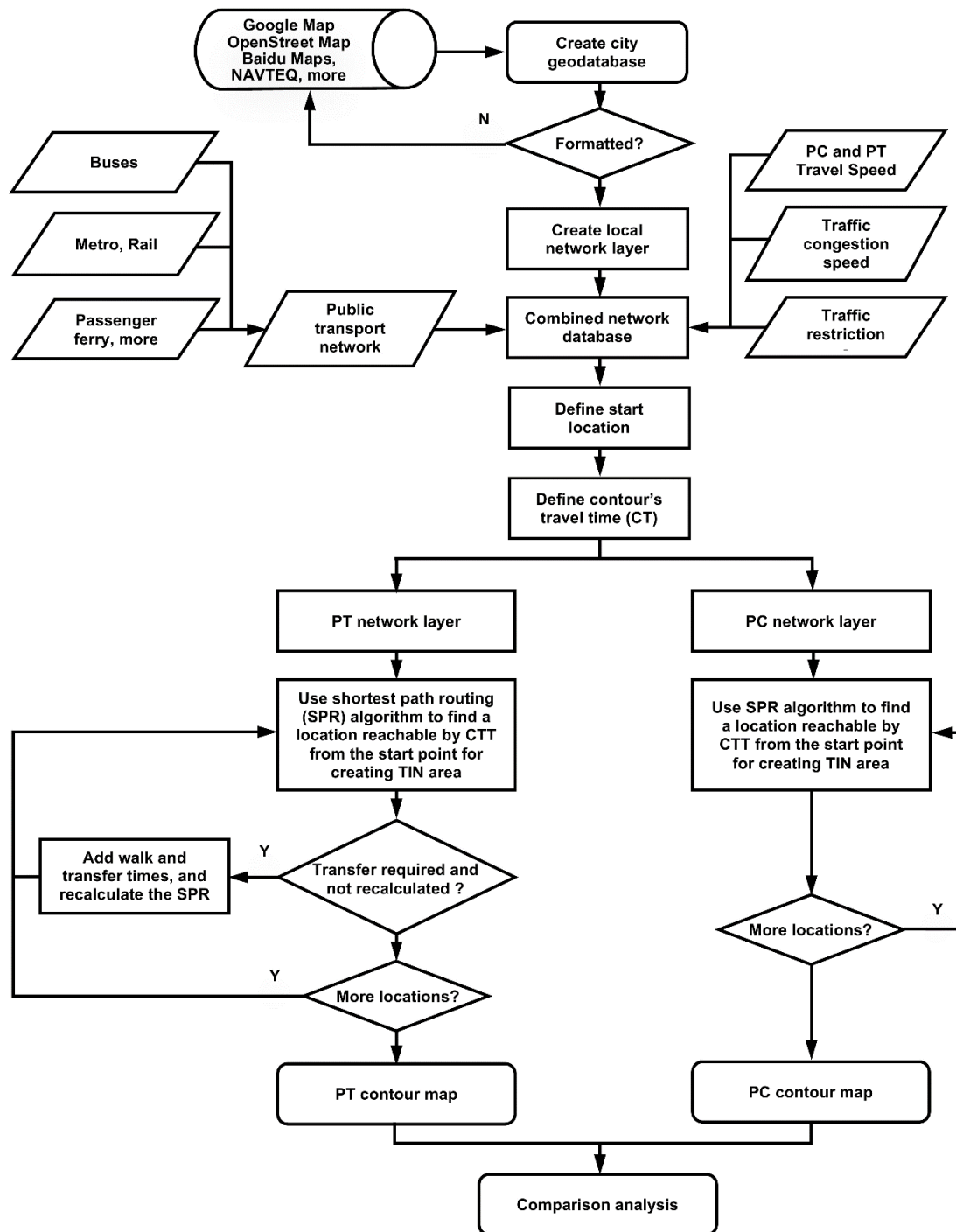**Supplementary Information** for

# Syncing sustainable urban mobility with public transit policy trends based on global data analysis

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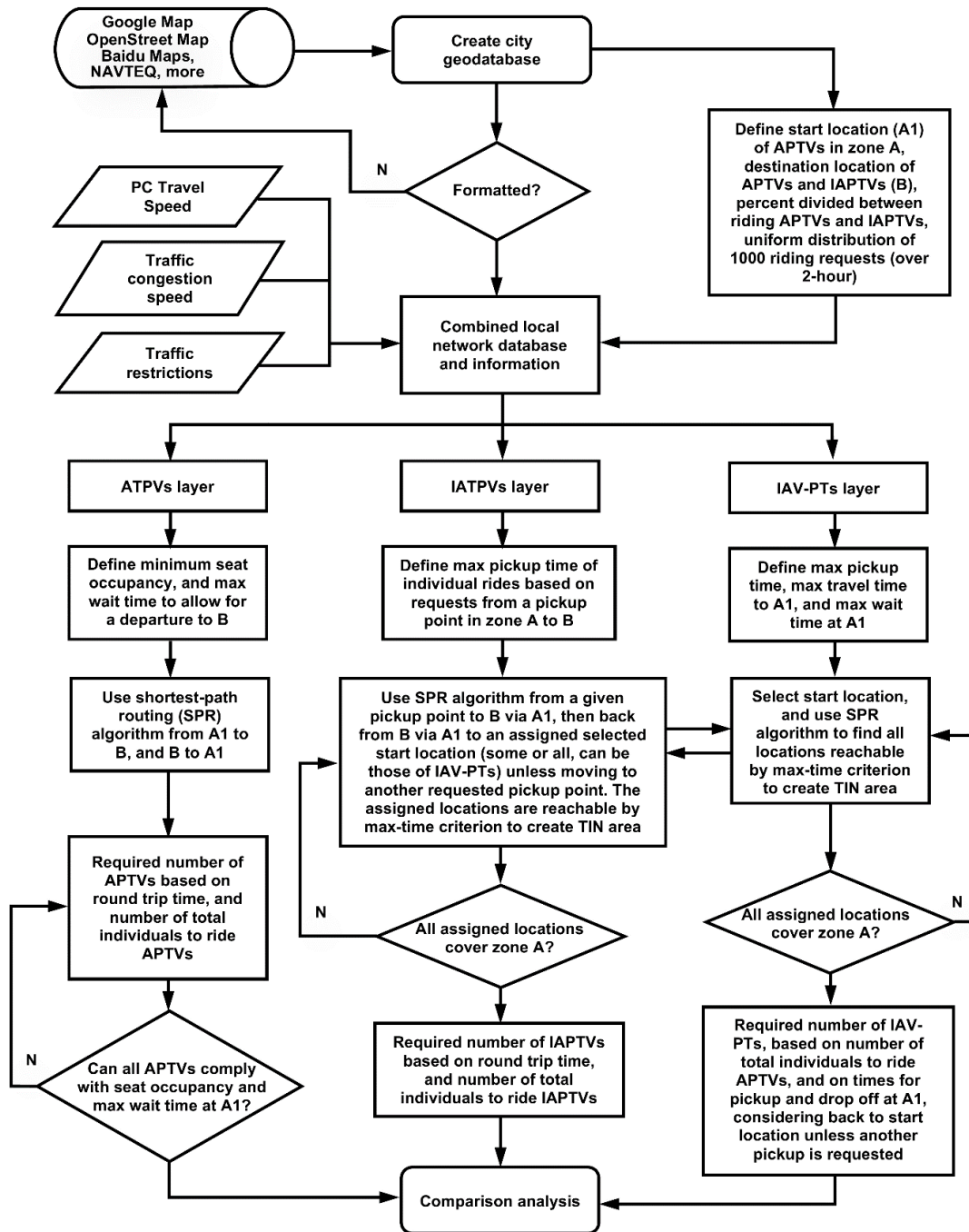
**This part includes:**

**Supplementary Fig. 1.   A conceptual flowchart for attaining contour maps**. The process occurring using ArcGIS 10.3.1 to create the PC and PT transport network layers followed by the SPR algorithm to all locations feasible to reach within, or at the maximum, travel time chosen of 30, 45, 60 or 90 minutes. This generates the PC, PT and the overlapped TIN area for each, for all of the 17 cities shown in Figs. 2 and 3 using actual input data.

