

NineSquared

Fares Benchmarking

2023



About NineSquared.

NineSquared is a specialist economic consulting and commercial advisory firm focused on helping governments and companies make great decisions and achieve their goals.

Our principals and staff are experienced, senior-level practitioners who have worked in and advised government and private sector clients about a range of commercial and economic issues, primarily relating to transportation. Broadly, our expertise lies in the fields of transport and regulatory economics; policy development and analysis; advising on commercial arrangements between government and the private sector; as well as arrangements between companies operating within regulated environments.

Our combined public and private sector experience means that we are well placed to provide our clients with a deep understanding of both the public and private sectors and the interface between them.

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Introduction.

The 2023 publication of the NineSquared Fare Benchmarking report is the ninth edition of the report. As in previous years, the report provides data on the relative cost of public transport fares in cities across the globe, marked by the estimated number of minutes of work it would take at the minimum wage to afford a public transport ticket. As a result, the report is as much about changes in the minimum and average wage levels in different countries as it is about changes in the level of fares.

This year, our database is larger than ever before, encompassing 112 cities from 50 countries across the globe. In this report, we have reported detailed tables for the 38 cities included in previous reports, with six new cities included.

Whilst this methodology to normalise fare prices with wages has its benefits, it is also important to note its drawbacks. One limitation is that neither minimum or average wages necessarily represent public transport users across all income brackets and ages. Wages as a deflator also do not reflect household income or costs – a factor that is important in considering the overall affordability of transportation especially in the current economic environment. Nevertheless, using wage rates allows for the consistent comparison between different fares for public transport services, which are not traded internationally or are directly comparable across cities or countries. Furthermore, like most public transport fares, minimum wages are set by governments rather than the market.

The first part of this report provides a general overview of fare structures across the set of all benchmarked cities in the database. The second section provides a series of more detailed tables providing the relative cost of public transport for cities around the world based on the number of minutes of work required to afford a ticket.

As in previous years, we have estimated the time required to afford the lowest single adult fare, but this year we have also looked at separate types of fares, such as single fares and passes, as well as the average cost of all types of fares.



Fare structures and products.

Across the cities in the NineSquared fares database, the majority calculate fares based on distance with 37% of the transit agencies using some form of zonal fare structures with a further 9% utilising a distance-based measure to determine fare levels. A small minority use a combination of section-based or station-based fares.

Flat fares are offered in 44% of the cities in the database and often found in North American systems where 23 of the 27 cities in the database have flat fare systems.

Single tickets remain a universal option for passengers across the transit agencies in the database with many 'single tickets' providing access over a short period of time (ranging 1 to 3 hours). In addition to single use or short time-period products, many systems continue to provide some form of product aimed at frequent users. These generally fall into one of three categories - passes, multi-trip tickets and capped fares.

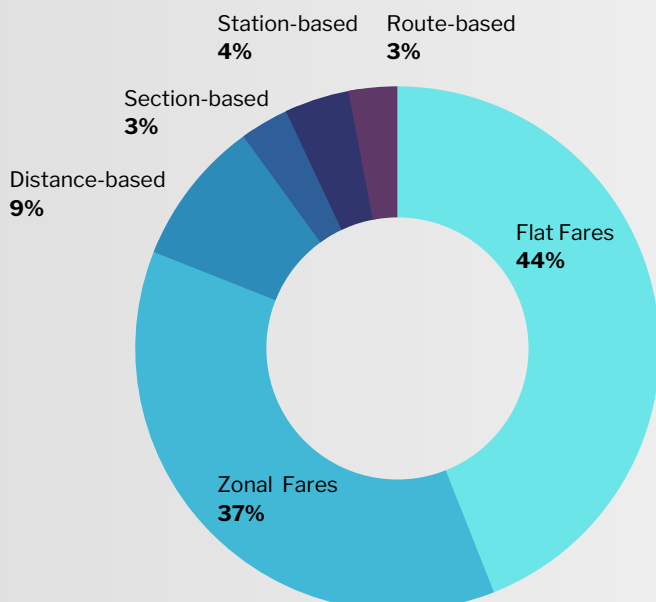
Most of the systems provide a pass product, with 84% of the systems providing a day pass product and 81% providing a monthly pass product. The next most provided product is the 7-day pass, with 46% of cities providing a weekly pass. Infrequently offered passes include 3-day passes, quarterly, half-yearly and yearly passes with the half-yearly passes being offered in only 17% of cases. For example, Chicago offers a 1-day, 3-day, 7-day and monthly passes but does not offer any longer passes.

