Urban Mobility Readiness Index

2022 REPORT

Foreword

Just as the world was beginning to recover from the disruption of COVID-19, global cities encountered a new wave of challenges from high inflation and slowing growth to an energy crisis and increasing threat of climate change. As cities tackle these issues and look for ways to strengthen their economic and environmental resilience, they should make modern mobility systems a core part of their strategies. Efficient and equitable mobility networks are key engines of urban vitality and sustainability.

In this report, you'll find the 2022 edition of the Urban Mobility Readiness Index, a ranking of 60 global cities on how prepared they are for mobility's next chapter, created by the Oliver Wyman Forum and the University of California, Berkeley. This year's edition introduces a Public Transit sub-index, a ranking of how well cities are managing their public transit systems and how many commuters use them. Public transit is by far the most eco-friendly way to enable large groups of people to move around and can help businesses attract the workers they need and keep city centers buzzing with activity.

This report also includes commentary and analysis on each city and region's strengths and challenges. We hope that you come away from this report informed, inspired, and prepared to innovate mobility for a more sustainable and equitable future.

Guillaume Thibault
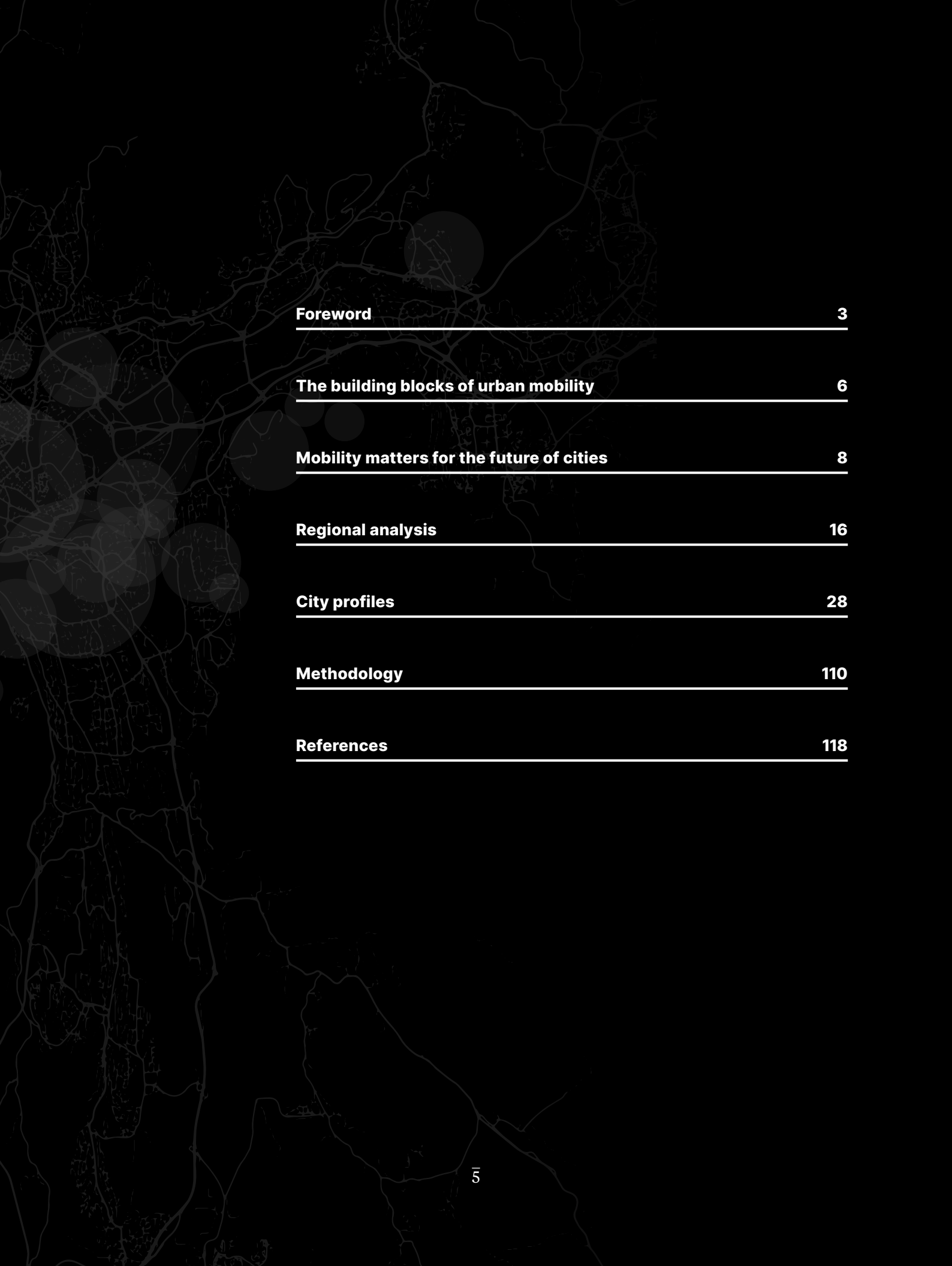Partner and Mobility Co-lead,
Oliver Wyman Forum

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Contents

The building blocks of urban mobility

In defining the new transport paradigm, four key trends were identified in the 2022 Urban Mobility Readiness Index where top cities are able to distinguish themselves

Connectivity

The global pandemic has hindered the connectivity of established transportation hubs in Europe, Asia, and the Middle East. Uncertainties over the long-term impact remain as the market rebounds.

Public transit

Remote work and lockdowns have jeopardized the public transit agencies' model. Solutions to bring commuters back have been experimented by cities with mixed results.

Electrification

Electric mobility is gearing up with different dynamics across regions (with no impact in investments due to COVID). European cities are leading the pack, followed by Asia, with US cities starting to embrace the transition.

Automation

Automated mobility continues its testing in developed cities but the industry is struggling to find a virtuous business model. As road casualties are on the rise in North America, new technologies should be explored.

The 2022 Index includes a selection of 60 global cities across five regions: **Asia Pacific, Europe, Latin America, the Middle East and Africa** and **North America**

The top performing cities are clustered in North America, Europe, and Asia Pacific
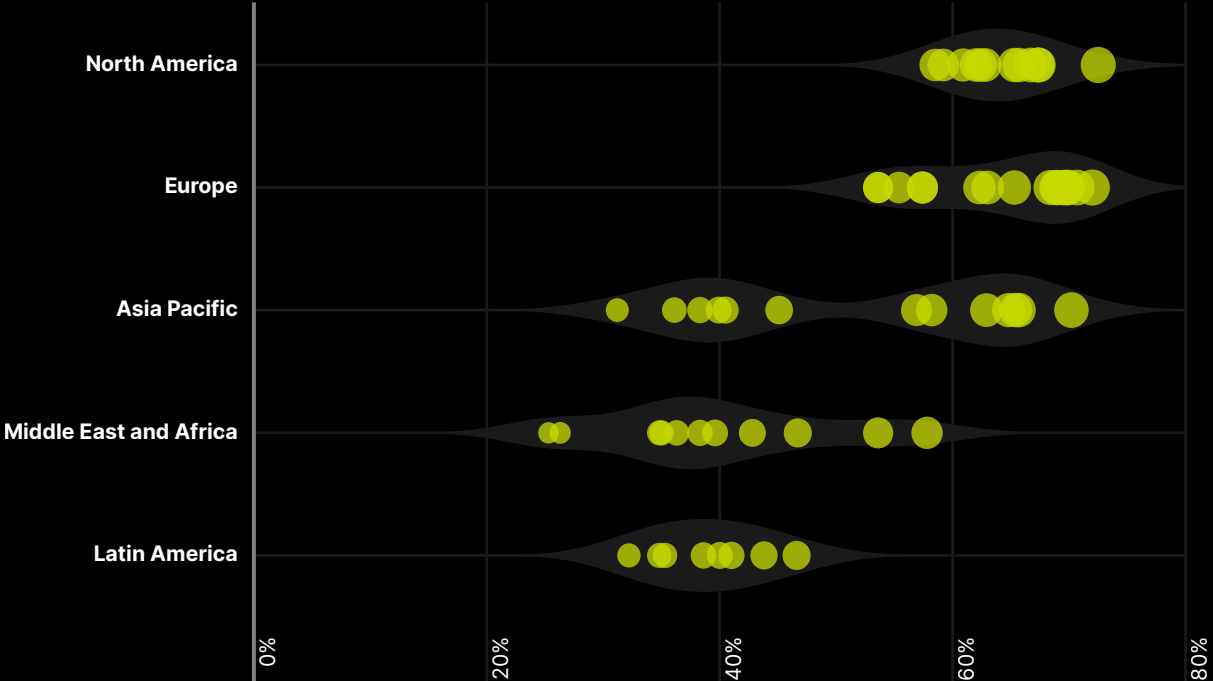
Source: Oliver Wyman Forum and University of California, Berkeley analysis

The Index captures what **business, consumers,** and **policymakers consider indispensable** for urban mobility

Urban Mobility Readiness Index

Mobility readiness is holistically measured by 57 KPIs across social impact, infrastructure, innovation, system efficiency, and market attractiveness.

Sustainable Mobility sub-index

First launched in 2021, the Sustainable Mobility sub-index measures cities' efforts to build greener and more sustainable mobility ecosystems.

Public Transit sub-index

The new sub-index for 2022 measures cities' performance on public transit density, efficiency, and utilization rate.

Succeeding in these five dimensions is critical
for a winning mobility ecosystem.

Social Impact

Social impact metrics are based on volatile variable measures that often prove controversial for municipal governments to regulate, such as commuting time, traffic fluidity, public transit utilization, commuter density, car ownership, vehicle occupancy, population density, road safety, air quality, and international airport volumes.

Infrastructure

Infrastructure metrics focus on static measures that are likely to remain near constant over time or are at least difficult to change, such as the density of public transit stations, the walkability of a city, and the strength of a city's multimodal networks.

Market Attractiveness

Market attractiveness is based on market-driven metrics over which municipal governments can exert influence, such as the competitiveness and penetration of sharing-economy business models in mobility, multimodal app maturity and availability, fleet management, internet connectivity, and the scope of international airport connections.
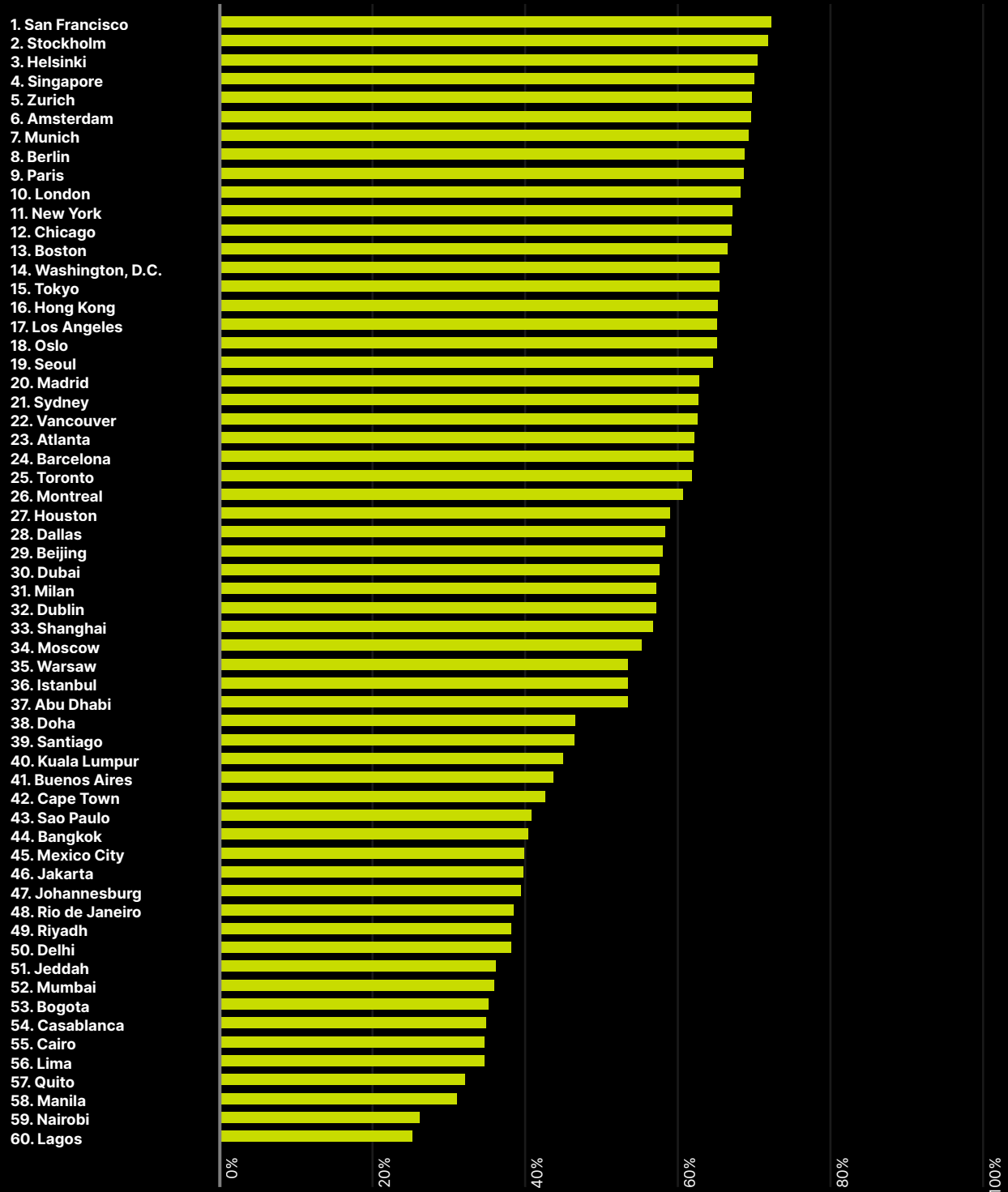
System Efficiency

System efficiency metrics focus on controllable factors that are influenced by market dynamics and the public sector, such as public transport operating hours, public transport affordability, public transport reliability, and traffic management.

Innovation

Innovation is a technology-related metric linked to emerging technologies, such as connected autonomous vehicles, electrification, and advanced connectivity. It considers the city government's investment and commitment to these technologies, and the city's abilities to attract and keep high-tech labor and startups.

The 2022 Urban Mobility Readiness Index

The top cities score highly in a diverse set of metrics, underscoring the importance of a well-rounded playbook

1. San Francisco
2. Stockholm
3. Helsinki
4. Singapore
5. Zurich
6. Amsterdam
7. Munich
8. Berlin
9. Paris
10. London
11. New York
12. Chicago
13. Boston
14. Washington, D.C.
15. Tokyo
16. Hong Kong
17. Los Angeles
18. Oslo
19. Seoul
20. Madrid
21. Sydney
22. Vancouver
23. Atlanta
24. Barcelona
25. Toronto
26. Montreal
27. Houston
28. Dallas
29. Beijing
30. Dubai
31. Milan
32. Dublin
33. Shanghai
34. Moscow
35. Warsaw
36. Istanbul
37. Abu Dhabi
38. Doha
39. Santiago
40. Kuala Lumpur
41. Buenos Aires
42. Cape Town
43. Sao Paulo
44. Bangkok
45. Mexico City
46. Jakarta
47. Johannesburg
48. Rio de Janeiro
49. Riyadh
50. Delhi
51. Jeddah
52. Mumbai
53. Bogota
54. Casablanca
55. Cairo
56. Lima
57. Quito
58. Manila
59. Nairobi
60. Lagos

0% 20% 40% 60% 80% 100%

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Mobility matters for the future of cities

Sustainable and efficient mobility is vital for economies as they face new disruptors

Cities, just recovering from the disruptions of COVID-19, cannot let new economic challenges and worsening extreme weather stall efforts to modernize their mobility systems. They need efficient and equitable mobility networks to ensure resilience and drive economic vitality.

Many cities already have implemented these strategies, including affordable and extensive transit systems and more shared options such as e-bikes and scooters, according to the 2022 edition of the Urban Mobility Readiness Index – a forward-leaning ranking of how well-positioned global cities are to lead mobility's next chapter.

Conducted by the Oliver Wyman Forum in partnership with the University of California, Berkeley, this year's edition introduces a new Public Transit sub-index that measures how well cities are maintaining mass transit networks and how many commuters use it. And while efficient public transit is a key ingredient for many cities, there are other elements that can elevate a city's mobility.

Thanks to its proximity to Silicon Valley firms and a rich ecosystem for mobility-as-a-service and autonomous tech, San Francisco claims this year's overall top ranking. The Golden Gate city also offers robust incentives for consumers to buy electric vehicles and has invested in a strong charging infrastructure. And while San Francisco's public transit usage isn't as high as it could be thanks to a car-centric infrastructure, the city introduced "slow" streets during lockdown measures to accommodate more micromobility modes like cycling and walking.

Public Transit Is Key for Urban Vitality

Hong Kong tops our inaugural Public Transit sub-index. Its affordable transport network has high station density and a strong rail network for the city's large population. It's a popular mode of transit among commuters, despite the fact that it isn't available 24/7, like in some cities. But Hong Kong has room for improvement. It lags in autonomous transit and lacks smartphone apps to seamlessly navigate its multimodal network.

Public transit is the most efficient and sustainable way for cities to transport large groups of people compared to private means of transit, and an efficiently run system can not only encourage workers and tourists to travel through cities but can provide more equal opportunity access to additional mobility modes, jobs, shopping centers, and more.

With many public transit systems struggling to recoup riders and revenue in this new work-from-home era, it's an immense piece of the puzzle for cities to solve to recover efficiently. The potential domino effect of a desolate public transit system is staggering: economic fallout from poor revenue and lost jobs to operate it, increased congestion associated with more private travel, likely more road fatalities, and worse noise, light, and air pollution.

Making public transit convenient and affordable is vital for cities looking to regain ridership. More than half of commuters in Canada, the United States, and the United Kingdom said that affordability was the

most important factor when choosing a mode of transportation, according to an Oliver Wyman Forum consumer sentiment survey completed in October 2022. Accessibility and safety tied as the second most-important factor.

Convenient and affordable is a hallmark of Helsinki's public transit system. It's multimodal, offering travel by bus, tram, metro, train, and ferry. A journey planner app, created by a startup in Helsinki, integrates and connects each of these different transport modes. A single ticket costs just over $3 and can be used on any travel mode.

Tokyo, ranking seventh in our Public Transit sub-index, plans to enhance its network with more buses that connect the city center with the waterfront area via Bus Rapid Transit, tests of demand-responsive transport programs, and more convenient transport hubs.

The 2022 Public Transit sub-index
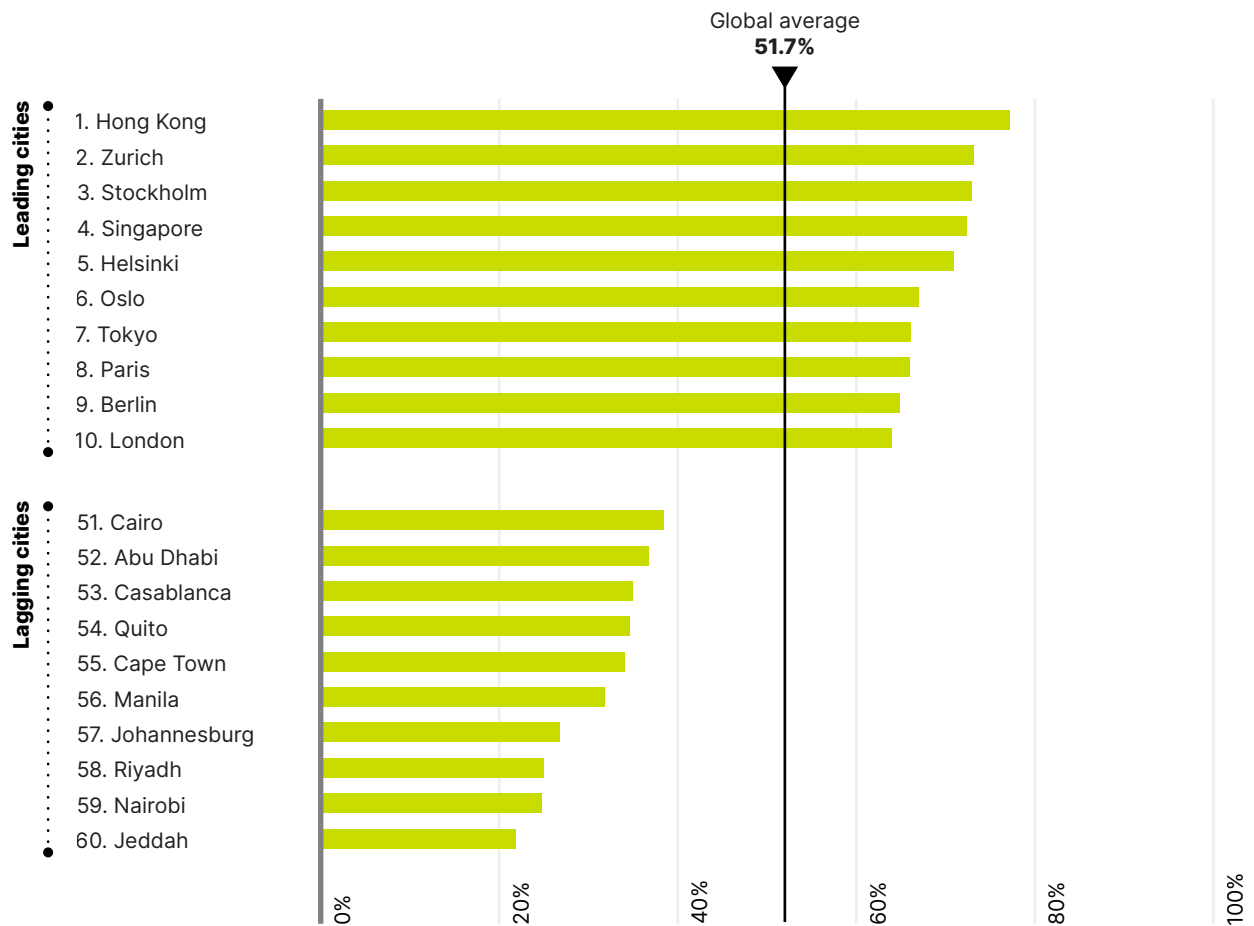
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Europe Continues to Lead in Sustainable Mobility

An increasing number of governments, cities, and mobility firms are committing to net-zero mobility, and that holds significant implications for urban residents and commuters. The second edition of our Sustainable Mobility sub-index measures how well cities are making that pivot to greener mobility.

Europe, particularly cities in Scandinavia, claims eight of the top 10 spots in that sub-index. They offer a comprehensive package of electrification, access to public transit, and strongly encourage more physical forms of mobility like walking and cycling.

Oslo, often called the electric vehicle capital of the world, leads that sub-index for the second year in a row – and is not likely to give up that ranking any time soon, given

The 2022 Sustainable Mobility sub-index

Global average
47.5%

Leading cities

1. Oslo
2. Amsterdam
3. Helsinki
4. Stockholm
5. Hong Kong
6. Singapore
7. Munich
8. London
9. Zurich
10. Berlin

Lagging cities

51. Cairo
52. Lima
53. Kuala Lumpur
54. Jakarta
55. Mumbai
56. Doha
57. Riyadh
58. Nairobi
59. Jeddah
60. Lagos

0% 20% 40% 60% 80% 100%
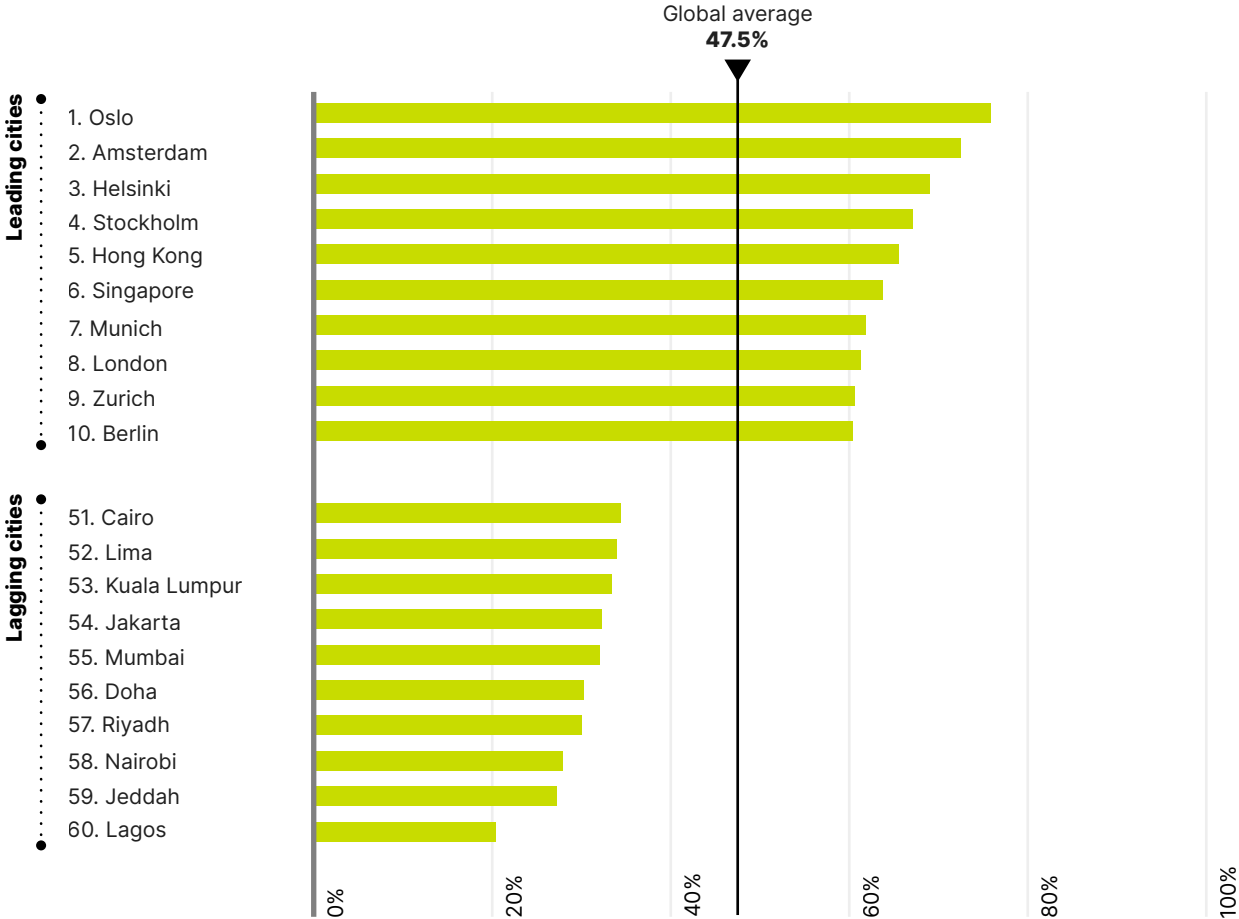
Source: Oliver Wyman Forum and University of California, Berkeley analysis

54%

The percentage of consumers in the US, UK, and Canada who said affordability was the most important factor in choosing a mobility mode. The emphasis on affordability can't be overstated if economies are serious about using mobility to revitalize their economies.

the lead it has secured. The city has a dense network of charging stations and provides a comprehensive package of incentives for electric vehicle owners, like cheaper toll fares and priority access to certain roads. Oslo is home to so many electric vehicle drivers that the city government has even begun dropping some incentives, like free parking, because those incentives are no longer necessary.

Outside of Oslo's sparkling electric vehicle reputation lies two other important factors that contribute to its sustainable mobility success: socially impactful policies, like car-free zones that in turn help reduce light pollution and congestion, and a strong, affordable public transit system.

Preparing for the Next Disruptors

Cities that tackle future mobility challenges, particularly as it relates to public transit, will be better prepared for future disruptions with resilient and sustainable economies. By some estimates, every $1 billion invested in public transport could create 50,000 jobs and every $1 invested may bring $5 in returns.

But inflation, social unrest, climate change, and other disruptions all pose a risk that urban mobility will fall off the priority list for governments. An increased commitment from the private sector is crucial to supplement the cost of new solutions and equitably raise the quality of life among all communities. Some companies in New York, for example, are subsidizing the cost of e-bikes for low-income communities. Efforts to expand electric vehicle charging infrastructure are typically carried out by automakers and other private firms, although public-private partnerships can accelerate their development. Zurich worked with a manufacturing firm, for example, to commission 45 electric bus charging stations that are scheduled to be installed this year.

The cities that struggled this year failed to take advantage of the pandemic's disruption, or even let the pandemic cause further regressions, like public transit service cuts and poorer road safety. Singapore, while still a top-five city, dropped one spot since last year's index because it struggled to strike a balance between COVID safety and connectivity. International flights and connections fell as tight controls were put in place to curb the virus' spread, and riders reported increased wait times for public transit. Activity of top mobility companies in Singapore dipped, perhaps reflecting the private sector's uncertainty in the face of the city-state's level of caution.

And for cities ranking outside of the top echelon of the index, there's still reason for optimism as many look to capitalize the industry's pivot to sustainable, interconnected networks: Dublin and Johannesburg have invested in their micromobility networks; Mumbai has seen a drop in traffic fatalities thanks to a road safety strategy; Dubai plans to make its public transit system emissions-free by 2050 and announced an agreement with Singapore to bolster its public transport and road infrastructure; and Mexico City continues to be a pioneer in offering non-monetary electric vehicle incentives, like tax exemptions from "no-car days."

Every city stands at a crossroads as the world faces an array of disruptions from inflation to climate change. And while cities like San Francisco and Oslo were predisposed to adapt more easily than others, thanks to existing tech capabilities and continued investment in sustainable mobility, the emphasis has now started to shift somewhat to bolstering public transit. That spirit of preparedness needs to be applied to every city as we enter a new chapter.

80%

The share of European cities, particularly in Scandinavia, that claim the top 10 spots in our Sustainable Mobility sub-index. They boast a comprehensive package of electrified mobility, easy access to public transit, and strongly encourage micromobility modes like walking and cycling.

Regional analysis

Each region possesses unique strengths. Some offer attractive markets for the private sector, dense electric charging infrastructure, strong public transit networks, or high rates of micromobility. Understanding urban mobility from a more macro view will provide a crucial backdrop for city-by-city insights.

Asia Pacific

	2022	vs. 2021	Score
Singapore	4	(−1)	70.2%
Tokyo	15	(+1)	65.7%
Hong Kong	16	(−8)	65.4%
Seoul	19	(+1)	64.8%
Sydney	21	(+1)	62.9%
Beijing	29	(−2)	58.2%
Shanghai	33	(−4)	56.9%
Global average			**53.7%**
Asia Pacific average			**51.9%**
Kuala Lumpur	40	(−2)	45.1%
Bangkok	44	(+2)	40.5%
Jakarta	46	(+1)	39.9%
Delhi	50	(−2)	38.3%
Mumbai	52	(−1)	36.1%
Manila	58	(−2)	31.2%

Asia Pacific encompasses leading, developing, and lagging cities with regards to urban mobility readiness. The leading mobility cities offer affordable, efficient, and high-density mass transit systems alongside high-quality roads with national road and rail connections. Hong Kong is home to what is widely regarded as one of the most efficient public transit systems in the world, topping the ranks for the Public Transit sub-index introduced this year. Public transit utilization is a strength for these cities, whilst private vehicles play a secondary role in urban transport.

However, air and noise pollution are often high in Asian cities and should be a key focus in the future with regards to sustainable mobility. For developed cities, such as Beijing, investments are being made to support electrification and improve electric vehicle market share. However, these cities are about to lose the race to Europe as European cities head towards carbon neutrality in 2050. For developing cities, including Jakarta and Manila, sustainable mobility is less of a priority and motorized vehicles are likely to remain the most common transit option.

Many cities within the Asia Pacific region have fallen in rank since 2020 due to challenges in finding a balanced approach to the COVID pandemic. Singapore, previously topping the Urban Mobility Readiness Index in 2020, now ranks at fourth in 2022 due to the impact of strict COVID-related lockdowns during 2020-2021 which hindered connectivity, reduced international airport volumes, and limited public transit offerings. This trend may be reversed in coming years as Singapore rebounds from the impacts of COVID.

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit

Distribution of Asian Pacific cities' scores in percentage

Singapore **70.2%**

Urban Mobility Readiness

Hong Kong **65.5%**

Sustainable Mobility

Hong Kong **77.2%**

Public Transit

0% 20% 40% 60% 80%
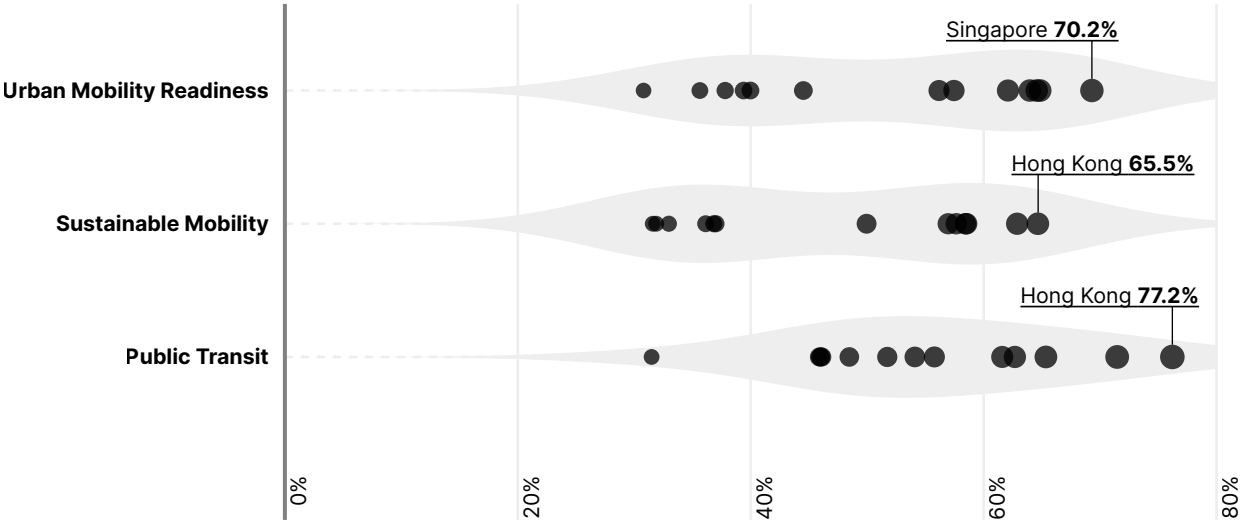
Dimensions of the Urban Mobility Readiness Index Score

Average scores of Asian Pacific cities in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global average

■ Asia Pacific   ■ Global

100%

80%

60%

40%

20%

0%

Social Impact | Infrastructure | Market Attractiveness | System Efficiency | Innovation
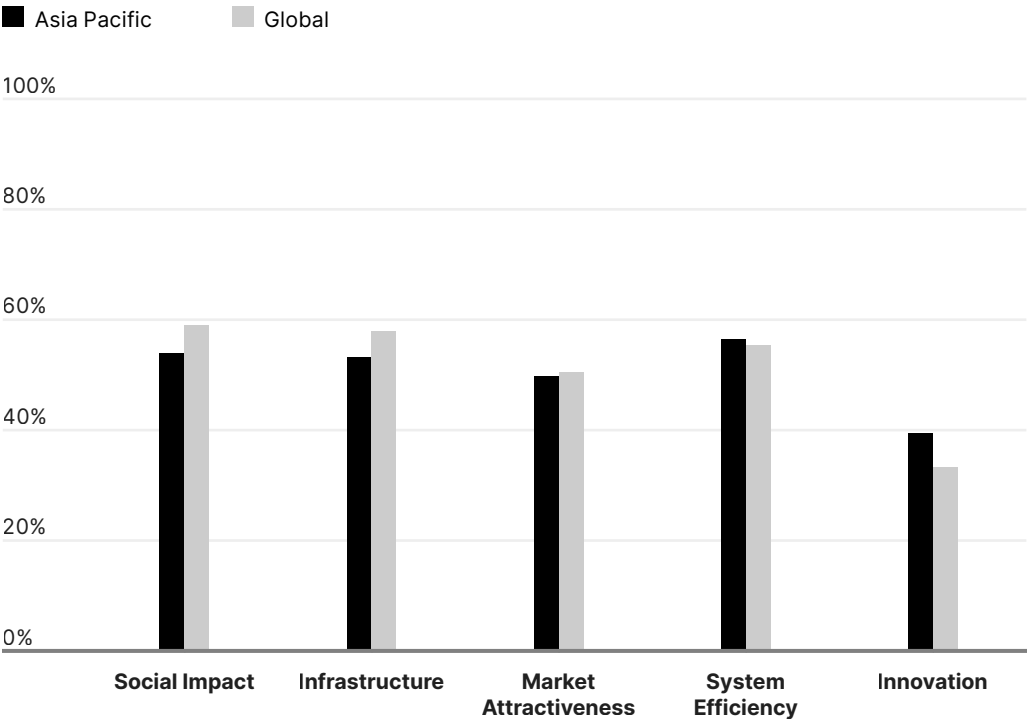
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Europe

	2022	vs. 2021	Score
Stockholm	2	(-1)	72.0%
Helsinki	3	(+1)	70.7%
Zurich	5	(+5)	69.9%
Amsterdam	6	(-1)	69.8%
Munich	7	(+2)	69.5%
Berlin	8	(-2)	69.0%
Paris	9	(+3)	68.9%
London	10	(-3)	68.4%
Oslo	18	-	65.3%
Europe average			**64.1%**
Madrid	20	(+4)	63.0%
Barcelona	24	(+1)	62.3%
Milan	31	(+2)	57.4%
Dublin	32	(-2)	57.4%
Global average			**53.7%**
Moscow	34	-	55.4%
Warsaw	35	-	53.6%
Istanbul	36	(+1)	53.6%

European cities dominate the top echelon of the 2022 Urban Mobility Readiness Index. Their mobility networks are highly sustainable thanks to high public transit use and electric vehicle penetration, particularly in Scandinavian cities. Stockholm, Helsinki, and particularly Oslo (ranking top for Sustainable Mobility) have made significant investments in charging infrastructure and implemented ambitious consumer incentives to use electric vehicles, boosting the region's electric vehicle market share. In fact, the incentives in Oslo have been so successful that public authorities are considering winding them down.