Supplementary Fig. 2. A conceptual flowchart for creating a future mobility scenario. The construction of the APTVs, IAPTVs, and IAV-PTs transport network layers and the general procedures for pickup, drop off, and traversing SPR based sections of 1000 individual travel requests. It shows the criteria of the analysis and the use of ArcGIS 10.3.1 for creating firstly, a small TIN area around the starting points of IAPTVs, and IAV-PTs, and secondly, the TIN area of the entire A zone. Actual data input were used to determine the number of automated vehicles required, as shown in Fig. 5.

**Supplementary Table 1. Data and results of road traffic damages**

| Group | Country | $D_{pc}$ (km) | $V_{pc}$ (km/hr) | $LT_{PC}$ (hr/year) | %LT | %F | %PM 2.5 | %P | Pop (M) | # PCs (M) | ALoM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Asia | China | 15,000 | 26 | 80 | 33.68 | 61.49 | 17 | 93.5 | 1,409.5 | 217.0 | 10 |
| | Japan | 18,000 | 24 | 78 | 48.00 | 13.99 | 23 | 91.3 | 127.5 | 78.1 | 54 |
| | Singapore | 16,700 | 29 | 87 | 23.73 | 33.77 | 36 | 93.5 | 5.7 | 1.0 | 12 |
| | India | 20,000 | 35 | 60 | 15.82 | 42.82 | 37 | 93.5 | 1,339.2 | 191.0 | 9 |
| | Korea | 13,651 | 32 | 107 | 34.70 | 57.81 | 23 | 95.2 | 51.0 | 22.8 | 22 |
| Oceania | Australia | 15,530 | 32 | 94 | 28.20 | 32.33 | 26 | 94.5 | 24.5 | 19.2 | 44 |
| | New Zealand | 10,400 | 24 | 80 | 32.54 | 28.57 | 26 | 95.0 | 4.7 | 3.8 | 50 |
| Africa | South Africa | 20,000 | 35 | 90 | 25.71 | 38.84 | 17 | 93.5 | 56.7 | 12.0 | 14 |
| | Egypt | 14,000 | 35 | 76 | 21.71 | 54.35 | 17 | 95.5 | 97.6 | 9.4 | 4 |
| America | USA | 18,000 | 47 | 42 | 12.76 | 38.30 | 24 | 95.6 | 324.5 | 268.8 | 36 |
| | Brazil | 12,000 | 29 | 36 | 11.22 | 35.76 | 34 | 95.3 | 209.3 | 4.3 | 1 |
| | Mexico | 13,000 | 29 | 58 | 21.42 | 34.34 | 30 | 95.0 | 129.2 | 43.0 | 17 |
| | Canada | 13,000 | 32 | 74 | 25.74 | 25.11 | 15 | 95.4 | 36.6 | 34.3 | 43 |
| Europe | UK | 14,550 | 28 | 30 | 9.86 | 21.13 | 25 | 94.1 | 66.2 | 37.5 | 33 |
| | France | 15,294 | 29 | 70 | 26.25 | 29.53 | 25 | 94.1 | 65.0 | 30.5 | 28 |
| | Germany | 14,835 | 29 | 35 | 14.00 | 19.97 | 19 | 94.2 | 82.1 | 63.7 | 45 |
| | Italy | 14,000 | 29 | 19 | 8.29 | 43.53 | 19 | 94.6 | 59.4 | 36.8 | 34 |
| | Spain | 4,148 | 29 | 18 | 8.47 | 31.94 | 35 | 98.4 | 46.4 | 22.1 | 8 |
| | Poland | 6,672 | 29 | 60 | 25.26 | 33.28 | 17 | 97.4 | 38.2 | 17.2 | 12 |

**Notations:** PCs = private cars; Pop = population; M = millions;

$D_{pc}$ = average annual driving distance per PC;

$LT_{pc}$ = average annual time lost in traffic congestion per PC;

$V_{pc}$ = estimated average road traffic speed of PCs;

%LT = percent of lost time in traffic congestion out of total commuting time;

%F = percentage of road accident fatalities out of all deaths by accidents;

%PM2.5 = percent of PM2.5 from road traffic out of total produced;

%P = percentage of time cars park;

ALoM = nonstop (24/7) active PCs per 1000 inhabitants.

**Note:** Complete coverage of the data elements including sources appear in Supplementary Table 8.

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**Supplementary Table 2.   Characteristics and data, part 1, of areas presented by Figs. 2 and 3**

| City (by pop. density) | Total city pop. (people) | Country | Examined zone | Zone's pop. density (people/km$^2$) | Selected zone's center location as starting point |
|---|---|---|---|---|---|
| Mumbai | 12,442,373 | India | Santa Cruz West | 27,223 | Santa Cruz |
| Paris | 2,240,000 | France | Le Marais | 21,000 | Le Centre Pompidou |
| Seoul | 9,774,000 | S. Korea | City centre | 17,000 | Dongdaemum |
| Tokyo | 9,273,000 | Japan | Bunkyo | 14,790 | Tokyo Train Station |
| Mexico City | 8,875,000 | Mexico | Doctores | 14,616 | General Hospital |
| New York | 8,538,000 | USA | Lower Manhattan | 10,858 | W41st St.& 6th Ave. |
| Santiago | 5.561,000 | Chile | City center | 9,339 | Mall Plaza Alameda |
| Singapore | 5,607,000 | Singapore | City center | 9,302 | Nex Mall |
| Bangkok | 5,782,000 | Thailand | City center | 7,561 | State Tower |
| London | 8,853,000 | United Kingdom | City center | 5,632 | Queen Theatre |
| Chicago | 2,695,598 | American | CBD area | 4,594 | Randolph/Wabash |
| Toronto | 2,731,571 | Canada | Old Toronto | 4,334 | CF Toronto Eaton Centre |
| Shanghai | 24,183,300 | China | Jingan | 6,000 | Shanghai People's Square |
| Auckland | 1,534,700 | New Zealand | Auckland CBD | 1,400 | Britomart |
| Copenhagen | 1,295,686 | Denmark | Indre By | 1,360 | Norreport Station |
| Beijing | 20,794,000 | China | Guomao | 1,293 | Beijing Yintai Centre |
| Sydney | 5,029,768 | Australia | CBD area | 400 | Westfield Sydney |

