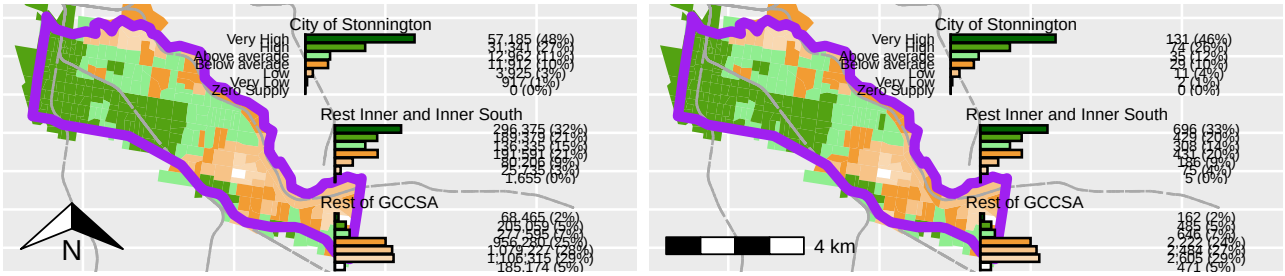

Figure 2: Transport Supply 2021 (left, by population) and 2023 (right, by SA1)

Figure 2 shows the distribution of transit service in 2021 and 2023. Transit service levels were below the Melbourne average for 14.2% of Stonnington residents in 2021, which is less than for the rest of the Inner and Inner South SA4s (32.5%)[9] or the rest of Melbourne (85.8%)[10]. 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 transit service levels.

[9] Differences were statistically significant ($\chi^2(6) = 45.84$, $p < .001$).

[10] Differences were statistically significant ($\chi^2(6) = 2186.48$, $p < .001$).

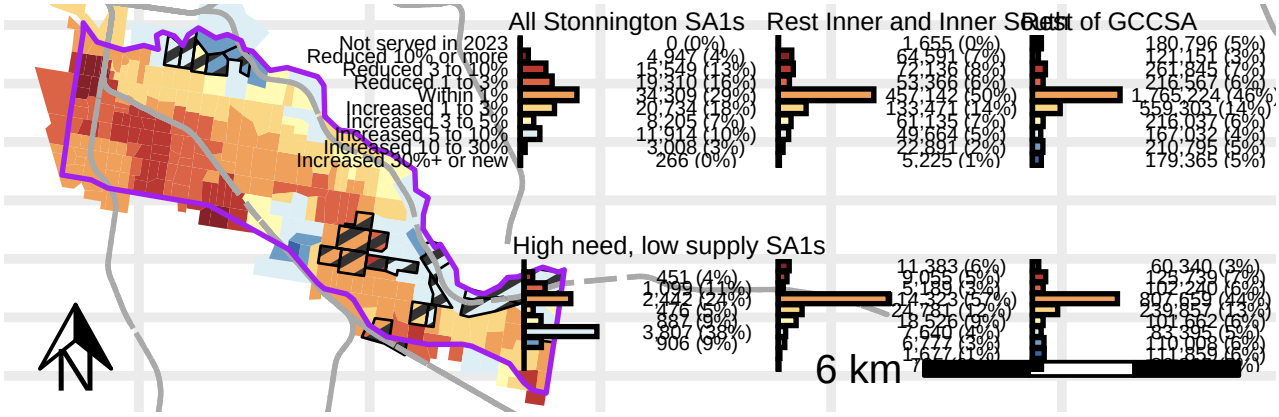

Figure 3: Transit service change 2021 to 2023. SA1s with needs above, but supply below, average highlighted in black.

Transit levels increased by 1% or more for 37.3% of Stonnington residents between 2021 and 2023. compared to 29.6% of those in the rest of the Inner and Inner South SA4s[11] and 34.4% of those in the rest of Melbourne[12]. 8.5% of the Stonnington population lived in SA1s with *needs above, but supply below* the Melbourne averages in 2021[13]. However, for 55.6% of this cohort service levels increase 1% or more, a higher proportion than for the similar cohorts in the rest of the Inner and Inner South SA4s (29.7%)[14], and elsewhere (35.4%)[15].

Overall, Stonnington residents appear less likely to have had transit service levels below Melbourne's average, and more likely to have seen increases, including for those with larger needs-gaps.

[11] Differences were statistically significant ($\chi^2(5) = 5.24$, $p = .388$).

[12] Differences were statistically significant ($\chi^2(5) = 14.92$, $p = .011$).

[13] Shown with black in Figure 3. This compares to 21.7% of Inner and Inner South SA4s residents and 47.2% of those elsewhere in Melbourne.

[14] Differences were statistically significant ($\chi^2(9) = 54.02$, $p < .001$).

