Key Transport Statistics of World Cities

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The key transport statistics across 20 major cities are presented here with a view to identify the performance benchmarks in urban transport. The cities included in this reference comprise those that are traditionally renowned for their advanced transport development (e.g., London, New York, Hong Kong and Tokyo) and the emerging mega cities (e.g., Seoul, Shanghai and Beijing).

Table 1 presents the basic statistics of the selected cities. The metropolitan area indicated in the table refers to the densely populated region around the city, which may include urban and suburban areas in some cities (e.g., Shanghai). The main city area refers to the core area of a city, which is typically more densely built up and covers a smaller area.

Table 1. Basic Statistics of the Selected Cities

City	Metropolitan Area			Main City Area		
	Population ('000)	Area (km^2)	Density (Persons/km^2)	Population ('000)	Area (km^2)	Density (Persons/km^2)
Barcelona [1]	3,239	587	5,523	1,621	102	15,867
Beijing [1]	20,186	16,411	1,230	12,014	1,368	8,780
Berlin	3,502	892	3,927	3,502	892	3,927
Chicago [2]	3,536	842	4,200	2,715	590	4,605
Guangzhou [1]	12,751	7,434	1,715	11,114	3,843	2,892
Hong Kong	7,184	1,104	6,505	7,184	1,104	6,505
London	8,302	1,572	5,281	8,302	1,572	5,281
Madrid	3,249	604	5,377	3,249	604	5,377
Melbourne	4,246	9,991	425	1,305	451	2,896
New York	8,337	790	10,553	8,337	790	10,553
Seoul	10,442	605	17,254	10,442	605	17,254
Shanghai [1]	23,475	6,341	3,702	14,679	1,871	7,847
Singapore	5,312	716	7,422	5,312	716	7,422
Stockholm	2,127	6,526	326	881	188	4,687
Sydney	4,667	12,368	377	1,721	594	2,899
Taipei	2,673	272	9,835	2,673	272	9,835
Tokyo [1]	13,277	2,189	6,066	9,050	622	14,550
Vienna	1,757	415	4,235	1,757	415	4,235
Warsaw	1,709	517	3,303	1,709	517	3,303
Washington DC [2]	3,720	2,460	1,512	632	159	3,976

[1] For calculations in subsequent tables and figures, the population and area of the metropolitan area are used except Barcelona, Beijing, Guangzhou, Shanghai and Tokyo (see notes under respective tables)

[2] For Chicago and Washington DC, as the areas where public transport agencies (Washington Metropolitan Authority and Chicago Metropolitan Authority) serve are beyond main city areas (District of Columbia and City of Chicago) and extended to districts in other cities or states, the area that the agency claims to serve is used as metropolitan area.

Public Transport

Public Transport Supply versus Usage

The public transport supply reported in *Table 2* is measured in terms of rail network coverage (i.e., total length and number of stations) and bus fleet size. To facilitate a common basis of comparison of the public transport supply amongst cities, the indicators are normalised based on population and land area as shown under the 'Density' column.