Other systems seek to incentivise regular users using capped fares. Capped fares are less common than passes and multi-trip tickets. Cities that offer capped fares have increased by 4 from last year to 14 in 2023. Capped fare products are limited to cities in the United Kingdom, Australia, the United States, New Zealand and more recently Canada - with Vancouver implementing the new fare type.

The third type of product offered by transit agencies for regular customers are multi-trip tickets. 19 transit agencies offer some form of multi-trip ticket ranging from 2 trip tickets to 90 trip tickets, with the most common being 10 trip tickets. This method is most popular in European countries with cities such as Milan, Barcelona and London offering the less common fare type.

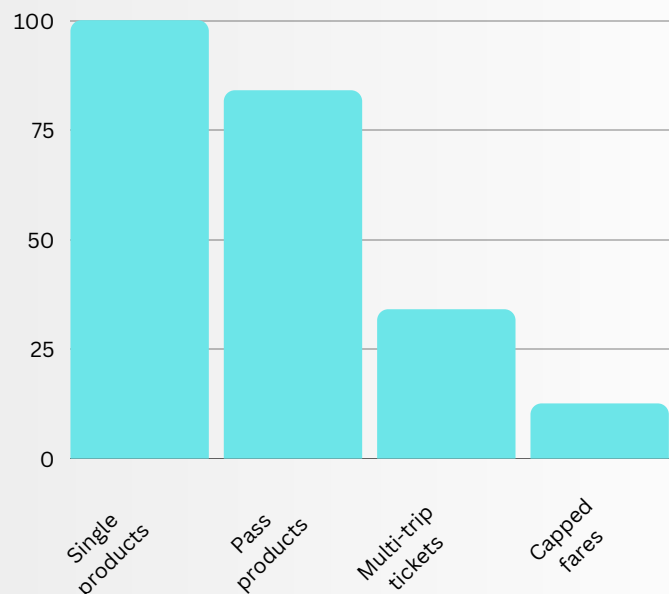
Fare structures

% of agencies offering different fare structures



Fare Products

% of agencies offering product types



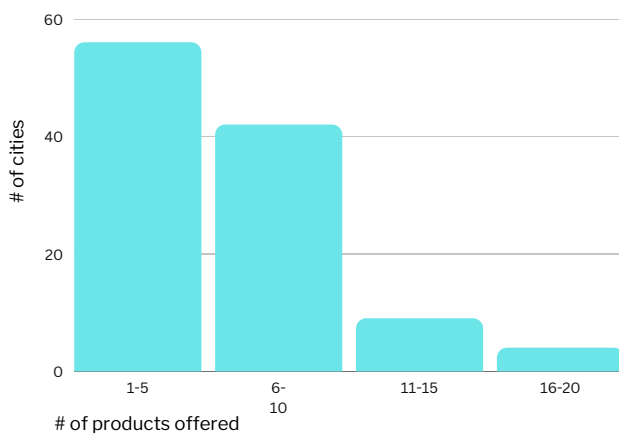
Products.

The 112 transit agencies in the database offer 67 different products between them. As noted earlier, every transit agency offers some form of single or short-term time-based product (for example, a 2-hour ticket). Most transit agencies offer multiple products. Excluding off-peak products, the median number of products offered across the cities in the database is five. Twelve cities in the database offer only a single option while two cities 20 different ticketing products.

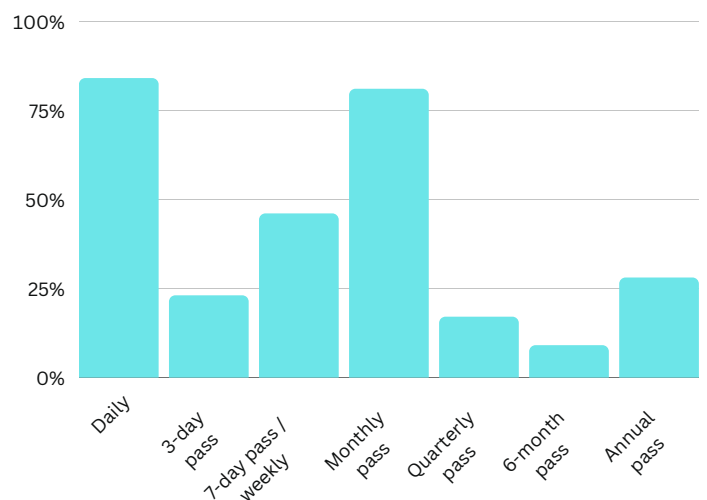
The most common product offered (other than a single ticket) are longer-term pass products. Pass products offered include daily and monthly passes (the most common) as well as weekly, quarterly, six monthly and annual passes. A number of cities offered a multi-day pass products that allowed for travel over 2, 3 4 5, 6, 7 10, 14-day periods as well.