European cities also perform well with regards to the adoption of active mobility, such as walking and cycling. Amsterdam has a world-renowned cycling culture and infrastructure, with more than a quarter of all trips made by bike – by far the highest share in the Urban Mobility Readiness Index.

All European cities in the Urban Mobility Readiness Index score higher on Public Transit than the global average. Local authorities in Europe are typically turning away from a car-centric mobility approach, giving an opportunity for public transit authorities to boost their utilization rate. The top cities in Europe boast efficient, affordable multimodal public transit systems with easy walking distance to stations and strong connections to the rest of the country. The availability of specific apps that can support journey planning and payment also add to the success of these cities with regards to public transit.
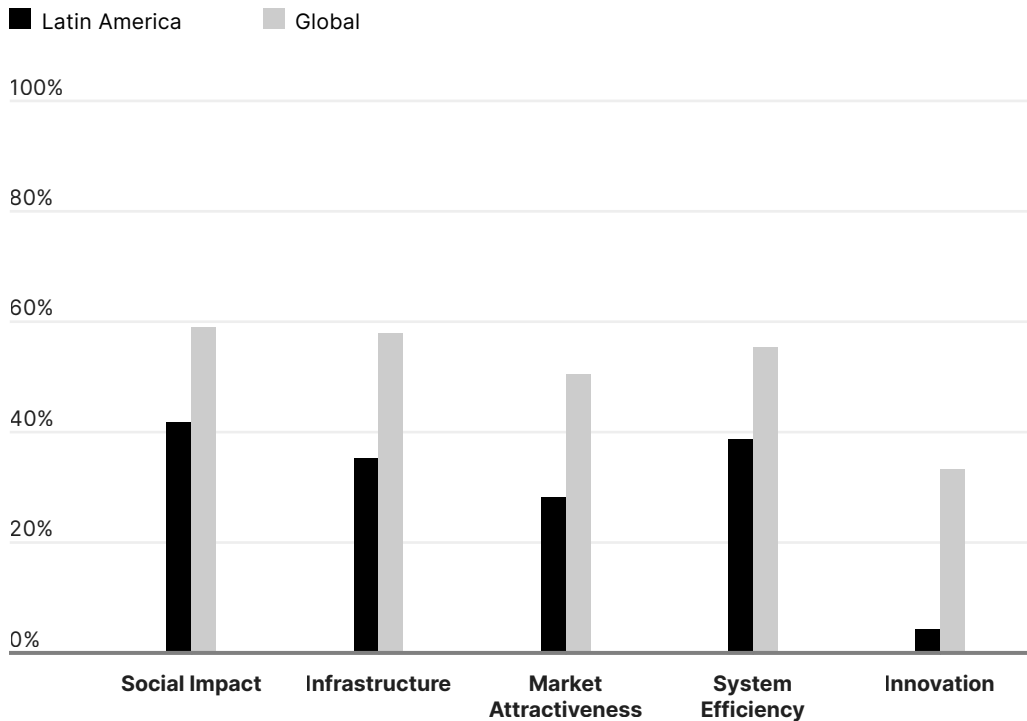
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit

Distribution of European cities' scores in percentage
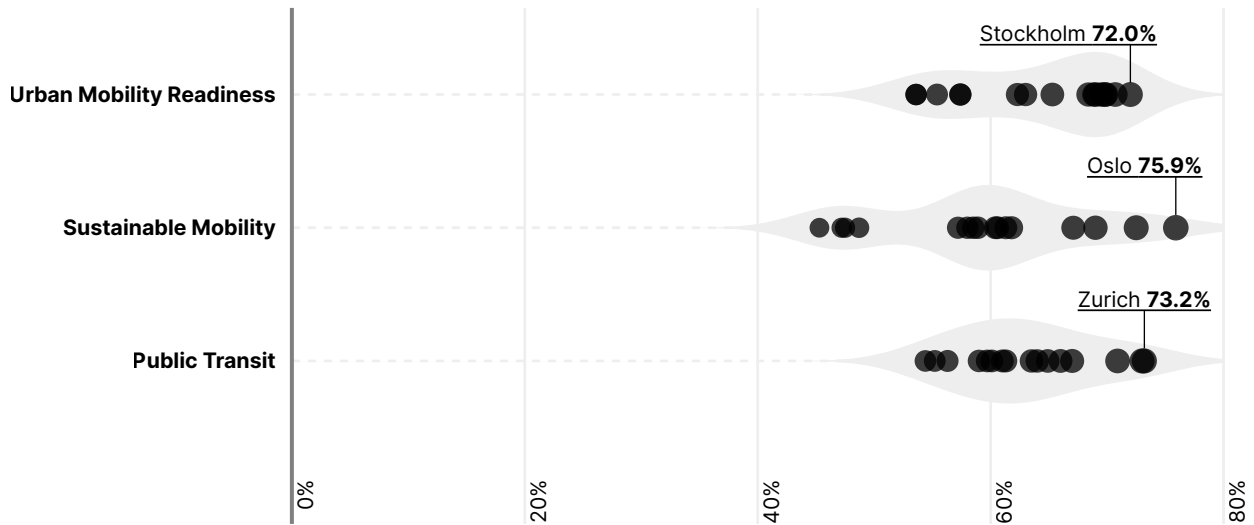
Dimensions of the Urban Mobility Readiness Index Score

Average scores of European cities in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global average
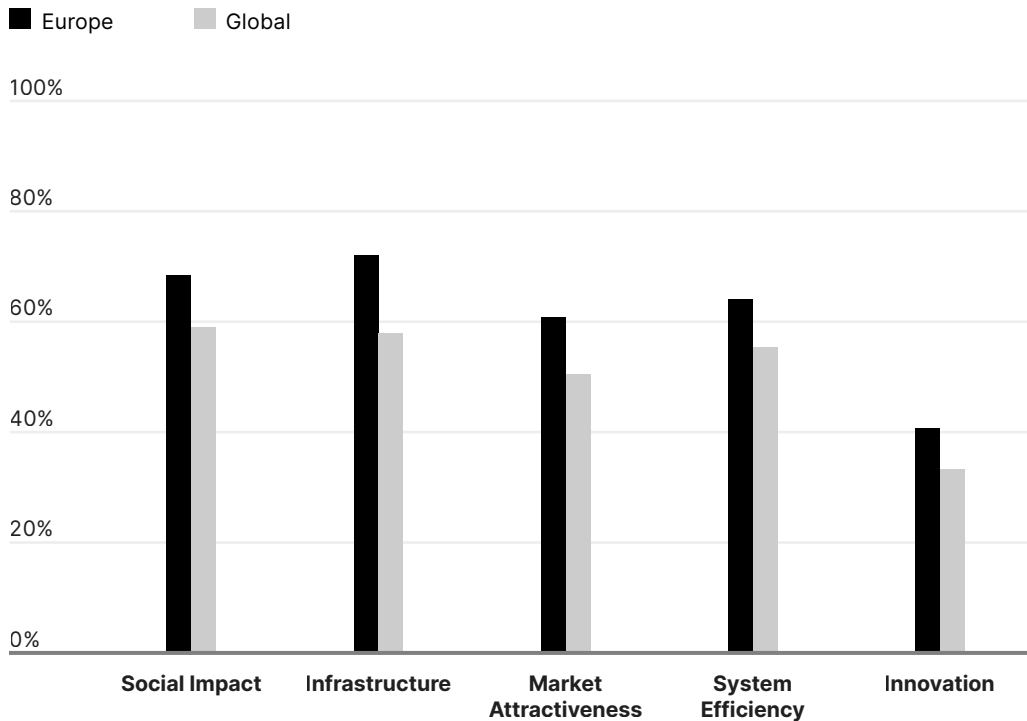
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Latin America

	2022	vs. 2021	Score
Global average			**53.7%**
Santiago	39	(+1)	46.6%
Buenos Aires	41	–	43.8%
Sao Paulo	43	–	41.0%
Mexico City	45	(–1)	40.0%
Latin America average			**39.0%**
Rio de Janeiro	48	(–3)	38.6%
Bogota	53	(–3)	35.3%
Lima	56	(–1)	34.8%
Quito	57	–	32.2%

Latin American cities are developing or lagging in their mobility maturity, as Urban Mobility Readiness Scores fall below the global average of 54%. Cities in the region offer relatively affordable, multimodal public transit networks that maintain relatively high ridership, but transit commute speed and accessibility would need to be improved for cities to boost Public Transit scores.

In lower-income cities, providing equitable and affordable access to public transit may be challenging. However, Rio de Janeiro's Sustainable Urban Mobility Plan has been credited with extending the reach of public transit to more low-income residents.

With regards to sustainable mobility, Latin America cities, such as Bogota, boast several car-free zones and low level of car ownership, whilst levels of walkability are relatively high. And while charging infrastructure is underdeveloped and electric vehicle market share is currently low, Latin America cities are increasing investments in charging infrastructure and consumer incentives. In Mexico City, government incentives such as exemption of local taxes and vehicle verification proceedings (where electric and hybrid cars can circulate daily without limitation) have had a positive impact with an observed uptake in electric vehicle adoption.

Fewer investments and academic institutes have limited innovation in the region, particularly in connected-vehicle technologies and availability of fully automated services.

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit

Distribution of Latin American cities' scores in percentage

Santiago **46.6%**

Urban Mobility Readiness

Bogota **43.2%**

Sustainable Mobility

Buenos Aires **53.5%**

Public Transit

0% 20% 40% 60% 80%
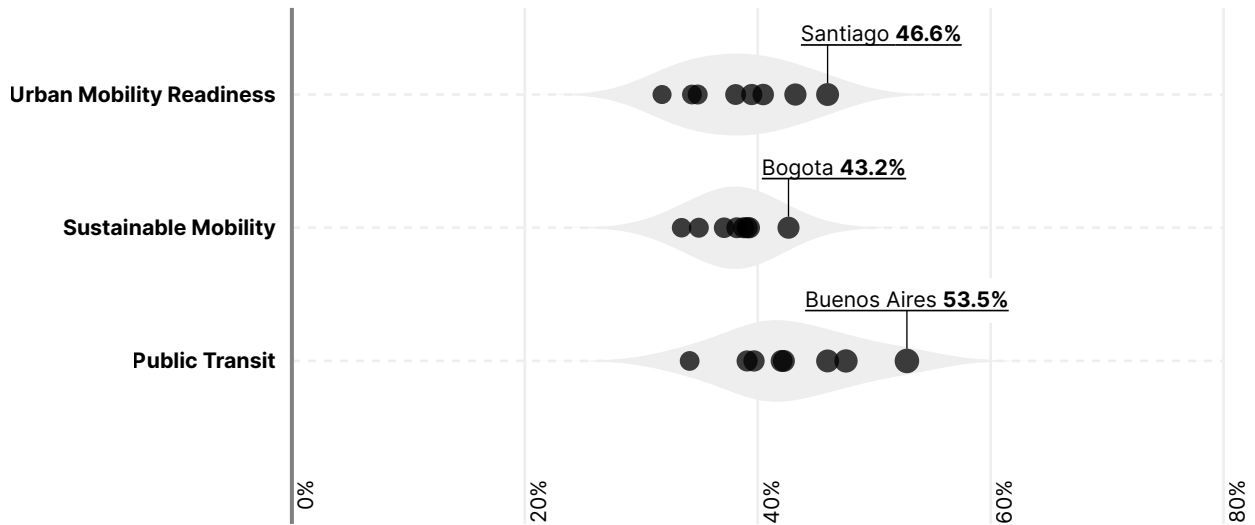
Dimensions of the Urban Mobility Readiness Index Score

Average scores of Latin American cities in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global average

■ Latin America   ■ Global

100%

80%

60%

40%

20%

0%

Social Impact   Infrastructure   Market Attractiveness   System Efficiency   Innovation

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Middle East and Africa

	2022	vs. 2021	Score
Dubai	30	(+2)	57.8%
Global average			**53.7%**
Abu Dhabi	37	(-1)	53.6%
Doha	38	(+1)	46.7%
Middle East average			**46.5%**
Cape Town	42	-	42.8%
Johannesburg	47	(+2)	39.6%
Riyadh	49	(+5)	38.3%
Jeddah	51	(+7)	36.3%
Casablanca	54	(-2)	35.0%
Cairo	55	(-2)	34.8%
Africa average			**34.0%**
Nairobi	59	-	26.3%
Lagos	60	-	25.3%

Most cities in the Middle East are developing, whilst African cities are currently lagging in their mobility maturity. However, some cities, including Dubai, Doha, Riyadh, and Jeddah, are rising in our Urban Mobility Readiness Index ranks, driven by substantial investments in mass transit.

Local authorities in Dubai seek to develop a public transit package on par with leading global cities, while also investing in alternative transit such as their fully automated metro and urban air mobility trials. Due to start operations in 2023, a new mass transit system under construction in Riyadh has the potential to increase public transit use, supporting the region's rapid growth.

Despite recent investments, the preference for cars contributes to low utilization of non-motorized transit in the Middle East, although a high penetration of shared mobility services helps lower congestion levels.

In African cities, including Nairobi and Casablanca, low or moderate rates of car ownership and less developed public transit systems result in relatively high levels of walking. Across both Africa and the Middle East, investment has been a barrier to development of electric vehicle solutions, although there may be opportunities for developing cities with currently low car ownership to rapidly develop strong electric vehicle markets and leapfrog the current leaders in electrification.
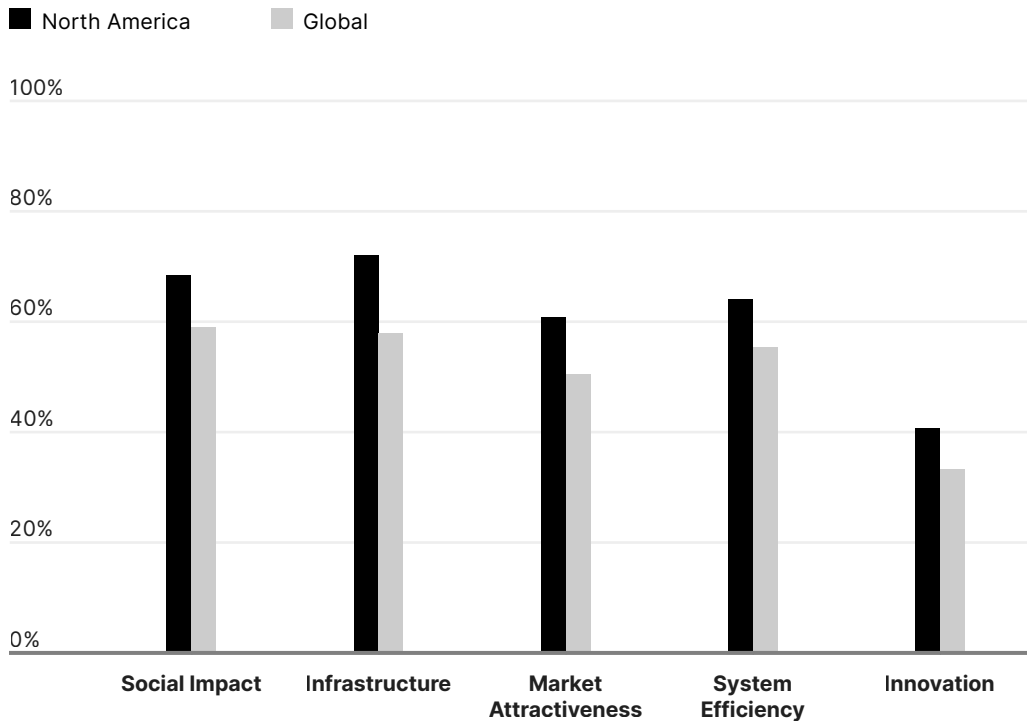
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit

Distribution of Middle Eastern and African cities' scores in percentage
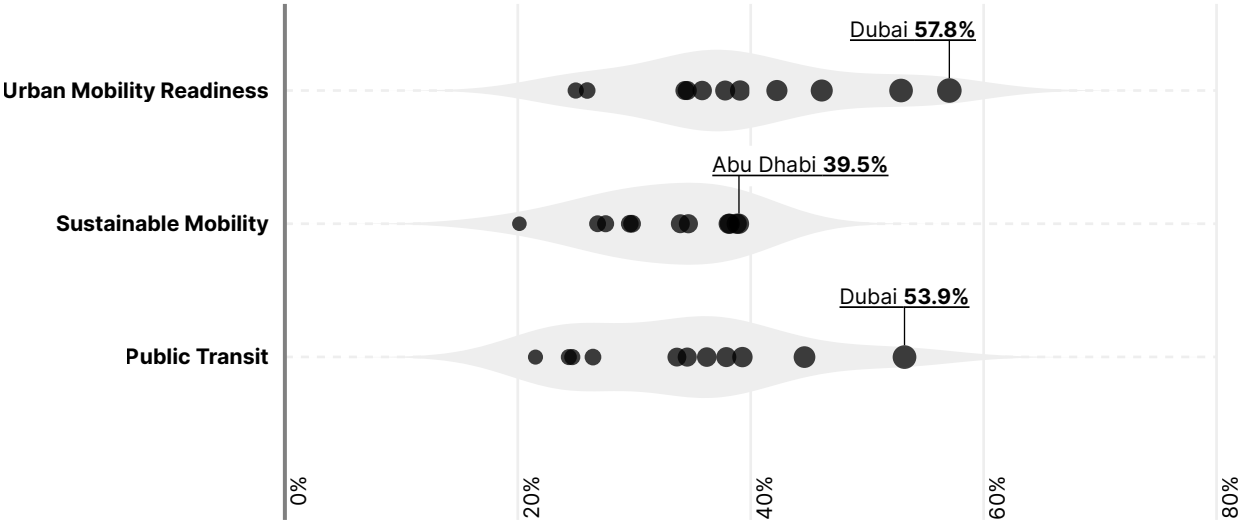
Dimensions of the Urban Mobility Readiness Index Score

Average scores of Middle Eastern and African cities in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global average
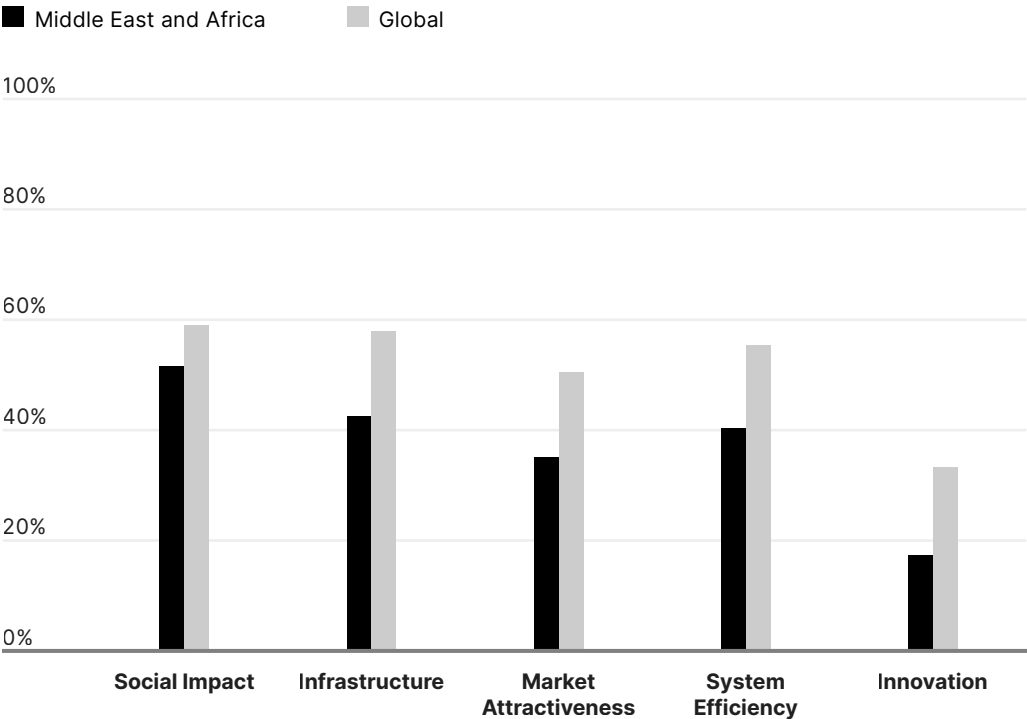
Source: Oliver Wyman Forum and University of California, Berkeley analysis

North America

	2022	vs. 2021	Score
San Francisco	1	(+1)	72.5%
New York	11	-	67.4%
Chicago	12	(+2)	67.3%
Boston	13	-	66.7%
Washington, D.C.	14	(+1)	65.7%
Los Angeles	17	-	65.3%
North America average			**64.2%**
Vancouver	22	(+1)	62.8%
Atlanta	23	(-4)	62.4%
Toronto	25	(-4)	62.0%
Montreal	26	-	60.9%
Houston	27	(+1)	59.2%
Dallas	28	(+3)	58.5%
Global average			**53.7%**

The success of North American cities is driven by infrastructure and system efficiency. San Francisco tops the 2022 Urban Mobility Readiness Index by excelling in market attractiveness thanks to a rich network of academics and entrepreneurs embracing emerging technology. The city is close to Silicon Valley, Stanford University, University of California at Berkeley, and Lawrence Berkeley National Laboratory, and it has embraced the new technology emerging from these institutions – particularly autonomous driving systems.

North American cities typically offer strong market attractiveness, usually through a strong university presence and high international airport volumes. However, these cities are sprawling, making it difficult for public transit authorities to provide enough stations. As a result, commuters have long walks to reach transit stations and utilization rate is low. Instead, many residents rely heavily on private car ownership as their primary mode of transport. There have been substantial investments in electric vehicle charging infrastructure, particularly in Californian cities, in an effort to make car usage more sustainable.

With lower car ownership, stronger public transit systems, and ample car-free zones, Canadian cities lead on Sustainable Mobility over those in the United States. Cities in the Unted States often have fewer car-free zones and underdeveloped micromobility infrastructure, resulting in low rates of active mobility such as walking and cycling.

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit

Distribution of North American cities' scores in percentage
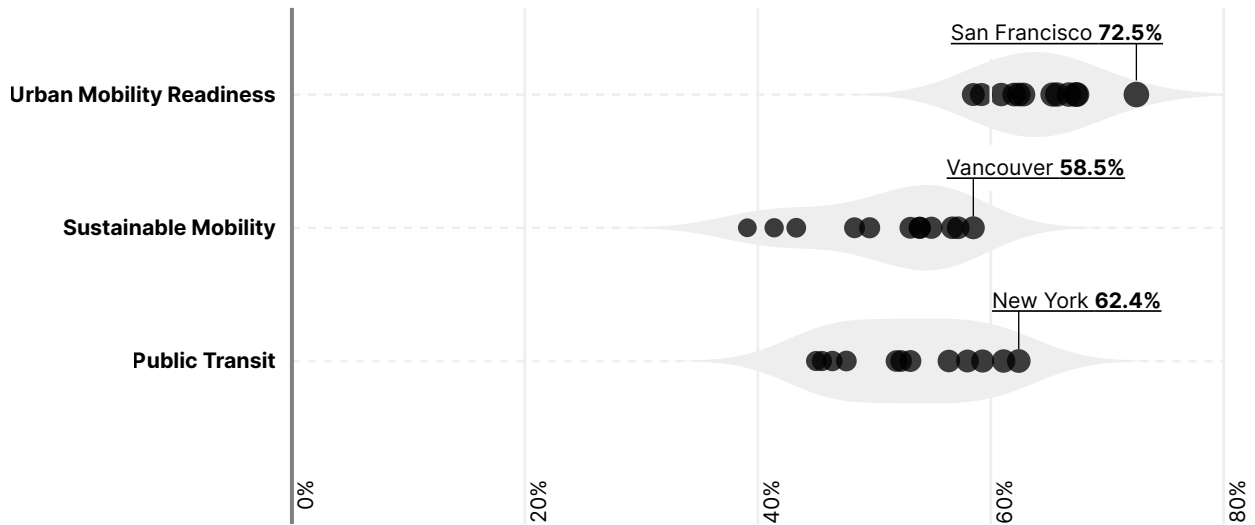
Dimensions of the Urban Mobility Readiness Index Score

Average scores of North American cities in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global average

Source: Oliver Wyman Forum and University of California, Berkeley analysis

City Profiles

No two cities are alike, and none are without their challenges. Even San Francisco, leader of this year's Urban Mobility Readiness Index, lags in some key metrics. The challenges of each city should be as instructional as their strengths; revealing the gaps that should inspire business and government leaders to innovate new solutions together.

San Francisco

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
1/60	22/60	16/60

GDP per capita (US$)[1]	142,661.64
Population[2]	4,822,176
Surface area (km²)[3]	2,872
Population density (people per km²)[4]	2,204

San Francisco takes the top ranking in this year's Urban Mobility Readiness Index thanks to a rich ecosystem of academia and entrepreneurs who have made the city a global hub for Mobility as a Service and connected autonomous vehicles technologies. The city is close to Silicon Valley, Stanford University, University of California at Berkeley, and Lawrence Berkeley National Laboratory, and it has embraced the new technology emerging from these institutions, in particular autonomous driving systems. In 2022, San Francisco became one of the world's first cities to allow commercial operations of self-driving cars.

Robust incentives and investment in charging stations are boosting Electric vehicle adoption. California motorists can receive up to $9,500 in rebates[5] when they buy an Electric vehicle, as well as a up to $7,500 federal tax credit.[6] Electric vehicles are also allowed to use high-occupancy vehicle lanes.

However, San Francisco does not feature in the top 15 in Sustainable Mobility or Public Transit rankings. The city's limited number of public transit stations means long walks to reach them and relatively low usage. Despite attempts to mitigate the threat of natural disasters, such as forest fires and earthquakes, San Francisco's legacy infrastructure means that its mobility systems are still inadequately prepared to meet these challenges.
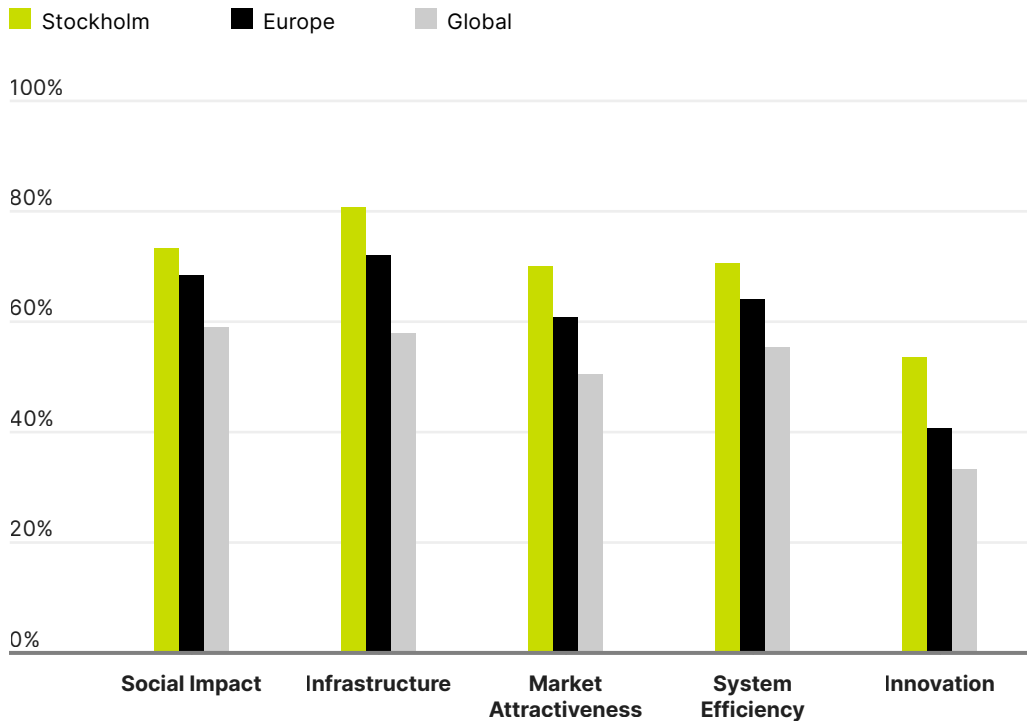
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
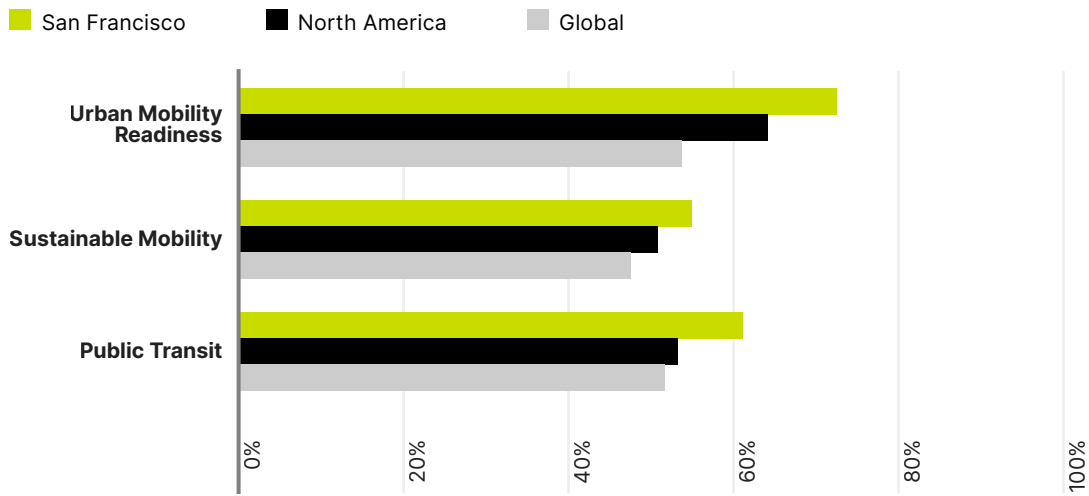
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages
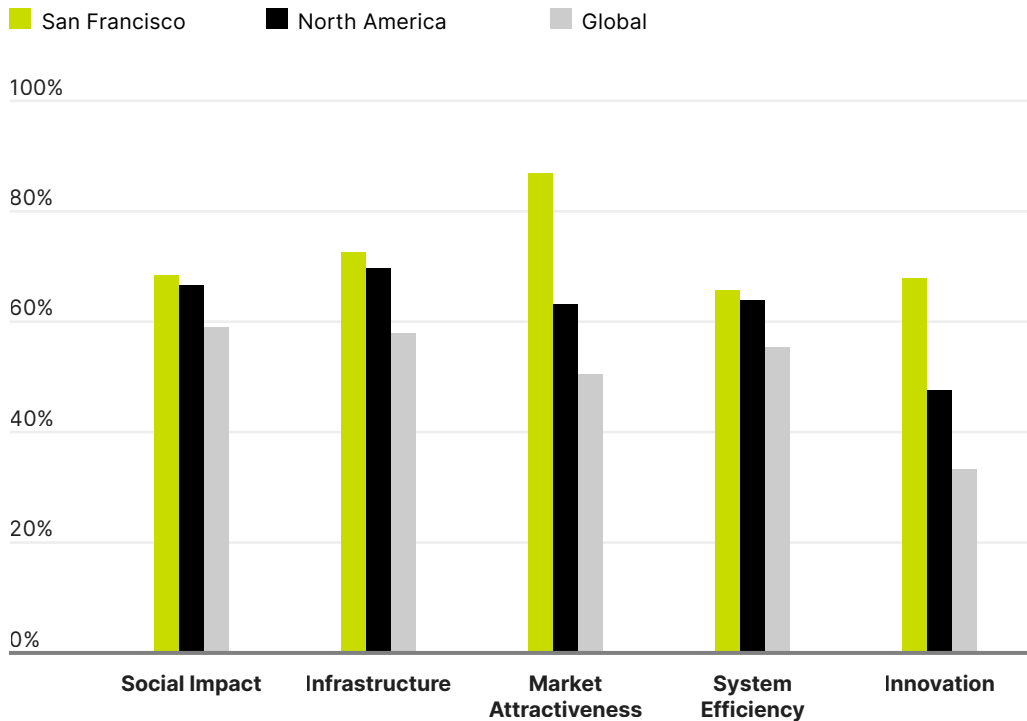
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Stockholm

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
2/60	4/60	3/60

GDP per capita (US$)[1]	81,048.53
Population[2]	1,888,786
Surface area (km²)[3]	847
Population density (people per km²)[4]	2,504
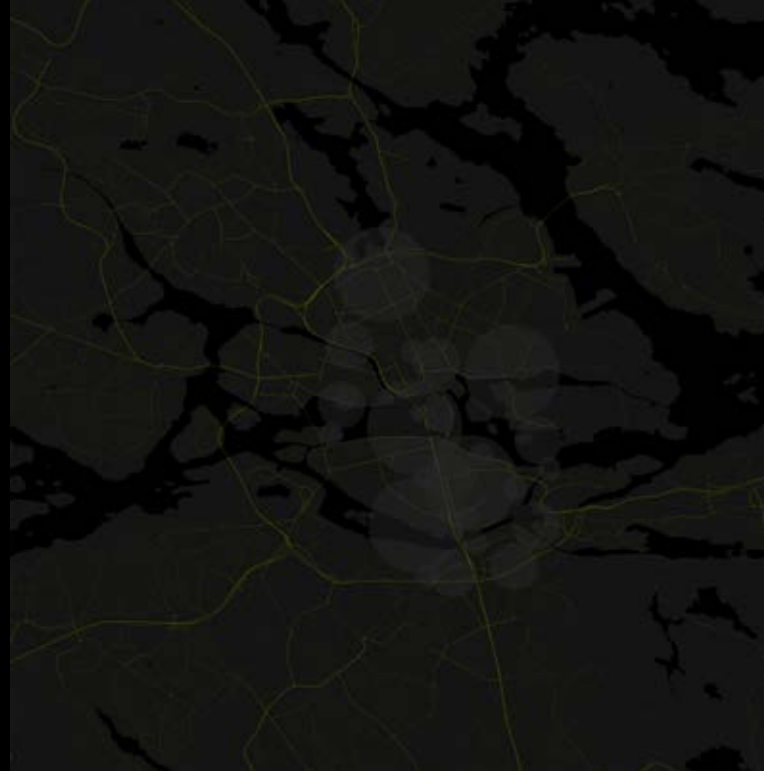
In contrast to first-placed San Francisco – which excels in innovation and market attractiveness but lags in other areas – Stockholm is a high performer in all dimensions of the Urban Mobility Readiness Index. Significant investments in charging infrastructure, combined with incentives to switch to electric vehicles, have boosted the market share of electric vehicles and turned Stockholm into a success story for electrification. It has the second highest share of electric vehicles in Europe, after Oslo.

Stockholm also boasts a dense, multimodal mass transit system with good connections to Sweden's excellent national rail network. However, utilization remains relatively low compared to private vehicles. And active mobility choices, such as walking and cycling, do not have high shares in the city's modal mix.