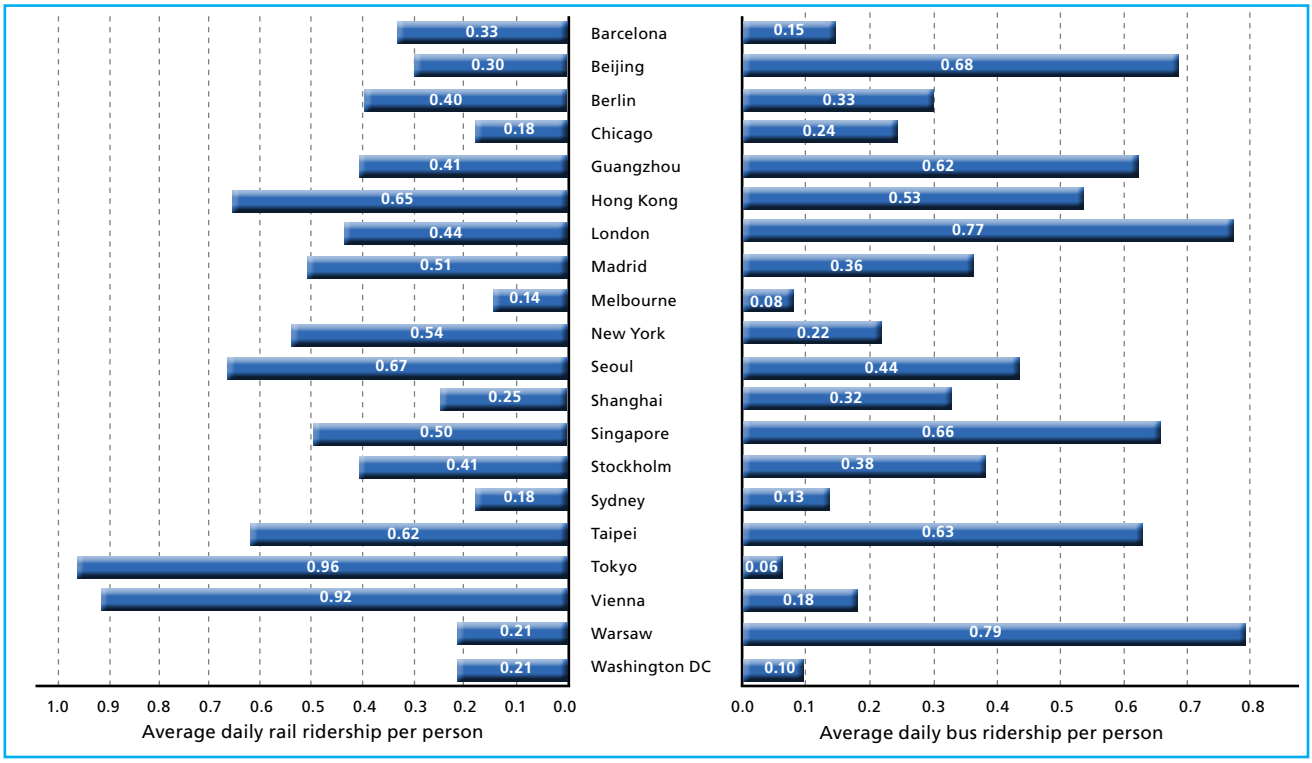
Public transport usage (or demand) refers to average daily ridership on public bus and rail. The average daily bus and rail ridership per person, which is computed by average daily bus and rail ridership over population of the selected city areas, is shown in *Figure 1*.

Table 2. Public Transport Supply and Usage

City	Public Transport Supply						Public Transport Usage	
	Rail[1] and public bus			Density			Daily ridership ('000)	
	Rail length (km)	No. of rail stations	Public bus fleet size	Rail length (km) per million persons	No. of rail stations per km² of land area	Public buses per million persons	Rail (MRT and LRT)	Public bus
Barcelona	110	154	1,072	33.8	0.263	331	1,084	475
Beijing [3]	456	269	21,628	38.0	0.197	1,071	6,008	13,788
Berlin	146	173	1,316	41.8	0.194	376	1,386	1,052
Chicago	180	145	1,877	51.0	0.172	531	632	859
Guangzhou [2]	236	144	11,445	21.2	0.037	1,030	4,506	6,920
Hong Kong	218	152	5,743	30.4	0.138	799	4,701	3,833
London	436	310	7,500	52.5	0.197	903	3,641	6,397
Madrid	292	300	2,095	90.0	0.496	645	1,644	1,169
Melbourne	390	217	1,753	91.8	0.022	413	607	337
New York	373	468	4,344	44.8	0.592	521	4,521	1,825
Seoul	327	302	7,512	31.3	0.499	719	6,994	4,565
Shanghai [3]	454	280	16,235	30.9	0.150	692	5,756	7,592
Singapore	178	134	4,212	33.5	0.187	793	2,649	3,481
Stockholm	110	100	2,114	51.7	0.015	994	874	814
Sydney	329	308	2,213	70.5	0.025	474	829	625
Taipei	113	102	3,727	42.2	0.375	1,394	1,645	1,681
Tokyo [2]	304	285	1,462	33.6	0.458	162	8,715	554
Vienna	74	101	496	42.2	0.243	282	1,608	323
Warsaw	23	23	1,561	13.5	0.044	914	362	1,346
Washington DC	171	86	1,519	46.0	0.035	408	780	358