65 **Supplementary Table 3.   Characteristics and data, part 2, of areas presented by**
66 **Figs. 2 and 3**
67

| City (by pop. density) | Characteristics of the selected center | Land use characteristics | Ave. vehicle speed (km/hr) 5-6PM | Year of data |
|---|---|---|---|---|
| Mumbai | Train station center with an airport nearby; high PT demand | Train station, airports, shopping mall | 19 | 2015 |
| Paris | A busy center of traffic and the metro system | Shopping mall, tourism | 22 | 2012 |
| Seoul | Subway transit center with heavy traffic conditions | University and shopping center | 19 | 2016 |
| Tokyo | Center with a high PT demand | University, library, shopping mall offices | 22 | 2016 |
| Mexico City | A point with high PT and traffic demand | Commercial center, shopping mall, hospital | 17 | 2013 |
| New York | A busy central traffic area | University, library, shopping mall offices | 20 | 2017 |
| Santiago | A busy central area with a high demand for subway and bus services | Shopping mall, offices, government buildings | 37 | 2014 |
| Singapore | Central, high demand, point of subway and bus lines | Shopping mall, schools, tourism | 24 | 2016 |
| Bangkok | High PT demand point with a subway station nearby | Tourism, shopping mall, offices | 24 | 2015 |
| London | Central busy traffic and subway point | Theater, shopping mall, tourism | 24 | 2017 |
| Chicago | Center and major PT demand point | Parks, shopping malls, offices | 34 | 2017 |
| Toronto | High PT demand point with many rail stops nearby | University, library, shopping mall, tourism | 35 | 2016 |
| Shanghai | Central point of high PT and traffic demand with huge shopping malls | Shopping mall, offices | 16 | 2017 |
| Auckland | A busy rail and bus activities and demand point | Shopping mall, offices | 27 | 2017 |
| Copenhagen | Center and major PT station | Parks, shopping malls, offices | 24 | 2012 |
| Beijing | A busy traffic, subway and bus demands' point | Conference hall, shopping mall, offices | 16 | 2017 |
| Sydney | Central demand point of trains and buses | Shopping mall, offices | 29 | 2017 |

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70 **Supplementary Table 4.   Results of contour areas for four travel times used in**
71 **Figs. 2 and 3**
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| City no. | City (by pop. density) | Total contour area (km$^2$) for four T (minutes) | | | | TBEC contour area (km$^2$) for four T (minutes) | | | | TBC contour area (km$^2$) for four T (minutes) | | | | CBT contour area (km$^2$) for four T (minutes) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | 45 | 60 | 90 | 30 | 45 | 60 | 90 | 30 | 45 | 60 | 90 | 30 | 45 | 60 | 90 |
| 1 | Mumbai | 53 | 62 | 64 | 103 | 42 | 40 | 48 | 62 | 27 | 20 | 15 | 7 | 11 | 22 | 16 | 41 |
| 2 | Paris | 36 | 103 | 189 | 251 | 30 | 86 | 162 | 207 | 7 | 31 | 77 | 71 | 6 | 17 | 27 | 44 |
| 3 | Seoul | 69 | 93 | 146 | 195 | 56 | 67 | 103 | 109 | 33 | 30 | 43 | 32 | 13 | 26 | 43 | 86 |
| 4 | Tokyo | 134 | 129 | 219 | 315 | 129 | 120 | 143 | 258 | 90 | 16 | 52 | 80 | 5 | 9 | 76 | 57 |
| 5 | Mexico City | 46 | 171 | 170 | 279 | 37 | 113 | 121 | 238 | 21 | 85 | 63 | 79 | 9 | 58 | 49 | 41 |
| 6 | Shanghai | 163 | 299 | 405 | 474 | 30 | 226 | 306 | 343 | 7 | 87 | 118 | 71 | 133 | 73 | 99 | 131 |
| 7 | Beijing | 26 | 56 | 109 | 153 | 20 | 54 | 88 | 110 | 8 | 23 | 31 | 14 | 6 | 2 | 21 | 43 |
| 8 | New York | 36 | 90 | 376 | 201 | 36 | 90 | 354 | 139 | 24 | 66 | 285 | 66 | 0 | 0 | 22 | 62 |
| 9 | Santiago | 61 | 126 | 129 | 205 | 44 | 75 | 74 | 134 | 18 | 45 | 14 | 14 | 17 | 51 | 55 | 71 |
| 10 | Singapore | 86 | 288 | 335 | 396 | 61 | 260 | 231 | 229 | 17 | 77 | 65 | 43 | 25 | 28 | 104 | 167 |
| 11 | Bangkok | 37 | 85 | 164 | 157 | 29 | 67 | 112 | 79 | 7 | 12 | 43 | 1 | 8 | 18 | 52 | 78 |
| 12 | London | 66 | 311 | 364 | 189 | 66 | 307 | 357 | 152 | 45 | 263 | 297 | 82 | 0 | 4 | 7 | 37 |
| 13 | Chicago | 127 | 73 | 103 | 131 | 124 | 45 | 57 | 63 | 103 | 8 | 7 | 6 | 3 | 28 | 46 | 68 |
| 14 | Toronto | 79 | 128 | 171 | 207 | 51 | 82 | 121 | 104 | 23 | 29 | 40 | 11 | 28 | 46 | 50 | 103 |
| 15 | Sydney | 52 | 158 | 285 | 300 | 32 | 88 | 137 | 117 | 9 | 23 | 24 | 9 | 20 | 70 | 148 | 183 |
| 16 | Auckland | 72 | 121 | 502 | 268 | 66 | 85 | 293 | 224 | 44 | 13 | 211 | 13 | 6 | 36 | 209 | 44 |
| 17 | Copenhagen | 121 | 143 | 190 | 306 | 107 | 81 | 99 | 142 | 70 | 13 | 11 | 0 | 14 | 62 | 91 | 164 |

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75 **Notations:** T=30, 45, 60, 90 minutes representing maximum travel time to the contour line of
76 one of the four contour maps, where travel time is based on the shortest path routing
77 from the city's center point.
78 CBT - cars are better (faster) than transit.
79 TBC - transit is better (faster) than cars.
80 TBEC - transit is better (faster) or equal to cars.
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## Supplementary Table 5.   Characteristics of A, A1, and B of the 17-city

| City (by pop. density) | Name of A | Name/ location of A1 | Name/ location of B | A1 to B distance (km) |
|---|---|---|---|---|
| Mumbai | Andheri East | MIDC Police Station | Santa Cruz | 7.6 |
| Paris | Boulogne-Billancourt | Mairie | Le Centre Pompidou | 10.1 |
| Seoul | Seocho-gu | Nambu Bus Terminal | Dongdaemum Market | 11.2 |
| Tokyo | Edogawa City | Matsue Park | Tokyo Train Station | 12.3 |
| Mexico City | Naucalpan | Acueducto de los Remedios | General Hospital | 14.6 |
| Shanghai | Putuo | Back Qinjia Corner | Shanghai People's Square | 13.4 |
| Beijing | Wangjing | Futong Train Station | Beijing Yintai Centre | 12.0 |
| New York | Maspeth | St. Stanislaus Kostka School | Midtown Soho | 9.0 |
| Santiago | Las Condes | Pueblito Los Dominicos | Mall Plaza Alameda | 18.5 |
| Singapore | Sengkang | Springdale Primary School | Nex Mall | 8.0 |
| Bangkok | Wang Thonglang | Udomsuksa School | State Tower | 17.0 |
| London | Camberwell | Camberwell Library | Queen Theatre | 7.8 |
| Chicago | Humboldt Park | Harding (Frederick) Park | Randolph/Wabash | 12.0 |
| Toronto | York | Eglinton - Gilbert Parkette | CF Toronto Eaton Centre | 10.5 |
| Sydney | Marrickville | Marrickville Town Hall | Westfield Sydney | 9.5 |
| Auckland | Mount Roskill | Dominion Road School | Britomart | 11.0 |
| Copenhagen | Vanløse | Børglumvej (Jernbane Allé) | Norreport Station | 8.2 |

90 **Supplementary Table 6.  Number of automated vehicles out of 1000 PCs for three cases**
91 **represented in Fig. 5**