The commitment to clean mobility allows Stockholm residents to enjoy high levels of air quality and low noise and light pollution, particularly as electric vehicles produce less noise than gasoline-powered vehicles. The city's climate action plan[7] outlines measures to go net-zero by 2040, with plans to expand public transit, bicycle lanes, and establishing mobility hubs to encourage free-flowing sharing services.

And although the city claims the #2 ranking, it has room to grow. Stockholm's Arlanda Airport is not considered a major European hub. It has relatively low passenger volumes and international connections.
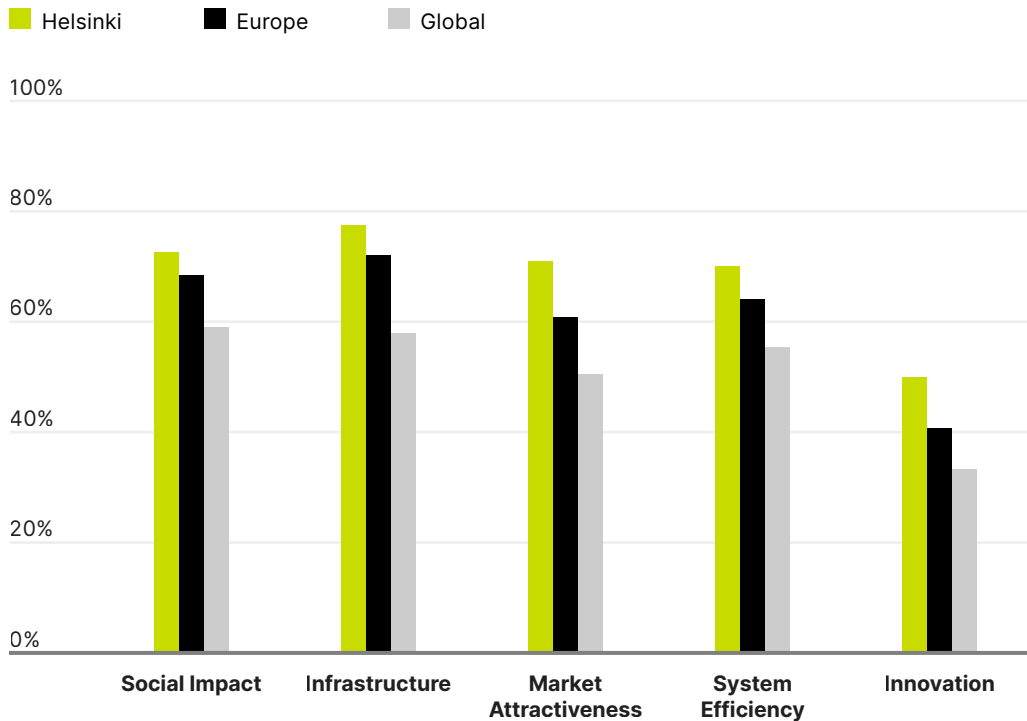
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

Stockholm ■ Europe ■ Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Stockholm ■ Europe ■ Global
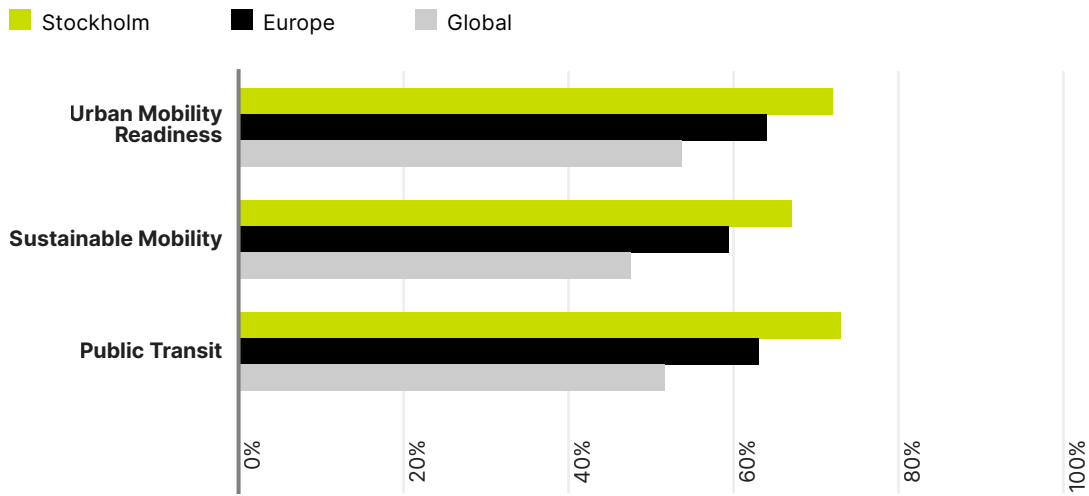
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Helsinki

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
3/60	3/60	5/60

GDP per capita (US$)[1]	68,543.71
Population[2]	1,269,879
Surface area (km²)[3]	515
Population density (people per km²)[4]	2,373

Helsinki is a leader in providing a clean urban living environment, and it ranked third in both the Urban Mobility Readiness Index and the Sustainable Mobility sub-index. Extensive car-free zones and a high market share of electric vehicles contribute to superior air quality, and both noise and light pollution are low. Car taxation in Finland is based mainly on vehicle carbon dioxide emissions intensity, and the country has Europe's second highest excise duty for petrol (gasoline) and fourth highest for diesel (though this is partly because Finland did not reduce fuel excise duties in early 2022 in response to rising fuel prices).

The multimodal public transportation network comprises bus, tram, metro, commuter train, and ferry services. It is convenient thanks to linkages to the robust national rail system and a journey planner app, created by a Helsinki startup, that integrates all transport modes. The system is also affordable: A single ticket costs $3.16[8]

and is valid on any form of transport in the entire region. Helsinki is also very walkable, and many journeys are carried out on foot.

However, the city is home to few major mobility companies, and this has had an impact on the amount of private investment available for mobility research. Helsinki residents have few shared-mobility options.

Another weak point is air travel. Helsinki Airport is not a European hub and sees relatively low passenger volumes and few international connections. Its development as a hub for travel between Europe and East Asia has been hampered by the war in Ukraine.

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
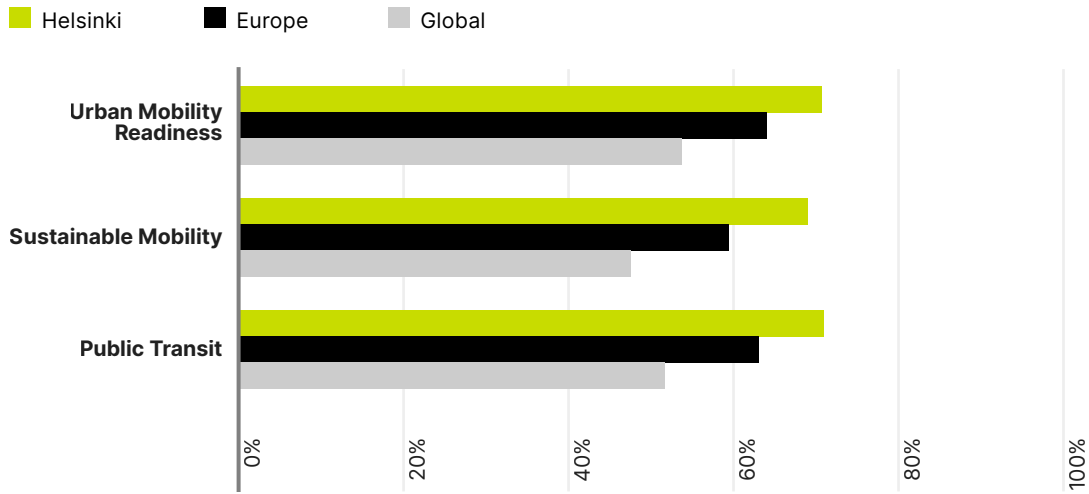
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Singapore

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
4/60	6/60	4/60

GDP per capita (US$)[1]	65,304.82
Population[2]	5,987,401
Surface area (km²)[3]	523
Population density (people per km²)[4]	11,436
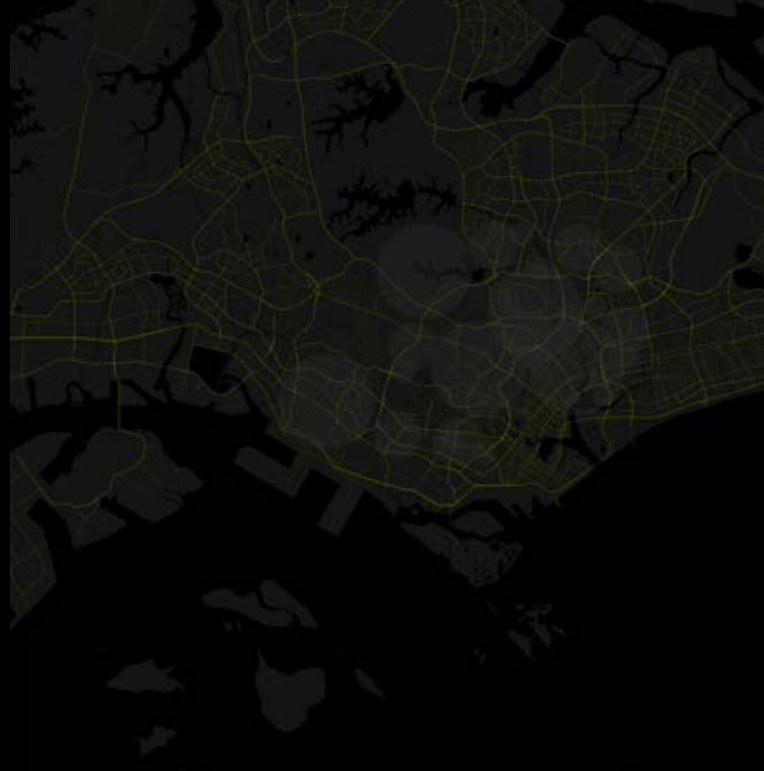
Singapore topped the Urban Mobility Readiness Index in 2020 but has since slipped in part because of its performance in shared and active mobility. Micromobility is a particular weakness, with a relatively low share of people walking or biking, in spite of good cycling infrastructure. There is great wariness of the safety implications of e-scooters, which are not banned but are subject to strict usage rules.[9] The city-state would benefit from enabling regulations and more investment to promote shared mobility and Mobility as a Service.

However, Singapore's traditional strengths remain – notably a rich innovation ecosystem and a strong political will to improve mobility that have led to forward-looking policies like congestion pricing. Singapore's traffic management system is unparalleled, and its road-user charging system has made it a pioneer in reducing congestion. Moreover, traffic rules are strongly enforced, and onboard cameras in many personal vehicles help to incentivize positive driving behavior.

Academics work together with government officials, and the government has taken an active role in connected autonomous vehicles promotion, especially through its National Research Foundation. Singapore launched the world's first self-driving taxi trial in 2016, and the city-state has become a living laboratory for urban mobility solutions, with numerous startups. It is now considered a model for metropolises aiming to distinguish themselves in autonomous mobility.

Singapore invested in one of the world's first automated rail systems, dating back to 2003, and is now credited with maintaining one of the best. Public transit options are affordable and within easy walking distance. Strong risk-preparedness and disaster-management capabilities make for a resilient transportation network.
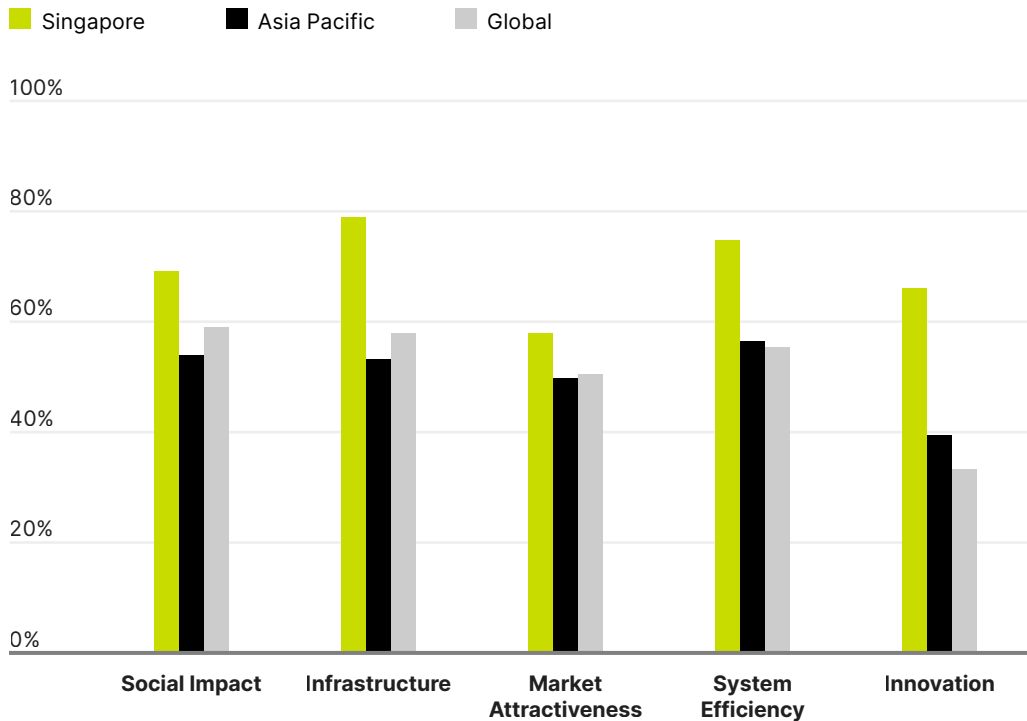
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
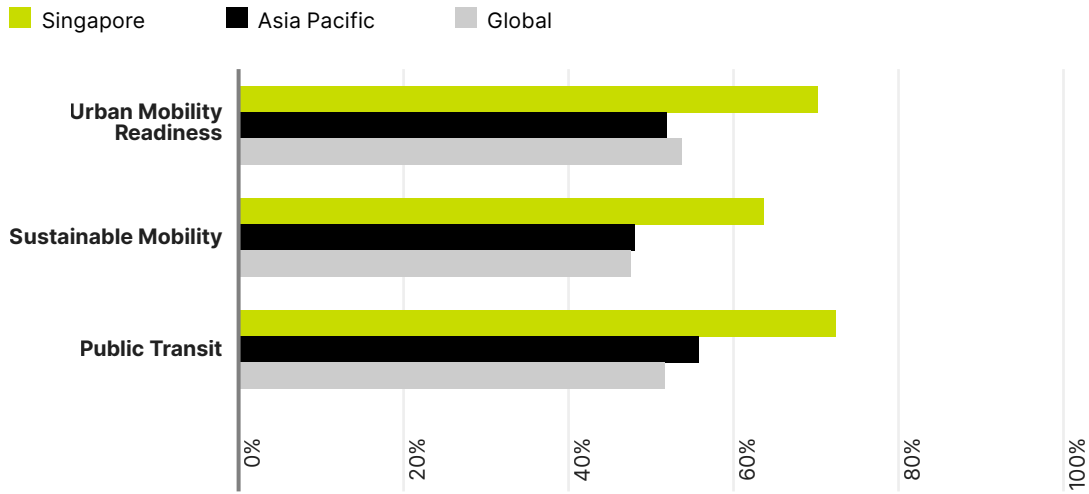
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Zurich

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
5/60	9/60	2/60

GDP per capita (US$)[1]	115,495.59
Population[2]	1,168,786
Surface area (km²)[3]	243
Population density (people per km²)[4]	3,820

Zurich's public transport system is efficient, affordable, and almost always within easy walking distance. That lands the city second in Public Transit, as well as fifth in the Urban Mobility Readiness Index. Zurich also benefits from Switzerland's excellent rail network.

Zurich's roads – like those in the rest of Switzerland – are safe and high-quality, which benefits pedestrians and results in low rates of traffic fatalities. One reason is a traffic enforcement structure that incentivizes good driving behavior through an exponential, and ultimately income-based, system of fines. Congestion is not a major issue, and air quality is highly rated.

Switzerland's largest city is planning to release an advanced master plan in 2023,[10] which is likely to integrate urban and social space with transport. It will also feature an urban climate vision and include an agenda for implementation over the next few decades.

However, the city's reliance on trams could cause it to fall behind metro-based cities, because the automation of metros has progressed much faster. One reason is that, despite strong public investments in mobility, Zurich is home to few mobility companies, which limits the access to private funding for infrastructural upgrades, such as autonomous transit.

In shared mobility, too, Zurich lags behind European peers. Usage rates are low, and relatively few companies provide services. And the city's cautious approach to connected autonomous vehicles technologies may put it at a disadvantage in next-generation mobility. In some ways, Zurich is an example of slow technology adoption: The municipal government has not invested in technology related to autonomy or connectivity, for example. Zurich Airport, while the largest airport in Switzerland, logs relatively few passengers and offers limited international connections in comparison to large European hubs.
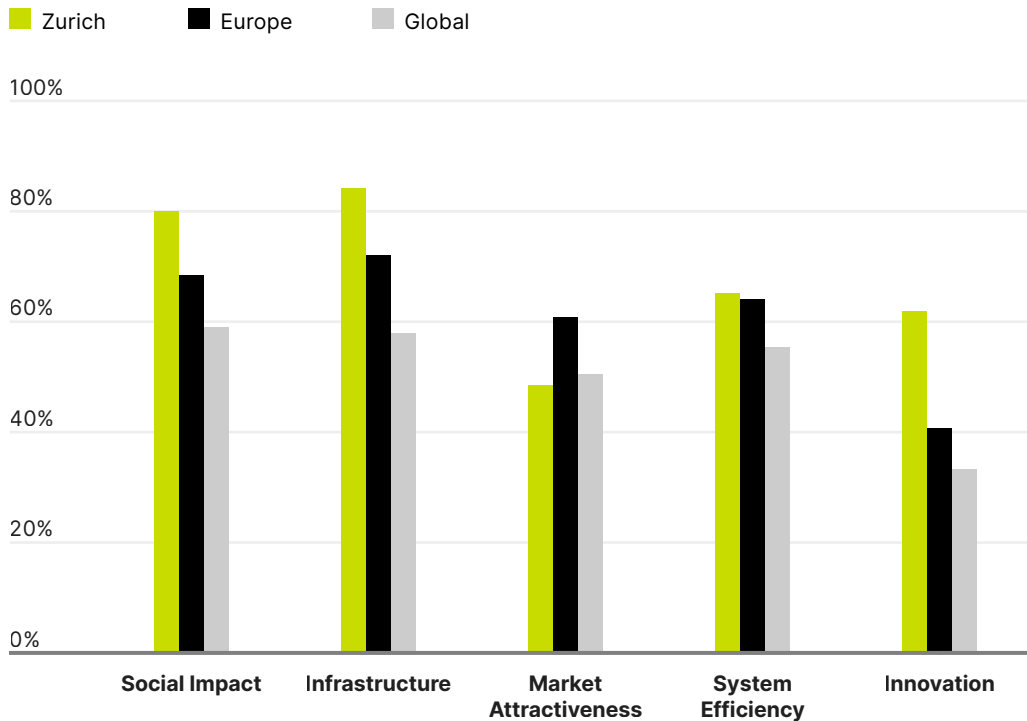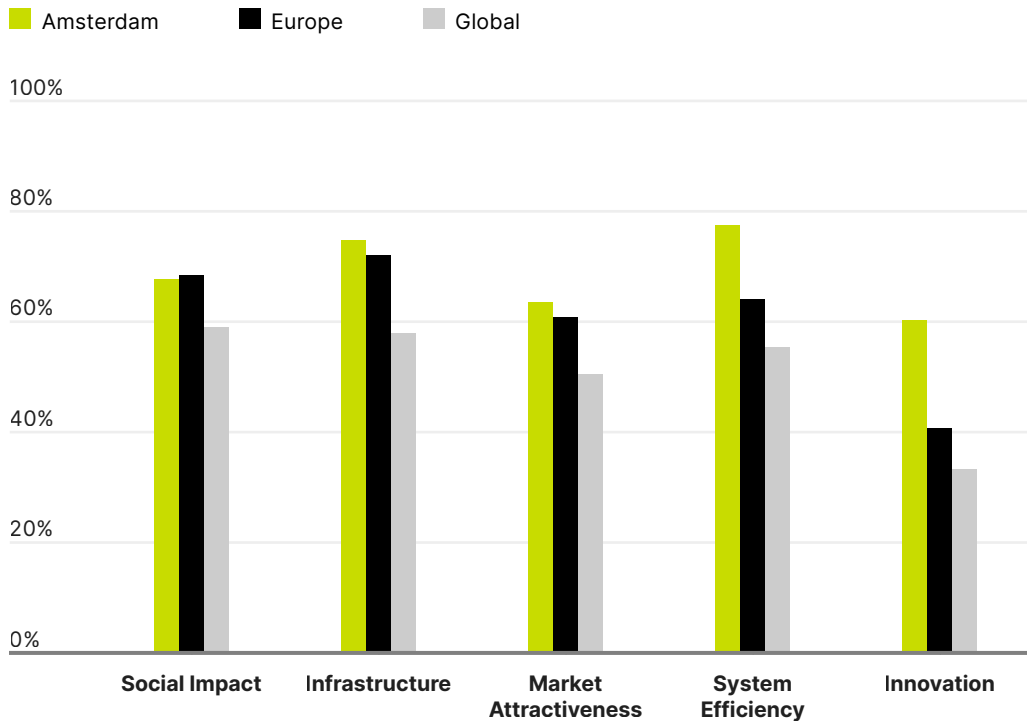
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

■ Zurich   ■ Europe   ■ Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

■ Zurich   ■ Europe   ■ Global
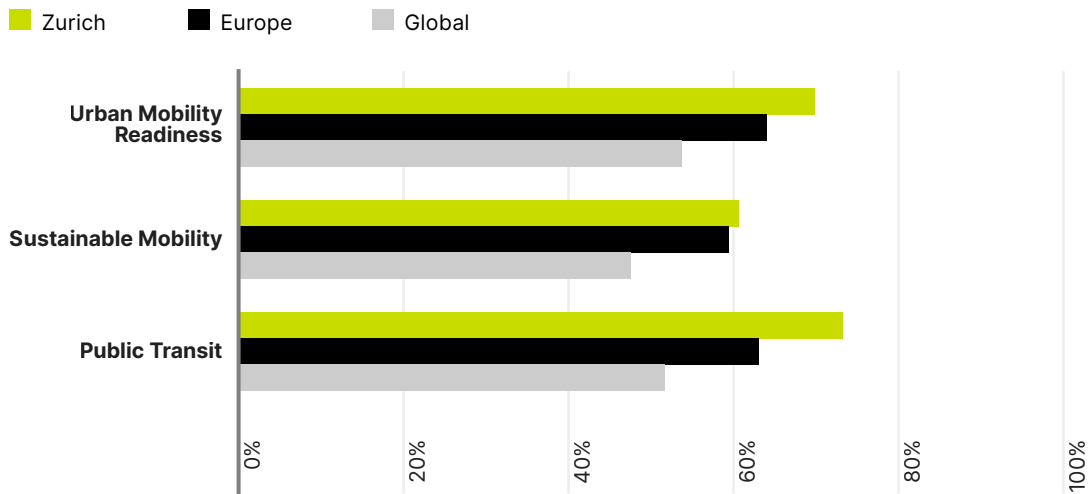
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Amsterdam

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
6/60	2/60	11/60

GDP per capita (US$)[1]	72,718.45
Population[2]	1,405,760
Surface area (km²)[3]	487
Population density (people per km²)[4]	3,397

Amsterdam has a world-renowned cycling culture and infrastructure, and more than a quarter of all trips are made by bike,[11] by far the highest share in the Urban Mobility Readiness Index. However, the bicycle is so dominant that usage of other forms of mobility – such as ride-sharing and public transit – is relatively low, and the city is home to relatively few mobility companies.

To address these challenges, the city government's 2019-2025 Smart Mobility program presents a vision of connected and electric mobility to create a more holistic network. It consists of three pillars: (i) implementing affordable shared mobility as an alternative to private cars; (ii) encouraging eco-friendly mobility options; and (iii) digitizing the mobility network to better manage traffic.[12] The plan envisages continued investments in mobility to support connected autonomous vehicles technologies and shared mobility. It also aims to add more electric vehicle charging stations, of which

Amsterdam already has a high density, with one station for every four electric vehicles.[13]

The city also plans to encourage market-led solutions with pitch competitions to strengthen the climate for innovation. The Smart Mobility program notes that, if the city wants to step into ride-share urban air mobility, changes to legislation will be required. It also indicates an openness to testing phases with e-scooter and microcar providers.[12]

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
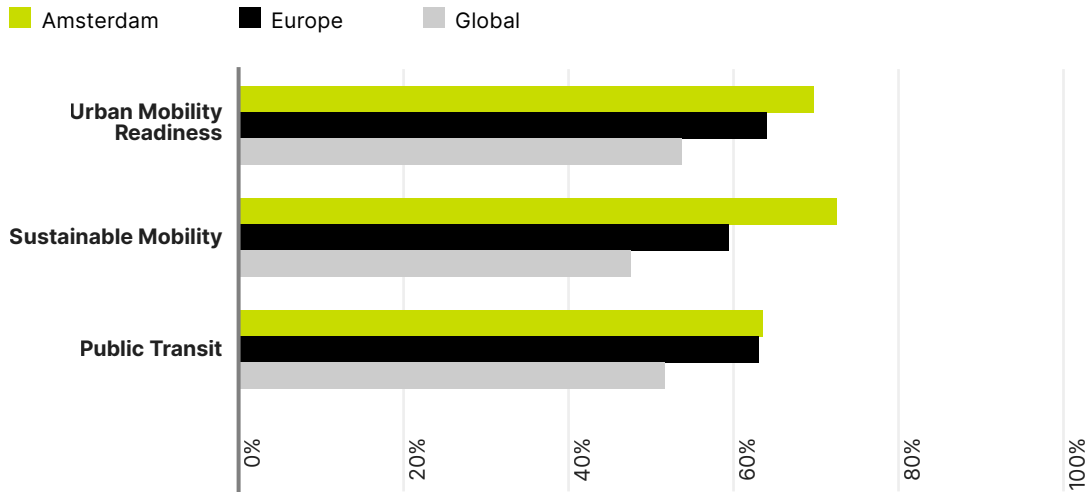
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Munich

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
7 /60	7 /60	17 /60

GDP per capita (US$)[1]	83,052.86
Population[2]	1,795,687
Surface area (km^2)[3]	482
Population density (people per km^2)[4]	4,231

Munich, ranked seventh in our Urban Mobility Readiness Index, also carries the same ranking in the Sustainable Mobility sub-index. The city maintains a robust, affordable, and multimodal public transit system consisting of eight-line metro and regional rail systems, 13 tram lines, and a bus network. Operating hours for the metro and tram systems are long, and tickets are relatively low-priced. Thanks to its extensive bikeways, Munich has the second highest percentage share of cycling journeys in the Urban Mobility Readiness Index (after Amsterdam).

The Bavarian capital aims to build on its success with a plan to make its mobility network carbon-neutral by 2035.[14] An intermediate goal for 2025 is for at least 80% of traffic to be a combination of emissions-free vehicles, public transit, pedestrians, and cyclists. To reduce car traffic, there are also plans to install up to 200 mobility hubs,[15] where riders can select shared bicycles, cars, and scooters conveniently located near mass transit stations. A proposed redistribution of traffic lights aims to encourage environmentally friendly mobility options.

Munich Airport has climate goals of its own, including plans for carbon-neutral operations by 2030.[16] The airport plans to reduce its emissions by 60% through measures such as supplying clean energy and electrifying its road vehicle fleet. The remaining 40% will be offset by supporting climate protection projects, including the creation of a forest to offset carbon dioxide emissions and promoting regional biodiversity.[17]

While Munich excels in its climate plans, it's not without its challenges. Munich Airport has strong international connectivity but suffers from low international passenger volumes. And the city's dependence on legacy infrastructure will make it challenging to switch to autonomous transit.
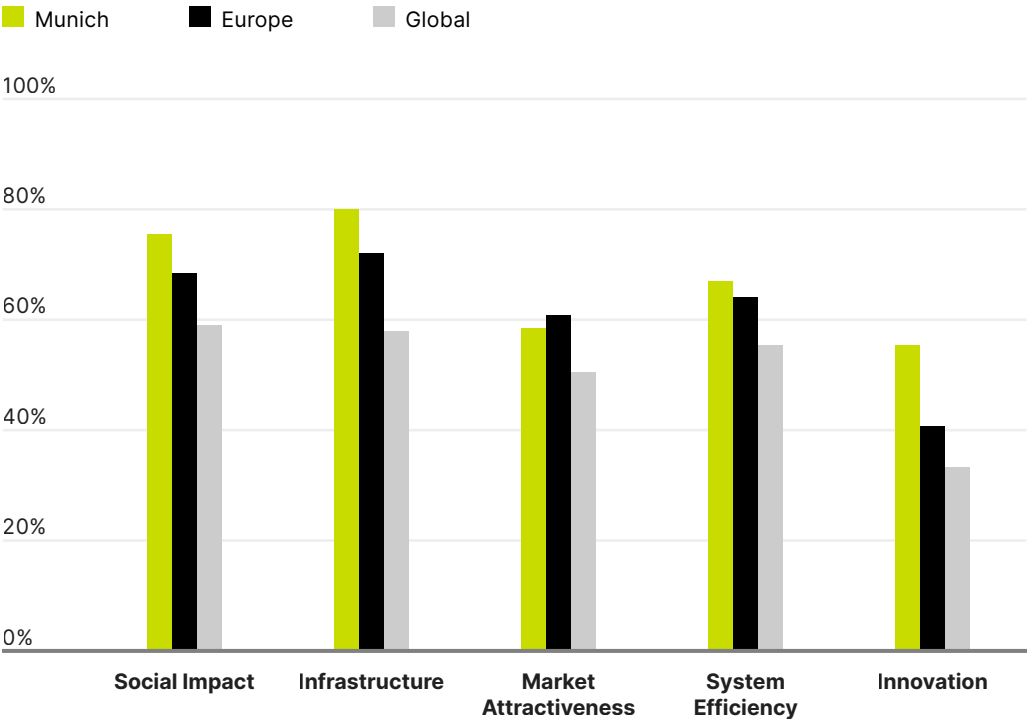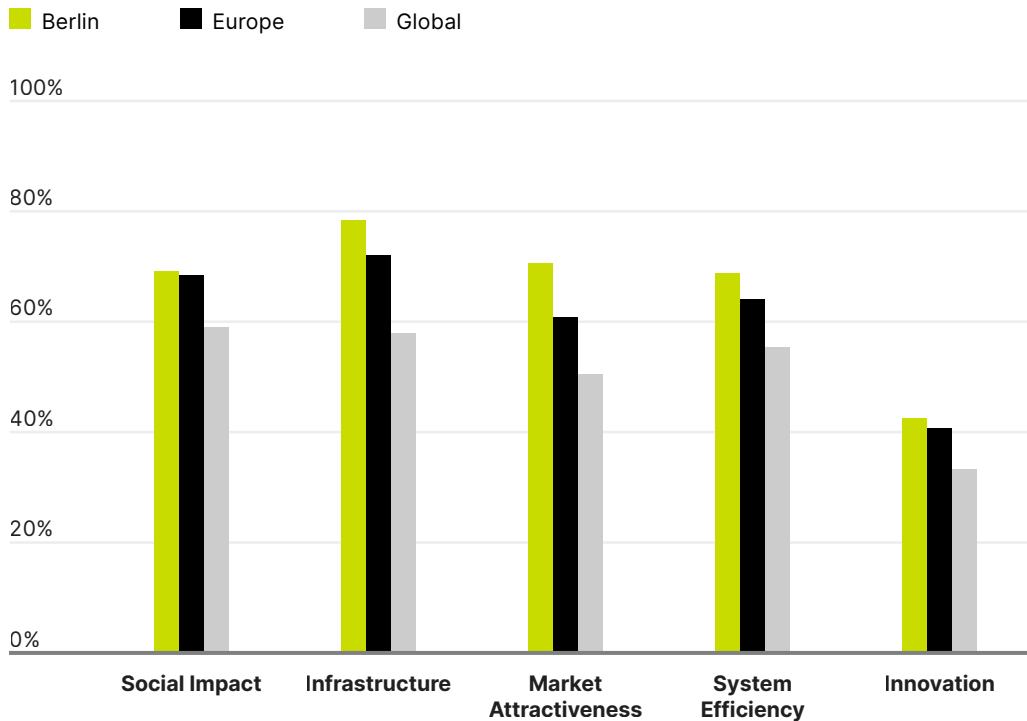
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- Munich
- Europe
- Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

- Munich
- Europe
- Global
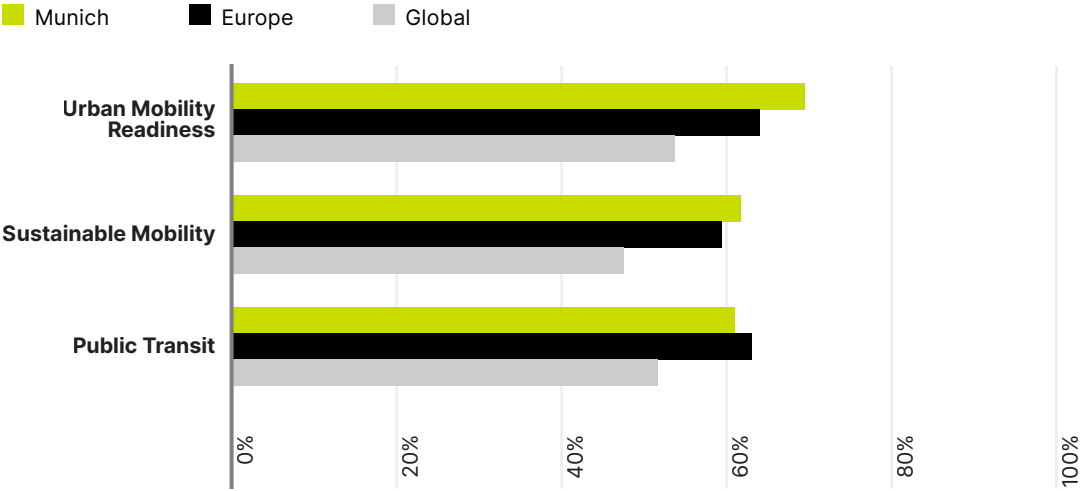
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Berlin

| Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
8/60	10/60	9/60

GDP per capita (US$)[1]	45,769.88
Population[2]	4,012,000
Surface area (km²)[3]	3,743
Population density (people per km²)[4]	2,934

Berlin has embraced multimodality through its networks of metro and suburban trains, trams, and ferries. These are supported by an integrated app, which provides journey planning and payment for all types of transport, including cars and e-scooters. However, low station density makes public transit less convenient, and more journeys are made by car and on foot. In 2020, Berlin replaced three older airports with the Brandenburg Airport; however, numerous technical problems mean that it is still only the third busiest in Germany,[18] with fewer international destinations than many European peers.

Cycling has become popular following recent investment in infrastructure;[19] including protected bike lanes, green markings to indicate space for cyclists, and cycle superhighways, as well as bike parking facilities. The city has launched schemes to encourage the use of cargo bikes. Berlin is also a leader in road safety,[20] and it records few traffic fatalities. Though the standard maximum speed limit is 50 kph, this has been reduced to 30 kph in certain areas – residential and mixed-use, for example – to make streets safer, as well as reducing noise and pollution.

Berlin is famous for past legal battles against prominent ride sharing companies, and ride sharing still attracts relatively few passengers. Also, few new mobility companies have chosen Berlin as their European base.