[1] Rail network includes MRT (Mass Rapid Transit)/Subway/Metro and LRT (Light Rail Transit). The MRT systems in Singapore and Taipei are equivalent to Subway or Metro in other cities. Commuter rail is excluded.
[2] For Guangzhou and Tokyo, the population and area of the main city areas are used.
[3] For Beijing and Shanghai, the population and area in the main city areas are used in the computation of rail density.

Figure 1. Average Daily Rail and Bus Ridership per person



The data collated suggests that public transport usage is positively related to public transport supply. *Figure 2* shows that the rail ridership is positively related to the rail density (in number of stations per km^2). This suggests that accessibility is an important factor influencing commuters' decision to take public transport. *Figure 3* shows that the bus ridership is positively related to bus fleet size. The correlation between the rail ridership and rail density is weaker than the correlation between the bus ridership and bus fleet size, possibly because of the different timeframe required for adjusting rail and bus provision in order to meet their respective demand. It

Figure 2. Rail Density versus Average Daily Rail Ridership per person

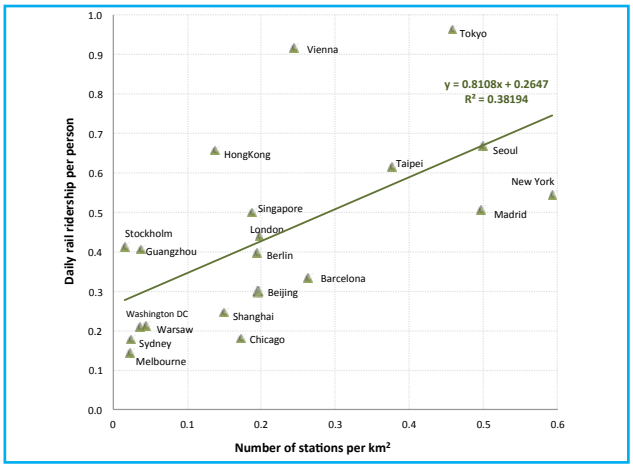
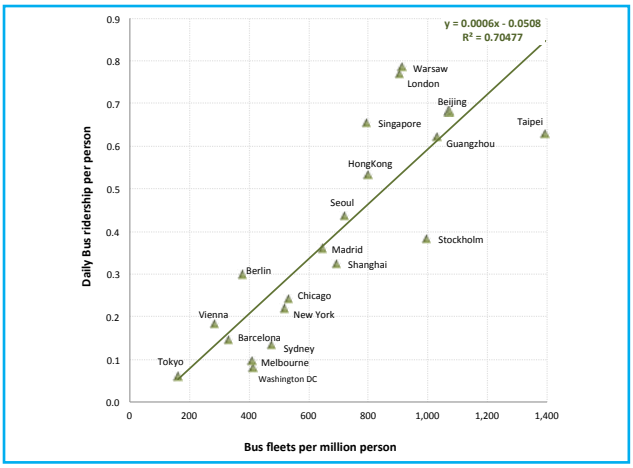