Forty cities offered a multi-trip ticket, the most common being a 10-trip product but with options existing from 2 trips to 200 trip tickets which are available in Johannesburg, South Africa. Zurich offers 6 trip tickets as well as combining daily and multi-trip options by providing a 6 x 24-hour ticket product.

Most cities offer between 1 and 5 products but some offer many more.



Proportion of cities offering pass products by length of pass product



Discounted fares.

Off-peak products.

Off peak products are offered in 24 of the cities in the database while another 10 offer discounted fares on weekends and public holidays. Many of these weekend and public holiday fares products are limited to specific ticket products. For example, weekend and public holiday discounts in San Sebastian in Spain require the purchase of a return ticket. Quebec and Tokyo both offer weekend products which require the purchase of a pass and / or multi-trip ticket. Many (but not all) systems also limit off-peak pricing to the use of smartcards, EMV or some other form of smart ticketing.

Smart ticketing.

One hundred and four of the cities in the database offered some form of smart ticketing to customers. These options included smartcards, mobile apps, QR codes and open loop payment / credit cards to purchase tickets. 22 of these cities provided discounts to their customers when using a smart ticketing option. Discounts for the use of a smart ticketing option ranged from 5% to 51% with an average of 21% for an adult single trip fare.



More isn't necessarily better.

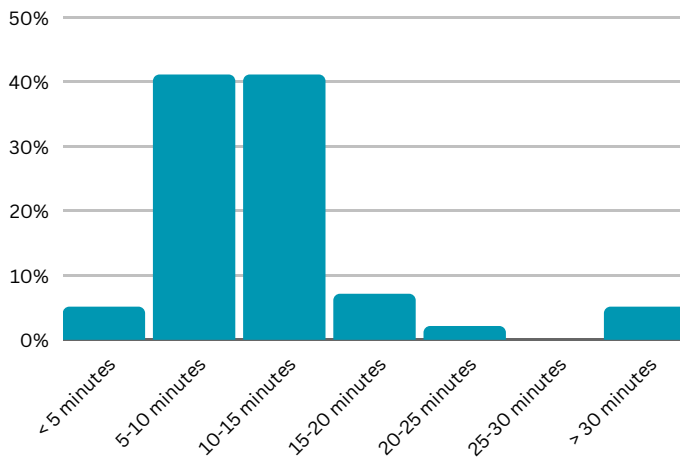
Offering many different types of products can have its limitations. Cities like Denver are considering reducing the number of fare products as feedback from passengers suggest it is too difficult to navigate the fare structure. As part of their proposal to reduce fare prices Denver's Regional Transportation District outlined three key aims – make their fares more equitable, affordable, and simple. Depending on the fare, on average a 3-hour ticket would be 6% cheaper and 21% cheaper for monthly tickets.

Benchmark fare tables.

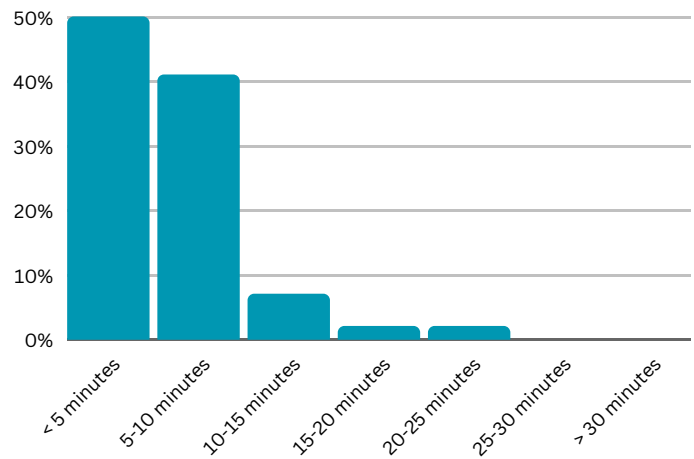
Fare levels for 44 public transport systems are compared using the minimum and average wage rates in each city to calculate the number of minutes of work required to afford a public transport ticket. Cities are ranked by the 'cost' of the lowest priced ticket made available for travel to or within the city centre (excluding short trip tickets) and for a trip of 15km from the city centre. Rankings are also provided for the cost of purchasing multi-use, cap and pass products for weekly and monthly travel.