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- Berlin
- Europe
- Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

- Berlin
- Europe
- Global
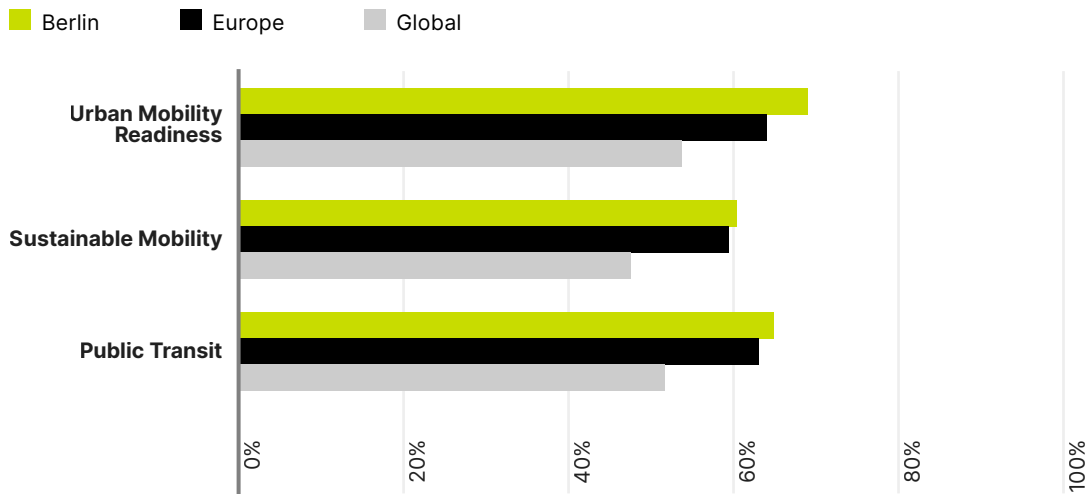
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Paris

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
9/60	20/60	8/60

GDP per capita (US$)[1]	72,707.53
Population[2]	11,069,273
Surface area (km²)[3]	2,300
Population density (people per km²)[4]	3,877
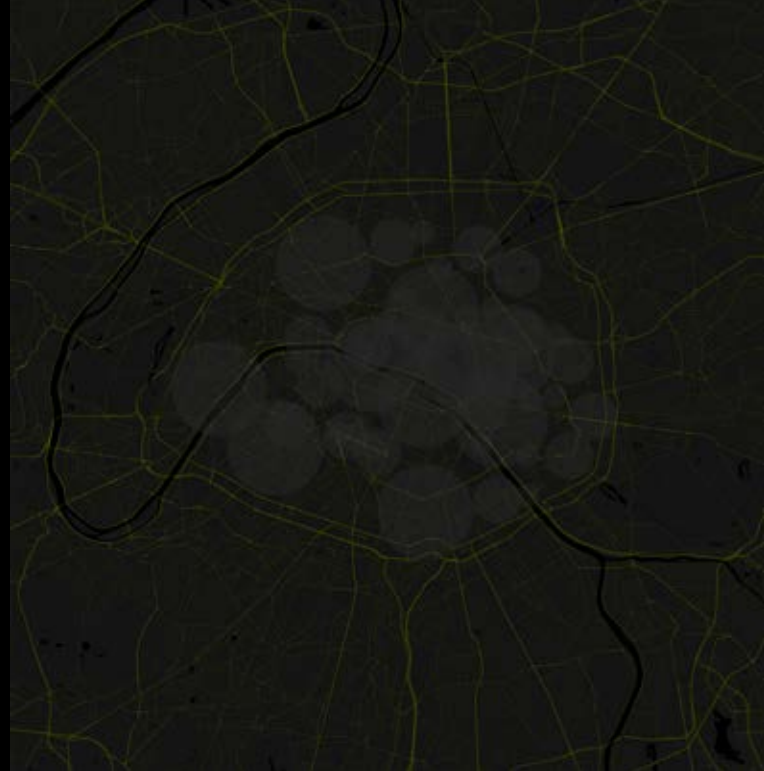
Over the last couple of years, Paris has repurposed some of its road space, and it now has significantly fewer parking spaces to encourage Parisians to use other forms of transit. Car-free zones, extra bike parking facilities and measures to improve safety have made the city more accessible by bike, and by 2021 it had more than 1,000 km of cycling infrastructure, including 300 km of bike lanes.[21]

Few parts of the city are more than a short walk from a public transit station, and the system enjoys a high rate of usage. As well as the 16-line Paris metro system, the city is also served by the Réseau Express Régional network, which reaches out to the surrounding region, as well as four tram lines around the perimeter. The Grand Paris Express project, scheduled for completion in 2030, will further expand the city's public transit.[22] As part of Europe's largest transport project, trains will run on 200 km of new, automated tracks around the city,

serving 68 new stations. In addition, major infrastructure work is being carried out to improve traffic flow ahead of the 2024 Olympic Games.

Innovation in smart mobility flourishes, in part thanks to a strong academic sector: The French capital is home to several of the world's top institutions for engineering and computer science. The government also invests strongly in the sector, and there are many mobility companies headquartered in Paris.

Traffic management remains underdeveloped because of insufficient infrastructure investment, and city residents complain of high levels of noise and light pollution typically associated with vehicles on the road. However, the speed limit was lowered from 50 to 30 kph across most of Paris in 2021 to reduce noise and improve road safety.
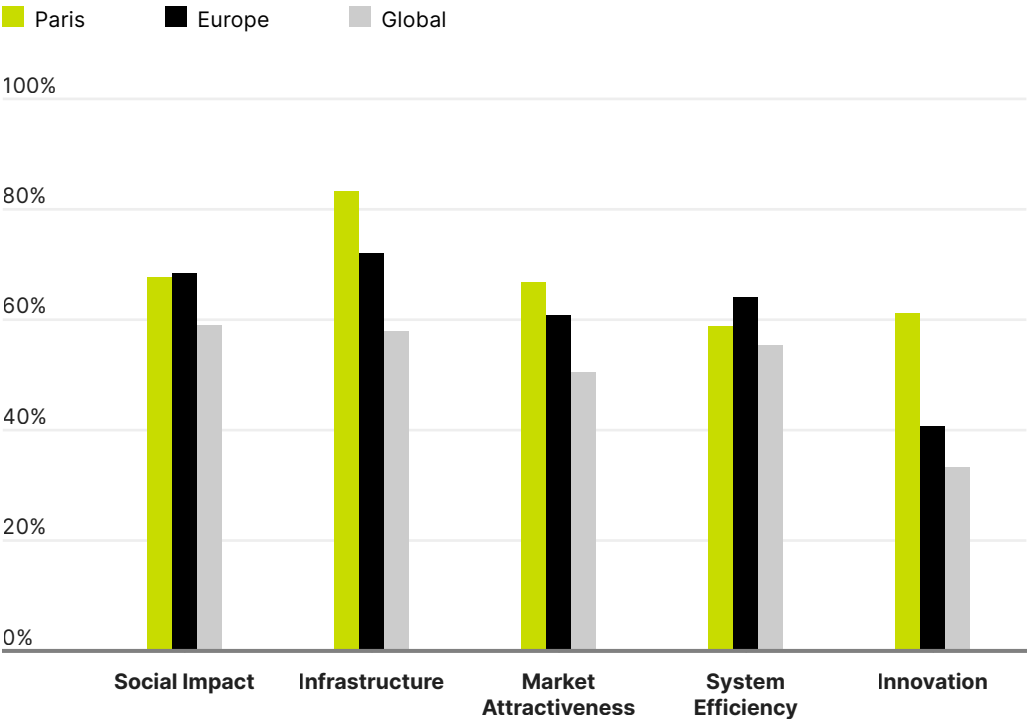
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

■ Paris ■ Europe ■ Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

■ Paris ■ Europe ■ Global
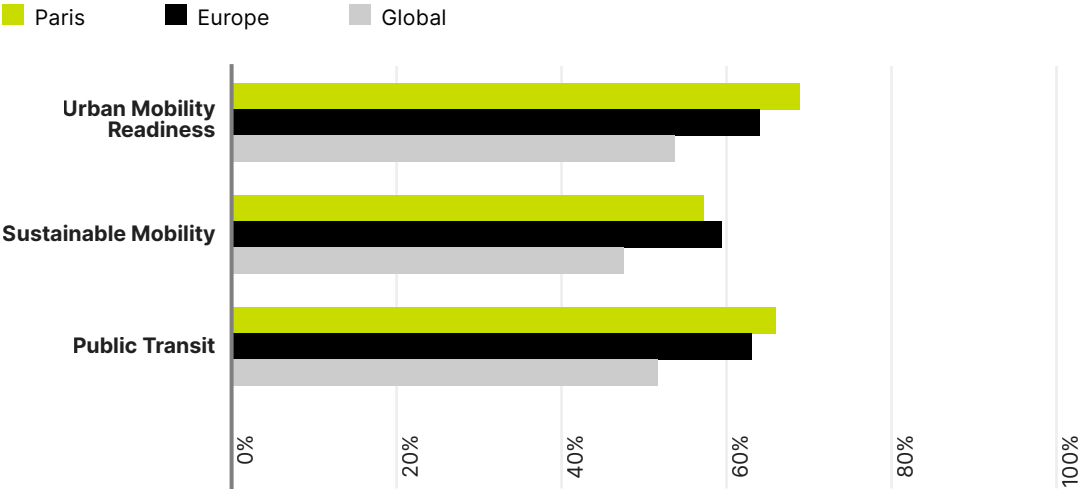
Source: Oliver Wyman Forum and University of California, Berkeley analysis

London

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
10/60	8/60	10/60

GDP per capita (US$)[1]	79,085.31
Population[2]	10,344,000
Surface area (km²)[3]	1,738
Population density (people per km²)[4]	6,481

London has one of the largest public transport networks in the world, with integrated metro ("Underground"), train and bus systems spanning the city.[23] In 2022, services started on the new, high-frequency Elizabeth line stretching between suburbs to the east and west of the city.

Pollution levels have dropped dramatically over the past 10 years, at least partly thanks to London's restrictions on polluting vehicles. The Low Emission Zone and Ultra Low Emission Zone impose charges on older, more-polluting vehicles. The Ultra Low Emission Zone was expanded in 2021 from central London to a wider area, a move expected to further contribute to air quality. London's fight against pollution is also helped by modest levels of car ownership and the London Congestion Charge, which is levied on most vehicles circulating central London. However, residents still complain of high levels of noise and light pollution.

The city's government is encouraging the switch to electric vehicles through investment in charging infrastructure and incentives for the use of electric vehicles, such as a "cleaner vehicle discount" on the Congestion Charge. As part of the Mayor's Transport Strategy to increase active and sustainable mobility, uptake of plug-in electric vehicles has been increasing year-on-year.[24] Furthermore, cycling infrastructure has been significantly expanded, so that in 2022, 20% of Londoners live within 400 meters of the Cycleways network.[20] In addition, sustained increase in customer demand for London's Santander Cycles hire scheme has been recorded for 2021/2022.

The UK capital hosts a wealth of top academic institutions – such as Imperial College London and University College London – and innovation flourishes. This is particularly the case for connected autonomous vehicles technologies, for which tests have been underway in parts of the city.[25]
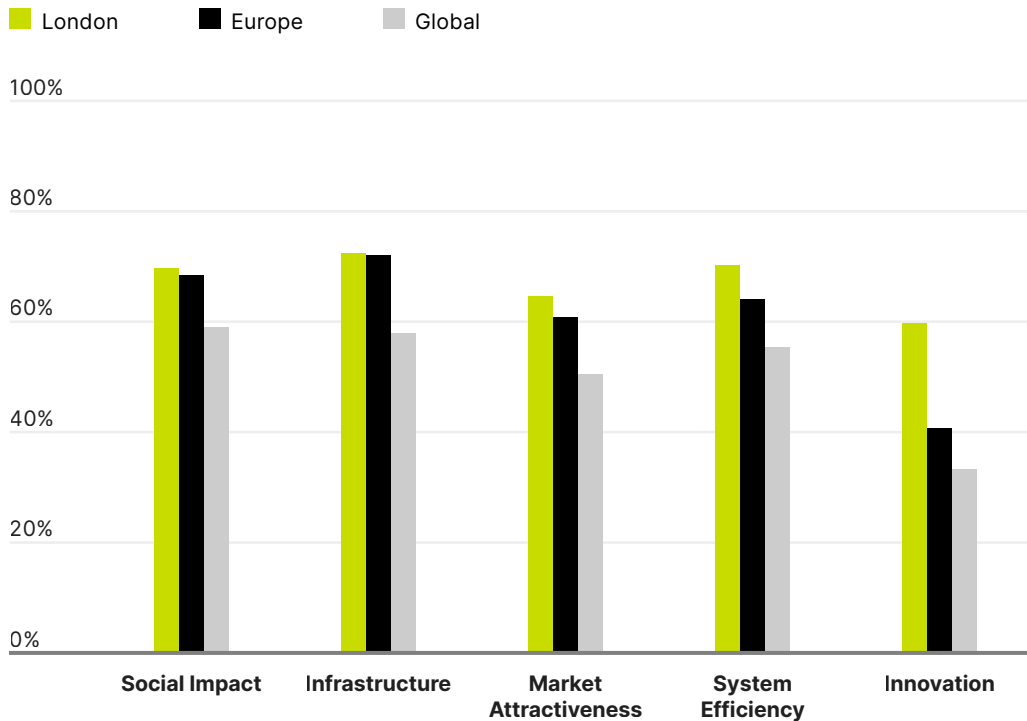
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

■ London   ■ Europe   ■ Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

■ London   ■ Europe   ■ Global
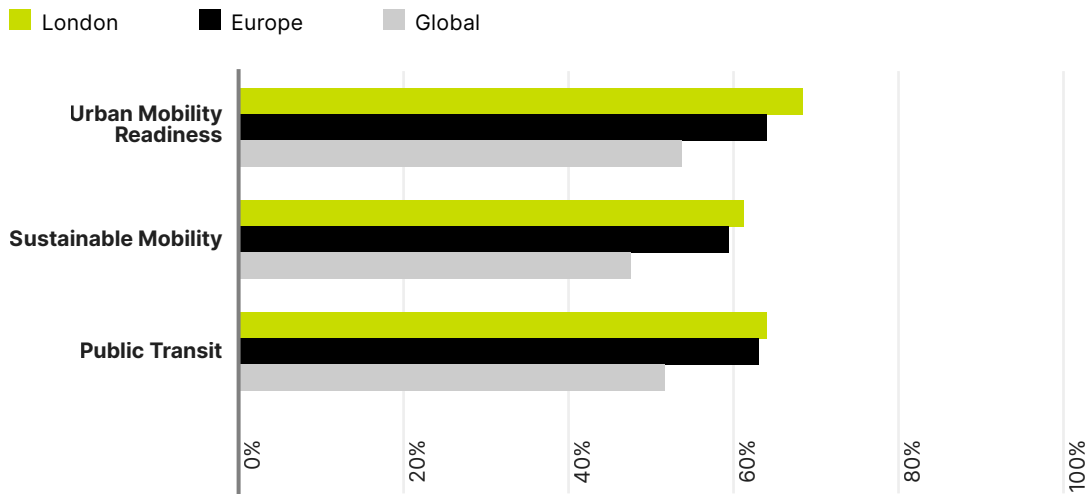
Source: Oliver Wyman Forum and University of California, Berkeley analysis

New York

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
11/60	23/60	13/60

GDP per capita (US$)[1]	105,209.49
Population[2]	20,165,785
Surface area (km²)[3]	9,469
Population density (people per km²)[4]	1,779

New York's public transit system boasts several major multimodal hubs, and large parts of it run throughout the night. The system is also friendly to bikes onboard. However, New York's transit systems need investment and modernization. While the Metropolitan Transportation Authority is upgrading subway signals that are 70 years old, autonomous operation is not imminent.

The New York area's airports have rebounded in a big way since the COVID pandemic. Both international connections and passenger volumes are strong, and facilities have been upgraded this year. The city is also seen as a big potential market for urban air taxis, where helicopters remain popular despite noise pollution.

The city that never sleeps suffers from significant levels of noise and light pollution and the resulting social impact. However, it has embraced cycling in recent years. Citi Bike, the New York public bikeshare program, is the biggest and most successful in the United States. It has 24,500 bikes and over 1,500 stations and operates in all boroughs, apart from Staten Island, as well parts of New Jersey.

New York is slowly rolling out e-scooters, with several pilots in the Bronx. It is taking a cautious approach because of the risk of accidents, and e-scooter rental companies are still not allowed to operate in Manhattan. A sign that the city is taking micromobility seriously is a plan to encourage people to report vehicles stopped on cycling lanes, by letting them claim 25% of the fine. Another major change has been the removal of thousands of street parking places to make way for outdoor restaurants.
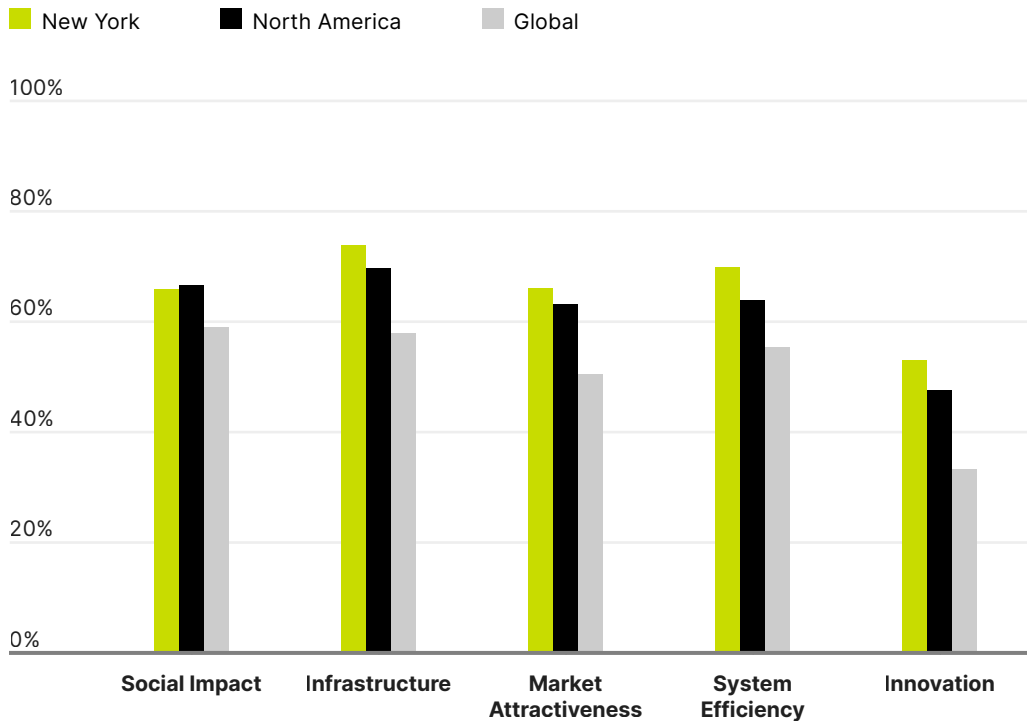
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
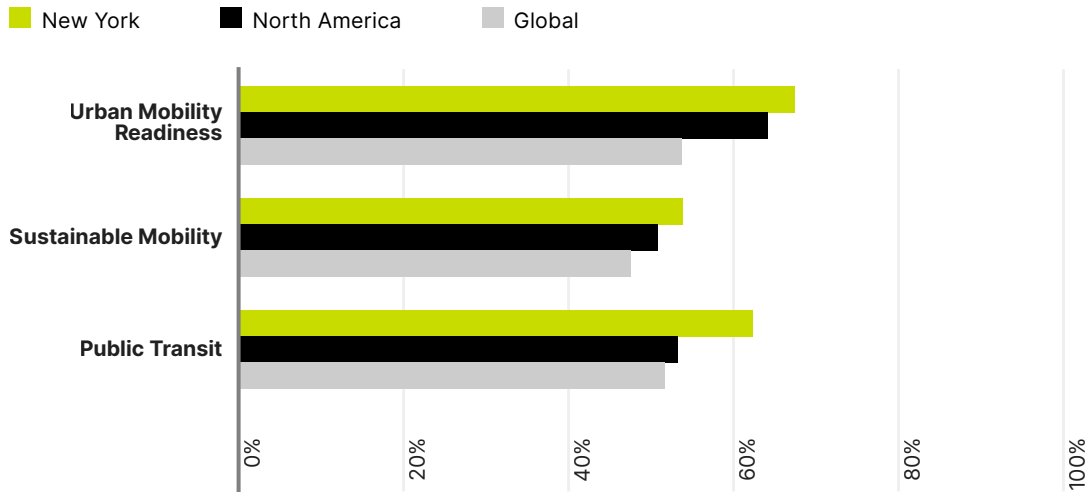
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Chicago

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
12/60	29/60	20/60

GDP per capita (US$)[1]	80,828.84
Population[2]	8,967,215
Surface area (km²)[3]	5,498
Population density (people per km²)[4]	1,293

After the COVID pandemic, the accompanying economic downturn, and the protests against racial injustice crises in 2020, Chicago released a Strategic Plan for Transportation to address inequity in the transportation system.[26] It includes one- and three-year goals to build safer streets and crosswalks to encourage walking, increase access to opportunities in neglected neighborhoods, and expand protected bike and bus lanes. In particular, the authorities have sought to make public transit widely accessible, by making it more affordable and increasing its hours of operation.[26]

Chicago currently has 400 miles of protected bike lanes, and the city boasts a sound bike-sharing service. However, due to the size of the city and a car-centric culture, Chicago still relies significantly on private cars, with low rates of cycling and walking. Due to this reliance on transportation via private vehicles, the city is a longtime leader in traffic management, having been

an early adopter of vehicle loop detection to monitor highways. As other American cities move forward with electrification, Chicago lags behind, both in terms of charging infrastructure and electric vehicle market share.

Chicago's O'Hare International Airport is one of the world's busiest and best-connected airports, ranking fourth in airport volumes in the Urban Mobility Readiness index and third in the Unted States, behind New York and Atlanta. The airport also boasts strong international flight connectivity.
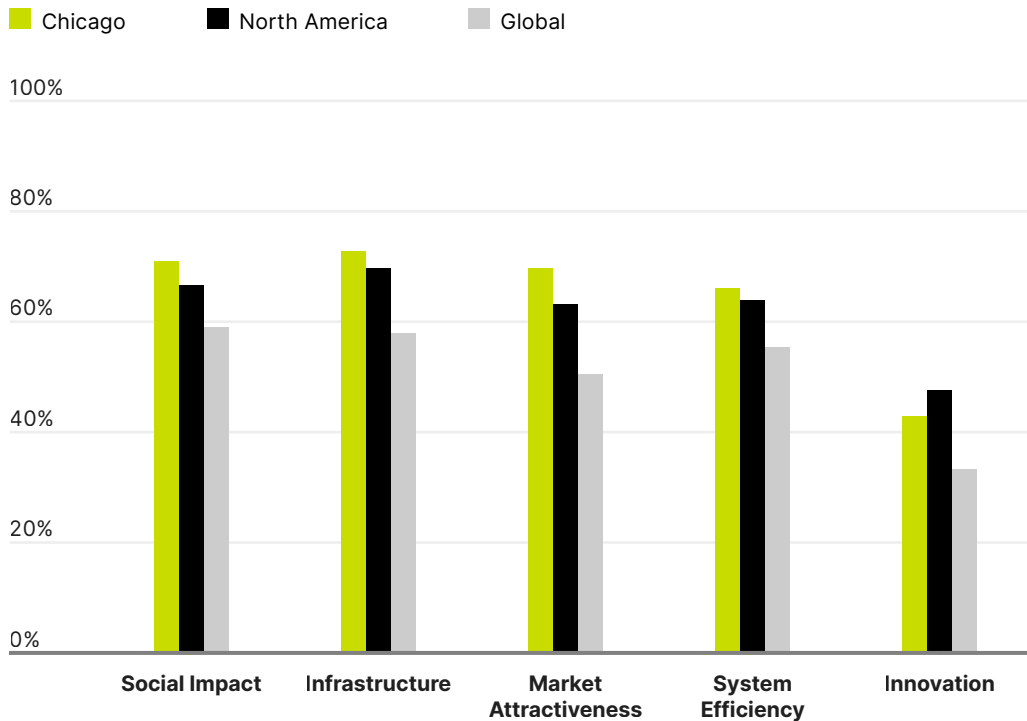
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- Chicago
- North America
- Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

- Chicago
- North America
- Global
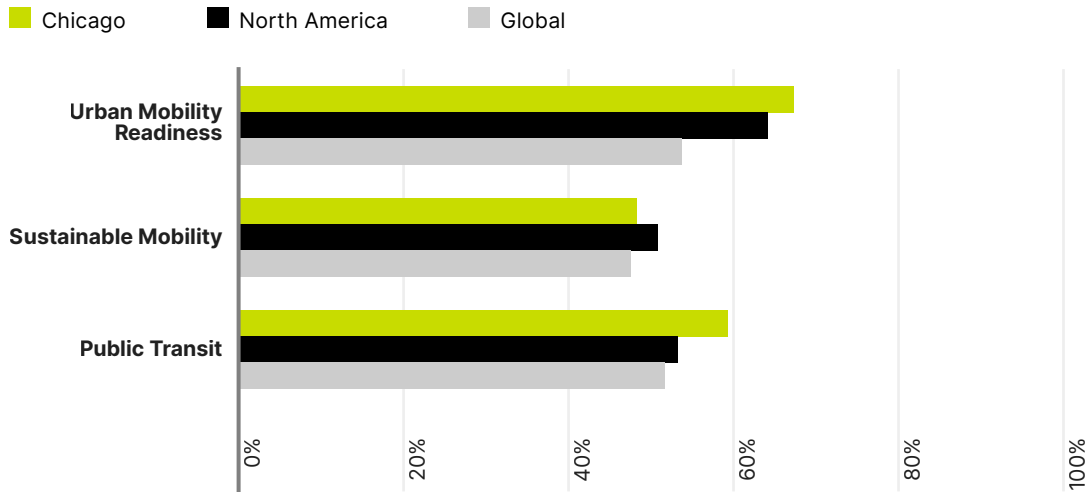
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Boston

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
13/60	25/60	33/60

GDP per capita (US$)[1]	108,876.04
Population[2]	5,875,947
Surface area (km^2)[3]	1,971
Population density (people per km^2)[4]	780
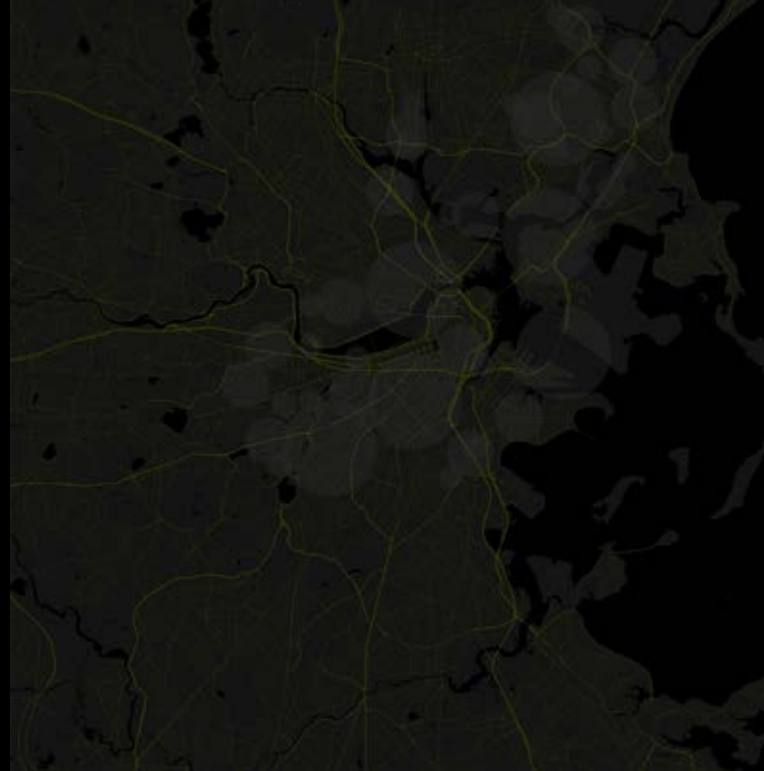
Boston offers affordable service on a comprehensive transit network consisting of five modes: commuter rail, subway, buses, ferry, and the RIDE – a door-to-door service for people with disabilities who cannot easily use the Boston area's public transit system.[27] However, the city's legacy transit infrastructure will make any transition to autonomous transportation difficult to implement.

Boston is one of the most bike-friendly cities in the United States thanks to a robust cycling infrastructure. The city's 2030 mobility plan aims to increase cycling by fourfold, create flexible lanes that can adapt for greater biking capacity, and expanding its bikeshare network to create 268 stations by the end of 2022.[28] Boston also hopes to make its city even more walkable, with pedestrian-first traffic signals that shorten wait times at crossings and adapt to real-time pedestrian traffic flows.[28]

Renowned for its innovative culture, the city and its surrounding area incubate top mobility talent and research through its abundance of leading universities and labs, with Harvard University, and the Massachusetts Institute of Technology in close proximity to the city.

Boston's Logan International Airport has limited international connections and modest passenger volumes.[29] However, passenger volumes are increasing after a downturn with the COVID pandemic and a $62 million grant has been awarded by the Federal Aviation Administration to support infrastructure projects at the airport.[29]
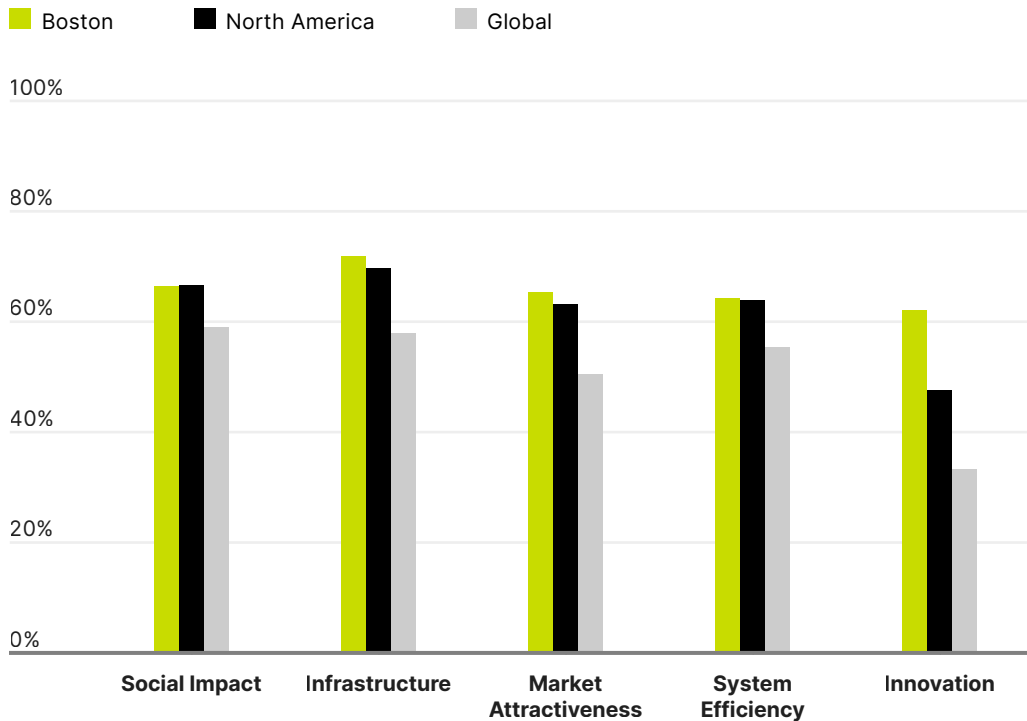
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

■ Boston ■ North America ■ Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

■ Boston ■ North America ■ Global
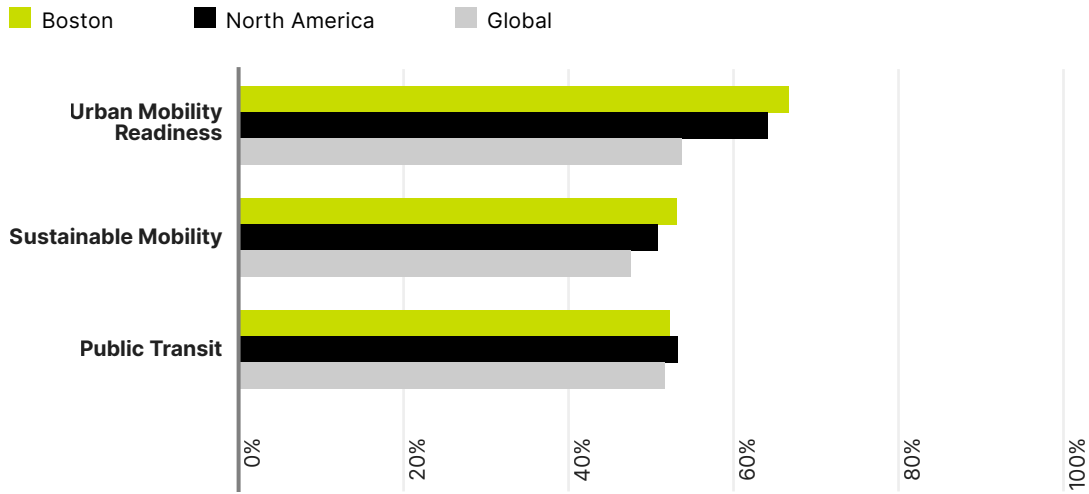
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Washington, D.C.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
14/60	21/60	24/60

GDP per capita (US$)[1]	97,441.19
Population[2]	5,378,377
Surface area (km²)[3]	3,644
Population density (people per km²)[4]	1,387

The Unted States capital benefits from being the seat of the national government and has one of the country's most developed mass transit systems, offering affordable prices and multiple modes of transit.[30] The Metrorail network, serving 91 stations over 117 miles of track averaged over 600,000 riders per day until 2019, after which numbers declined during the COVID pandemic. The Metrobus network operates around the clock.[30] Like many Unted States cities, however, some areas have low station density, and car ownership still rules.

Washington D.C. also possesses a robust traffic management system, featuring changeable message signs, coordinated traffic lights for arterial roads, and high-occupancy lanes. However, the city has been slower than some of its peers in making electric charging infrastructure widely available.

Cycling infrastructure has been improving with the District Department of Transportation and as of the end of 2021, there were 24 miles of protected bike lanes (with a physical separation from car lanes).[31] And there is still growing demand to install more protected bike lanes with the DDOT embarking on a plan to build 20 miles of new protected bike lanes by 2023. The bikeshare service, Capital Bikeshare, has 5,000 bikes and more than 600 stations in Washington, D.C. and the surrounding area. E-scooters are permitted, and more than 10,000 are available in the District.[32]
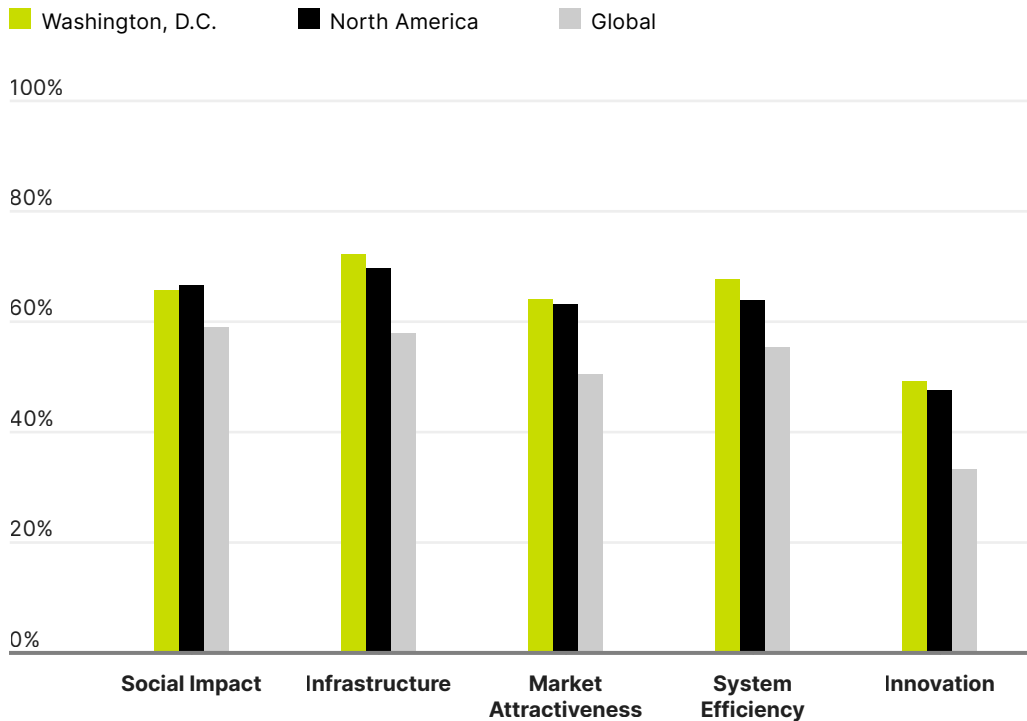
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- Washington, D.C.
- North America
- Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

- Washington, D.C.
- North America
- Global
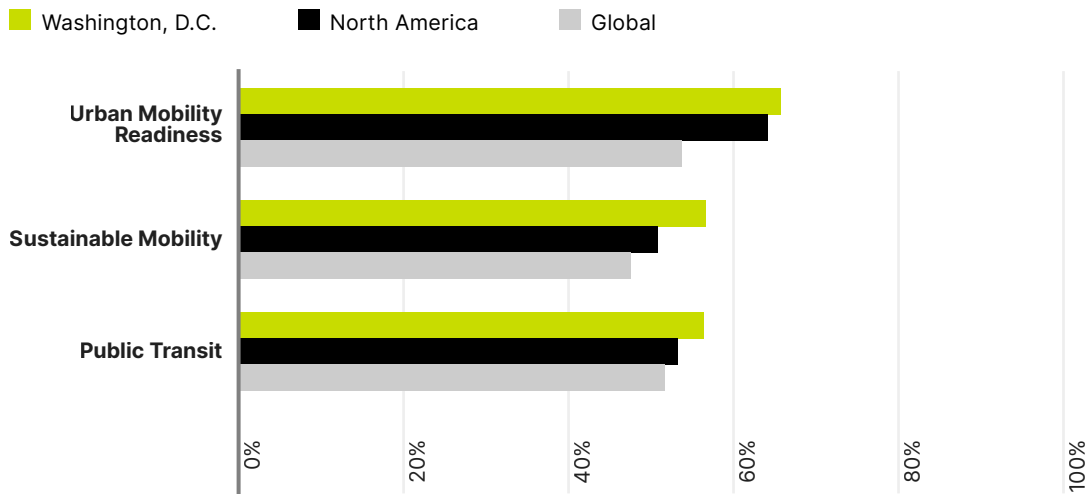
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Tokyo

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
15/60	11/60	7/60

GDP per capita (US$)[1]	43,610.89
Population[2]	37,535,903
Surface area (km²)[3]	2,191
Population density (people per km²)[4]	4,584

Tokyo's mass transit system, dominated by the world's most extensive urban rail network of suburban trains and subways, alongside buses, trams, and monorails, boasts frequent service and on-time departures. It also connects with Japan's top-notch rail network, including high-speed bullet trains.