Figure 3. Bus Fleet Size versus Average Daily Bus Ridership per person



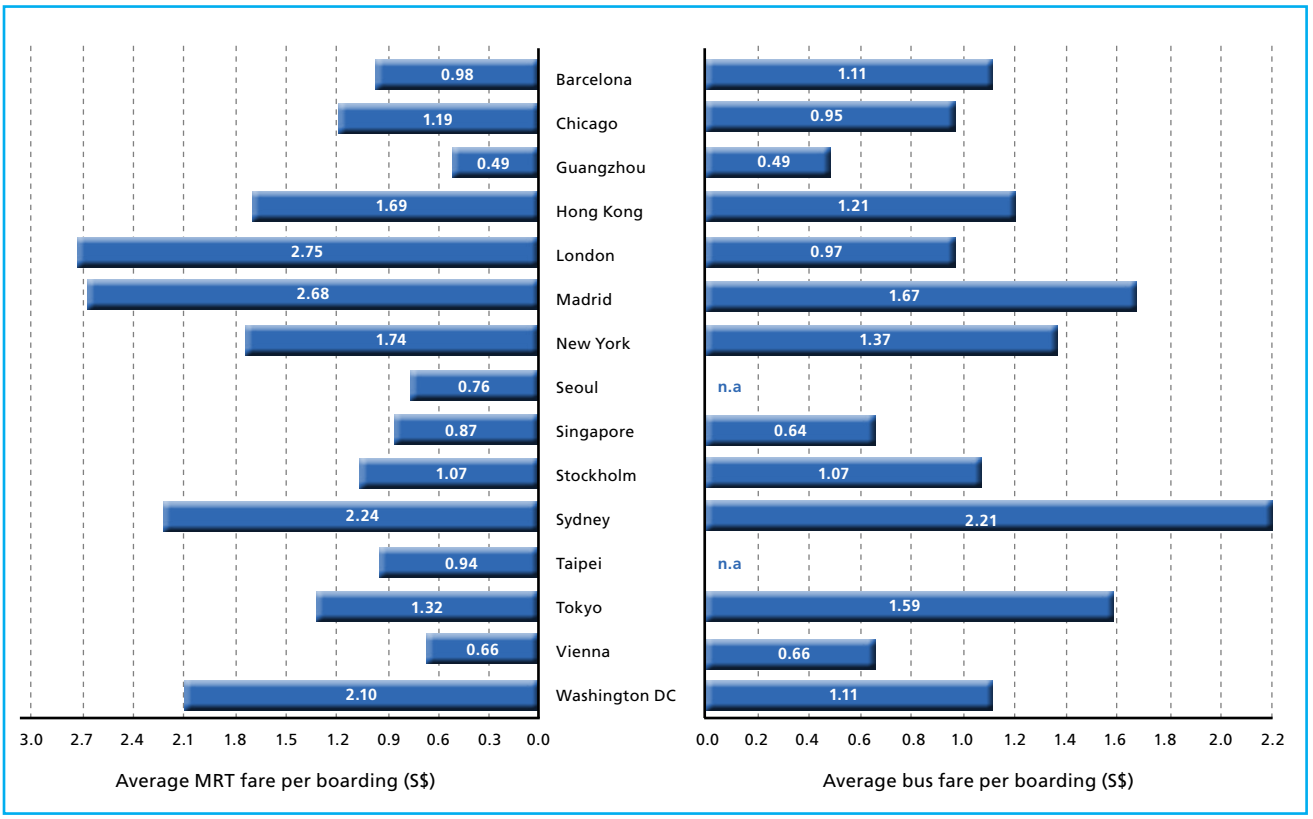
takes years for the rail infrastructure to be planned and developed based on projected demand. Bus fleet size, on the other hand, can respond to changing demand faster.

Public Transport Fare Level

Cities have different fare structures, including distance-based fare (e.g., Singapore and Seoul), zonal fare (e.g., London Underground) and flat fare (e.g., New York). Various concessions are given to children, students, and senior citizens. In addition, there are also different kinds of tickets, such as single ticket, cash payment, stored value cards and passes etc. These differences make comparison of fare levels directly across the different cities challenging.

Hence, for the purpose of this comparative assessment, the public transport fare indicator as shown in *Figure 4* is based on the average fare per boarding, which is the total fare revenue collected on the overall public transport network divided by the total ridership. In some cities, the government subsidises concession travel (e.g., concession fares for child, student and senior citizen, etc.) and pays for the difference between normal fare and concession fare to operators accordingly. Such subsidies are excluded in this computation so as to enable a straightforward comparison between different fare levels of the various cities. However, this comparison does not take into account the different sizes of cities.