Graphing the distribution of the fares across the sample of cities and systems provides an indication of the affordability of fares. Forty-six percent of the transit systems in the benchmarking sample set the price of their lowest cost, peak period adult fare at a price that requires less than 10 minutes of work at the minimum wage. A further 41 percent of systems require between 10 and 15 minutes of work at minimum wage. Around 12 percent require more than 15 minutes of work, and, of that cohort, there are some transit systems that set fares at a level where more than 30 minutes of work at the minimum wage rate is required. It should be noted that the benchmarking data only provides information on the affordability of public transport systems relative to other systems in the sample set and only for a limited set of passenger types and fare levels. We have not benchmarked, for example, the affordability of fares for passengers who are not in employment or who may be eligible for concession fares.

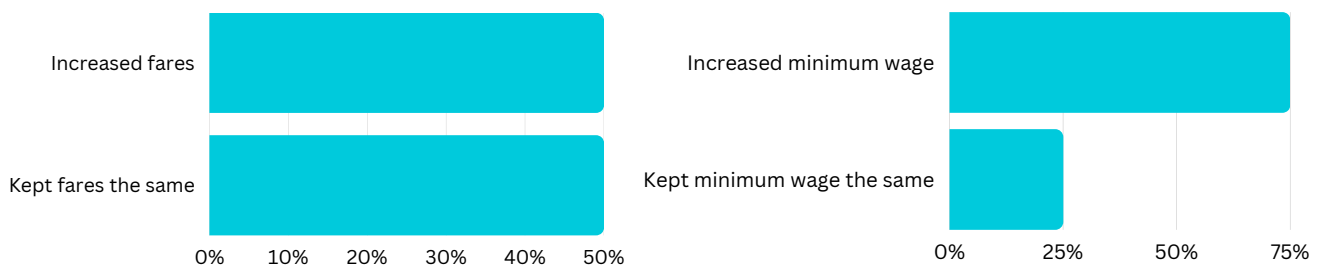
Distribution of fare cost minutes at minimum wage



Distribution of fare cost minutes at average wage



Percentage of cities in the benchmark tables that changed fares and /or the minimum wage rates



Change in number of minutes required to be worked at minimum wage to afford the lowest priced single ticket