Given the extensive transit system, private automobiles and motorcycles play a secondary role in urban transport in Tokyo. As a leader in road safety, Tokyo diligently enforces traffic laws and records few fatalities from road accidents. Walking and cycling are much more common than in many cities around the globe, and people use their bikes for everything from shopping trips to work and school commutes. Around 14% of all trips in Tokyo are made by bikes, much higher than most other big cities, despite limited cycling infrastructure.

Tokyo is vulnerable to natural hazards such as typhoons and earthquakes and needs to take precautions to ensure service continuity. Preventing climate change-related disasters is at the heart of Tokyo's sustainability plan, which aims to reduce greenhouse gas emissions by 50% by 2030, using renewable energy and green hydrogen where possible.[33] The plan also seeks to bolster the city's road system (like developing better cycling and walking routes), public transit network, multimodal offerings, and airport functionality. Tokyo takes 11th place on our Sustainable Mobility sub-index. However, despite government investment, charging infrastructure remains somewhat underdeveloped in Tokyo and consequently electric vehicle uptake has been relatively slow.
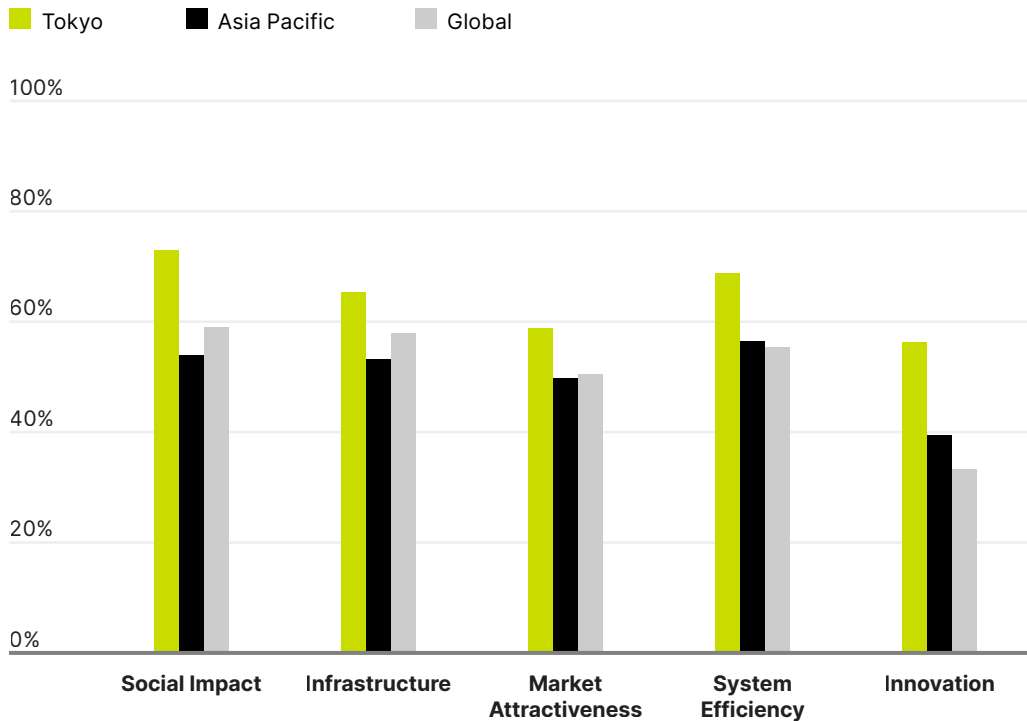
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

■ Tokyo ■ Asia Pacific ■ Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

■ Tokyo ■ Asia Pacific ■ Global
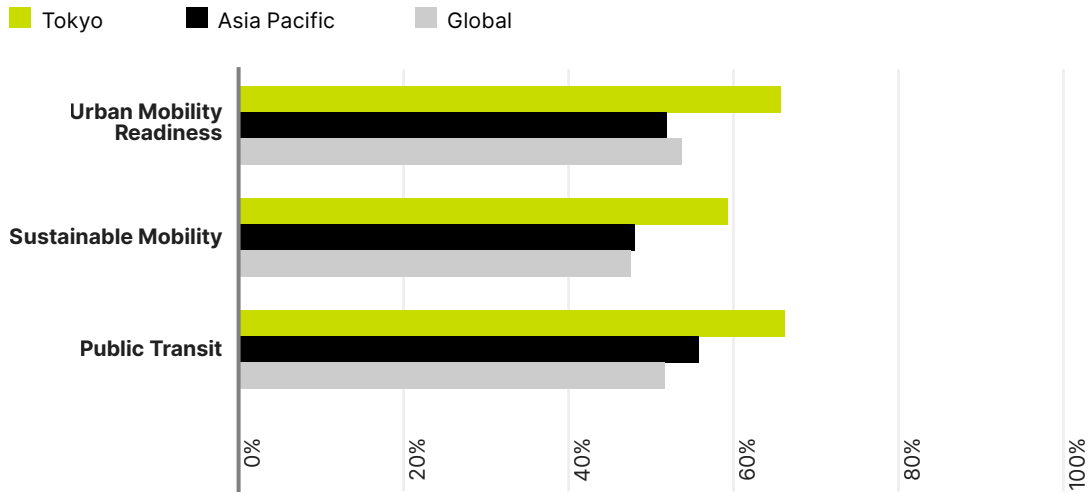
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Hong Kong

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
16/60	5/60	1/60

GDP per capita (US$)[1]	47,970.98
Population[2]	7,524,095
Surface area (km²)[3]	290
Population density (people per km²)[4]	25,684

Hong Kong offers one of the best public transportation services in the world and lands atop the Public Transit sub-index. The Mass Transit Railway operates a multi-layered network that serves 166 stations with very few delays or service disruptions. It is affordable, stations are rarely more than a short walk away, and interchanges are designed to be seamless to ensure a smooth flow of passengers. As a result, Hong Kong residents are avid users of public transportation, and it has the highest utilization rate in the world. However, the system is lagging in autonomous transit.

The city's high population density has led local authorities to prioritize public transit over private modes, and to integrate the metro system into the city infrastructure. Residential communities and offices are built above stations, and the network counted 1,550 station retail outlets as of December 2021.[34] This optimizes land use, is financially and environmentally sustainable, offers convenience for commuters, and encourages people to choose the metro over other modes of transportation. Profits generated from property sales are used to finance new railway projects, and the system is one of the most profitable operators in the world, despite being self-financing and setting fares relatively low. It could thus serve as a model for other cities.

Hong Kong has installed ample car-free zones, and the rate of car ownership is relatively low. The city is pedestrian-friendly, and a high share of journeys are carried out on foot. But Hong Kong's policies and systems are insufficient to promote shared mobility.
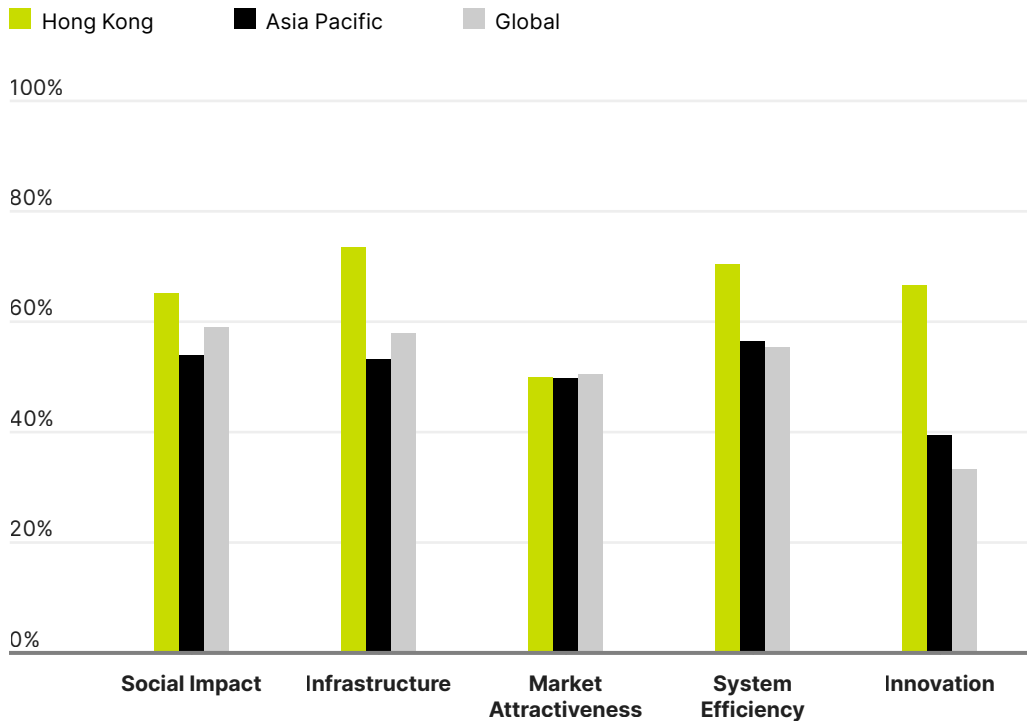
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

Hong Kong   Asia Pacific   Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Hong Kong   Asia Pacific   Global
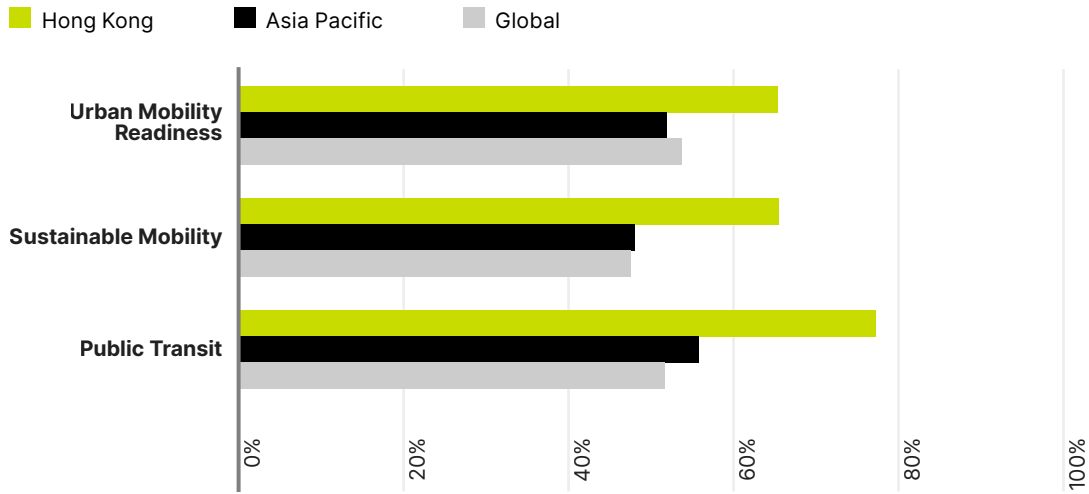
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Los Angeles

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
17 /60	27 /60	37 /60

GDP per capita (US$)[1]	85,013.66
Population[2]	13,831,444
Surface area (km²)[3]	6,351
Population density (people per km²)[4]	2,394

Los Angeles has historically experienced high levels of car ownership, and its notorious traffic congestion may reach new peaks as traffic returns to pre-COVID levels. One way to improve mobility for Angelenos is better public transit options. But the city spreads over a wide area, which makes it challenging to provide a service with a sufficient density of stations. As a consequence, travel by public transit tends to be slow, and ridership is low: Only 6% of workers living in the city of Los Angeles commute by public transportation.[35]

However, local authorities are highly involved in mobility improvement and innovation. The county's 2020 Long Range Transportation Plan envisages investment of more than $80 billion over a 30-year period to improve, expand, and upgrade Los Angeles County's public transit system. That will include expanding the Metro Rail network to over 200 stations covering nearly 240 miles.[36]

To make better use of roads, some carpool lanes have been converted to Express Lanes, which are free for carpoolers but charge single drivers a toll. The prices change based on real-time traffic demand to ensure that vehicles travel at least 45 mph in the toll lanes.[36, 37]

The electrification of the vehicle fleet is continuing, helped by financial incentives, as well as a California order directing that all new car sales be zero-emission by 2035.[38, 39]
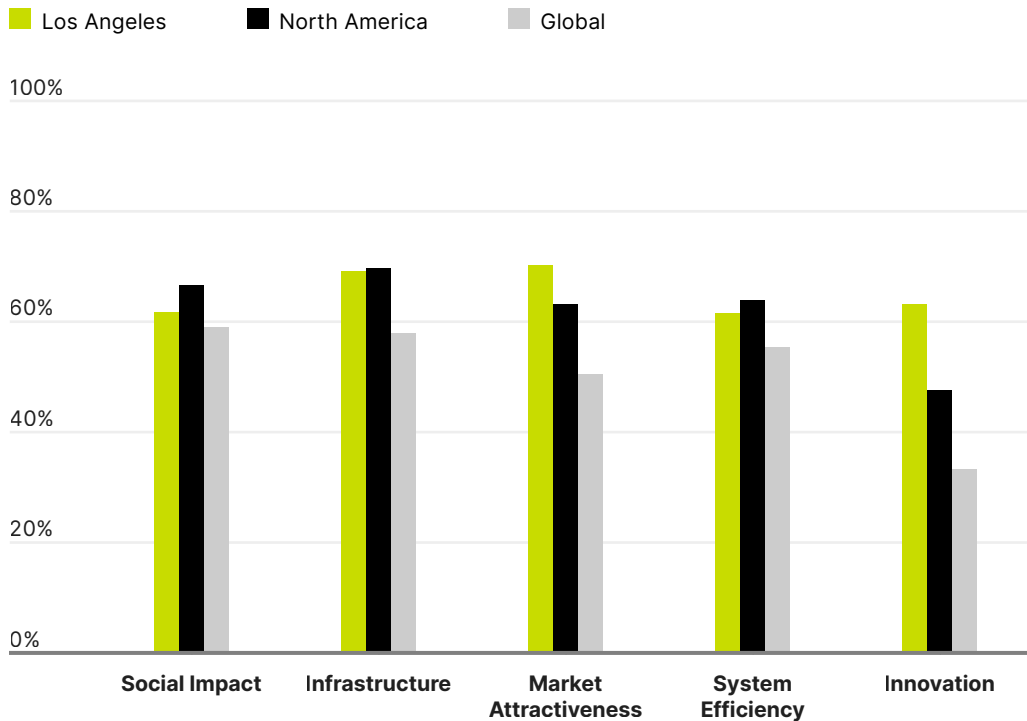
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
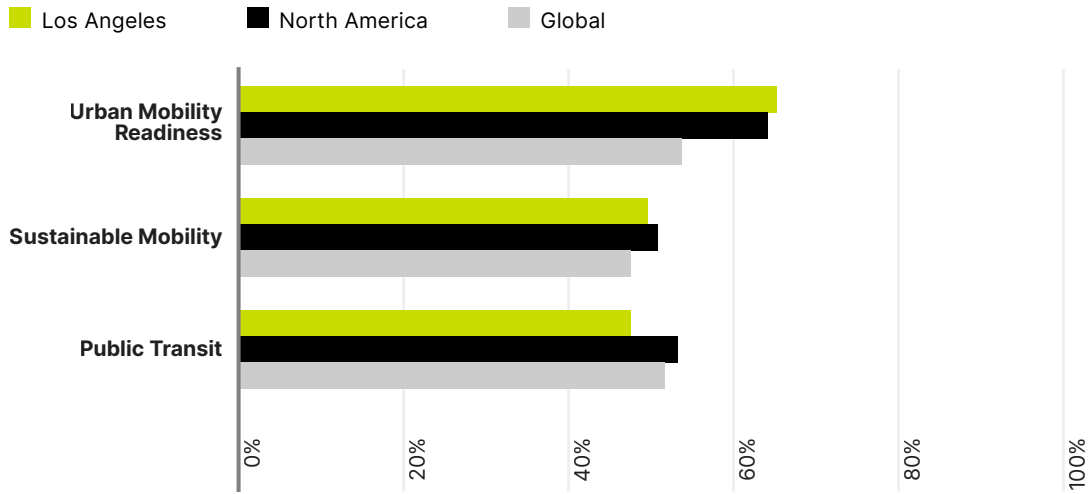
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Oslo

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
18/60	1/60	6/60

GDP per capita (US$)[1]	89,461.01
Population[2]	1,061,590
Surface area (km²)[3]	324
Population density (people per km²)[4]	3,296

Often called the electric vehicle capital of the world, Oslo holds the top rank in our Sustainable Mobility sub-index. The Norwegian capital has encouraged adoption with strong monetary incentives, and local authorities have invested heavily in charging infrastructure. Electric vehicles have also been encouraged through lower road tolls and taxes, free parking schemes, and access to bus lanes. In September 2021, the number of electric vehicles entering Oslo's toll ring was higher than the number of fossil-fueled vehicles. Oslo is home to so many electric vehicle drivers that the government has even begun dropping some incentives because they're no longer necessary.

Oslo has won a reputation for road safety, which it achieved through a combination of measures that slow traffic and discourage car use, such as tolls on vehicles, a reduction in the number of parking spaces, increased parking charges, and the imposition of a 30 kph speed limit outside schools. The city

has also improved its cycling and public transport infrastructure. Its metro network consists of several lines, with another under construction. Multiple tram lines run primarily on the road network, though with a few dedicated tracks.

The city promotes a circular economy: It uses biogas produced from bio-waste and city sewage to fuel city buses and waste trucks. The city has the ambition to become one of the first zero emission cities in the world and is targeting a 95% reduction in climate emissions by 2030.

However, a relatively small academic community may limit Oslo's ability to innovate, and few mobility companies are headquartered or operating in the city, restricting access to external resources for development.
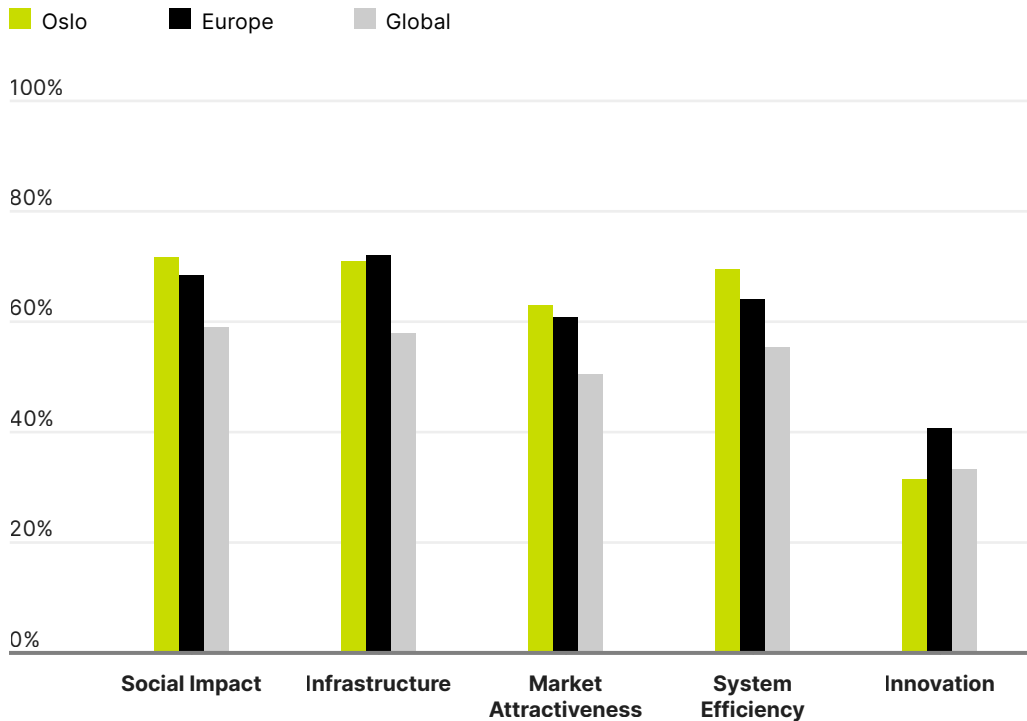
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- Oslo
- Europe
- Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

- Oslo
- Europe
- Global
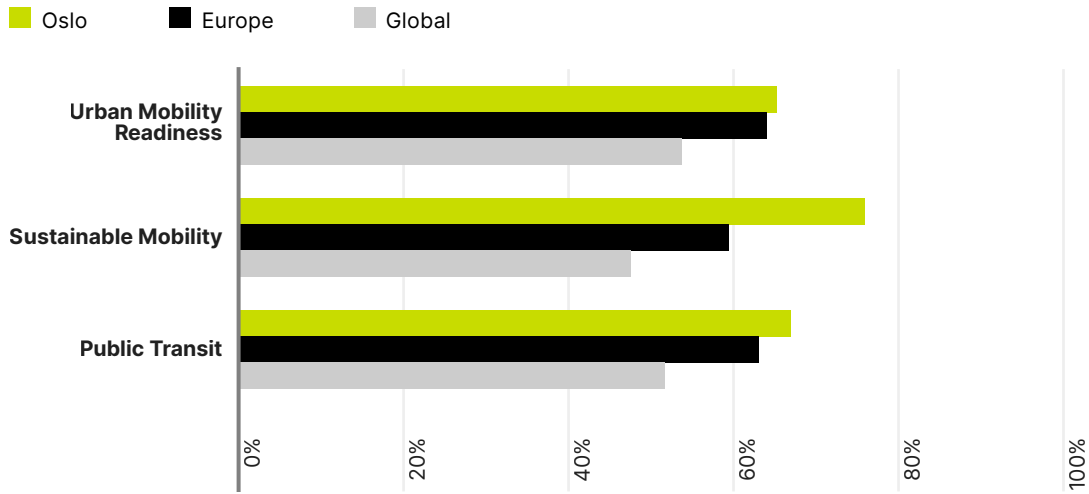
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Seoul

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
19/60	12/60	12/60

GDP per capita (US$)[1]	42,743.57
Population[2]	16,491,839
Surface area (km^2)[3]	2,769
Population density (people per km^2)[4]	8,313

Seoul's affordable and efficient public transit system sustains high ridership levels, and the city ranked second for Public Transit. Seoul Metro is one of the world's largest urban railways and has 23 lines, 293 stations and 319 km of track. The system serves nearly 10 million inhabitants within Seoul and the Gyeonggi, Incheon, and northern Chungnam provinces.

Few residents prefer walking or cycling to less environmentally friendly transport modes. But the city's "Vision 2030 for Transportation in Seoul," moves away from a past emphasis on car ownership and economic growth and instead focuses on pedestrians and environmental protection.[40] It consists of policies to promote walking and cycling by increasing the space for sidewalks, closing roads to cars on certain days, setting up bike-sharing services, and building cycle paths. Other policies include the encouragement of car-sharing and other measures to discourage the excessive use of private cars. The government expects the policies to reduce residents' annual per capita greenhouse-gas emissions.

A rich ecosystem of strong university talent and several local mobility and tech players fosters technological innovation in mobility-related industries, such as batteries, automation, robotics, and urban air mobility. But Seoul lags many peers in offering incentives for electric vehicles, and adoption remains correspondingly modest.
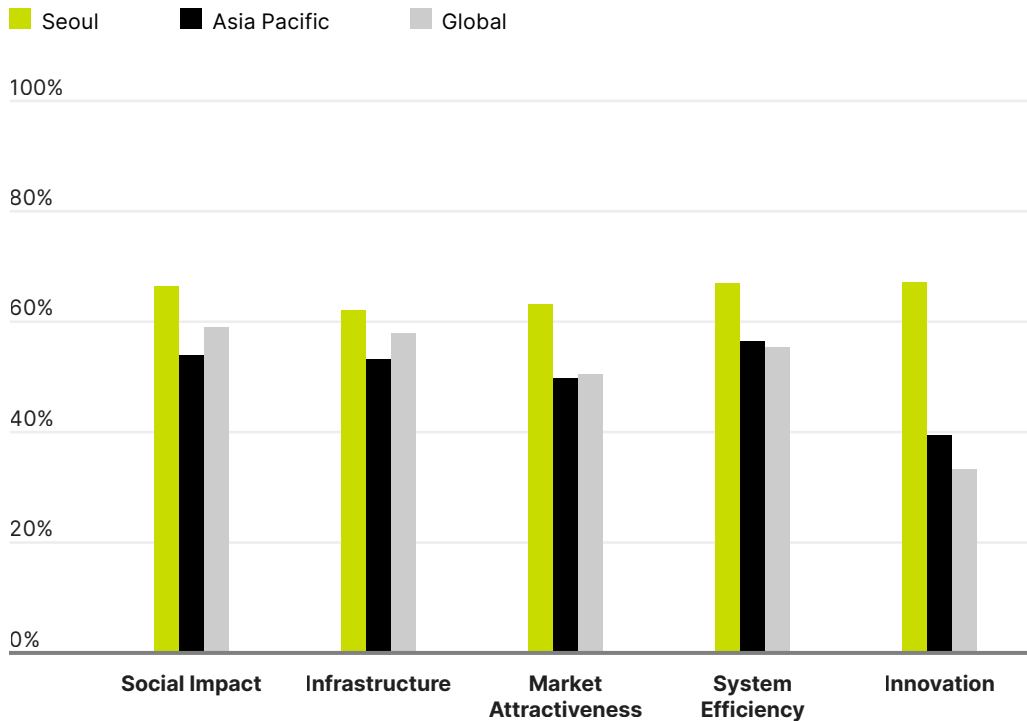
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- Seoul
- Asia Pacific
- Global

Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

- Seoul
- Asia Pacific
- Global
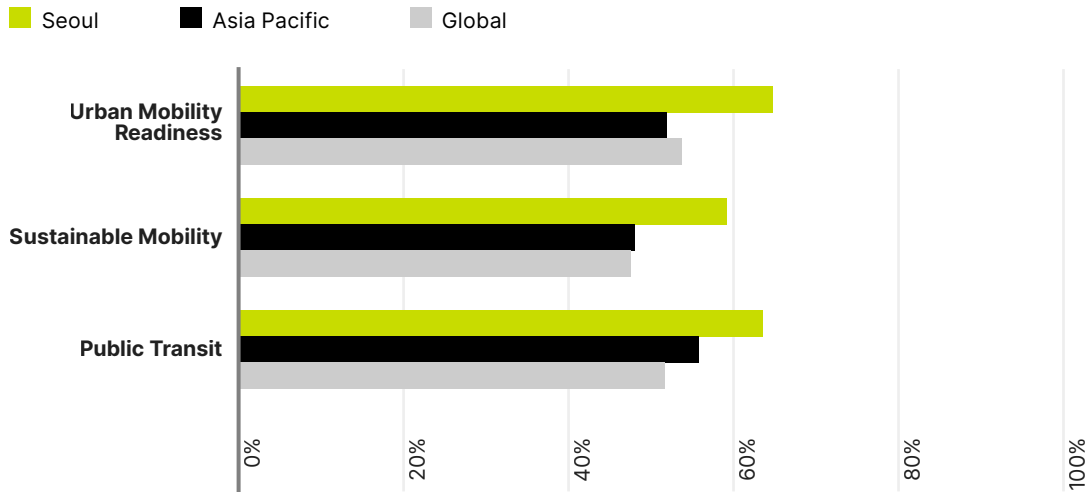
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Madrid

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
20/60	14/60	26/60

GDP per capita (US$)[1]	39,729.68
Population[2]	6,439,933
Surface area (km²)[3]	2,124
Population density (people per km²)[4]	4,551

Madrid provides affordable transit through a strong multimodal network including metro, local rail, and buses, as well as park-and-ride facilities. Bikes can be carried on public transport with some restrictions,[41] and the city operates BiciMAD, an electric bike-sharing service.[42] Madrid is the hub of Spain's high-speed rail network, which makes it very easy to access from the rest of the country. The network has significantly reduced inter-city travel by road and air.[41, 42]

The city is pushing forward with clean air initiatives which include a maximum speed limit of 30 kph in many streets and low-emissions zones for different parts of the city, preventing more-polluting vehicles from circulating.[43, 44, 45] Drivers must display an environmental sticker reflecting how clean their vehicle is. The zones are scheduled to be extended in the coming years. Madrid is also installing electric vehicle charging points, but the pace of deployment has been modest, and the Spanish capital ranks among the lowest European cities in the Urban Mobility Readiness Index for number of charging points per capita.

The Madrid 360 Sustainable Mobility Plan includes an expansion of the metro and bus-lane networks, including the implementation of 60 km of green corridors to enable buses to achieve similar speeds to the metro.[46] High-occupancy vehicle lanes will be introduced at all major road entrances to the city, according to the plan. And the city's electric bike sharing system, BiciMAD, will be expanded, as will its network of bike lanes and the availability of parking spaces for bicycles and personal mobility vehicles.

Madrid-Barajas Airport is not a major European hub, and it has comparatively low passenger numbers. Madrid lacks an extensive presence of top universities and labs working on mobility and is home to few mobility companies.
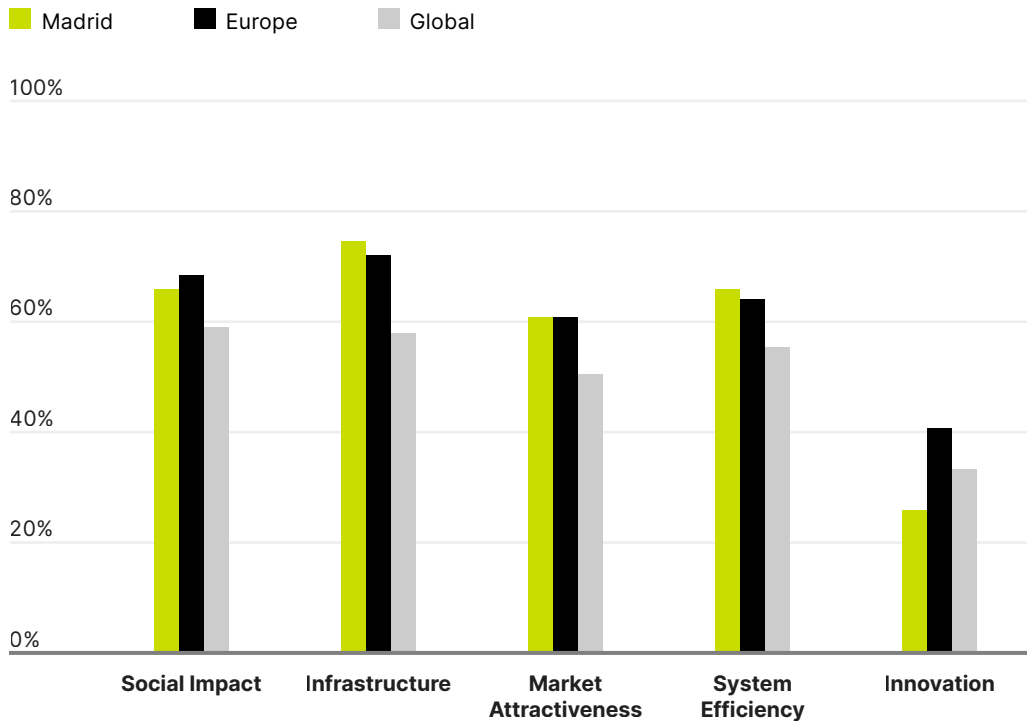
Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages
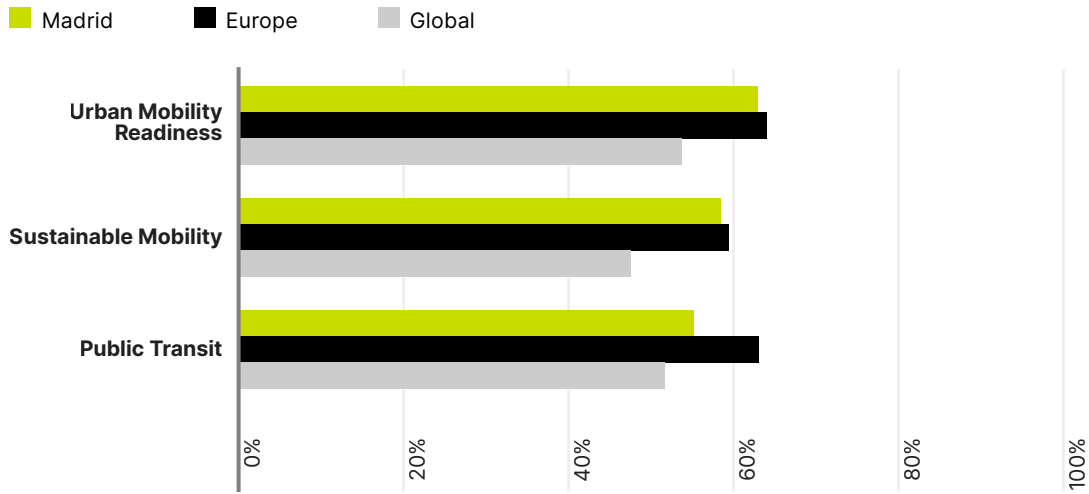
Dimensions of the Urban Mobility Readiness Index score

City scores in percentage across the five dimensions of the Urban Mobility Readiness Index, compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Sydney

Sydney boasts a strong multimodal transport network, seamlessly connecting bus, train, and ferry. It includes a fully automated metro system, which opened in 2019 and is one of the world's most innovative transit systems.