Figure 4. Public Transport Fare Level



Roads and Vehicles

Road network length and car ownership are two key indicators relating to private transport performance of cities. The road length indicated in *Table 3* includes expressways, arterial, collector and local roads within the metropolitan area, regardless whether they are directly managed by the city. The data of motor vehicles includes cars, motorcycles, buses and goods vehicles. The quantity of private cars includes only cars for private use (the data of passenger cars is used if the data specific to private cars is not available).

Road Density

Road density is the ratio of the total road length (km) in a city to the city's total land area (km^2). Road densities vary among the selected cities.

Car Ownership

Car ownership is reflected here in terms of the number of private cars owned per 100 persons in a city. *Figure 6* shows that car ownership is positively related to economic development, however, a large difference in car ownership can be observed among cities with the same level of economic development. This suggests that other factors may play a role as well, for example, urban planning, public transport supply, public transport priority schemes and promotional efforts, vehicle ownership and/or usage control measures.

Table 3. Roads and Vehicles

City	Road length (km)	Road density (km of km^2)	Motor Vehicles ('000)	Private cars ('000)	Private cars per 100 persons
Barcelona [1]	1,369	13.40	968	585	36.1
Beijing	28,446	1.73	4,983	2,862	14.2
Berlin	5,419	6.08	1,305	1,120	32.0
Guangzhou	9,052	1.22	2,325	1,365	10.7
Hong Kong	2,090	1.89	653	455	6.3
London	14,814	9.42	2,934	2,535	30.5
Madrid	2,944	4.87	1,687	1,330	40.9
Melbourne	n.a	n.a	2,853	2,379	56.0
New York	10,105	12.79	1,978	1,777	21.3
Seoul	8,174	13.51	3,414	2,318	22.2
Shanghai	16,792	2.65	3,280	989	4.2
Singapore	3,426	4.79	970	535	10.1
Stockholm	n.a	n.a.	n.a.	829	39.0
Sydney	n.a	n.a.	2,626 [2]	2,626 [2]	56.3
Taipei	1,617	5.95	1,857	576	21.5
Tokyo [1]	11,863	19.07	2,117	1,641	18.1
Vienna	2,809	6.77	838	679	38.7
Warsaw	1,876	3.63	1,187	957	56.0

[1] For Barcelona and Tokyo, the population and area of the main city areas are used.
[2] For Sydney, the data of private vehicles is used.

On the other hand, higher car ownership is usually associated with a lower public transport mode share (see *Figure 7).* The correlation between public transport mode share and car ownership is statistically significant, suggesting measures controlling car ownership are effective in pushing commuters to public transport by reducing the usage of private vehicles.

Figure 5. Road Densities (km/km²)