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| City (by pop. density) | [%APTV, %IAPTV] | | | | | | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | [100,0] | | | | | [50,50] | | | | | [0,100] | | | | |
| | APTVs $a$ | IAV-PTs $b$ | IAPTVs $c$ | Total $d=a+c$ | Total in % $e$ | $a$ | $b$ | $c$ | $d$ | $e$ | $a$ | $b$ | $c$ | $d$ | $e$ |
| Mumbai | 32 | 62 | 0 | 32 | 3% | 17 | 52 | 350 | 367 | 37% | 0 | 0 | 700 | 700 | 70% |
| Paris | 31 | 91 | 0 | 31 | 3% | 16 | 45 | 317 | 333 | 33% | 0 | 0 | 633 | 633 | 63% |
| Seoul | 28 | 45 | 0 | 28 | 3% | 19 | 35 | 263 | 282 | 28% | 0 | 0 | 525 | 525 | 53% |
| Tokyo | 29 | 62 | 0 | 29 | 3% | 15 | 36 | 267 | 282 | 28% | 0 | 0 | 533 | 533 | 53% |
| Mexico City | 33 | 83 | 0 | 33 | 3% | 17 | 42 | 363 | 380 | 38% | 0 | 0 | 725 | 725 | 73% |
| Shanghai | 32 | 62 | 0 | 32 | 3% | 17 | 41 | 333 | 350 | 35% | 0 | 0 | 667 | 667 | 67% |
| Beijing | 31 | 70 | 0 | 31 | 3% | 16 | 36 | 300 | 316 | 32% | 0 | 0 | 630 | 630 | 63% |
| New York | 32 | 62 | 0 | 32 | 3% | 17 | 33 | 313 | 330 | 33% | 0 | 0 | 625 | 625 | 63% |
| Santiago | 31 | 77 | 0 | 31 | 3% | 16 | 55 | 308 | 324 | 32% | 0 | 0 | 617 | 617 | 62% |
| Singapore | 31 | 87 | 0 | 31 | 3% | 15 | 43 | 292 | 307 | 31% | 0 | 0 | 583 | 583 | 58% |
| Bangkok | 31 | 95 | 0 | 31 | 3% | 15 | 48 | 296 | 311 | 31% | 0 | 0 | 592 | 592 | 59% |
| London | 31 | 100 | 0 | 31 | 3% | 15 | 50 | 317 | 332 | 33% | 0 | 0 | 633 | 633 | 63% |
| Chicago | 29 | 80 | 0 | 29 | 3% | 14 | 42 | 250 | 264 | 26% | 0 | 0 | 500 | 500 | 50% |
| Toronto | 30 | 111 | 0 | 30 | 3% | 14 | 56 | 254 | 268 | 27% | 0 | 0 | 508 | 508 | 51% |
| Sydney | 27 | 62 | 0 | 27 | 3% | 12 | 31 | 221 | 233 | 23% | 0 | 0 | 442 | 442 | 44% |
| Auckland | 22 | 50 | 0 | 22 | 2% | 11 | 29 | 229 | 240 | 24% | 0 | 0 | 458 | 458 | 46% |
| Copenhagen | 30 | 125 | 0 | 30 | 3% | 14 | 63 | 267 | 281 | 28% | 0 | 0 | 533 | 533 | 53% |

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94 **Notations:** APTV - automated PT vehicle, i.e., shared automated bus.
95 IAPTV - individual automated PT vehicle, i.e., automated taxi-type company car.
96 IAV-PT - individual automated vehicle of local PT service, i.e., automated local
97 company car to feed into, or distribute from, an APTV.
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**Supplementary Table 7.  Number of automated vehicles out of 1000 PCs for two additional cases**

| City (by pop. density) | [%APTV, %IAPTV] | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | [75,25] | | | | | [25,75] | | | | |
| | APTVs a | IAV-PTs b | IAPTVs c | Total d= a+c | Total in % e | a | b | c | d | e |
| Mumbai | 22 | 94 | 133 | 155 | 16% | 8 | 31 | 400 | 408 | 41% |
| Paris | 22 | 83 | 127 | 149 | 15% | 7 | 28 | 381 | 388 | 39% |
| Seoul | 20 | 35 | 131 | 151 | 15% | 19 | 35 | 394 | 413 | 41% |
| Tokyo | 25 | 52 | 175 | 200 | 20% | 11 | 52 | 525 | 536 | 54% |
| Mexico City | 23 | 71 | 148 | 171 | 17% | 11 | 24 | 444 | 455 | 46% |
| Shanghai | 24 | 47 | 156 | 180 | 18% | 16 | 33 | 469 | 485 | 49% |
| Beijing | 23 | 75 | 158 | 181 | 18% | 8 | 48 | 75 | 83 | 8% |
| New York | 25 | 63 | 181 | 206 | 21% | 11 | 41 | 544 | 555 | 56% |
| Santiago | 22 | 63 | 125 | 147 | 15% | 7 | 23 | 375 | 382 | 38% |
| Singapore | 24 | 47 | 167 | 191 | 19% | 16 | 41 | 500 | 516 | 52% |
| Bangkok | 23 | 58 | 154 | 177 | 18% | 8 | 55 | 463 | 471 | 47% |
| London | 24 | 68 | 158 | 182 | 18% | 15 | 26 | 475 | 490 | 49% |
| Chicago | 23 | 53 | 156 | 179 | 18% | 8 | 27 | 469 | 477 | 48% |
| Toronto | 23 | 65 | 146 | 169 | 17% | 10 | 32 | 438 | 448 | 45% |
| Sydney | 21 | 47 | 133 | 154 | 15% | 15 | 36 | 400 | 415 | 42% |
| Auckland | 20 | 47 | 110 | 130 | 13% | 9 | 22 | 331 | 340 | 34% |
| Copenhagen | 17 | 40 | 115 | 132 | 13% | 6 | 23 | 344 | 350 | 35% |

**Supplementary Table 8.** Information for Supplementary Table 1 with list of references/sources indicated by superscripts