[15] Differences were statistically significant ($\chi^2(5) = 14.92$, $p = .011$).

```
## [1] 1
```

```
##  transit_supply City of Stonnington Rest Inner and Inner South
##     Zero Supply                   0                           5
##        Very Low                   2                          74
##             Low                  10                         185
##   Below average                  32                         431
##   Above average                  32                         315
##            High                  75                         431
##       Very High                 131                         689
```

```
## [1] 2
```

```
##  transit_supply City of Stonnington Rest Inner and Inner South
##     Zero Supply           0.5845771                   4.415423
##        Very Low           8.8855721                  67.114428
##             Low          22.7985075                 172.201493
##   Below average          54.1318408                 408.868159
##   Above average          40.5696517                 306.430348
##            High          59.1592040                 446.840796
##       Very High          95.8706468                 724.129353
```

```
## [1] 3
```

```
##  transit_supply City of Stonnington Rest of Greater Melbourne
##     Zero Supply                   0                        484
##        Very Low                   2                       2616
##             Low                  10                       2496
##   Below average                  32                       2228
##   Above average                  32                        628
##            High                  75                        468
##       Very High                 131                        155
```

```
## [1] 4
```

```
##  transit_supply City of Stonnington Rest of Greater Melbourne
##     Zero Supply           14.586727                  469.4133
##        Very Low           78.900930                 2539.0991
##             Low           75.525489                 2430.4745
##   Below average           68.111574                 2191.8884
##   Above average           19.890991                  640.1090
##            High           16.364861                  526.6351
##       Very High            8.619429                  277.3806
```

```
## [1] 5
```

```
##  transit_supply City of Stonnington Rest Inner and Inner South
##     Zero Supply                   0                           5
##        Very Low                   2                          75
```

```
##             Low                  11                         186
##   Below average                  29                         431
##   Above average                  35                         308
##            High                  74                         429
##       Very High                 131                         696
```

```
## [1] 6
```

```
##  transit_supply City of Stonnington Rest Inner and Inner South
##     Zero Supply           0.5845771                   4.415423
##        Very Low           9.0024876                  67.997512
##             Low          23.0323383                 173.967662
##   Below average          53.7810945                 406.218905
##   Above average          40.1019900                 302.898010
##            High          58.8084577                 444.191542
##       Very High          96.6890547                 730.310945
```

```
## [1] 7
```

```
##  transit_supply City of Stonnington Rest of Greater Melbourne
##     Zero Supply                   0                        471
##        Very Low                   2                       2605
##             Low                  11                       2484
##   Below average                  29                       2222
##   Above average                  35                        646
##            High                  74                        485
##       Very High                 131                        162
```

```
## [1] 8
```

```
##  transit_supply City of Stonnington Rest of Greater Melbourne
##     Zero Supply           14.194934                   456.8051
##        Very Low           78.569413                  2528.4306
##             Low           75.193972                  2419.8060
##   Below average           67.840333                  2183.1597
##   Above average           20.523886                   660.4761
##            High           16.847066                   542.1529
##       Very High            8.830394                   284.1696
```

```
## [1] 9
```

```
##           ratio_binned City of Stonnington Rest Inner and Inner South
##  Increased 30%+ or new                   1                          13
##    Increased 10 to 30%                   8                          51
##     Increased 5 to 10%                  33                         112
##      Increased 3 to 5%                  17                         144
##      Increased 1 to 3%                  51                         307
```

```
##              Within 1%                 78                      1057
##        Reduced 1 to 3%                 46                       127
##       Reduced 3 to 10%                 36                       160
##    Reduced 10% or more                 12                       154
##     Not served in 2023                  0                         5
```

```
## [1] 10
```

```
##           ratio_binned City of Stonnington Rest Inner and Inner South
##  Increased 30%+ or new           1.6368159                  12.363184
##    Increased 10 to 30%           6.8980100                  52.101990
##     Increased 5 to 10%          16.9527363                 128.047264
##      Increased 3 to 5%          18.8233831                 142.176617
##      Increased 1 to 3%          41.8557214                 316.144279
##              Within 1%         132.6990050                1002.300995
##        Reduced 1 to 3%          20.2263682                 152.773632
##       Reduced 3 to 10%          22.9154229                 173.084577
##    Reduced 10% or more          19.4079602                 146.592040
##     Not served in 2023           0.5845771                   4.415423
```

```
## [1] 11
```

```