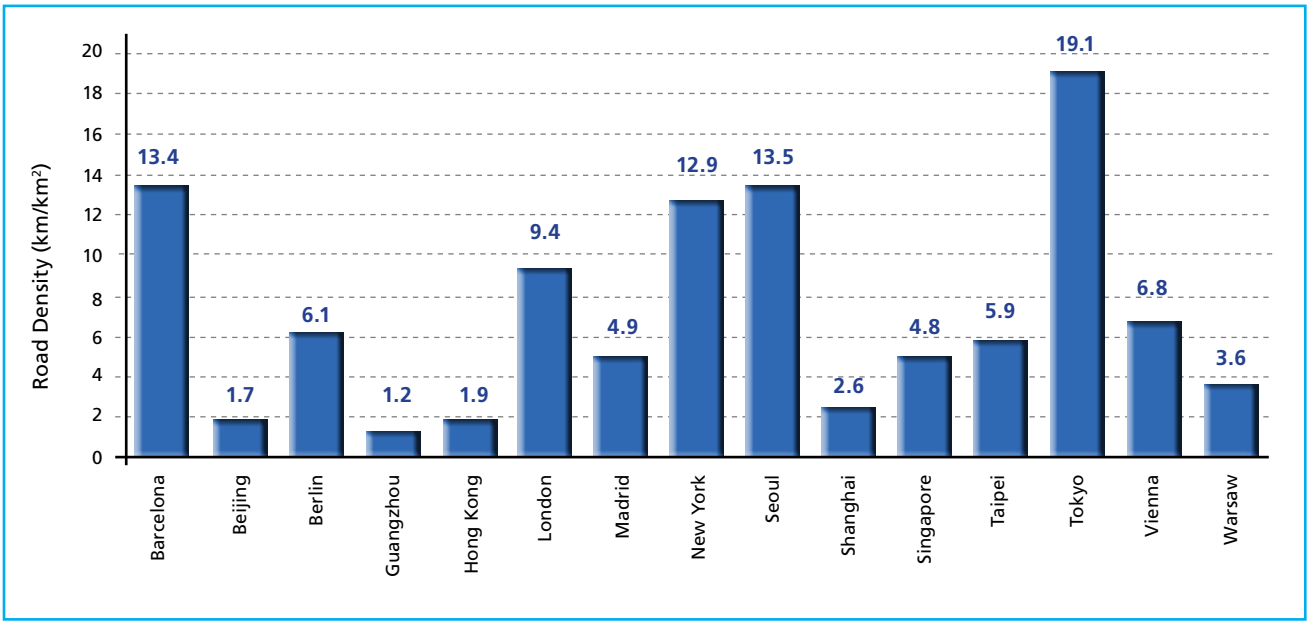


Figure 6. Car Ownership versus GDP per capita

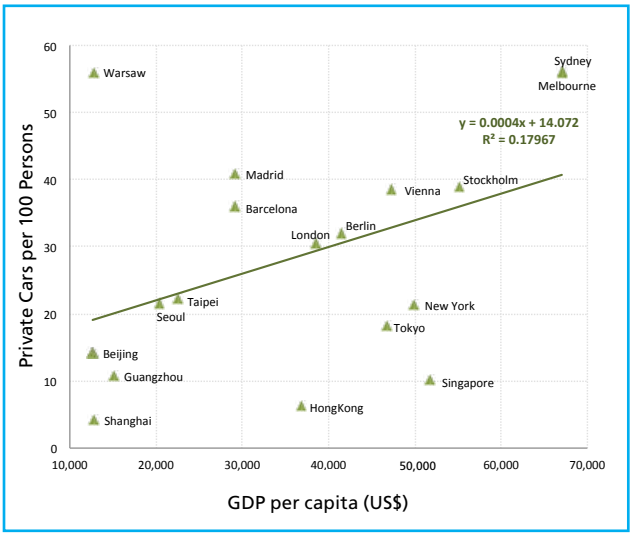
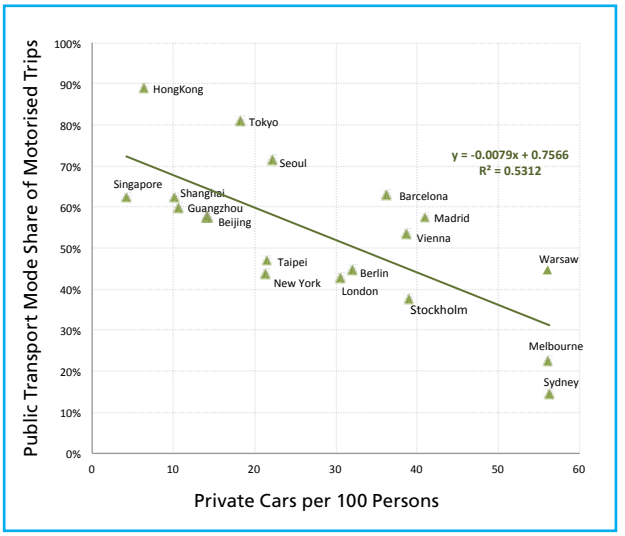


Figure 7. Car Ownership versus Public Transport Mode Share



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