| Group | Country | $D_{pc}$ (km) | $V_{pc}$ (km/h) | $LT_{pc}$ (hr/year) | %LT | %F | %PM2.5 | %P | Pop (M) | # PCs (M) | ALoM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Asia | China | 15,000[2] (2015)* | 26[58] (2016) | 80[20,21] (2017) | 33.68% | 61.49%[37] (2016) | 17%[56] (2014) | 93.5% | 1,409.5[57] (2017) | 217.0[59] (2018) | 10 |
| | Japan | 18,000[3] (2014) | 24[58] (2016) | 78[19] (2017) | 48.00% | 13.99%[38] (2016) | 23%[56] (2014) | 91.3% | 127.5[57] (2017) | 78.1[60] (2017) | 54 |
| | Singapore | 16,700[4] (2016) | 29[58] (2016) | 87[22] (2015) | 23.73% | 33.77%[39] (2016) | 36%[56] (2014) | 93.5% | 5.7[57] (2017) | 1.0[61] (2017) | 12 |
| | India | 20,000[5] (2016) | 35[58] (2016) | 60[23] (2017) | 15.82% | 42.82%[40] (2016) | 37%[56] (2014) | 93.5% | 1,339.2[57] (2017) | 191.0[62] (2016) | 9 |
| | Korea | 13,651[6] (2015) | 32[58] (2016) | 107[24] (2017) | 34.70% | 57.81%[41] (2016) | 23%[56] (2014) | 95.2% | 51.0[57] (2017) | 22.8[63] (2018) | 22 |
| Oceania | Australia | 15,530[7] (2013) | 32[58] (2016) | 94[25] (2013) | 28.20% | 32.33%[42] (2016) | 26%[56] (2014) | 94.5% | 24.5[57] (2017) | 19.2[64] (2018) | 44 |
| | New Zealand | 10,400[16] (2014) | 24[58] (2016) | 80[26] (2018) | 32.54% | 28.57%[43] (2016) | 26%[56] (2014) | 95.0% | 4.7[57] (2017) | 3.8[65] (2015) | 50 |
| Africa | South Africa | 20,000[8] (2017) | 35[58] (2016) | 90[27] (2014) | 25.71% | 38.84%[44] (2016) | 17%[56] (2014) | 93.5% | 56.7[57] (2017) | 12.0[66] (2017) | 14 |
| | Egypt | 14,000[9] (2014) | 35[58] (2016) | 76[28] (2015) | 21.71% | 54.35%[45] (2016) | 17%[56] (2014) | 95.5% | 97.6[57] (2017) | 9.4[67] (2017) | 4 |
| America | USA | 18,000[10] (2015) | 47[58] (2016) | 42[17] (2015) | 12.76% | 38.30%[46] (2016) | 24%[56] (2014) | 95.6% | 324.5[57] (2017) | 268.8[68] (2017) | 36 |
| | Brazil | 12,000[11] (2013) | 29[58] (2016) | 36[29] (2018) | 11.22% | 35.76%[47] (2016) | 34%[56] (2014) | 95.3% | 209.3[57] (2017) | 4.3[69] (2018) | 1 |
| | Mexico | 13,000[12] (2015) | 29[58] (2016) | 58[30] (2018) | 21.42% | 34.34%[48] (2016) | 30%[56] (2014) | 95.0% | 129.2[57] (2017) | 43.0[70] (2018) | 17 |
| | Canada | 13,000[13] (2015) | 32[58] (2016) | 74[31] (2010) | 25.74% | 25.11%[49] (2016) | 15%[56] (2014) | 95.4% | 36.6[57] (2017) | 34.3[71] (2017) | 43 |
| Europe | UK | 14,550[13] (2015) | 28[58] (2016) | 30[18] (2015) | 9.86% | 21.13%[50] (2016) | 25%[56] (2014) | 94.1% | 66.2[57] (2017) | 37.5[72] (2017) | 33 |
| | France | 15,294[13] (2015) | 29[58] (2016) | 70[32] (2018) | 26.25% | 29.53%[51] (2016) | 25%[56] (2014) | 94.1% | 65.0[57] (2017) | 30.5[73] (2017) | 28 |
| | Germany | 14,835[13] (2016) | 29[58] (2016) | 35[33] (2018) | 14.00% | 19.97%[52] (2016) | 19%[56] (2014) | 94.2% | 82.1[57] (2017) | 63.7[74] (2018) | 45 |
| | Italy | 14,000[14] (2014) | 29[58] (2016) | 19[34] (2016) | 8.29% | 43.53%[53] (2016) | 19%[56] (2014) | 94.6% | 59.4[57] (2017) | 36.8[75] (2016) | 34 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Spain | 4,148[13] (2015) | 29[58] (2016) | 18[35] (2016) | 8.47% | 31.94%[54] (2016) | 35%[56] (2014) | 98.4% | 46.4[57] (2017) | 22.1[76] (2015) | 8 |
| Poland | 6,672[15] (2015) | 29[58] (2016) | 60[36] (2015) | 25.26% | 33.28%[55] (2016) | 17%[56] (2014) | 97.4% | 38.2[57] (2017) | 17.2[77] (2017) | 12 |

**Notations:** PCs = private cars; Pop = population; M = millions; $D_{pc}$ = average annual driving distance per a PC;

$LT_{pc}$ = average annual time lost in traffic congestion per a PC; $V_{pc}$= estimated average PC road traffic speed;

%LT = percent of total commuting lost time in traffic congestion;

%F = percentage of road accident fatalities out of all deaths by accidents;

%PM2.5 = percent of PM2.5 from road traffic out of total produced;

%P = percentage of time cars park;

ALoM = nonstop (24/7) active PCs per 1000 inhabitants.

*Year of data shown in each cell of the table; sources of data appear in the following list.

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18. https://www.fleetnews.co.uk/news/fleet-industry-news/2016/03/15/uk-drivers-spent-30-hours-in-congestion-in-2015
19. https://newsphere.jp/economy/20170427-4/ (using Google translation, in Japanese)

141  20. http://cn-hangzhou.oss-pub.aliyun-inc.com/download-
142      report/download/yearly_report/2017/2017%E5%B9%B4%E4%B8%AD%E5%9B%BD%E4%B8%BB%E8%A6%81%E5%9F%8E%E5%B8%8
143      2%E4%BA%A4%E9%80%9A%E5%88%86%E6%9E%90%E6%8A%A5%E5%91%8A-final%E7%89%88.pdf  (using  Google  translation,  in
144      Chinese)
145  21. http://www.chinanews.com/sh/2015-01-26/7005909.shtml (using Google translation, in Chinese)
146  22. https://mustsharenews.com/time-wasted-on-traffic-jams/
147  23. https://timesofindia.indiatimes.com/city/bengaluru/10-million-bengalureans-lose-60-crore-hours-rs-3700-crore-a-year-to-road-
148      congestion/articleshow/56368901.cms
149  24. http://www.edaily.co.kr/news/news_detail.asp?newsId=02430486616057496&mediaCodeNo=257 (using Google translation, in Korean)
150  25. https://www.news.com.au/travel/travel-updates/australian-motorists-spend-94-hours-a-year-in-congestion-tomtom-traffic-index/news-
151      story/30a81e41178911bffc00f1380383153f
152  26. https://www.radionz.co.nz/news/national/351558/commuters-waste-80-hours-stuck-in-traffic
153  27. https://www.cnbcafrica.com/news/southern-africa/2015/04/02/south-africa-traffic-congestion-tomtom-index/
154  28. https://www.systemdynamics.org/assets/conferences/2015/proceed/papers/P1312.pdf
155  29. https://www.cbsnews.com/pictures/worst-traffic-cities-in-the-world/23/
156  30. https://www.cbsnews.com/pictures/worst-traffic-cities-in-the-world/11/
157  31. http://www.wikiwand.com/en/Traffic_congestion
158  32. http://inrix.com/press-releases/2661/
159  33. http://inrix.com/press-releases/2663/
160  34. https://www.wantedinmilan.com/news/milan-italys-worst-for-traffic.html
161  35. https://www.autoescuelago.com/ciudades-atascos/ (using Google translation, in Spanish)
162  36. www.inrixtraffic.com/feed/
163  37. https://www.worldlifeexpectancy.com/country-health-profile/china
164  38. https://www.worldlifeexpectancy.com/country-health-profile/japan
165  39. https://www.worldlifeexpectancy.com/country-health-profile/singapore
166  40. https://www.worldlifeexpectancy.com/country-health-profile/india
167  41. https://www.worldlifeexpectancy.com/country-health-profile/korea
168  42. https://www.worldlifeexpectancy.com/country-health-profile/australia
169  43. https://www.worldlifeexpectancy.com/country-health-profile/new-zealand
170  44. https://www.worldlifeexpectancy.com/country-health-profile/south-africa
171  45. https://www.worldlifeexpectancy.com/country-health-profile/egypt
172  46. https://www.worldlifeexpectancy.com/country-health-profile/united-states
173  47. https://www.worldlifeexpectancy.com/country-health-profile/brazil
174  48. https://www.worldlifeexpectancy.com/country-health-profile/mexico
175  49. https://www.worldlifeexpectancy.com/country-health-profile/canada
176  50. https://www.worldlifeexpectancy.com/country-health-profile/united-kingdom
177  51. https://www.worldlifeexpectancy.com/country-health-profile/france
178  52. https://www.worldlifeexpectancy.com/country-health-profile/germany
179  53. https://www.worldlifeexpectancy.com/country-health-profile/italy
180  54. https://www.worldlifeexpectancy.com/country-health-profile/spain