##           ratio_binned City of Stonnington Rest of Greater Melbourne
##  Increased 30%+ or new                   1                        396
##    Increased 10 to 30%                   8                        478
##     Increased 5 to 10%                  33                        393
##      Increased 3 to 5%                  17                        480
##      Increased 1 to 3%                  51                       1301
##              Within 1%                  78                       4157
##        Reduced 1 to 3%                  46                        501
##       Reduced 3 to 10%                  36                        614
##    Reduced 10% or more                  12                        284
##     Not served in 2023                   0                        471
```

```
## [1] 12
```

```
##           ratio_binned City of Stonnington Rest of Greater Melbourne
##  Increased 30%+ or new           11.964732                  385.0353
##    Increased 10 to 30%           14.647002                  471.3530
##     Increased 5 to 10%           12.838730                  413.1613
##      Increased 3 to 5%           14.978519                  482.0215
##      Increased 1 to 3%           40.746393                 1311.2536
##              Within 1%          127.633857                 4107.3661
##        Reduced 1 to 3%           16.485412                  530.5146
##       Reduced 3 to 10%           19.589612                  630.4104
##    Reduced 10% or more            8.920808                  287.0792
##     Not served in 2023           14.194934                  456.8051
```

```
## [1] 13
```

```
##  composite_needs City of Stonnington Rest Inner and Inner South
##         Very Low                 32                         280
##              Low                 52                         341
##    Below average                 52                         365
##    Above average                 43                         336
##             High                 55                         342
##        Very High                 44                         409
##               NA                  4                          57
```

```
## [1] 14
```

```
##   City of Stonnington Rest Inner and Inner South
## 1            36.89324                   275.1068
## 2            46.47129                   346.5287
## 3            49.30923                   367.6908
## 4            44.81582                   334.1842
## 5            46.94428                   350.0557
## 6            53.56614                   399.4339
```

```
## [1] 15
```

```
##  composite_needs City of Stonnington Rest of Greater Melbourne
##         Very Low                 32                       1724
##              Low                 52                       1642
##    Below average                 52                       1618
##    Above average                 43                       1299
##             High                 55                       1280
##        Very High                 44                       1224
##               NA                  4                        288
```

```
## [1] 16
```

```
##   City of Stonnington Rest of Greater Melbourne
## 1            53.85196                  1702.148
## 2            51.95058                  1642.049
## 3            51.21456                  1618.785
## 4            41.15565                  1300.844
## 5            40.94098                  1294.059
## 6            38.88627                  1229.114
```

```
##      ratio_binned_less City of Stonnington Rest Inner and Inner South
##     Not served in 2023                   0                          1
##  Increased 30%+ or new                   0                          3
##    Increased 10 to 30%                   2                         12
##     Increased 5 to 10%                   8                         14
```

```
##      Increased 3 to 5%                  2                        35
##      Increased 1 to 3%                  1                        46
##              Within 1%                  5                       216
##        Reduced 1 to 3%                  2                        10
##       Reduced 3 to 10%                  1                        17
##    Reduced 10% or more                  0                        21
```

```
##      ratio_binned_less City of Stonnington Rest Inner and Inner South
##     Not served in 2023           0.0530303                  0.9469697
##  Increased 30%+ or new           0.1590909                  2.8409091
##    Increased 10 to 30%           0.7424242                 13.2575758
##     Increased 5 to 10%           1.1666667                 20.8333333
##      Increased 3 to 5%           1.9621212                 35.0378788
##      Increased 1 to 3%           2.4924242                 44.5075758
##              Within 1%          11.7196970                209.2803030
##        Reduced 1 to 3%           0.6363636                 11.3636364
##       Reduced 3 to 10%           0.9545455                 17.0454545
##    Reduced 10% or more           1.1136364                 19.8863636
```

```
##      ratio_binned_less City of Stonnington Rest of Greater Melbourne
##     Not served in 2023                  0                       152
##  Increased 30%+ or new                  0                       185
##    Increased 10 to 30%                  2                       191
##     Increased 5 to 10%                  8                       147
##      Increased 3 to 5%                  2                       179
##      Increased 1 to 3%                  1                       424
##              Within 1%                  5                      1422
##        Reduced 1 to 3%                  2                       179
##       Reduced 3 to 10%                  1                       224
##    Reduced 10% or more                  0                       107
```

```
##      ratio_binned_less City of Stonnington Rest of Greater Melbourne
##     Not served in 2023           0.9879294                  151.0121
##  Increased 30%+ or new           1.2024141                  183.7976
##    Increased 10 to 30%           1.2544104                  191.7456
##     Increased 5 to 10%           1.0074280                  153.9926
##      Increased 3 to 5%           1.1764160                  179.8236
##      Increased 1 to 3%           2.7623027                  422.2377
##              Within 1%           9.2748375                 1417.7252
##        Reduced 1 to 3%           1.1764160                  179.8236
##       Reduced 3 to 10%           1.4623955                  223.5376
##    Reduced 10% or more           0.6954503                  106.3045
```