However, the public transit system still has a low density of stations, which makes them hard to access and results in low ridership. Sydney has a low density of electric vehicle charging stations, which leads to range anxiety for consumers. That has also slowed the uptake of electric vehicles in Sydney, despite Australia's targets of reducing emissions 43% by 2030 and to achieve net-zero by 2050.[47, 48]

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
21/60	26/60	14/60

GDP per capita (US$)[1]	60,002.74
Population[2]	4,851,827
Surface area (km²)[3]	2,178
Population density (people per km²)[4]	2,163

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores

City scores in percentage compared with global and regional averages

- ■ Sydney
- ■ Asia Pacific
- ■ Global
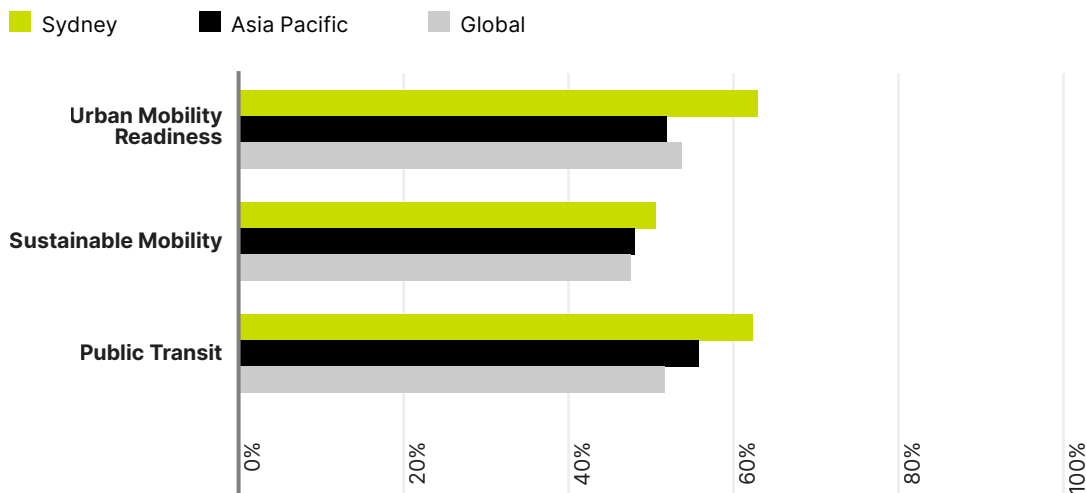
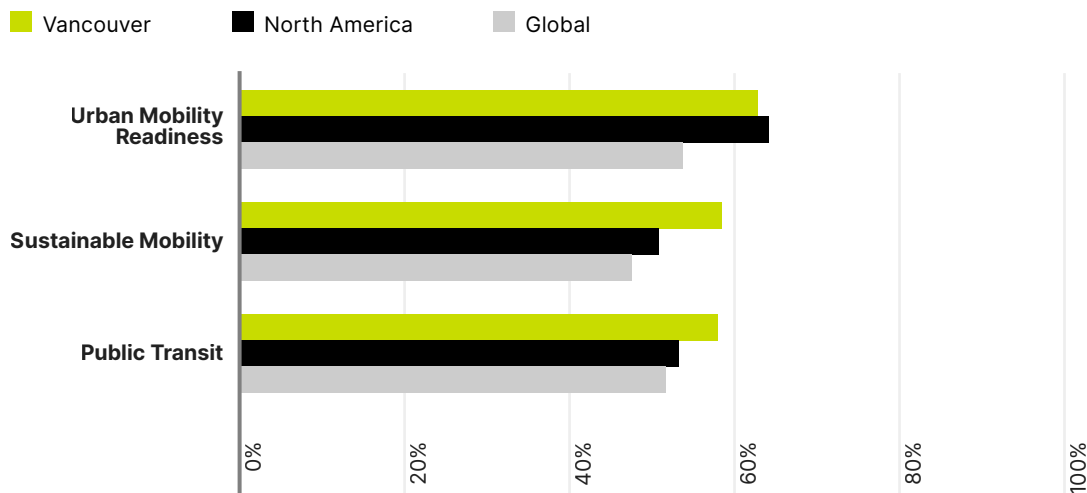Source: Oliver Wyman Forum and University of California, Berkeley analysis

Vancouver

Vancouver's affordable public transit has a strong multimodal network, and the city ranks 22nd globally for Public Transit. Vancouver's long history of automated transit started with its Skytrain, putting the system at the forefront of innovation. Its mass transit authority plans to achieve net-zero emissions by 2050 and deploy over 400 electric buses by 2030.[49] It also aims to identify infrastructure vulnerabilities to climate-related events.

The city hosts few shared mobility companies and lacks a central multimodal app for routing and payment across providers. Vancouver's airport has low international passenger volumes and relatively few connections despite being Canada's second busiest.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
22/60	15/60	22/60

GDP per capita (US$)[1]	52,725.73
Population[2]	2,533,176
Surface area (km^2)[3]	912
Population density (people per km^2)[4]	2,698

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages


Source: Oliver Wyman Forum and University of California, Berkeley analysis

Atlanta

Atlanta has a car-centric approach to mobility, translating into low public transit station density and longer walks to stations. As a result, utilization rates are currently low, even though the transit system is fast and affordable – qualities that may help boost ridership in the future.

Car-free zones are limited, and cycling infrastructure is currently underdeveloped. However, a $750 million infrastructure initiative over the next five years plans to build more sidewalks and bike lanes.[50] Atlanta's airport is a major hub: It is the second largest airport in the Urban Mobility Readiness Index, and international travel continues to recover from the COVID pandemic.
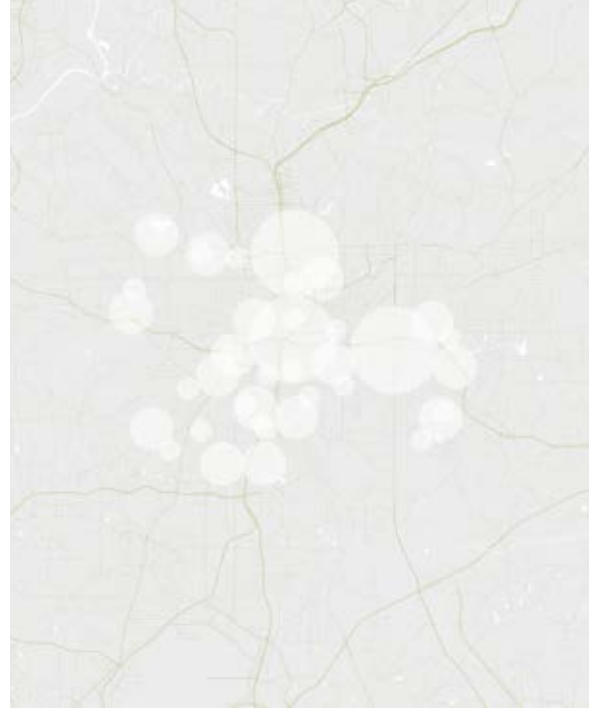
Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
23/60	33/60	42/60

GDP per capita (US$)[1]	76,247.09
Population[2]	5,694,620
Surface area (km²)[3]	7,400
Population density (people per km²)[4]	740

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages
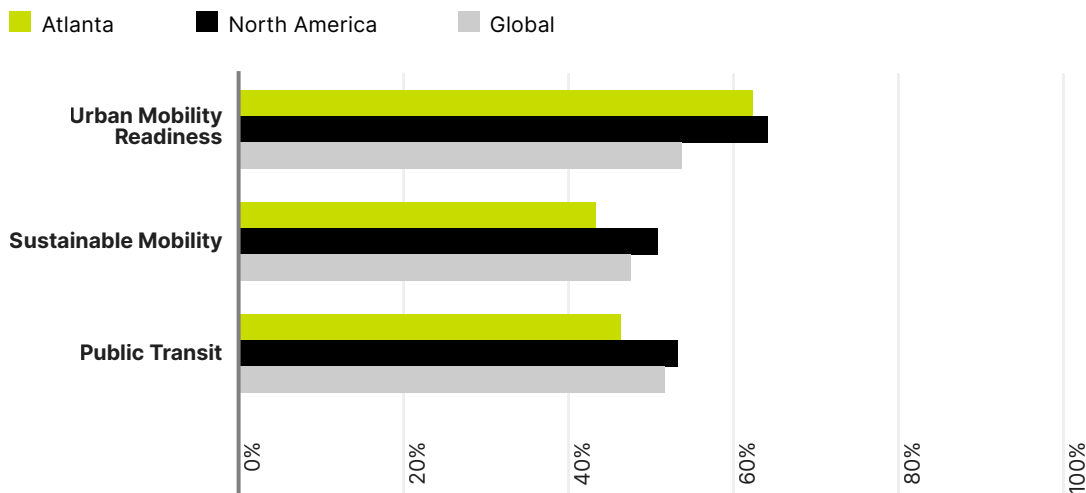
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Barcelona

Barcelona's well-connected multimodal public transit network is affordable and complemented by Spain's strong rail system. Barcelona also benefits from a national road network that provides strong regional connectivity. A national road safety plan announced this year plans to halve traffic deaths and serious injuries by 2030, through increasing bike lanes and lowering speed limits.[51]

Despite low-emission zones, electric vehicle market share remains lower than in many other European cities, due to relatively low density of charging stations. Cycling adoption lags other European cities, but a proposed mobility plan aims to improve traffic lights for cyclists and create safer bicycle parking.[52]

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
24/60	17/60	21/60

GDP per capita (US$)[1]	35,274.16
Population[2]	5,212,249
Surface area (km²)[3]	1,072
Population density (people per km²)[4]	4,477

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages
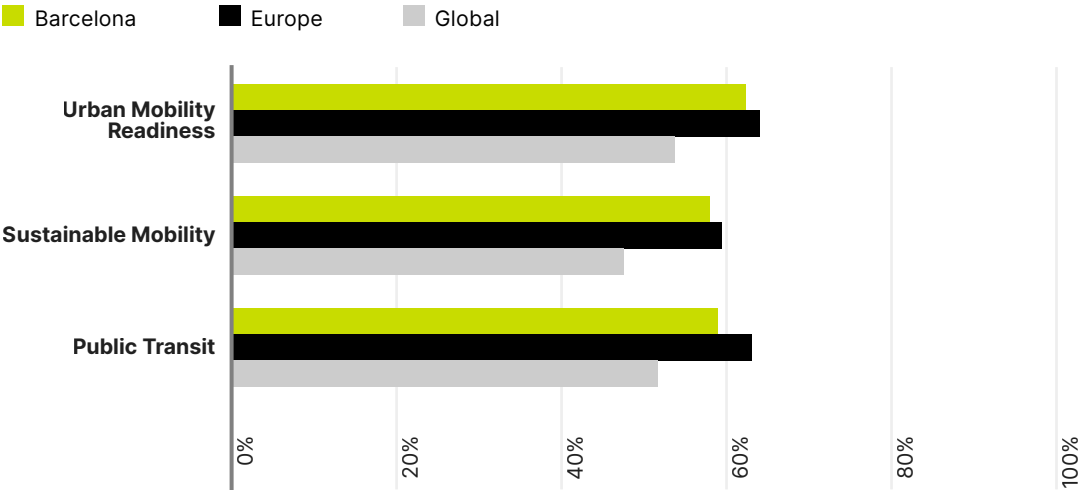
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Toronto

Toronto has affordable public transit, and its subway system, buses, streetcars, trains, and ferries are connected by a strong multimodal network. The metropolitan area benefits from the regional connectivity offered by Canada's strong road network. Road infrastructure is of high quality, and Toronto sees relatively few traffic fatalities. However, the city's 2017 Vision Zero goal to eliminate traffic deaths hasn't yet been achieved: Fatalities remain in the double digits.[53]

Few mobility companies are based in Toronto, and past initiatives to attract private sector investment have failed. The city's international airport logs low passenger volumes compared with leading global hubs.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
25/60	19/60	34/60

GDP per capita (US$)[1]	54,155.82
Population[2]	6,512,786
Surface area (km²)[3]	2,344
Population density (people per km²)[4]	2,889

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Toronto　■ North America　■ Global
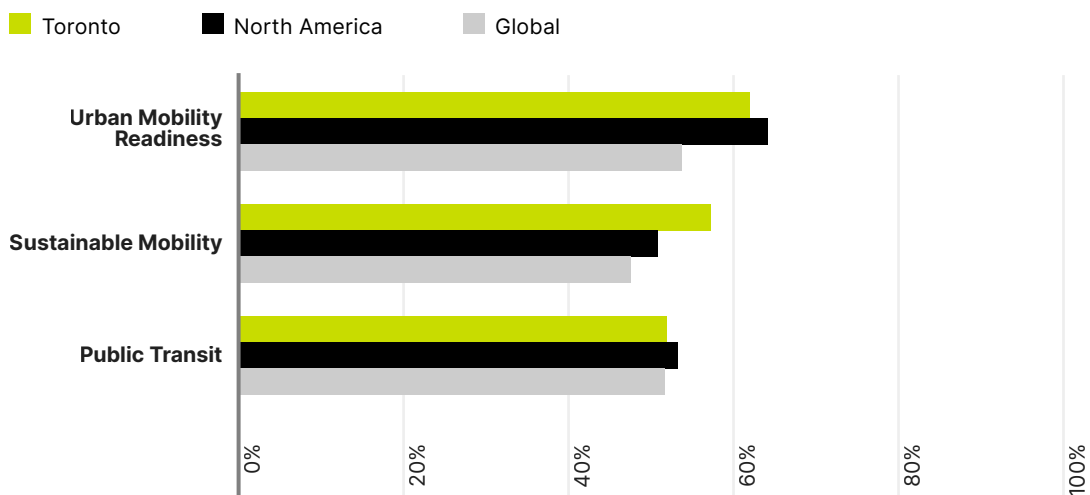
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Montreal

Montreal has prioritized multimodality in its dense, affordable bus and metro networks. The city's 2021-2023 Transportation Electrification Strategy aims to have 84% of trips electrically powered.

The local government has continued strong investment in electric charging infrastructure and incentives, and the Transportation Electrification Strategy is aiming for 600 public charging stations and more than 2,000 shared electric bikes by 2023.[54]

However, residents tend to avoid active modes of mobility like cycling and walking, perhaps due to winter weather. Few shared mobility companies operate in Montreal, which appears not to be seen as a major market.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
26/60	24/60	31/60

GDP per capita (US$)[1]	46,672.59
Population[2]	3,977,223
Surface area (km²)[3]	1,383
Population density (people per km²)[4]	2,680

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

- Montreal
- North America
- Global
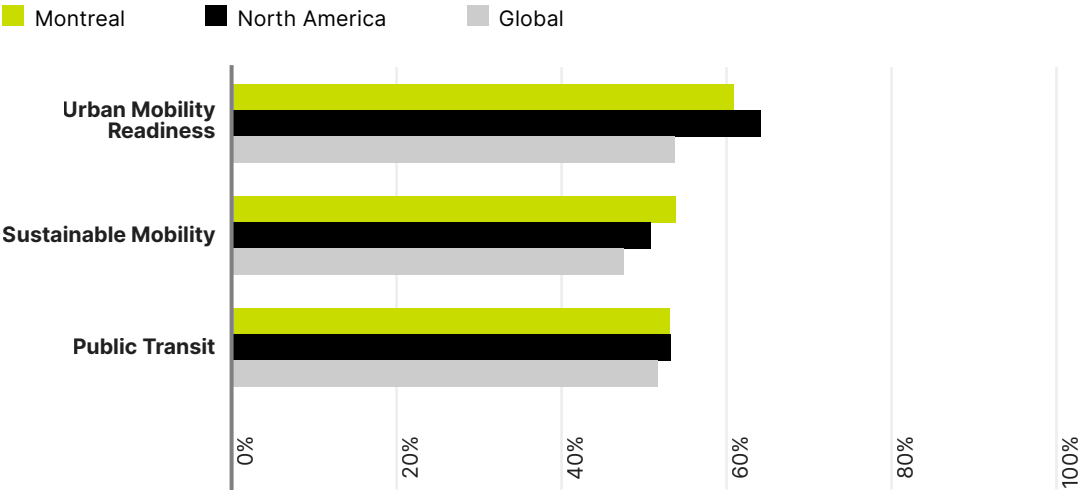
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Houston

Houston's high rate of car ownership contributes to low usage of its limited public transit system. But the city is seeking to improve public transportation through its Moving Forward Plan. This envisages multimodal offerings, including more park-and-ride facilities, and aims to expand bus and light-rail services, as well as high-occupancy-vehicle lanes.[55]

City authorities are encouraging connected autonomous vehicles pilots, and self-driving pizza deliveries started in 2021. However, Texas residents have been slow to switch to electric vehicles, and charging infrastructure is limited in much of the state.
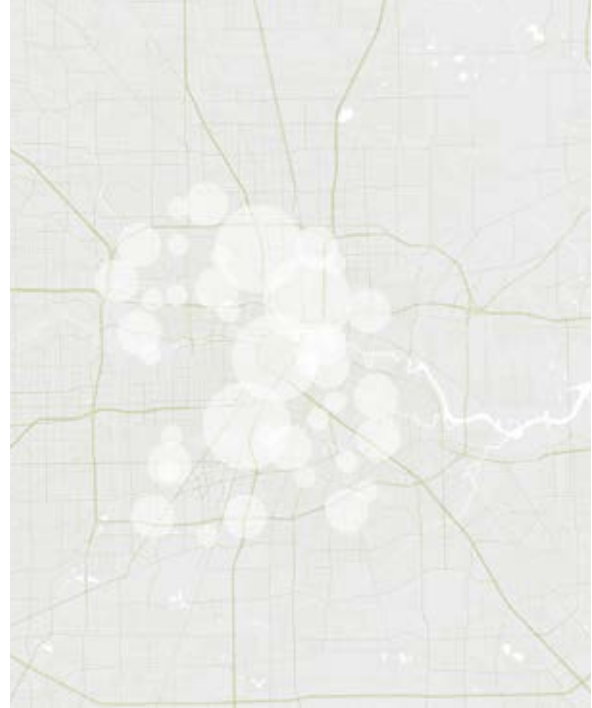
Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
27/60	35/60	43/60

GDP per capita (US$)[1]	73,767.88
Population[2]	6,495,375
Surface area (km²)[3]	4,931
Population density (people per km²)[4]	1,318

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

Legend: Houston, North America, Global

Urban Mobility Readiness

Sustainable Mobility

Public Transit
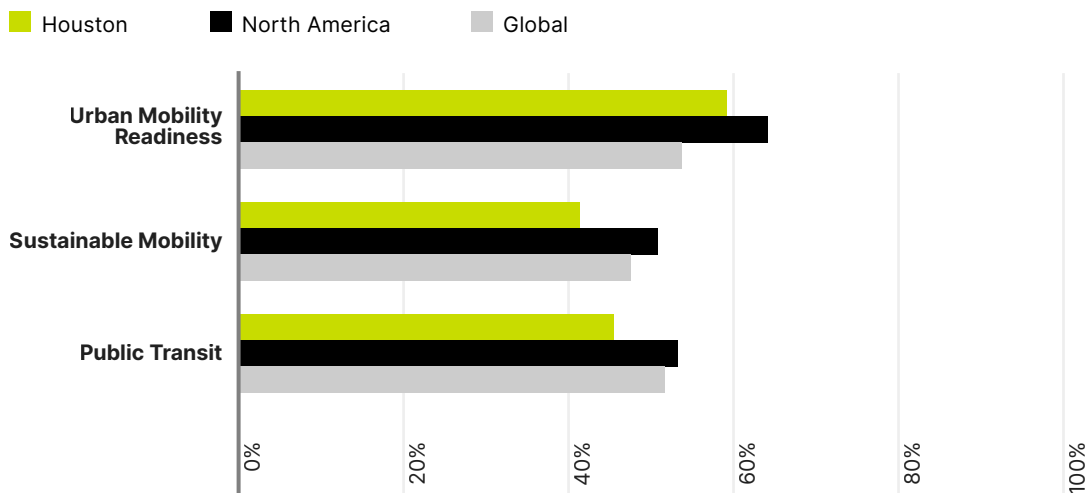
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Dallas

Dallas is emerging as a living lab for connected autonomous vehicles technologies, and several mobility providers carried out pilots in the city in 2022. Arlington, a 30-minute drive west of Dallas, launched an on-demand self-driving shuttle service last year in partnership with mobility providers and a local university.[56] Traffic in Dallas is increasing, and the city operates adaptive congestion pricing to prevent major traffic blockages.

However, Dallas has not yet developed infrastructure to encourage non-motorized modes of mobility, such as walking and cycling. As such, Dallas is regarded as one of the least bikeable cities in the United States.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
28/60	41/60	45/60

GDP per capita (US$)[1]	75,644.63
Population[2]	6,673,253
Surface area (km^2)[3]	5,278
Population density (people per km^2)[4]	1,317

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages
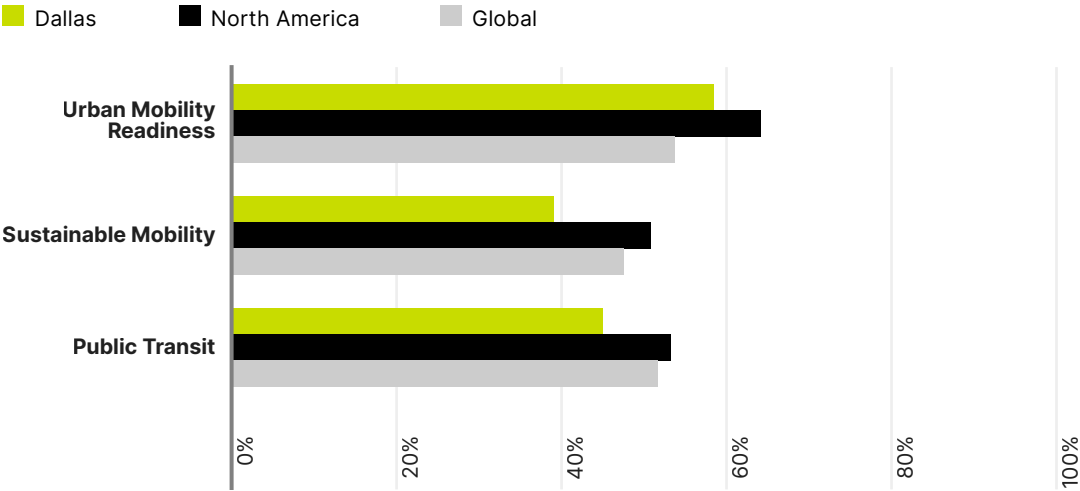
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Beijing

Beijing commuters benefit from strong regional connectivity, as China boasts an excellent rail network. The city has achieved wide adoption of electric vehicles by offering incentives for consumers, such as easing restrictions on peak-hour driving for electric vehicles[57] and extensions on tax breaks for electric vehicle buyers.[58]

Despite the high market share of electric vehicles, Beijing is one of the world's most polluted cities, having poor air quality and high levels of noise and light pollution. In addition, the Chinese capital is not very pedestrian-friendly, which limits the number of trips made on foot.
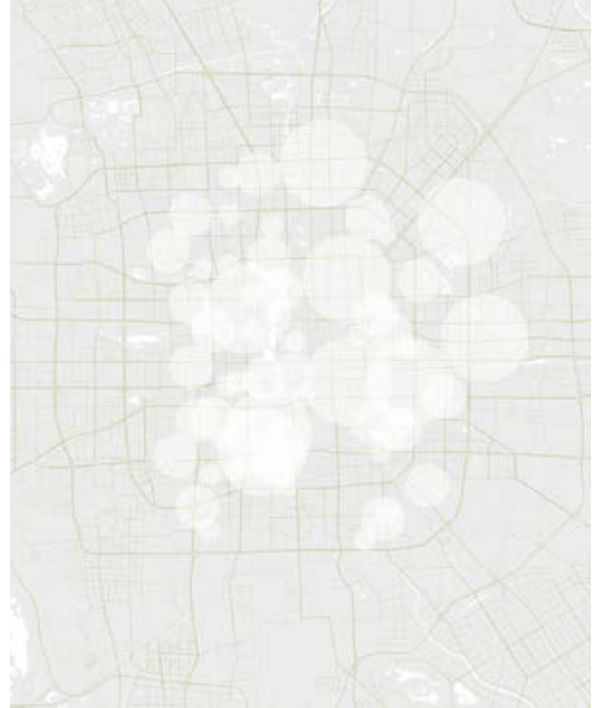
Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
29/60	16/60	27/60

GDP per capita (US$)[1]	27,504.55
Population[2]	19,709,411
Surface area (km²)[3]	4,284
Population density (people per km²)[4]	4,324

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

- Beijing
- Asia Pacific
- Global
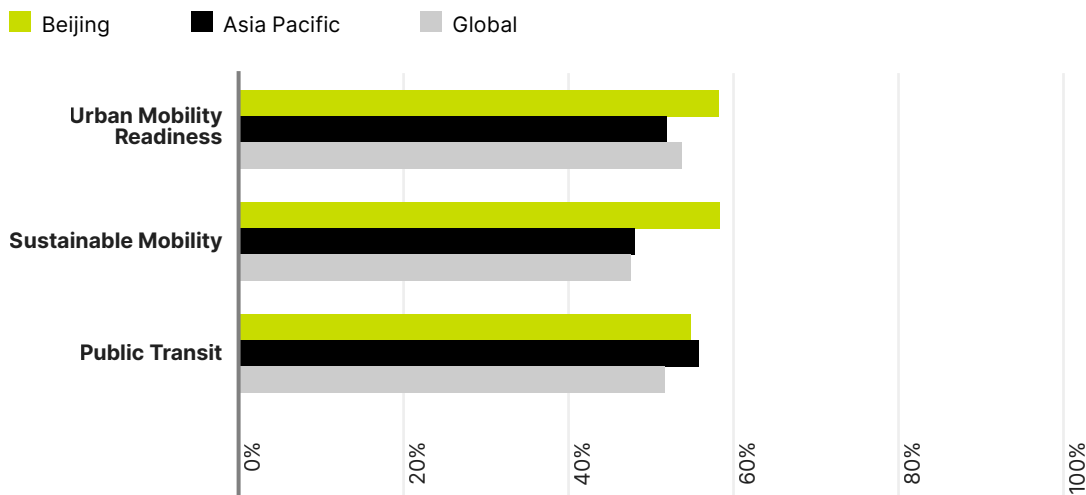
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Dubai

Dubai is institutionally friendly to new paradigms in mobility. The city has invested significantly in urban air mobility and scooter-sharing pilots over the last year.

The city has sought to develop fast, affordable, and sustainable public transit, with a multimodal app and automated operation on the metro lines,[59] with plans for the system to be net-zero by 2050. Still, car ownership is currently preferred to public transit due to Dubai's geographical spread.[60] Residents have not fully embraced cycling or walking, due to the high summer temperatures and the current small number of bike lanes and car-free zones.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
30/60	39/60	29/60

GDP per capita (US$)[1]	31,234.17
Population[2]	4,662,688
Surface area (km²)[3]	1,507
Population density (people per km²)[4]	4,249

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Dubai   ■ Middle East   ■ Global
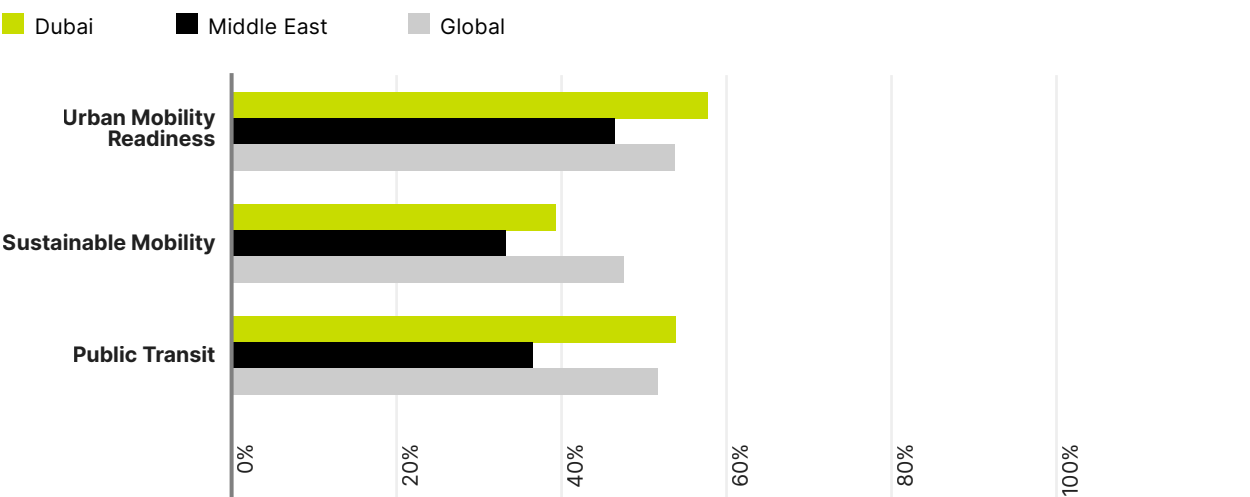
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Milan

Milan boasts a well-connected, multimodal network of central transit hubs and suburban park-and-ride stations. Its public transit system is fast and affordable.

Although Milan has put in place regulations and incentives to increase the adoption of electric vehicles, charging infrastructure and electric vehicle sales lag compared with the city's European peers. Milan does not benefit from a rich environment of mobility innovation: Few mobility companies are located there, and only a limited number of Information and communications technology patents are filed in Italy, indicating relatively little innovation in new forms of mobility.
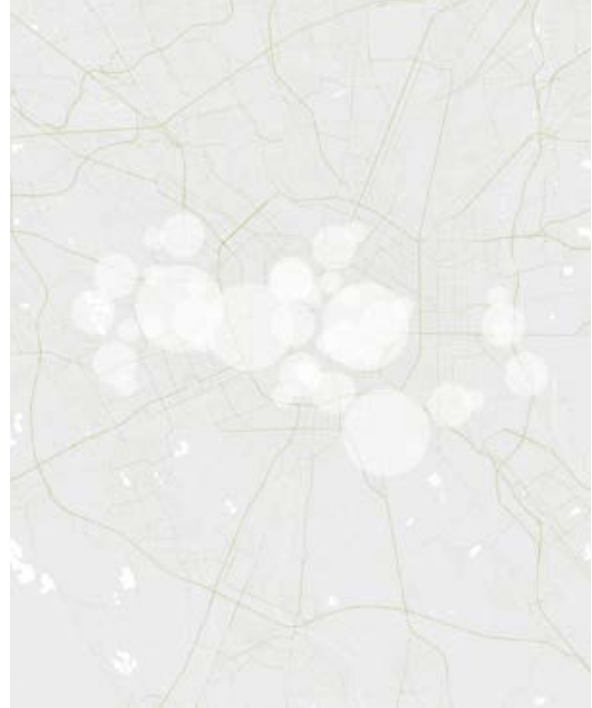
Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
31/60	28/60	18/60

GDP per capita (US$)[1]	58,415.37
Population[2]	4,316,237
Surface area (km²)[3]	2,225
Population density (people per km²)[4]	2,467

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Milan ■ Europe ■ Global
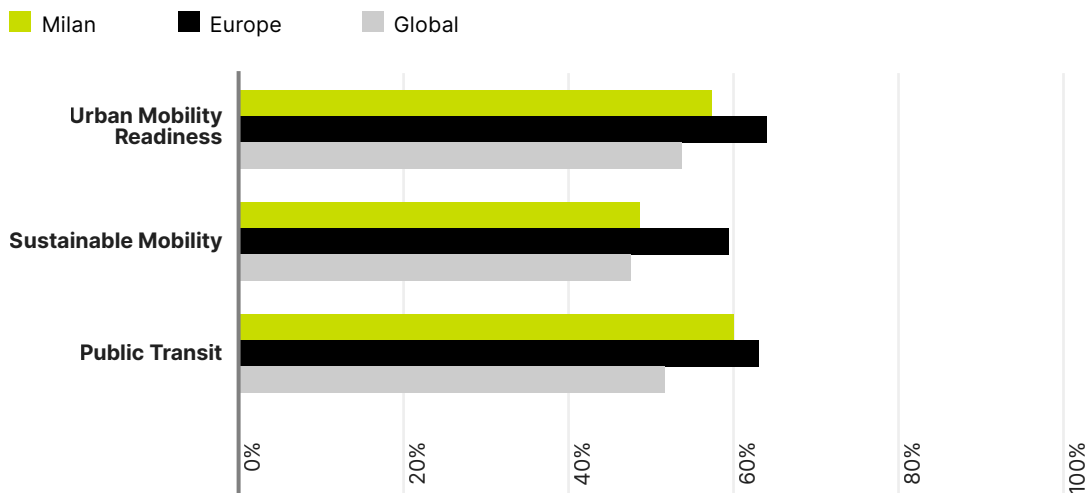
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Dublin

Dublin has few road fatalities and enforces traffic laws diligently, in line with Ireland's road safety strategy. The city has one of the fastest growing market shares of electric vehicles, and the government has invested in building out the charging infrastructure. However, Dublin does not have a strong mobility innovation ecosystem, and few of the leading universities and labs operating in the mobility space are present in the city.

Dublin's airport is not a major hub and has low international connectivity compared with its European peers.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
32/60	13/60	28/60

GDP per capita (US$)[1]	111,335.27
Population[2]	1,314,477
Surface area (km²)[3]	461
Population density (people per km²)[4]	3,009

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

- Dublin
- Europe
- Global
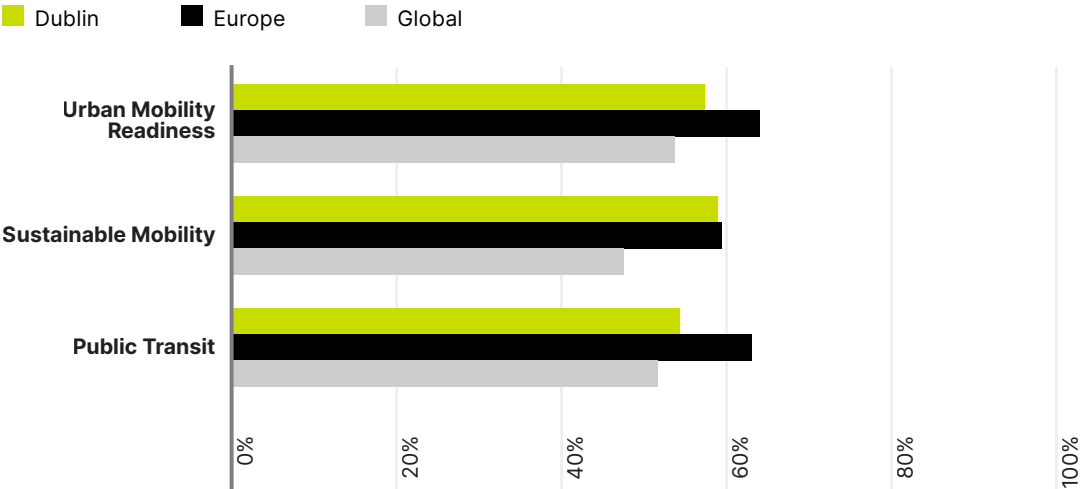
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Shanghai

Ride-sharing is popular among residents, and the city continues to invest in shared mobility modes. Bold regulations and investment in charging stations have fueled impressive growth in the city's electric vehicle market share.

But despite the popularity of electric vehicles, Shanghai experiences poor air quality and high levels of noise and light pollution, similarly to other Chinese cities. The city struggles with sustainable mobility outside of electric vehicles, as few residents bike or walk. A low density of public transit stations also impedes accessibility.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
33/60	**18**/60	**32**/60

GDP per capita (US$)[1]	26,000.58
Population[2]	27,795,702
Surface area (km²)[3]	4,333
Population density (people per km²)[4]	5,556

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

- Shanghai
- Asia Pacific
- Global
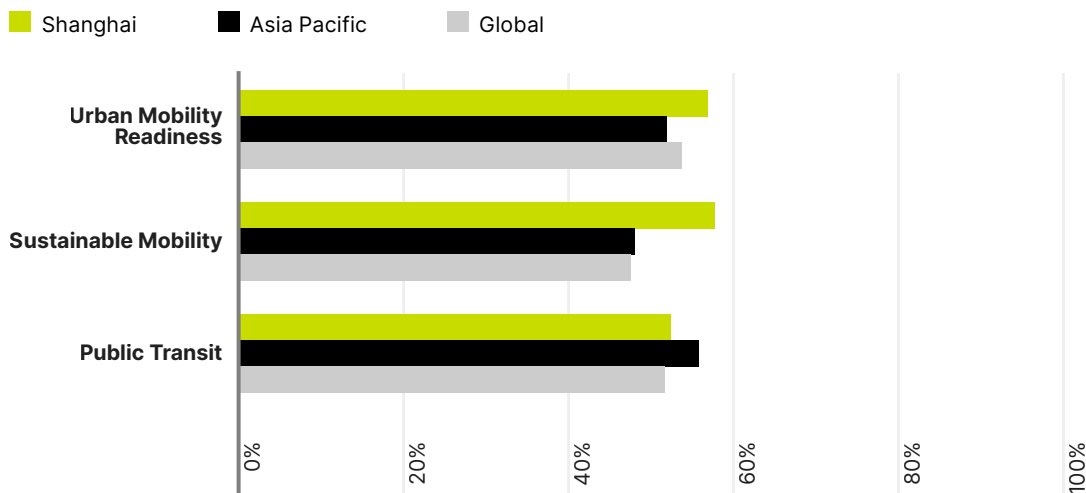
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Moscow

Moscow operates a wide variety of public transit modes, including buses, trams, subways and more. The public transportation network is supported by a well-developed multimodal app.

Despite the comprehensive public transit system, Moscow's roads are highly congested – a problem likely exacerbated by Russia's overall poor road quality. Moscow has also suffered from weaknesses in its supply chain infrastructure and services.


Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
34/60	31/60	15/60

GDP per capita (US$)[1]	22,796.39
Population[2]	14,962,626
Surface area (km²)[3]	2,562
Population density (people per km²)[4]	2,817

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Moscow ■ Europe ■ Global
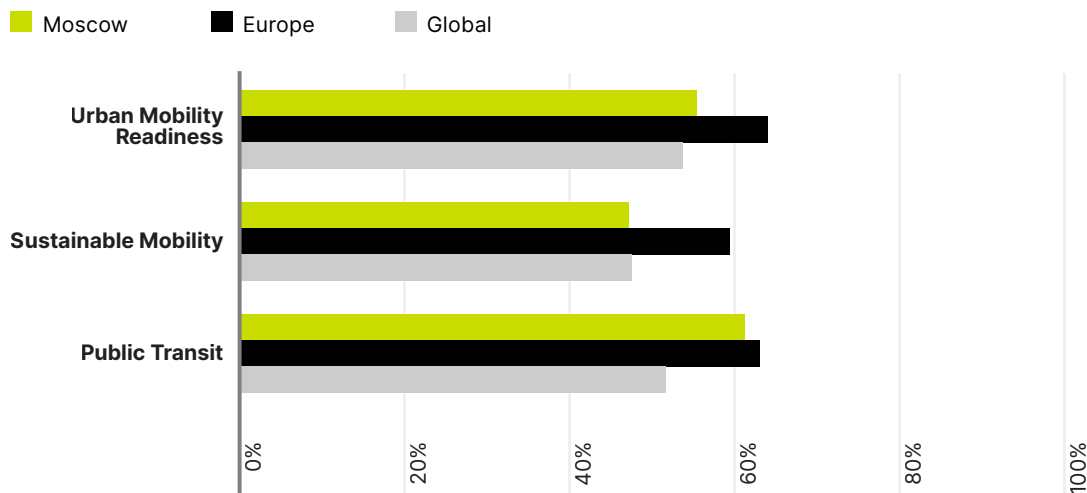
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Warsaw

Warsaw benefits from a high level of employment in the transportation sector. Multimodality flourishes in Warsaw with extensive car-free zones. The Polish capital's Urban Mobility Operating System project aims to further strengthen its mobility-as-a-service offerings by 2023, with options including a journey planner to integrate multimodal fares in one place.[61]

Warsaw's electric vehicle market lags that of other European cities, in part due to limited charging infrastructure and incentives. With relatively few companies or leading universities and labs in the city, the mobility innovation ecosystem is currently quiet. Nationally, few information and communication technology patents are filed, suggesting relatively little mobility innovation.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
35/60	32/60	19/60

GDP per capita (US$)[1]	37,614.72
Population[2]	1,876,310
Surface area (km²)[3]	546
Population density (people per km²)[4]	3,592

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Warsaw ■ Europe ■ Global
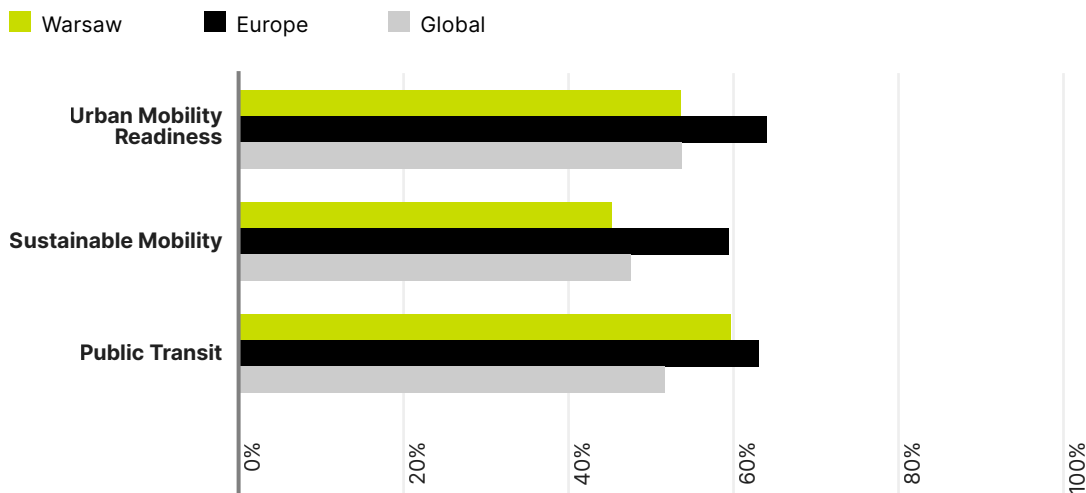
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Istanbul

Road transportation is well developed in Istanbul. High-quality infrastructure in the metropolitan area is supported by strong connectivity with the rest of the country. However, roads are often extremely congested, especially in the morning and evening rush hours.

Residents have not embraced cycling as a way of getting around, partly because Istanbul sits atop hilly terrain. The city's new international airport, opened in 2019, has seen relatively high volumes of traffic.
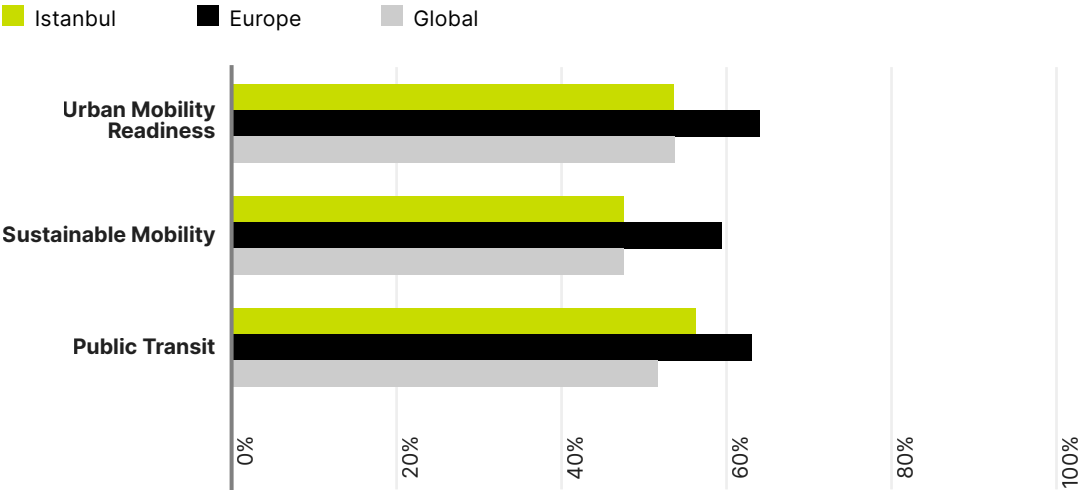
Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
36/60	30/60	25/60

GDP per capita (US$)[1]	14,151.87
Population[2]	15,747,099
Surface area (km2)[3]	1,471
Population density (people per km2)[4]	10,930

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Abu Dhabi

Abu Dhabi is implementing a strategy to manage driving speeds in order to reduce traffic accidents.[62]

Public transit includes buses, taxis, and ferries, and the city is trying to make these services more attractive through affordable prices and a comprehensive multimodal app. Abu Dhabi International Airport is secondary to Dubai's airport, resulting in fewer passengers and international connections. The city needs to invest in more charging infrastructure to boost its low rate of electric vehicle adoption.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
37/60	38/60	52/60

GDP per capita (US$)[1]	67,712.50
Population[2]	1,442,884
Surface area (km²)[3]	1,064
Population density (people per km²)[4]	1,291

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Abu Dhabi   ■ Middle East   ■ Global
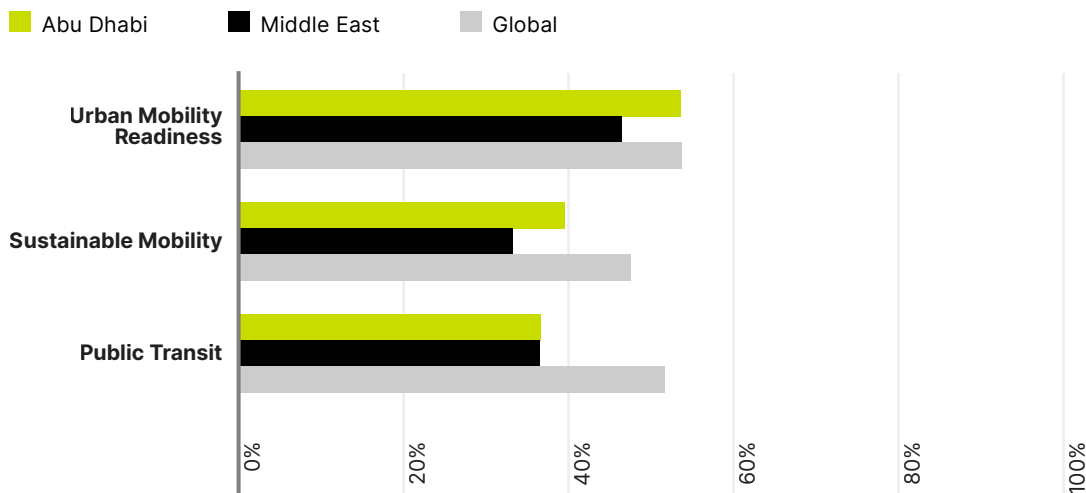
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Doha

Residents generally favor personal cars over walking, but ride-sharing is common among residents as well. Doha lags in sales of electric vehicles and needs to expand its charging infrastructure and experiment with incentives in order to spur consumer adoption.

The government has invested heavily in the recent launch of the autonomous Doha Metro, which is known for its low wait times and affordable pricing relative to local incomes.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
38/60	56/60	44/60

GDP per capita (US$)[1]	58,677.75
Population[2]	1,266,089
Surface area (km^2)[3]	575
Population density (people per km^2)[4]	3,280

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Doha ■ Middle East ■ Global
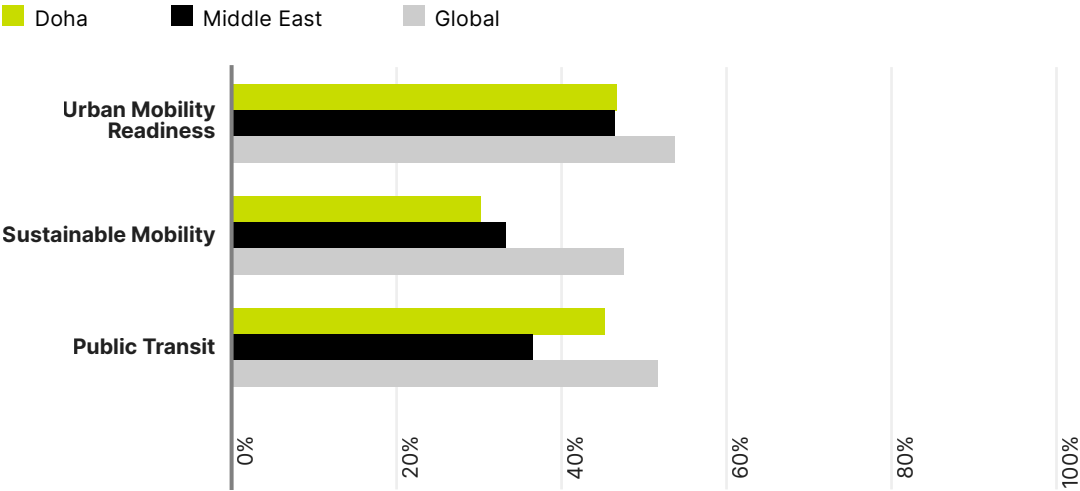
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Santiago

Santiago benefits from strong regional linkages thanks to Chile's well connected overall road network. The city possesses an affordable public transit system, combining bus, metro and train. It includes an integrated fare system using a single contactless transit smartcard.[63]

Santiago has few leading universities and labs focused on the mobility space and does not have a strong presence of mobility companies to spur innovation. The city's airport has only limited international connectivity, with correspondingly few passengers.


Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
39/60	42/60	36/60

GDP per capita (US$)[1]	15,327.21
Population[2]	6,991,298
Surface area (km²)[3]	838
Population density (people per km²)[4]	6,250

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Santiago ■ Latin America ■ Global
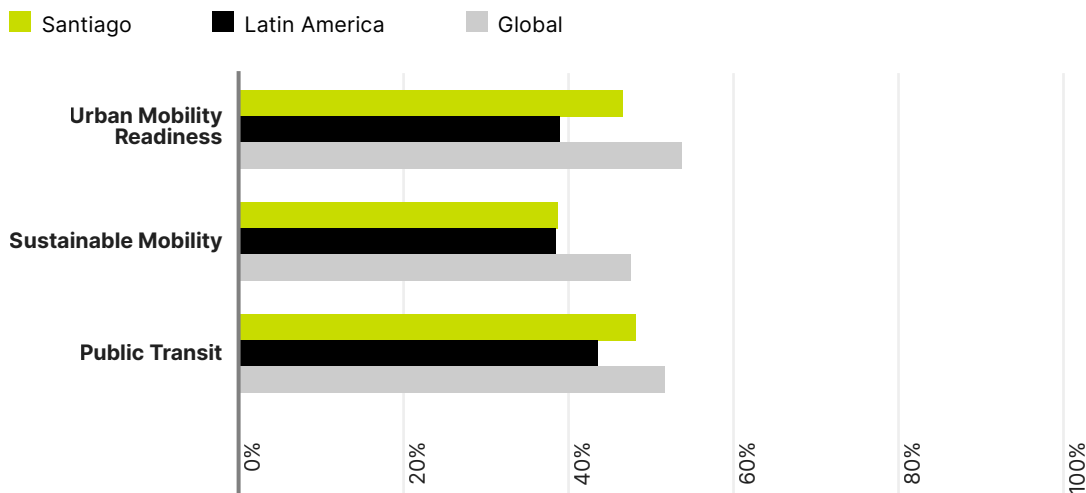
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Kuala Lumpur

Kuala Lumpur benefits from a wide variety of public transit modes, ranging from Bus Rapid Transit to rapid rail. Autonomous technology powers the city's metro system.

Despite its strong public transit system, Kuala Lumpur has a high number of road traffic accidents – a rate that's among the worst in our Urban Mobility Readiness Index. The city's roads also provide low regional connectivity, as Malaysia has a fragmented road network. Few residents currently bike or walk on a daily basis, and the city would benefit from investment in cycling infrastructure and in sidewalks.
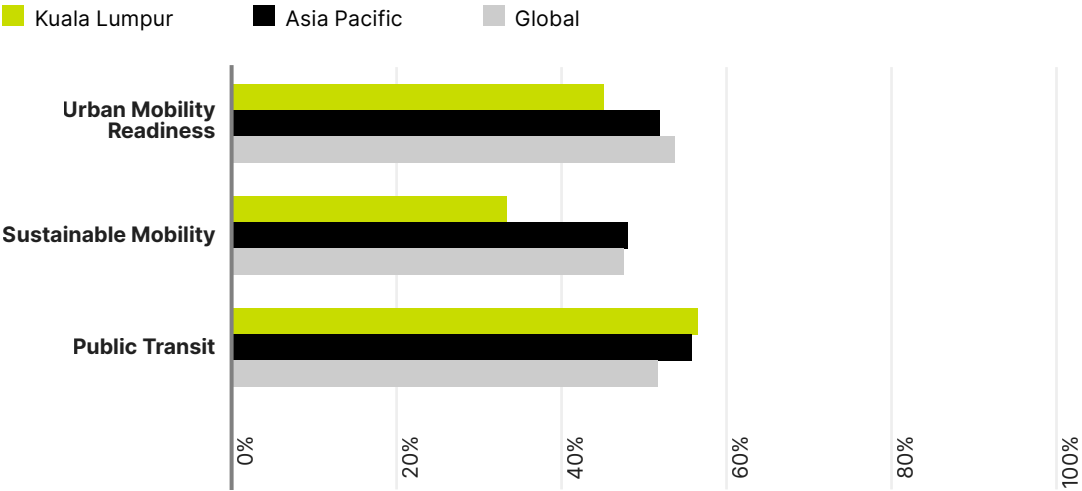

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
40/60	53/60	23/60

GDP per capita (US$)[1]	31,228.03
Population[2]	8,560,873
Surface area (km²)[3]	2,163
Population density (people per km²)[4]	4,121

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Buenos Aires

Buenos Aires is noted for its affordable public transit, which has a high rate of usage. Its networks include Bus Rapid Transit, traditional buses, trams, and commuter rail services. The six-line metro system is known for rapid service.[64]

Argentina employs a high proportion of workers in transport and storage, with the lion's share in the capital. However, the city struggles with supply chain efficiency due to the country's weak logistics infrastructure. Ezeiza International Airport has limited international connectivity and comparatively few passengers.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
41/60	40/60	30/60

GDP per capita (US$)[1]	13,621.69
Population[2]	15,983,837
Surface area (km²)[3]	3,437
Population density (people per km²)[4]	4,862

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Buenos Aires   ■ Latin America   ■ Global
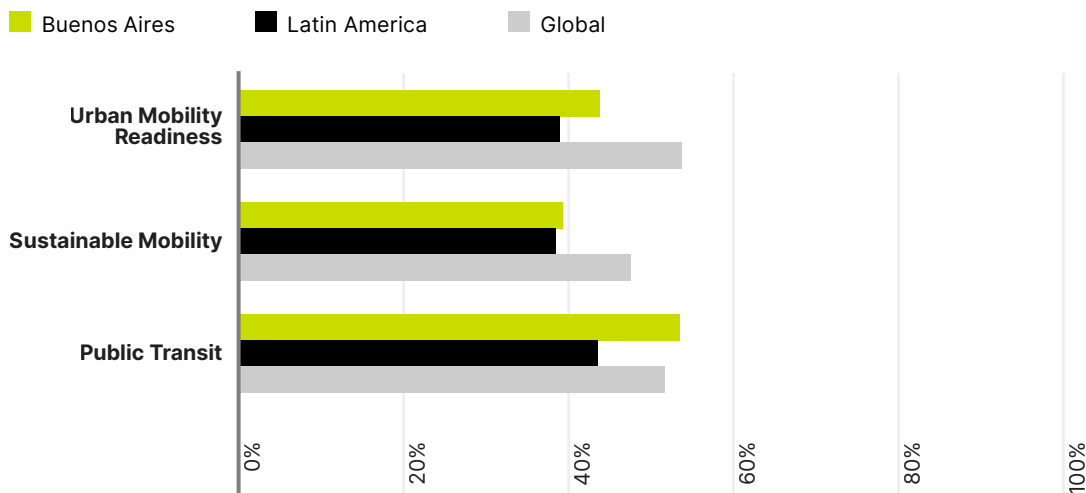
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Cape Town

Cape Town's extensive Bus Rapid Transit system has strong multimodal linkages, with park-and-ride connections and permissive rules for bikes on transit. The city is also served by commuter and suburban rail services.[65] Cape Town has few internationally competitive universities, which may hurt its prospects for future mobility development.

The city is South Africa's most congested due to heavy use of private cars.[66] It also suffers from high rates of road traffic fatalities, in part due to poor enforcement of traffic laws. But Cape Town benefits from good regional linkages with South Africa's road network.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
42/60	44/60	55/60

GDP per capita (US$)[1]	7,066.59
Population[2]	4,578,995
Surface area (km²)[3]	839
Population density (people per km²)[4]	5,301

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages
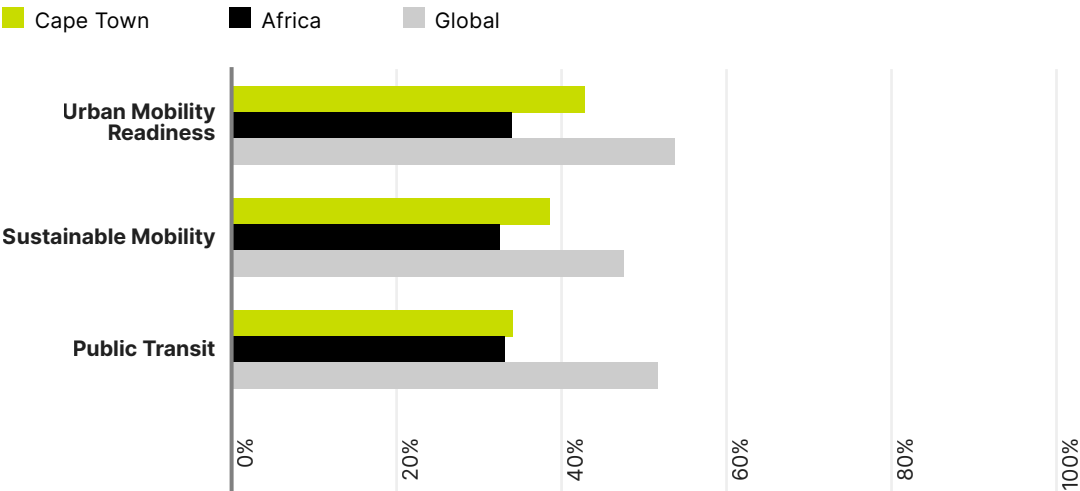

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Sao Paulo

Sao Paolo is connected by a strong multimodal network, including significant hubs connecting bus, metro, and rail networks. Despite having bike-friendly rules on public transit, cycling adoption in the city remains limited. However, the city has poor rail connections to the rest of Brazil. Ticket prices are high relative to local incomes, putting public transit out of reach of Sao Paulo's poorest residents.

Local and national authorities have sought to encourage electric vehicle adoption through monetary and non-monetary incentives, such as exemptions from some of Sao Paulo's circulation restrictions.
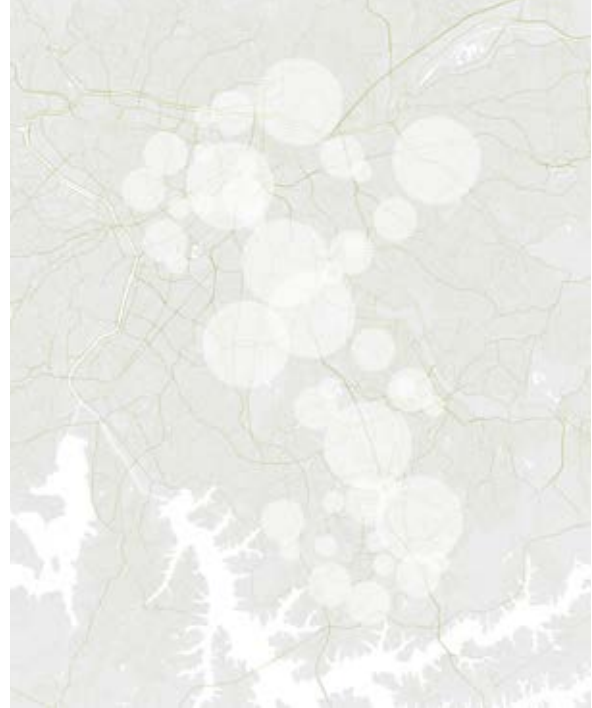
Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
43/60	37/60	47/60

GDP per capita (US$)[1]	12,566.23
Population[2]	22,661,736
Surface area (km²)[3]	3,649
Population density (people per km²)[4]	6,326

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Sao Paulo ■ Latin America ■ Global
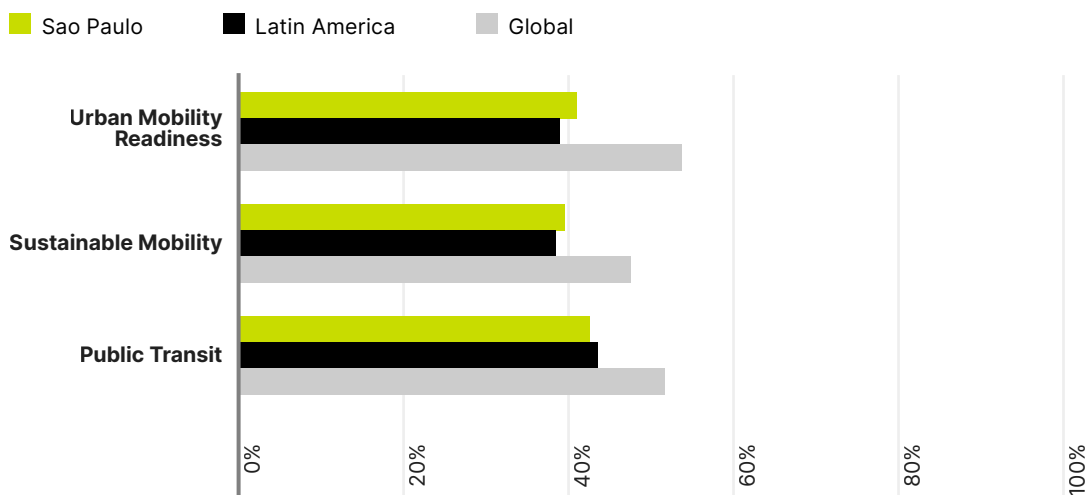
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Bangkok

Bangkok has a rich mix of transportation modes, including light rail, buses, and river taxis, and it is linked by a strong multimodal network. This enables residents to park at commuter lots and bring bicycles on public transportation. Transit is affordable for the general public, with tickets priced at a reasonable level relative to local incomes.

However, traffic laws are not well enforced, and the city suffers from a high rate of road fatalities and ranks near the bottom of the Urban Mobility Readiness Index for road safety. And the authorities have yet to take adequate precautions against natural hazards despite frequent flooding during the rainy season.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
44/60	47/60	39/60

GDP per capita (US$)[1]	18,979.01
Population[2]	14,364,908
Surface area (km²)[3]	3,199
Population density (people per km²)[4]	5,630

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Bangkok ■ Asia Pacific ■ Global
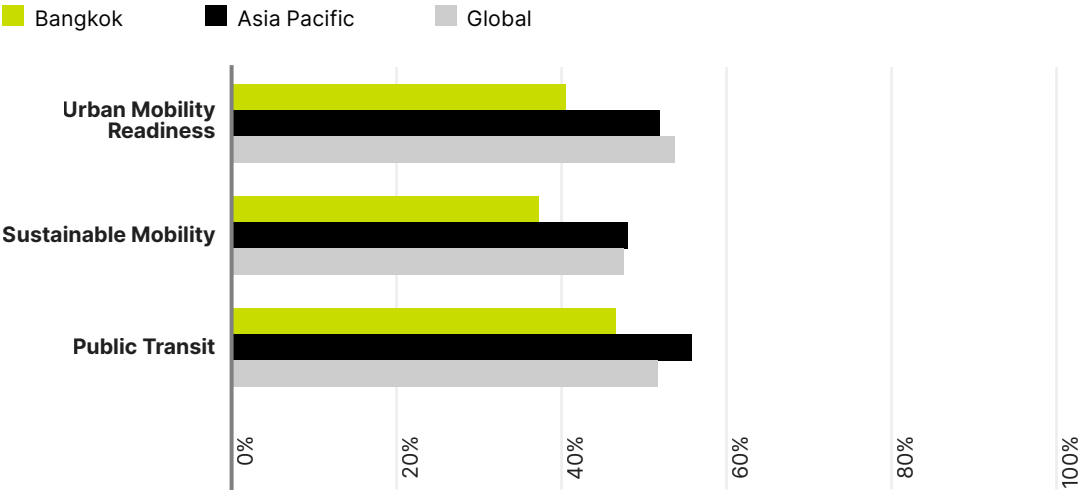
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Mexico City

Mexico City benefits from Mexico's national investment in mobility, which has achieved a high level of road connectivity. But the city also suffers from an underdeveloped traffic management system, as well as low enforcement of transport safety rules. Public transit consists of various forms of bus and rail service, including a heavily used metro network and Metrobús, a seven-line Bus Rapid Transit system.[67]

The authorities offer monetary and non-monetary incentives to encourage electric vehicle adoption, and these have been effective. However, Mexico City has not yet prioritized connected autonomous vehicles technologies. Investment and enabling regulations are lacking, and fully autonomous transit is not yet in place.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
45/60	36/60	50/60

GDP per capita (US$)[1]	23,451.42
Population[2]	21,861,468
Surface area (km²)[3]	2,530
Population density (people per km²)[4]	8,617

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

- Mexico City
- Latin America
- Global
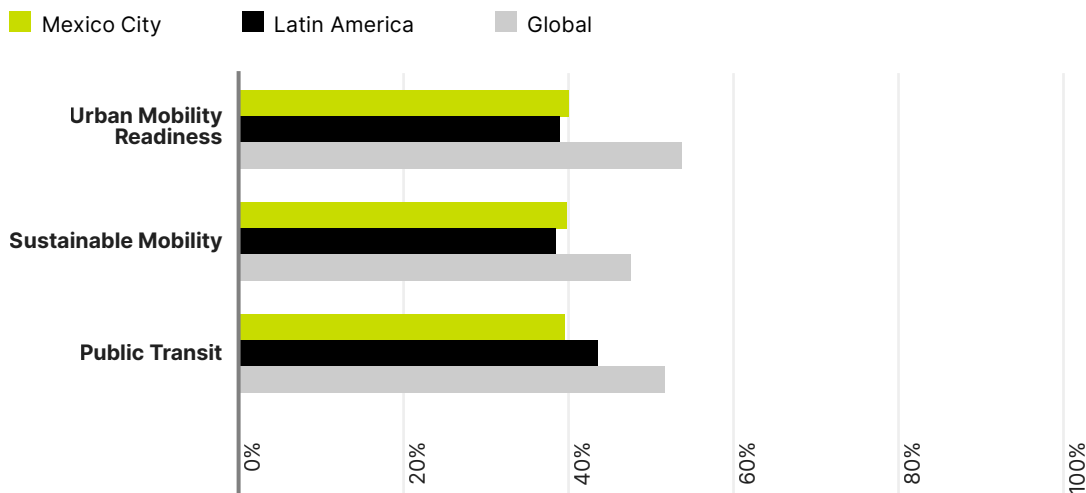
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Jakarta

Jakarta's public transit system is affordably priced and offers integrated payment for a range of modes, including Bus Rapid Transit, metro, light rail, and commuter rail. However, the Indonesian capital's transportation infrastructure remains inadequate in terms of the density of public transit stations and the country's low-quality road network.

The city has been making efforts to become more sustainable and move away from car-oriented planning, for example by repurposing space for cars into space for walking and cycling. It still faces challenges from pollution and congestion, but its relatively low level of car ownership may mitigate future impact. The city is not noted for its mobility innovation ecosystem, with few leading universities contributing to research in the field.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
46/60	54/60	38/60

GDP per capita (US$)[1]	19,555.51
Population[2]	22,335,682
Surface area (km²)[3]	3,546
Population density (people per km²)[4]	9,521

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Jakarta ■ Asia Pacific ■ Global
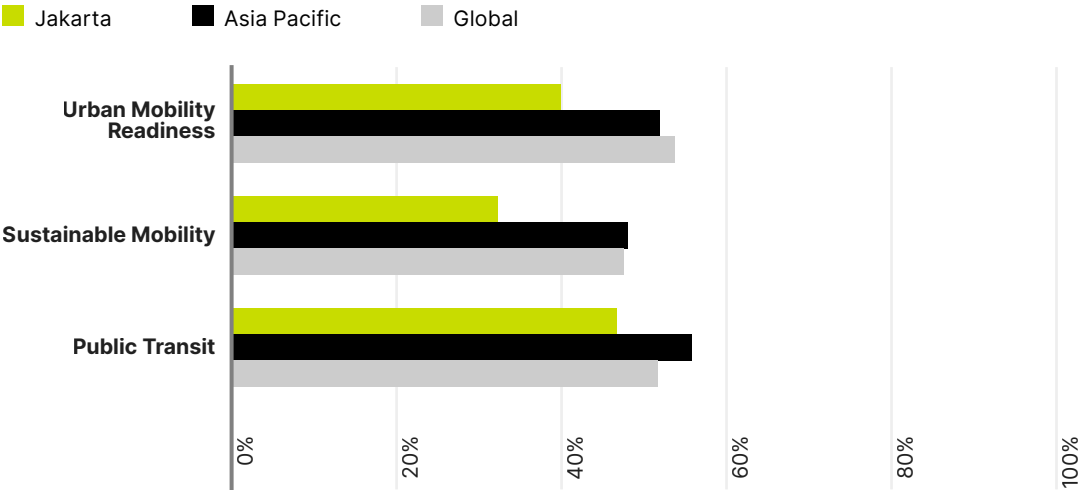
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Johannesburg

Johannesburg benefits from strong road connectivity with the rest of South Africa. Over the next decade, local authorities plan to invest extensively in public transportation.

The city has been slow to embrace shared mobility. Few companies operate, and residents' usage rate is low. Despite some bike infrastructure, Johannesburg residents have been slow to adopt cycling in their daily routines.


Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
47/60	50/60	57/60

GDP per capita (US$)[1]	8,004.04
Population[2]	10,256,334
Surface area (km²)[3]	4,040
Population density (people per km²)[4]	3,610

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Johannesburg ■ Africa ■ Global
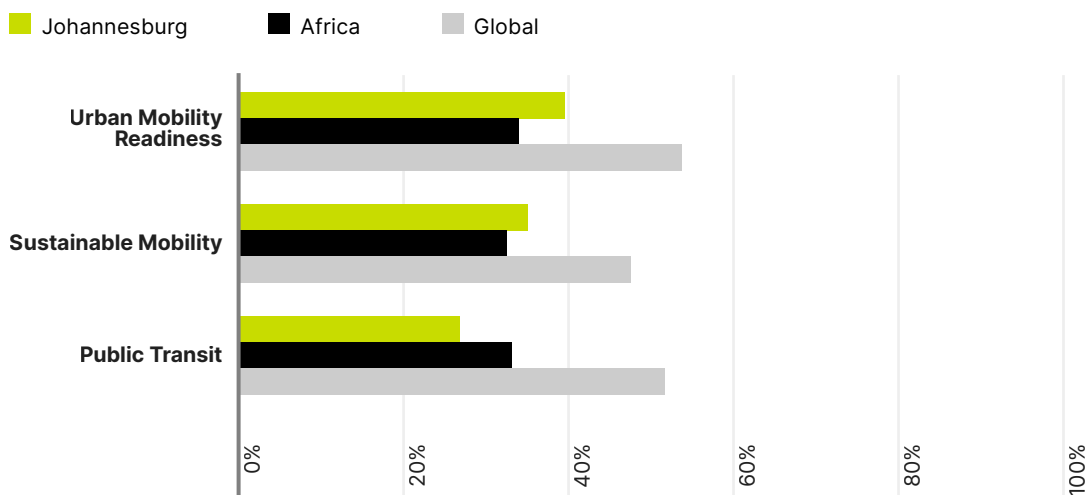
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Rio de Janeiro

Rio de Janeiro offers diverse public transit modes, and transit stations are generally within a short walk for residents. The options include ferries, a metro, light- and commuter-rail services, city buses, and minibuses. Mobility has been the focus of the city's recent planning efforts. Its Sustainable Urban Mobility Plan,[68] for example, is credited with having extended the reach of public transit to more low-income residents.

Rio de Janeiro's airports lag Sao Paulo's in international connections and passenger volumes. The city, like Brazil as a whole, suffers from inefficient supply chain infrastructure and poor-quality roads.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
48/60	49/60	40/60

GDP per capita (US$)[1]	10,573.73
Population[2]	13,068,231
Surface area (km²)[3]	2,020
Population density (people per km²)[4]	6,233

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Rio de Janeiro   ■ Latin America   ■ Global
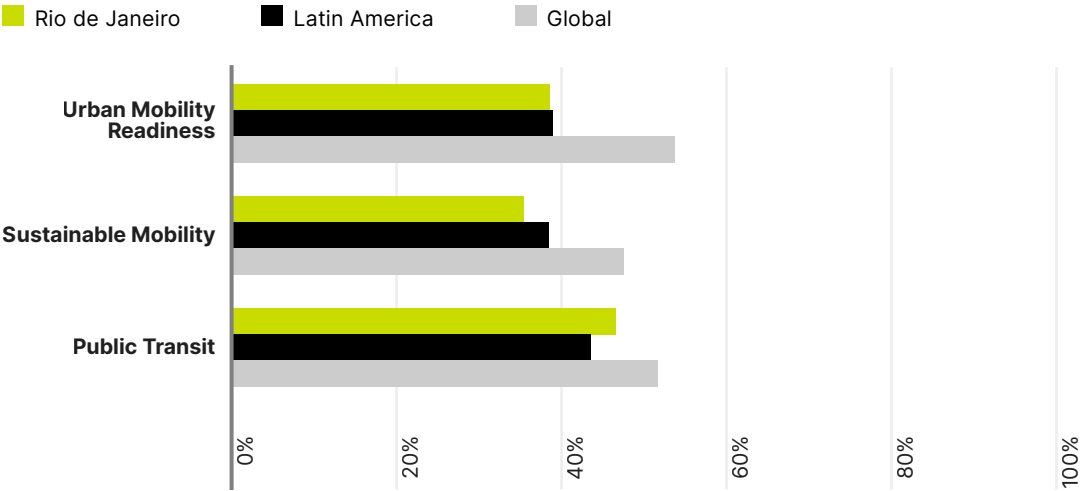
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Riyadh

To support its rapid growth and diversify its mobility options, Riyadh is nearing completion of a new mass transit system combining a bus network and a driverless metro with 85 railway stations and six lines.[69] The metro will be connected to the city's international airport, the financial district, the main universities, and the downtown area. However, Saudi Arabia's limited rail network impedes the capital's regional connectivity.