181    55. https://www.worldlifeexpectancy.com/country-health-profile/poland
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183         ambient particulate matter (PM): A systematic review of local source contributions at global level. Atmospheric environment, 120, 475-483.
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185    58. http://chartsbin.com/view/41749
186    59. https://www.statista.com/statistics/285306/number-of-car-owners-in-china/
187    60. https://www.statista.com/statistics/674574/japan-motor-vehicle-in-use-numbers/
188    61. https://www.singstat.gov.sg/-/media/files/publications/households/pp-s24.pdf
189    62. https://www.statista.com/statistics/664729/total-number-of-vehicles-india/
190    63. https://www.ceicdata.com/en/korea/number-of-registered-motor-vehicles/registered-motor-vehicles
191    64. https://www.abs.gov.au/ausstats/abs@.nsf/mf/9309.0
192    65. http://www.ehinz.ac.nz/assets/Factsheets/Released-2017/EHI8-9-NumberOfVehiclesInNZ2000-2015-release-201701.pdf
193    66. https://www.wheels24.co.za/News/Industry_News/youll-never-guess-how-many-vehicles-are-registered-in-sa-20170328
194    67. http://english.ahram.org.eg/NewsContent/1/64/270451/Egypt/Politics-/-million-licensed-vehicles-in-Egypt-CAPMAS.aspx
195    68. https://www.census.gov/history/www/homepage_archive/2018/october_2018.html
196    69. https://www.volkswagen-newsroom.com/en/press-releases/volkswagen-group-deliveries-reach-all-time-high-392
197    70. https://oxfordre.com/latinamericanhistory/view/10.1093/acrefore/9780199366439.001.0001/acrefore-9780199366439-e-456
198    71. https://www150.statcan.gc.ca/n1/daily-quotidien/180615/dq180615e-eng.htm
199    72. https://www.gov.uk/government/statistics/vehicle-licensing-statistics-january-to-march-2017
200    73. https://www.statista.com/statistics/455887/passenger-cars-registered-in-france/
201    74. https://www.best-selling-cars.com/germany/2018-germany-total-number-registered-cars/
202    75. https://knoema.com/atlas/ranks/Private-car-theft-rate
203    76. https://www.statista.com/statistics/452310/spain-number-of-registered-passenger-cars/
204    77. https://www.acea.be/uploads/statistic_documents/ACEA_Report_Vehicles_in_use-Europe_2017.pdf
205

**Supplementary Table 9.** **Information on data sources and input data for ArcGIS 10.3.1**

206

207 **Notes:**

208     (a) The speeds of all main/major/general roads are average speeds as they appear in the sources.

209     (b) The speeds appearing for the main/minor/general roads are those found for the majority (or all) of the roads.

210     (c) Sources could not be found for some of the minor roads, and thus, their design speed was assumed.

211     (d) General speed is for a general category road between main and minor roads.

212     (e) Restraining and congestion refer to data on traffic congestion and/or traffic restrictions.

213

| City | City name (by pop. density) | | | |
|---|---|---|---|---|
| 1 | Mumbai | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 17 km/hr | https://www.tomtom.com/en_gb/traffic-news/mumbai-traffic/traffic-flow |
| | | Minor road speed | 20 km/hr | https://www.tomtom.com/en_gb/traffic-news/mumbai-traffic/traffic-flow |
| | | General speed | 25 km/hr | https://www.tomtom.com/en_gb/traffic-news/mumbai-traffic/traffic-flow |
| | | Restraining & congestion | | https://timesofindia.indiatimes.com/topic/Traffic-congestion-in-Mumbai<br>https://timesofindia.indiatimes.com/city/delhi/congestion-fee-to-unclog-some-roads/articleshow/61886317.cms - |
| | | All PT timetables | | |
| | | Other | | https://en.wikipedia.org/wiki/Public_transport_in_Mumbai |
| 2 | Paris | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 23 km/hr | https://www.tomtom.com/en_gb/traffic-news/paris-traffic/traffic-flow |
| | | | | http://www.parisaeroport.fr/docs/default-source/groupe-fichiers/presse/cp-juillet-septembre-2017/pr-12092017-traffic-figures-august-2017.pdf?sfvrsn=2 |
| | | | | https://www.franceix.net/en/technical/traffic-statistics/ |
| | | Minor road speed | 30 km/hr | https://www.tomtom.com/en_gb/traffic-news/paris-traffic/traffic-flow |
| | | General speed | 27 km/hr | https://www.tomtom.com/en_gb/traffic-news/paris-traffic/traffic-flow |
| | | | | http://www.parisaeroport.fr/en/group/finance/investor-relations/traffic |
| | | Restraining & congestion | | https://www.tomtom.com/en_gb/traffic-news/paris-traffic/traffic-flow<br>http://ec.europa.eu/eurostat/statistics- |

| | | | |
|---|---|---|---|
| | | All PT timetables | |
| | | Other | http://www.asianhumannet.org/db/datas/10_transport/planning_en.pdf |
| 3 | Seoul | Map | |
| | | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | Google Map | maps.google.com |
| | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 15 km/hr | https://english.koti.re.kr/ |
| | | Minor road speed | 23 km/hr | https://english.koti.re.kr/ |
| | | General speed | 28 km/hr | https://github.com/SeoulTech/open-data-seoul#transportation |
| | | | | https://www.data.go.kr/search/index.do |
| | | Restraining & congestion | http://www.unikorea.go.kr/eng_unikorea/relations/statistics/traffic/ |
| | | All PT timetables | http://topis.seoul.go.kr/eng/english.jsp |
| | | Other | http://english.seoul.go.kr/policy-information/traffic/major-traffic-statistics/ |
| 4 | Tokyo | Map | |
| | | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | Google Map | maps.google.com |
| | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 18.5 km/h | http://journal.jp.fujitsu.com/en/2015/08/27/01/ |
| | | Minor road speed | 22 km/hr | http://www.trafficindex.org/tokyo/ |
| | | General speed | 30 km/hr | |
| | | | | http://nlftp.mlit.go.jp/ksj-e/gml/datalist/KsjTmplt-S05-c.html |
| | | | | https://www.distancecalculator.net/from-osaka-shi-to-tokyo |
| | | Restraining & congestion | http://nlftp.mlit.go.jp/ksj-e/gml/cgi-bin/download.php |
| | | | http://nlftp.mlit.go.jp/ksj-e/gml/datalist/KsjTmplt-S05-c.html |
| | | | http://trafficdata.iis.u-tokyo.ac.jp/repository.php?loc=66 |
| | | | http://www.mlit.go.jp/road/management-e/e_pdf/0403_3.pdf |
| | | All PT timetables | |
| | | Other | http://www.asianhumannet.org/db/datas/10_transport/planning_en.pdf |
| 5 | Mexico City | Map | |
| | | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | Google Map | maps.google.com |
| | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |

| | | | | |
|---|---|---|---|---|
| | | Main road speed | 17 km/hr | https://www.tomtom.com/en_gb/traffic-news/mexico-city-traffic/traffic-flow |
| | | Minor road speed | 20 km/hr | https://www.tomtom.com/en_gb/traffic-news/mexico-city-traffic/traffic-flow |
| | | General speed | 23 km/hr | https://www.tomtom.com/en_gb/traffic-news/mexico-city-traffic/traffic-flow |
| | | Restraining & congestion | | https://www.tomtom.com/en_gb/traffic-news/mexico-city-traffic/traffic-flow https://www.transitwiki.org/TransitWiki/index.php/Publicly |
| | | Other | | http://www.accessmagazine.org/articles/spring-2015/suburban-transit-in-mexico-city/ http://www.accessmagazine.org/articles/spring-2015/suburban-transit-in-mexico-city/ |
| 6 | Shanghai | Map | OpeStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | Baidu Map | https://maps.baidu.com/ |
| | | | Part of the map | http://download.csdn.net/download/u012222998/6309629 |
| | | | Gaode Map | https://ditu.amap.com/ |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 13-17 km/hr | http://www.jtcx.sh.cn/trafficanalyse.html |
| | | General speed | 15 km/hr | https://wenku.baidu.com/view/d591ccd06037ee06eff9aef8941ea76e58fa4ae5.html |
| | | | | http://www.sohu.com/a/131413091_182825 |
| | | | | http://www.jfdaily.com/news/detail?id=50054 |
| | | Restraining & congestion | | http://sh.sina.com.cn/news/m/2018-01-19/detail-ifyqtwzu6809008-p5.shtml?from=wap http://report.amap.com/predict/holiday/predict.do# |
| | | | | A few stops chosen to calculate average bus travel time. |
| | | All PT timetables | | |
| | | | | http://bus.mapbar.com/shanghai/xianlu/ |
| | | | | Subway system travel speed, 60 km/hr |
| | | | | https://wenku.baidu.com/view/6762c56c87c24028905fc338.html |
| 7 | Beijing | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | Baidu Map | https://maps.baidu.com/ |
| | | | Map of Beijing | http://www.pudn.com/Download/item/id/1722941.html |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Average travel speed | 15 km/hr | https://www.tomtom.com/en_gb/traffic-index/beijing-traffic |
| | | Restraining & congestion | | http://www.bjdata.gov.cn/cms/web/download/NohistoryDownload.jsp?articleID=4677 http://www.bjdata.gov.cn/cms/web/bjdata/loginDoSomething/dengluLogin.jsp |