City	2019	2020	2021	2022	2023	% change 2022-23	
Adelaide	11.4	11.6	11.3	11.4	11	-3.4	▼
Athens	New	19.8	16.5	15	15	0.0	—
Auckland	6.6	6.3	6.6	3.1	6.3	101.2	▲
Beijing (Bus)	2.5	2.5	2.5	2.4	2.4	0.0	—
Beijing (Metro)	7.5	7.5	7.5	7.1	7.1	0.0	—
Berlin	18.3	18.6	19	15	16	6.7	▲
Bogota	30.6	37.7	26.3	25.5	24.6	-3.2	▼
Brisbane	10.2	10.2	10.0	9.7	9.2	-5.3	▼
Canberra	9.9	9.7	9.5	9	8.3	-8.0	▼
Chicago (Bus)	16.4	10	9.6	11.3	10.4	-7.7	▼
Chicago (Rail)	18.2	11	10.7	12.5	11.5	-7.7	▼
Darwin	9.2	6	5.9	5.6	7.7	38.1	▲
Delhi (Bus)	New	3.5	3.9	5.9	5.7	-3.5	▼
Delhi (Metro)	New	5.6	6.3	11.7	11.3	-3.5	▼
Hobart	8.6	8.5	8.3	7.9	7.2	-8.0	▼
Houston	10.3	10.3	10.3	10.3	10.3	0.0	—
Istanbul	11.2	11.7	11.4	14.5	9	-37.7	▼
Jakarta (BRT)	8.5	9.7	8.2	8.2	7.4	-9.1	▼
London (Bus)	11	10.3	10.4	10.4	10.1	-3.3	▼
London (Underground)	17.5	16.5	16.2	15.8	15.5	-1.5	▼
Los Angeles	8.8	7.4	7	7.5	6.8	-9.7	▼
Melbourne	13.5	13.6	13.3	12.9	12.9	0.0	▲
Miami	16	15.8	15.6	13.5	12.3	-9.1	▼
Montreal	16.8	16	15.6	14.7	14.8	0.1	▲
Moscow	30.6	34.3	32.5	31.3	32	2.3	▲
Munich	18.9	18	18.4	17.5	18.5	5.7	▲
New York	12	11	11	12.5	11.6	-7.0	▼
Osaka	11.5	10.7	10.7	10.1	11.1	10.6	▲
Oslo	12.9	13.3	13.7	13.3	12.6	-5.7	▼
Ottawa	15.2	16.3	16	14.3	14.3	0.0	—
Paris	11.4	11.2	11.1	10.3	10.9	6.2	▲
Perth	8.9	8.7	8.5	8.3	7.9	-5.2	▼
Portland	14	12	10.7	11.1	11.1	0.0	—
Quebec City	13.8	14.2	13.8	13.7	13.4	-2.2	▼
Sao Paulo	45.5	43.8	41.6	37.7	34.6	-8.2	▼
Seoul	7.5	7.3	8.6	8.2	7.8	-4.8	▼
Singapore	New	7	7.7	7.5	6.6	-12.9	▼
Sydney (Bus)	9.9	9.7	9.4	9	8.3	-8.0	▼
Sydney (Rail)	11.1	10.9	10.8	10.6	9.8	-8.0	▼
Taipei	6.4	6.4	8.7	7.1	6.8	-4.5	▼
Tokyo	10.5	9.8	10	9.4	10	6.0	▲
Toronto	13.9	14.7	14.2	12.4	12.8	3.1	▲
Vancouver	10.4	11	10.9	9.6	9.1	-4.7	▼
Wellington	5.8	5.4	5.1	2.5	2.4	-1.2	▼

Minutes of work required to afford lowest priced single ticket

City	Minimum Wage (Minutes)	Rank	Average Wage (Minutes)	Rank
Beijing (Bus)	2.4	1	1.1	1
Wellington	2.4	2	1.4	2
Delhi (Bus)	5.7	3	3.8	14
Auckland	6.3	4	3.7	9
Singapore	6.6	5	1.5	3
Los Angeles	6.8	6	2.5	5
Taipei	6.8	7	3.2	6
Beijing (Metro)	7.1	8	3.3	7
Hobart	7.2	9	4.2	18
Jakarta (BRT)	7.4	10	6.4	28
Darwin	7.7	11	4.1	15
Seoul	7.8	12	3.4	8
Perth	7.9	13	3.7	10
Sydney (Bus)	8.3	14	4.2	19
Canberra	8.3	15	3.8	13
Istanbul	9.0	16	14.4	42
Vancouver	9.1	17	5.2	24
Brisbane	9.2	18	4.8	21
Sydney (Rail)	9.8	19	5	23
Tokyo	10.0	20	4.9	22
London (Bus)	10.1	21	6.5	29
Houston	10.3	22	2.2	4
Chicago (Bus)	10.4	23	3.8	11
Paris	10.9	24	6.3	27
Adelaide	11.0	25	6.2	26
Portland	11.1	26	4.6	20
Osaka	11.1	27	5.2	25
Delhi (Metro)	11.3	28	7.7	36
Chicago (Rail)	11.5	29	4.2	16
New York	11.6	30	3.8	12
Miami	12.3	31	4.2	17
Oslo	12.6	32	7.6	35
Toronto	12.8	33	6.5	30
Melbourne	12.9	34	6.7	31
Quebec City	13.4	35	7.3	33
Ottawa	14.3	36	7.3	34
Montreal	14.8	37	8	37
Athens	15.0	38	9.3	39
London (Underground)	15.5	39	10	40
Berlin	16.0	40	8.8	38
Munich	18.5	41	10.2	41
Bogota	24.6	42	20.7	44
Moscow	32.0	43	7.3	32
Sao Paulo	34.6	44	16.3	43