Riyadh is accustomed to cars for hire, and residents have been quick to embrace ride-sharing. But the city, like the country, suffers from limited enforcement of traffic regulations and a high rate of road traffic fatalities.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
49/60	57/60	58/60

GDP per capita (US$)[1]	25,477.06
Population[2]	7,312,409
Surface area (km²)[3]	1,673
Population density (people per km²)[4]	4,326

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Riyadh ■ Middle East ■ Global
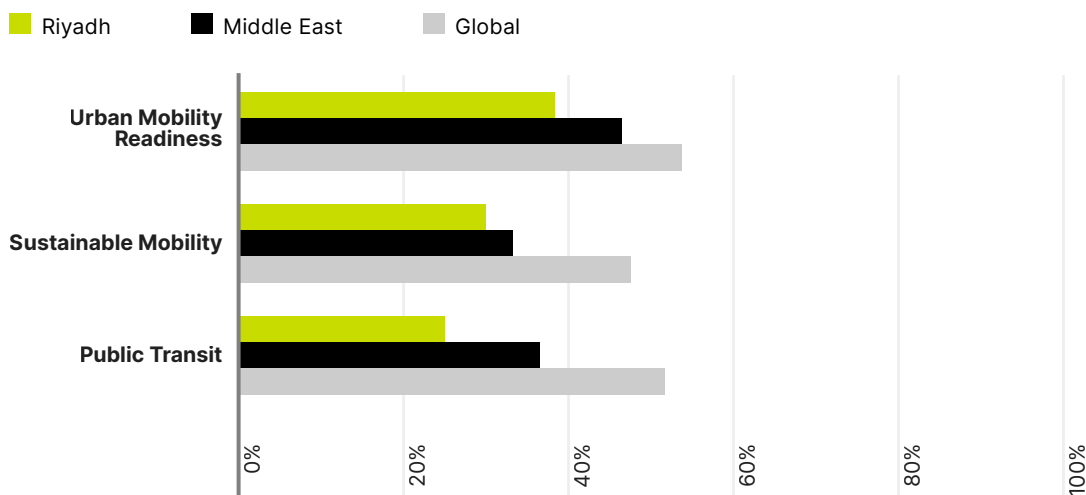
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Delhi

Delhi's public transit is attractive and affordable, and there is a multimodal app to navigate the system. As of 2022, the Delhi Metro network has 12 lines serving 286 stations.[70]

Delhi's streets are regularly gridlocked because of a weak traffic management system, and the city scores low on most social impact indicators, including safety, pollution, and national employment in the transportation sector. Low levels of car ownership among its residents may aid in containing congestion and air quality in the future.

City authorities have been investing in an electric vehicle transition, showing their willingness to address the pollution linked to mobility.


Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
50/60	46/60	35/60

GDP per capita (US$)[1]	6,441.02
Population[2]	31,703,689
Surface area (km²)[3]	2,344
Population density (people per km²)[4]	13,749

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

Legend: Delhi — Asia Pacific — Global
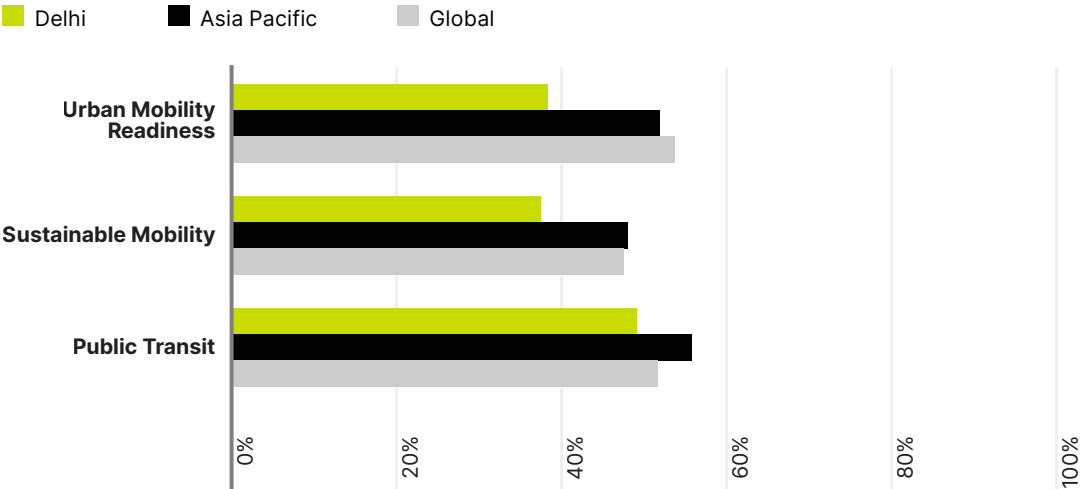
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Jeddah

Jeddah has strong regional linkages thanks to Saudi Arabia's well-connected roads, and road infrastructure in the metropolitan area is high quality. The government has invested in connected autonomous vehicles technologies, but the city does not yet have a framework to enable testing and development.

Most trips in Jeddah are made by private car, and a low density of bus stations contributes to low usage of public transit.[71] In an effort to increase ridership, the city has made its public transit network more affordable for locals. The city plans to open a metro system in 2030.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
51/60	59/60	60/60

GDP per capita (US$)[1]	21,093.52
Population[2]	4,695,535
Surface area (km^2)[3]	1,261
Population density (people per km^2)[4]	3,634

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Jeddah   ■ Middle East   ■ Global
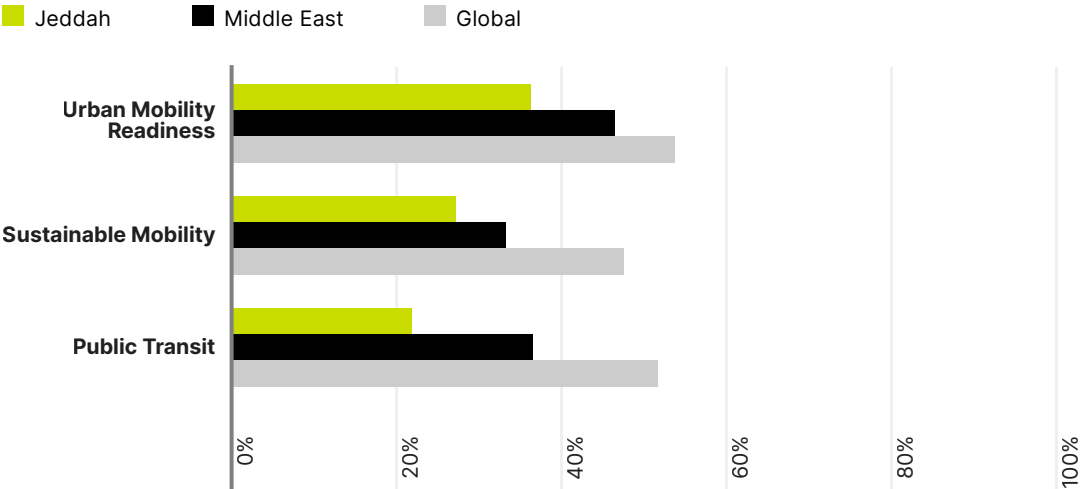
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Mumbai

Mumbai has low car ownership levels, and the city has a promising public transit system. This includes suburban rail and the Mumbai Metro, which is currently being expanded,[72] and also includes some autonomous lines. While residents have started to use electric mopeds and scooters, the city's share of electric cars remains low amid limited density of charging facilities.

Mumbai has several mobility related environmental problems, such as traffic congestion, poor air quality, and noise and light pollution.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
52/60	55/60	41/60

GDP per capita (US$)[1]	5,329.32
Population[2]	20,667,655
Surface area (km²)[3]	976
Population density (people per km²)[4]	25,577

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Mumbai   ■ Asia Pacific   ■ Global
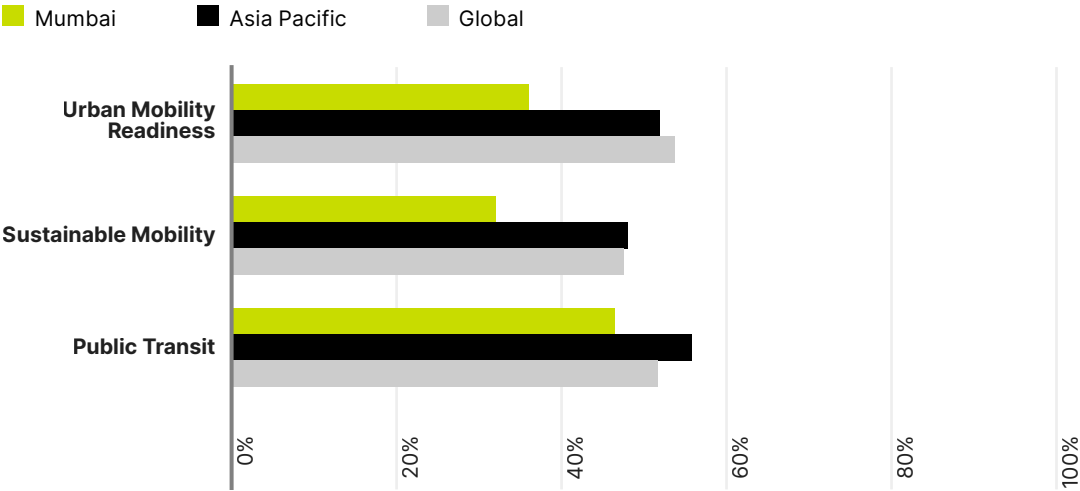
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Bogota

Local authorities are prioritizing electrification by investing in electric vehicle charging infrastructure, incentives for consumers to buy electric vehicles, and a fleet of electric buses. Still, the density of charging points and the electric vehicle share of the car market remain relatively low, although the level of car ownership is generally low. The city has several car-free zones, and air quality is high.

The enforcement of traffic laws is limited, and road traffic fatalities have worsened in the past few years, giving the city a poor rating for road safety. International connections from the airport are poor, as is Bogota's supply chain infrastructure, and the city suffers from delays in cargo transportation.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
53/60	34/60	48/60

GDP per capita (US$)[1]	6,173.84
Population[2]	10,626,196
Surface area (km[2])[3]	562
Population density (people per km[2])[4]	17,945

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Bogota ■ Latin America ■ Global

Urban Mobility Readiness

Sustainable Mobility

Public Transit

0% 20% 40% 60% 80% 100%
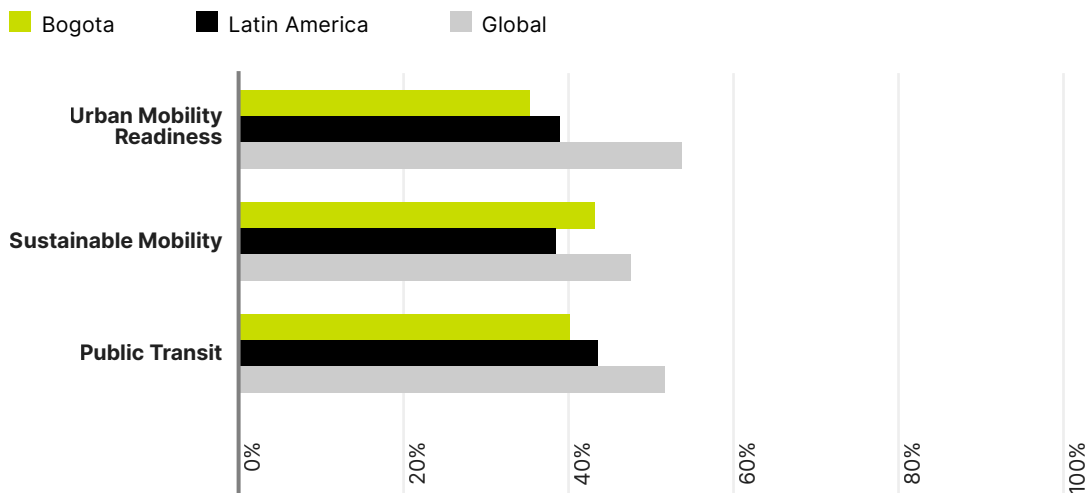
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Casablanca

Casablanca is a walker's city and has one of the highest percentages of pedestrians in the Urban Mobility Readiness Index. The rate of car ownership is low, yet road congestion is high. The municipal and national governments have been slow to invest in charging stations, and the share of electric vehicles is low.

Shared mobility is not popular among residents: Casablanca has few providers, and the government invests little in the area.
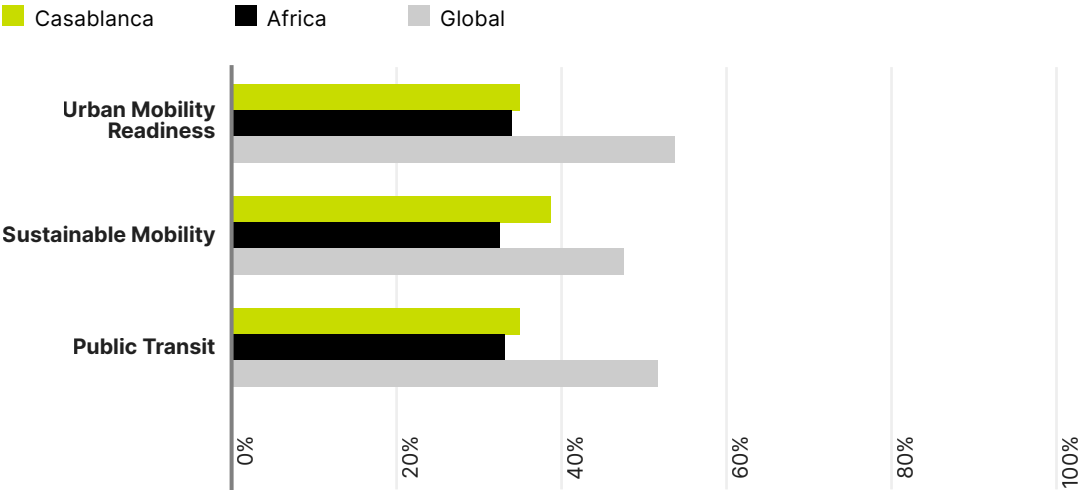

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
54/60	43/60	53/60

GDP per capita (US$)[1]	5,471.17
Population[2]	4,053,793
Surface area (km²)[3]	469
Population density (people per km²)[4]	9,203

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Cairo

Most residents use the public transit system, which includes buses, light rail, and the Cairo Metro. The metro currently has three lines, with one under construction and two more planned.[73]

The city's roads are often gridlocked, and noise and light pollution are also seen as problems. However, Egypt has an extensive national road network, providing Cairo with links to other parts of the country. Cairo suffers from an underdeveloped supply chain infrastructure, with low visibility and increasing delays, especially in the light of recent global supply chain challenges.


Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
55/60	51/60	51/60

GDP per capita (US$)[1]	7,210.46
Population[2]	21,322,750
Surface area (km²)[3]	2,010
Population density (people per km²)[4]	10,099

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Cairo   ■ Africa   ■ Global
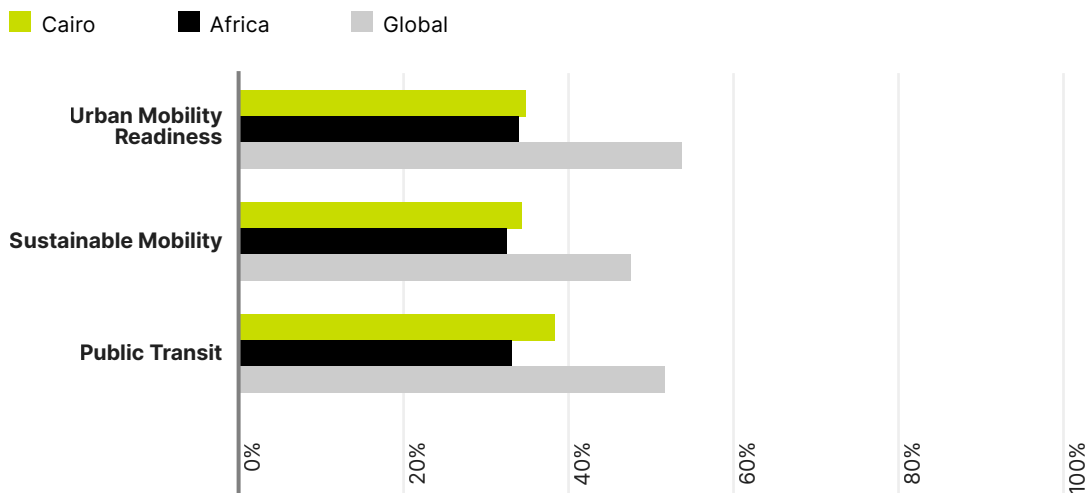
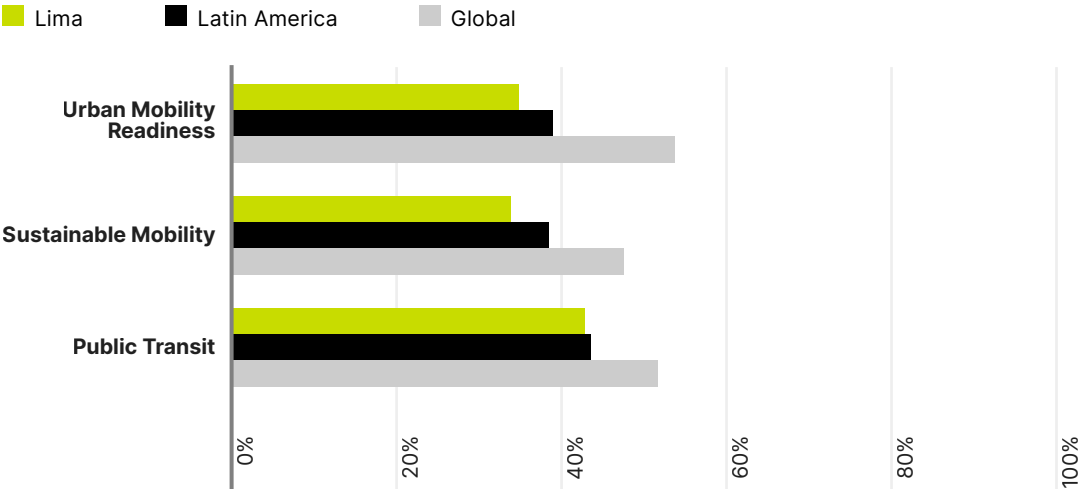Source: Oliver Wyman Forum and University of California, Berkeley analysis

Lima

Car ownership rates in the city remain low, and residents tend to use public and shared transportation. The city's public transit network will become more expansive, as multiple metro lines are being constructed as part of a 2019 National Infrastructure Plan.[74] Shared mobility is gaining significant market share, in part thanks to a local tradition of shared taxis.

However, residents complain of high levels of noise and light pollution. The city has done little to spur innovation, relying on limited investment from the municipality. And the research environment is not sufficient to develop new mobility services.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
56/60	52/60	46/60

GDP per capita (US$)[1]	9,600.29
Population[2]	10,601,379
Surface area (km²)[3]	891
Population density (people per km²)[4]	11,583

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

Source: Oliver Wyman Forum and University of California, Berkeley analysis

Quito

Quito has created a strong public transit offering at affordable prices, leading to its widespread use. In addition to the existing bus services, a metro line is expected to open by the end of 2022.[75]

The city's car ownership rate is low, which could help a future transition to more sustainable transport. However, Quito has a limited innovation ecosystem, with few universities and labs to lead research on mobility. The city's international airport has relatively few international connections and low passenger volumes.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
57/60	45/60	54/60

GDP per capita (US$)[1]	9,335.92
Population[2]	2,346,286
Surface area (km²)[3]	536
Population density (people per km²)[4]	5,208

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Quito　■ Latin America　■ Global
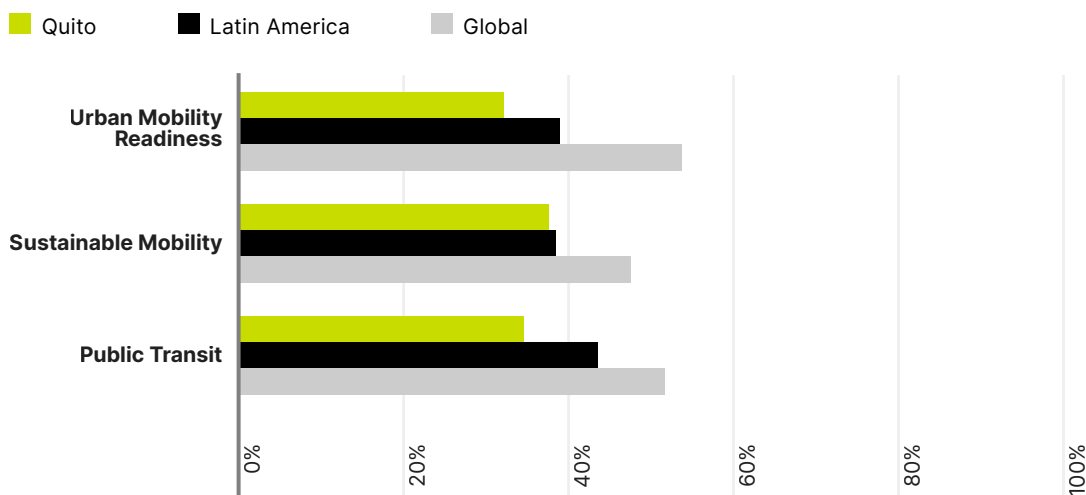
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Manila

Several modes of transportation are available in Manila, including jeepneys and some metro lines. Linkages to active mobility are provided by permissive transit rules towards bikes, as well as significant cycling infrastructure. Despite these multimodal strengths, Manila's public transit system has room for improvement in speed, wait times, station density, and affordability.

Road transport faces challenges including the poor quality of roads in the metropolitan area and the limited regional connectivity provided by the national road network. Manila is congested and polluted, but a low level of car ownership should help prevent these problems from worsening.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
58/60	48/60	56/60

GDP per capita (US$)[1]	10,593.65
Population[2]	14,158,573
Surface area (km²)[3]	1,911
Population density (people per km²)[4]	13,039

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Manila　■ Asia Pacific　■ Global
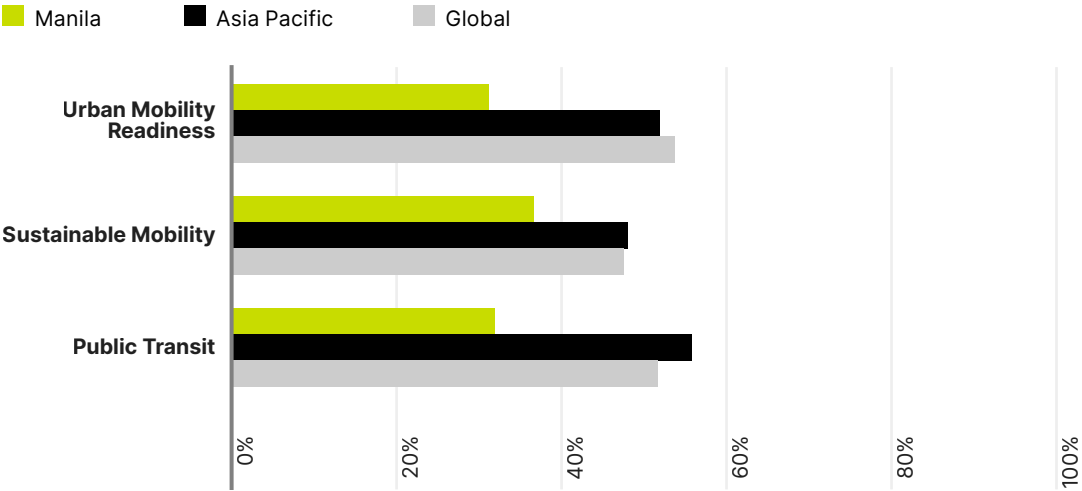
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Nairobi

Nairobi's public transit, consisting of matatus (public minibuses) and buses, is affordable, and wait times are low. However, it is underutilized due to inadequate station density and a poor national rail network.

Walking is a popular mode of transportation in the city due to low road quality and connectivity as well as a limited public transit offering. But few shared mobility operators are active in the city, and residents have not yet embraced it.


Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
59/60	58/60	59/60

GDP per capita (US$)[1]	4,112.83
Population[2]	5,760,596
Surface area (km²)[3]	852
Population density (people per km²)[4]	7,745

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Nairobi ■ Africa ■ Global
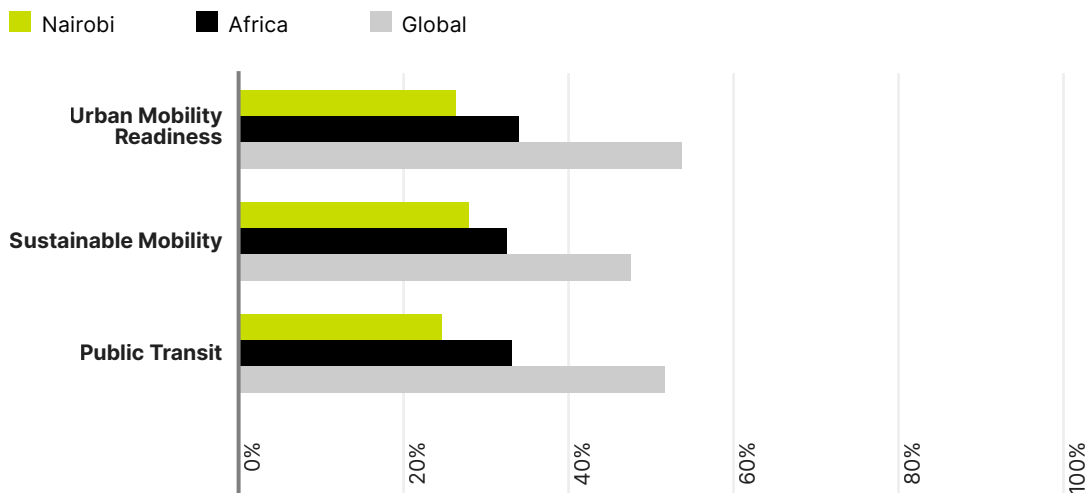
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Lagos

Car ownership has stayed at a moderate level in Lagos, which may limit future problems with noise and light pollution. Instead, the city's population relies on public transportation, which currently consists of Bus Rapid Transit and ferry services. A rail system is being developed, with some operations planned to begin shortly.[76]

Lagos' mobility systems have insufficient risk preparedness and business continuity measures to cope with potential crises such as natural disasters. Poor road quality has worsened the city's supply chain issues: It is known for long delays, limited visibility, and an underdeveloped infrastructure.

Urban Mobility Readiness Index	Sustainable Mobility	Public Transit
60/60	60/60	49/60

GDP per capita (US$)[1]	7,384.20
Population[2]	15,749,556
Surface area (km²)[3]	1,966
Population density (people per km²)[4]	8,464

Urban Mobility Readiness Index, Sustainable Mobility and Public Transit scores
City scores in percentage compared with global and regional averages

■ Lagos ■ Africa ■ Global
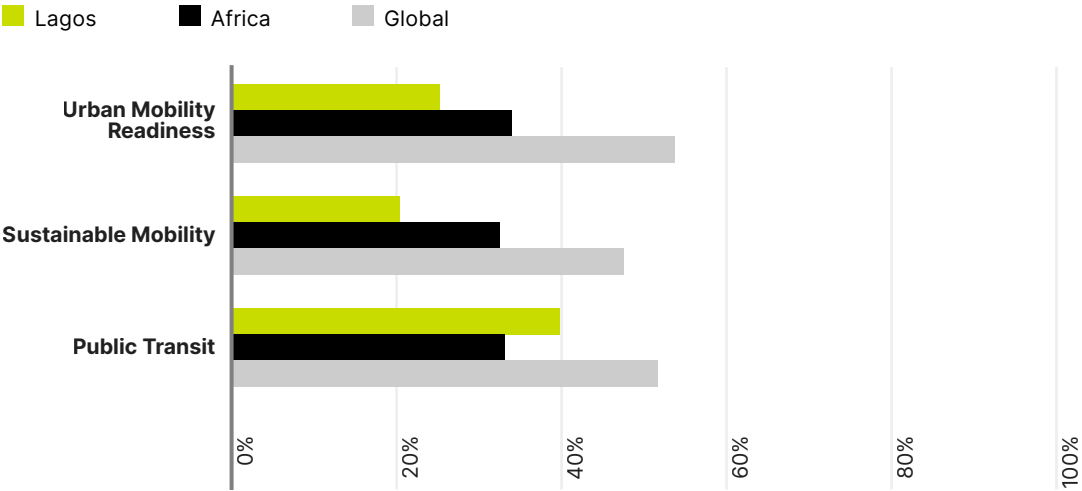
Source: Oliver Wyman Forum and University of California, Berkeley analysis

Methodology

For the 2022 edition of Oliver Wyman Forum's Urban Mobility Readiness Index, our research covered 60 global cities for in-depth analysis. These cities are geographically diverse, representing six regions – North America, Latin America, Europe, the Middle East, Asia Pacific, and Africa. They range from sprawling megacities like Tokyo and Delhi, to more compact cities such as Oslo and Washington D.C., to fast-developing metropolises like Nairobi. They were selected because of their distinct mobility challenges and the varied solutions they are pursuing. They tend to be leaders in understanding the importance of mobility and serve as economic epicenters for their regions, making their efforts to improve mobility vital to the growth of much wider areas. The cities were also chosen because data is available to assess, compare, and track the evolution of their mobility capabilities.

In developing the Urban Mobility Readiness Index, we began with a vision of what cities need to be striving for – the characteristics that businesses, consumers, and policymakers consider indispensable today and will still be pursuing a decade from now. That approach led us to break out a sub-index on Sustainable Mobility, which groups together cities' performance on existing metrics such as the strength of the multi-modal network, public transit usage, electric vehicle ownership and infrastructure, walking, and the cycling infrastructure. In addition, a sub-index on Public Transit was introduced to this year's edition covering metrics such as the transit commute speed, public transit station density, strength of the multimodal network, and public transit utilization rate.

The 60 mobility ecosystems examined in this year's Urban Mobility Readiness Index consist of real-time connected, multimodal networks for moving people or goods with minimal impact on the environment. Based on internal discussions and conversations with leading professionals and experts, the research team arrived at the six key attributes of future mobility ecosystems.

Integrated
Mobility in the future will stress intermodal, one-stop services that provide seamless travel, commutes, and delivery experiences.

Accessible
Future mobility will focus on user-oriented approaches that are transparent, easy to use, affordable, convenient, efficient, and available to everyone.

Sustainable
Systems and solutions that will not degrade the environment or health of city residents and can even offer economic benefits to them.

Innovative
Cities should encourage a local innovation ecosystem and take advantage of the latest technologies, reinterpreting them to fit their needs.

Collaborative
Municipalities need to create coalitions with private-sector enterprises – both large legacy players and start-ups – so they can work together to shape the future.

Resilient
As disasters and other risks threaten the health of cities, it is important that mobility ecosystems emphasize preparedness in a conscious effort to meet the needs of their residents.

Leading cities in the mobility revolution are likely to expand their public transportation modes, availability and linkages; provide safe roads, reliable services, and employment opportunities; enable emerging technologies, like electric and autonomous vehicles; emphasize digitization and sustainability; bolster their risk preparedness; and align municipal policies, regulations, and budgets accordingly.

Ranking dimensions

The Urban Mobility Readiness Index uses five basic dimensions to rank the 60 cities – infrastructure, social impact, market attractiveness, system efficiency, and innovation. These five dimensions, in turn, are comprised of a total of 57 metrics, – key performance indicators – that collectively identify which cities are ready to excel in meeting their future mobility challenges.

Sustainable Mobility sub-index

Along with the 2022 Urban Mobility Readiness Index, our results also display a sub-index on Sustainable Mobility. It is based on the following 16 metrics drawn from the Urban Mobility Readiness Index:

- Air quality
- Noise and light pollution restraint
- Walkability
- Car-free zones
- Cycling infrastructure
- Rail network
- Strength of multimodal network
- Government investment in charging stations
- Direct electric vehicle incentivization
- Electric charging station density
- Public transit utilization
- Car ownership moderation
- Cycling adoption
- Disaster-risk informed development
- Climate-related losses
- Electric vehicle market share in sales

Public Transit sub-index

For this 2022 edition, we are introducing a new sub-index on Public Transit. It is based on the following 13 metrics drawn from the Urban Mobility Readiness Index:

- Transit commute speed
- Public transit affordability
- Rail network
- Public transit station density
- Length of walk to Public Transit
- Strength of multimodal network
- Diversity of public transit modes
- Public transit operating hours
- Transit estimated time of arrival
- Multimodal app maturity
- Public transit utilization
- Share of time in public transit
- Autonomous transit in operation

2022 Urban Mobility Readiness Index Methodology

The Urban Mobility Readiness Index uses five basic dimensions to rank the cities – infrastructure, social impact, market attractiveness, systems efficiency, and innovation. Below, find the 57 metrics that fall under these five dimensions – key performance indicators that identify which cities will excel in mobility.

Social Impact

Does the city maximize societal benefits while minimizing harmful qualities like poor air quality?

Social benefits	• Road safety • Enforcement of transport safety
Environmental benefits	• Air quality • Noise and light pollution restraint
Economic benefits	• Transit commute speed • Public transit affordability
Business benefits	• Mobility employment • Mobility-related spend • International airport volumes

Infrastructure

Has the city developed robust infrastructure and expanded connectivity to support future mobility?

Micromobility enablement	• Walkability • Pedestrian friendliness • Cycling Infrastructure
Public transit accessibility	• Rail network • Public transit station density • Length of walk to Public transit
Regional connectivity	• Road connectivity • Strength of multimodal network
International connectivity	• International airport connectivity
Quality of infrastructure	• Road quality • Air transport facilities • Supply chain infrastructure

Market Attractiveness

How well does the city engage the private sector and secure diverse investments to build out mobility?

Public transit offering	• Diversity of public transit modes • Public transit operating hours • Transit estimated time of arrival
Smart mobility activation	• Mobility sharing economy competitiveness and penetration • Multimodal app maturity
Mobility headquarters	• Market capitalization of mobility companies headquartered in city
Public funding availability	• Government investment in the mobility sharing economy, charging stations, and connected and autonomous vehicles technologies

Systems Efficiency

How well does the municipal government coordinate and enhance the city's mobility network through things like traffic management systems or investment in e-charging stations?

Demand and transport planning	• Existence of master plan • Information and communication technology preparedness • Innovation grade • Direct electric vehicle incentivization • Electric charging station availability
Modal mix optimization	• Public transit utilization • Car ownership moderation • Cycling adoption • Share of time in public transit
Operational efficiency	• Traffic management grade • Traffic fluidity • Supply chain efficiency
Risk preparedness	• Disaster-risk informed development • Natural hazard preparedness • Catastrophe insurance • Institutional capacity and access to resources
Service continuity	• Disaster management/business continuity • Annual deaths from natural disaster • Annual attacks on facilities/infrastructure • Supply chain services

Innovation	
How well does the city leverage local talent and resources to drive technological advances?	
Quality of human capital	• Top university/lab presence • University quality • Information and communication technology patents
Technology adoption	• Connected and autonomous vehicles adoption grade • Autonomous transit in operation • Electric market share in sales

Urban Mobility Readiness Index Structure and Reliability

In the process of constructing the Urban Mobility Readiness Index, the key performance indicators that make up each dimension have been assigned a weight based on their relative importance to the ultimate task of building urban mobility ecosystems that can thrive in the future. The Urban Mobility Readiness Index gives extra weight to factors that capture the ability of a city to become a future leader and ensure rankings reflect performance prospects rather than the competitive status quo.

Weights of the key performance indicators were determined based on discussions that our Urban Mobility Readiness Index team conducted with a wide range of experts including urban planners, traffic managers, transportation finance specialists, and mobility technology executives as well as data collected by the Oliver Wyman Forum and the Institute of Transportation Studies at UC Berkeley. As part of the construction and testing of the Urban Mobility Readiness Index, convex optimization techniques were used to understand the proper weight structure needed to benchmark cities against each other. The extensive testing yielded results similar to the weights chosen by our team, reinforcing our confidence in the Urban Mobility Readiness Index composition and metrics' weighting.

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