| # | City | Category | Type | Details / URL |
|---|------|----------|------|---------------|
| | | PT-Subway | | Use the timetables to get the average travel speed between stations. Average wait time is 2 minutes. |
| | | | | http://map.sogou.com/index.html#c=12940924,4859575,11&lq=%u5730%u94C1%u660C%u5E73%u7EBF&where=12913250,4840656.25,12974750,4873093.75,0&page=1,10 |
| | | | | Train travel at 80 km/hr. |
| | | | | A few stops selected to calculate average bus travel time. |
| | | Bus timetables | | |
| | | | | http://bus.mapbar.com/beijing/xianlu/ |
| | | | | http://www.baidu.com/link?url=JHYvgK_buInvt6EPIjx3AlZY34faVlbnXDQT-PdHDYIkyhX6iYT_18Kj1psxVOfSl99VcQPjwgXE8W9yeAF_rxeFjoiCdCnPJA5mY4WUHeG&wd=&eqid=fb29479c0070e3de000000045891aea7 |
| | | Other | | |
| 8 | New York City | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | Government data | https://opendata.cityofnewyork.us/ |
| | | | | https://data.cityofnewyork.us/City-Government/Georeferenced-NYC-Zoning-Maps/mxbm-493w |
| | | | PT Map | https://data.cityofnewyork.us/Transportation/Subway-Stations/arq3-7z49 |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Average travel speed | 8-12 km/hr | https://data.cityofnewyork.us/Transportation/Real-Time-Traffic-Speed-Data/qkm5-nuaq |
| | | Restraining & congestion | Government data | https://data.cityofnewyork.us/Transportation/Real-Time-Traffic-Speed-Data/qkm5-nuaq |
| | | | Real time data | http://dotsignals.org/ |
| | | PT-Subway | Real time data | http://dotsignals.org/ |
| | | Bus timetables | PT data | https://data.cityofnewyork.us/Transportation/Subway-Stations/arq3-7z49 |
| | | Other | | http://www.chinadaily.com.cn/china/2012cpc/2012-11/10/content_15910395.htm |
| 9 | Santiago | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | | | https://www.viamichelin.com/web/Traffic/Traffic_info-Santiago-_-Region_Metropolitana_de_Santiago-Chile |
| | | Main road speed | 21 km/hr | https://www.caminoadventures.com/camino-de-santiago-statistics/ |

|  |  |  |  |  |
|---|---|---|---|---|
|  |  |  |  | https://www.waze.com/driverindex |
|  | Minor road speed | 27 km/hr | | |
|  | General speed | 24 km/hr | | https://www.caminoadventures.com/camino-de-santiago-statistics/ |
|  | Restraining & congestion | | | |
|  | Other | | | http://www.worldbank.org/en/results/2013/04/11/Urban-Transport-in-Santiago |
|  |  |  |  | http://unhabitat.org/wp-content/uploads/2013/06/GRHS.2013.Case_.Study_.Santiago.Chile_.pdf |
| 10 | **Singapore** | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
|  |  |  | Google Map | maps.google.com |
|  |  |  | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
|  |  |  | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
|  |  | Main road speed | 25 km/hr | https://www.tomtom.com/en_gb/trafficindex/city/singapore |
|  |  |  |  | https://www.singstat.gov.sg/statistics/latest-data#9 |
|  |  | Minor road speed | 27 km/hr | https://www.tomtom.com/en_gb/trafficindex/city/singapore |
|  |  | General speed | 25 km/hr | |
|  |  |  |  | https://www.lta.gov.sg/content/ltaweb/en/roads-and-motoring.html |
|  |  | Restraining & congestion | | |
|  |  | All PT timetables | | https://www.sbstransit.com.sg/transport/trpt_bus_timetable.aspx |
|  |  |  |  | https://www.mytransport.sg/content/mytransport/home/dataMall.html |
|  |  |  |  | https://www.lta.gov.sg/content/ltaweb/en/public-transport/mrt-and-lrt-trains/train-system-map.html |
| 11 | **Bangkok** | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
|  |  |  | Google map | maps.google.com |
|  |  |  | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
|  |  |  | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
|  |  | Main road speed | 24 km/hr | https://www.ontario.ca/data/2011-average-car-travel-speed |
|  |  | Minor road speed | 26 km/hr | |
|  |  | General speed | 27 km/hr | |
|  |  |  |  | https://coconuts.co/jakarta/news/average-driving-speed-jakarta-weekday-mornings-5-kmh/ |

| | | | |
|---|---|---|---|
| | | Restraining & congestion | http://inrix.com/scorecard-city/?city=Bangkok&index=16 |
| | | | http://www.straitstimes.com/asia/se-asia/thailand-has-worlds-most-congested-roads-survey |
| | | All PT timetables | |
| | | Other | http://unhabitat.org/wp-content/uploads/2013/06/GRHS.2013.Case_.Study_.Bangkok.Thailand.pdf |
| 12 | London | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | Government data | https://tfl.gov.uk/ |
| | | | | https://data.gov.uk/dataset/gb-road-traffic-counts |
| | | | | https://data.gov.uk/dataset/gb-road-traffic-counts/resource/e85266b0-4c7b-4f5b-b2db-22c57f9b952c |
| | | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 31 km/hr | http://www.dft.gov.uk/traffic-counts/download.php |
| | | Minor road speed | 15 km/hr | http://www.dft.gov.uk/traffic-counts/download.php |
| | | General speed | 32 km/hr | https://data.gov.uk/dataset/gb-road-traffic-counts |
| | | | | https://www.gov.uk/government/collections/road-traffic-statistics#publications-2017 |
| | | Restraining & congestion | | https://londontransportdata.wordpress.com/2012/06/25/traffic-speeds-and-congestion-by-region/ |
| | | | | https://data.london.gov.uk/dataset/traffic-flows-borough |
| | | | | https://data.london.gov.uk/dataset/cycle-flows-tfl-road-network |
| | | PT travel data | | https://tfl.gov.uk/info-for/open-data-users/our-open-data#on-this-page-3 |
| | | | | https://data.london.gov.uk/dataset/public-transport-journeys-type-transport |
| | | | | https://data.london.gov.uk/dataset/traffic-flows-borough |
| | | Other | | http://content.tfl.gov.uk/Travel-in-London-report-1.pdf |
| | | | | http://search.abs.gov.au/s/search.html?clicked_fluster=public+transport+use&cluster0=public+transport&form=simple&origin=- |
| 13 | Chicago | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | Google Map | maps.google.com |
| | | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |

| | | | |
|---|---|---|---|
| | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | | http://gis.dot.illinois.gov/StateMapViewer/ |
| | Main road speed | 33 km/hr | https://www.tomtom.com/en_gb/trafficindex/city/chicago |
| | Minor road speed | 40 km/hr | https://www.tomtom.com/en_gb/trafficindex/city/chicago |
| | General speed | 37 km/hr | https://www.tomtom.com/en_gb/trafficindex/city/chicago |
| | | | https://www.travelmidwest.com/lmiga/map.jsp?mapname=chicagoArea |
| | | | http://www.cmap.illinois.gov/data/transportation/traffic/historic-traffic-data |
| | Restraining & congestion | | http://udforu.com/in-progress/chicago-traffic-congestion-study/ |
| | | | https://data.cityofchicago.org/Transportation/Average-Daily-Traffic-Counts-Map/pf56-35rv/data |
| | | | https://catalog.data.gov/dataset?tags=traffic&publisher=data.cityofchicago.org&organization=city-of-chicago |
| | All PT timetables | | https://www.transitchicago.com/schedules/ |
| 14 Toronto | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | Google Map | maps.google.com |
| | | TomTom City | https://www.tomtom.com/en_gb/traffic-news/ |
| | | World Map | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | | https://www.toronto.ca/wp-content/uploads/2017/11/91f0-city_congestion_trends_09-15-2015.pdf |
| | Main road speed | 35km/hr | http://www.civil.uwaterloo.ca/bhellinga/publications/Publications/ITE-1994-Speed-delay.pdf |
| | Minor road speed | 40km/hr | https://www.tomtom.com/en_gb/trafficindex/city/toronto |
| | General speed | 39km/hr | https://www.tomtom.com/en_gb/trafficindex/city/toronto |
| | | | http://www.cbc.ca/news/technology/three-in-4-drivers-travel-above-the-speed-limit-on-canada-s-busiest-highway-1.3280254 |
| | Restraining & congestion | | https://www.thestar.com/news/gta/2015/10/09/congestion-in-toronto-still-a-headache-report.html |
| | | | https://torontoist.com/2016/09/the-real-cost-of-congestion-in-toronto/ |
| | | | https://www.theglobeandmail.com/news/toronto/constant-gridlock/article18406658/ |
| | | | http://www.metrolinx.com/en/regionalplanning/costsofcongestion/costs_congestion.aspx |
| | All PT timetables | | https://ttc.ca/Routes/index.jsp |

| 15 | Sydney | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
|----|--------|-----|----------------|----------------------------------|
| | | | Google Map | maps.google.com |
| | | PT stations | | http://www.rms.nsw.gov.au/about/corporate-publications/statistics/traffic-volumes/aadt-map/index.html#/?z=7&lat=-33.78977232045953&lon=151.3446739999999&st=2 |
| | | | | http://roadsreport.rms.nsw.gov.au/#/chart?location=NSW&dateStart=2017-09-01&dateEnd=2017-11-30&peak=AM&type=period-plot |
| | | World Map | | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | | | http://www.rms.nsw.gov.au/documents/about/corporatepublications/statistics/annual-speed-traffic-volume-data-2009-2010.pdf |
| | | Average travel speed | 31 km/hr | http://roadsreport.rms.nsw.gov.au/#/chart?location=NSW&dateStart=2017-09-01&dateEnd=2017-11-30&peak=AM&type=period-plot |
| | | Average Highway speed | 40.5 km/hr | http://roadsreport.rms.nsw.gov.au/#/chart?location=NSW&dateStart=2017-12-01&dateEnd=2018-02-28&peak=AM&type=period-plot |
| | | PT travel data | | https://data.nsw.gov.au/data/dataset/train-data |
| | | | | https://www.transport.nsw.gov.au/ |
| | | | | https://www.transport.nsw.gov.au/data-and-research |
| | | | | http://search.abs.gov.au/s/search.html?clicked_fluster=public+transport+use&cluster0=public+transport&form=simple&origin=-9.483307%2C176.91669&profile=_default&query=%60Public+transport+use%60&collection=abs |
| | | Other | | |
| 16 | Auckland | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | | https://wiki.openstreetmap.org/wiki/WikiProject_New_Zealand#OSM_Auckland_meetings |
| | | Road maps/levels | | https://www.google.co.nz/maps?source=tldsi&hl=zh-CN |
| | | Google Map | | |
| | | Changes & revise | | Use Map-editor to change data from internet; to suit the requirements. |
| | | World Map | | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | Main road speed | 42 km/hr | https://at.govt.nz/media/970611/Penlink-Traffic-and-Economic-Analysis.pdf |
| | | Minor road speed | 30 km/hr | |
| | | General speed | Speed limits | Restrictions are not assigned to some road layers. |
| | | | | https://at.govt.nz/media/1973943/schedule-of-speed-limits-27-june-2012.pdf |
| | | | | Graphs of state highway MADT percentage changes (all vehicles) 2013. |

| | | | |
|---|---|---|---|
| | | | https://www.nzta.govt.nz/assets/resources/state-highway-traffic-volumes/docs/2013-2017-national-telemetry-site-profiles.pdf |
| | | | http://www.transport.govt.nz/research/roadsafetysurveys/speedsurveys/2013speedsurveyresultscarspeeds/ |
| | Restraining & congestion | | |
| | | | https://www.nzta.govt.nz/assets/resources/state-highway-traffic-volumes/docs/2013-2017-national-telemetry-site-profiles.pdf |
| | | | http://www.transport.govt.nz/ourwork/tmif/transport-volume/ |
| | | | https://www.greaterauckland.org.nz/our-analysis/transport-statistics/traffic-volumes/ |
| | All PT timetables | | https://at.govt.nz/bus-train-ferry/timetables/#Central |
| | Other | | http://transportblog.co.nz/tag/patronage/ |
| **17 Copenhagen** | Map | OpenStreetMap | http://www.openstreetmap.org.nz/ |
| | | | https://www.openstreetmap.org/node/13707878#map=11/55.6414/12.5910&layers=TND |
| | | Road maps/levels | |
| | | | https://www.google.com/maps/place/Copenhagen,+Denmark/@55.6802826,12.5254926,12.25z/data=!4m5!3m4!1s0x4652533c5c803d23:0x4dd7edde69467b8!8m2!3d55.6760968!4d12.5683372?hl=en |
| | | Google Map | Use Map Editor to change data from Internet to suit requirements. |
| | | Changes & revise | http://www.arcgis.com/home/item.html?id=94f838a535334cf1aa061846514b77c7 |
| | | World Map | https://www.tomtom.com/en_gb/trafficindex/city/copenhagen |
| | Main Road speed | 35km/hr | |
| | Minor Road speed | 30km/hr | |
| | | | https://books.google.co.nz/books?id=SBCmiaRdoGEC&pg=PT28&dq=copenhagen+traffic+congestion&hl=en&sa=X&ved=0ahUKEwj57syB4pXiAhUw6XMBHZlwAKEQ6AEINjAC#v=onepage&q=copenhagen%20traffic%20congestion&f=false |
| | General speed | Speed limits | |
| | | | https://books.google.co.nz/books?id=ZY7qISU8ZdIC&pg=PA87&dq=copenhagen+traffic+congestion&hl=en&sa=X&ved=0ahUKEwj57syB4pXiAhUw6XMBHZlwAKEQ6AEIPDAD#v=onepage&q=copenhagen%20traffic%20congestion&f=false |
| | | | https://en.wikipedia.org/wiki/Transport_in_Copenhagen |
| | All PT timetables | | https://stateofgreen.com/en/publications/sustainable-urban-transportation/ |
| | | | http://www.trafikdage.dk/td/papers/papers06/Trafikdage-2006-556.pdf |

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