Minutes of work required to afford a fare for a 15km journey

City	Minimum Wage (Minutes)	Rank	Average Wage (Minutes)	Rank
Beijing (Bus)	3.6	1	1.6	1
Wellington	6.0	2	3.5	5
Los Angeles	6.8	3	2.5	3
Jakarta (BRT)	7.4	4	6.4	22
Darwin	7.7	5	4.1	10
Canberra	8.3	6	3.8	9
Seoul	8.4	7	3.6	6
Istanbul	9.0	8	14.4	39
Hobart	9.9	9	5.8	16
London (Bus)	10.1	10	6.5	23
Houston	10.3	11	2.2	2
Chicago (Bus)	10.4	12	3.8	7
Paris	10.9	13	6.3	20
Adelaide	11.0	14	6.2	18
Portland	11.1	15	4.6	13
Brisbane	11.2	16	5.9	17
Chicago (Rail)	11.5	17	4.2	11
New York	11.6	18	3.8	8
Singapore	11.7	19	2.6	4
Perth	11.9	20	5.5	15
Beijing (Metro)	11.9	21	5.5	14
Sydney (Rail)	12.2	22	6.2	19
Miami	12.3	23	4.2	12
Toronto	12.8	24	6.5	24
Melbourne	12.9	25	6.7	25
Sydney (Bus)	13.0	26	6.7	26
Quebec City	13.4	27	7.3	29
Taipei	13.6	28	6.3	21
Tokyo	14.1	29	6.9	27
Ottawa	14.3	30	7.3	30
Montreal	14.8	31	8	31
Athens	15.0	32	9.3	34
Auckland	15.3	33	8.9	33
Berlin	16.0	34	8.8	32
Vancouver	17.2	35	9.7	36
London (Underground)	19.6	36	12.6	37
Osaka	19.9	37	9.4	35
Oslo	20.8	38	12.6	38
Delhi (Bus)	22.6	39	15.3	40
Bogota	24.6	40	20.7	43
Munich	28.0	41	15.4	41
Moscow	32.0	42	7.3	28
Delhi (Metro)	34.0	43	23	44
Sao Paulo	34.6	44	16.3	42

Minutes of work required at the minimum wage in each city to afford the lowest priced fare over a one week and one month period

City	Single ticket (Minutes)	Rank	Weekly Product	Weekly Cost	Rank	Monthly Product	Monthly Cost	Rank
Beijing (Bus)	2.4	1	Nil	23.7	1	Nil	94.9	4
Wellington	2.4	2	Nil	24.3	2	Monthly	73	3
Delhi (Bus)	5.7	3	Nil	56.6	5	Nil	226.4	6
Auckland	6.3	4	Nil	62.6	6	Monthly*	250.6	7
Singapore	6.6	5	Nil	65.5	7	Nil	262.1	8
Los Angeles	6.8	6	7D pass*	67.7	8	30 Day Pass	0	1
Taipei	6.8	7	5 Day Pass*	68.2	9	5 Day Pass*	272.7	10
Beijing (Metro)	7.1	8	5 Day Pass*	71.1	10	5 Day Pass*	284.6	11
Hobart	7.2	9	Nil	72.3	11	Nil	289.3	12
Jakarta (BRT)	7.4	10	Nil	74.2	12	Nil	296.8	14
Darwin	7.7	11	Weekly	51.7	4	Weekly	206.6	5
Seoul	7.8	12	Nil	78	13	Nil	311.9	15
Perth	7.9	13	Nil	79	14	Nil	316.1	16
Sydney (Bus)	8.3	14	Nil	82.7	16	Nil	330.6	18
Canberra	8.3	15	Nil	83.2	17	Nil	332.7	19
Istanbul	9.0	16	10 Trip*	90.2	19	Monthly Pass*	360.9	24
Vancouver	3.8	17	Nil	38.1	3	Month Pass	3.8	2
Brisbane	9.2	18	CAP-W	82.5	15	CAP-W	330.1	17
Sydney (Rail)	9.8	19	Nil	97.9	22	Nil	391.6	27
Tokyo	10	20	Nil	99.6	23	Month Pass*	398.5	28
London (Bus)	10.1	21	7 Day Pass*	100.8	24	Monthly*	403.1	29
Houston	10.3	22	Nil	103.4	26	Nil	413.8	30
Chicago (Bus)	10.4	23	7 Day Pass	92.3	20	30 Day Pass	346.2	21
Paris	10.9	24	10 trip	88	18	10 trip	352.1	23
Adelaide	11	25	Nil	109.8	28	28D Pass	289.5	13
Portland	11.1	26	Nil	111.1	29	30D Pass	444.4	32
Osaka	11.1	27	Nil	111.4	30	1 Month Pass*	445.7	33
Delhi (Metro)	11.3	28	Nil	113.2	31	Nil	452.8	34
Chicago (Rail)	11.5	29	7 Day Pass	92.3	20	30 Day Pass	346.2	21
New York	11.6	30	7D pass*	116.2	32	30D Pass*	464.8	36
Miami	12.3	31	7 Day Pass*	122.7	34	7 Day Pass*	490.9	38
Oslo	12.6	32	7 Day Pass	105.4	27	30 Day Pass	268.3	9
Toronto	12.8	33	Nil	127.7	35	Month Pass*	511	40
Melbourne	12.9	34	7D Pass	129.1	37	28D+ Pass	433.9	31
Quebec City	13.4	35	5 Day Pass	127.9	36	1 Month Pass	371.8	25
Ottawa	14.3	36	5 Day Pass*	143.2	38	1 Month Pass	485.8	37
Montreal	14.8	37	Weekly Pass	118	33	Monthly Pass	381.6	26
Athens	15	38	5D Pass	102.4	25	30D Pass	337.3	20
London (Underground)	15.5	39	7 Day Pass*	155.5	39	Monthly*	621.9	41
Berlin	16	40	7 Day Ticket*	160	40	Monthly Ticket	455	35
Munich	18.5	41	Weekly Pass	163	41	Monthly	509	39
Bogota	24.6	42	Nil	246.4	42	Nil	985.4	42
Moscow	32	43	Nil	319.9	43	30 Day*	1279.6	43
Sao Paulo	34.6	44	Nil	346.4	44	Monthly*	1385.6	44

Asterisked weekly products are more than 10 times the price of a single ticket.
Asterisked monthly products are more than 40 times the price of a single ticket

Data sources

Data used to populate the database comes from a range of publicly available, online sources including fare schedules and fare tables from websites published by the transit agencies included in the database. Minimum wage and average data are accessed from a number of different government and international agencies including statistical agencies and those with responsibility for the setting and administration of minimum wages. In some instances, non-government sources have been used for minimum and average wages where official data is not available. All data sources for the fares database are listed on the NineSquared website at <https://ninesquared.com.au/fares/fares-database-source-list/>.

NineSquared is a data driven economics, commercial advisory and strategy firm with a strong focus on the transport and infrastructure sectors.

We're focussed on helping our clients make great decisions.

We apply economic frameworks and commercial thinking to help our clients make and influence great, evidence based decisions about their strategy, their investments and their projects. We have helped clients make decisions about a diverse range of topics from risks associated with the acquisition of bus companies to quantifying the impact of a fare change on customers.

We have provided expert rigorous economic and commercial analysis to help decisions understand the impacts of decisions and the risks and opportunities that may flow from them. We are experts in economic evaluation of projects using cost-benefit analysis and associated techniques to provide clients with an understand of the social as well as the financial impacts of projects.

Data led, evidence based decision making.

We bring a strong data-led and evidence based focus to our analysis and recommendations for clients. We use data to develop actionable insights that allow our clients to make decisions and influence decision makers.

Our analysis is underpinned by economic and financial modelling as well as the development of bespoke models to address specific questions. For example, we have developed bespoke models of the arrangements for transferring marine pilots from shore to ship, for the analysis of contract performance risks in Victoria and to calculate the impact of changing bus zone boundaries in regional Queensland towns.



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Find out more

Want more information about our fares and ticketing experience or just want to know about NineSquared? ninesquared.com.au

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Fare benchmarking reports

Since 2015, NineSquared has published an annual report benchmarking fares in Australian capital cities with cities overseas using the amount of time a person on minimum wage would have to work to afford the fare for a return journey. Download a copy of all of the reports at <https://ninesquared.com.au/resources>

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NineSquared is proud to have signed up to Pledge 1%.

Pledge 1% is a global movement to create a new normal in which giving back is integrated into the DNA of companies of all sizes. Pledge 1% encourage and challenge individuals and companies to Pledge 1% of equity, profit, product, and/or employee time for their communities.

As one part of the commitment, we have pledged to donate 1% of our profit, time and our product to non-profits each year. Product donations are in the form of pro-bono consulting. If you are a non-profit and are wondering if you might benefit from having your program evaluated using Cost Benefit Analysis or would like to understand how else economics might be used to assist your organisation, please get in touch with us to discuss how we can help.

