Business Region

Oslo's international benchmark performance

2022

Dr Tim Moonen, Jake Nunley,
Borane Gille and Charlie Ford
The Business of Cities, London

Oslo: State of the City

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The report has been commissioned by **Oslo Business Region**, which is owned and funded by the **City of Oslo**.

The report is written by **The Business of Cities**, an urban intelligence firm based in London that provides data and advice to 100 global cities and companies.

Foto: Kamil Klyta

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Executive Summary

In 2022, Oslo has emerged from Covid-19 into a world that is entering a new chapter of globalisation.

A new geopolitical and energy context overlays the changes already unfolding in cities. The pre-pandemic agenda for cities to be sustainable, liveable and innovative, now meets a post-pandemic priority to embrace hybridity, fairness and self-sufficiency.

Cities will no longer compete in all the areas they used to: predictable activities and services are moving online and elsewhere. Instead cities are in a new business of persuading people that their face-to-face and face-to-place experience is worth coming to work, visit, study, discover and live.

Oslo appears to be ahead of the curve in adapting.

The last 6 years of State of the City have shown that Oslo had more momentum than many cities in the lead up to Covid. This year, although the recovery is not yet complete, the city looks like it has shifted more efficiently to remote and hybrid work. Its digital advantage has helped give it a productivity bounce over others. It now achieves more No.1s than ever before.

Many believe that Oslo can succeed on this renewed agenda for cities. People who live in Oslo rate the city highly – in fact they are 6th most fulfilled in the world across all measures. They have high expectations – about the services they receive and the leadership they experience. On the whole, the city delivers.

The big breakthrough is that the world now sees that Oslo's innovation ecosystem is thriving, after a decade-long push. Venture investment, unicorns and high value exits are happening at a faster rate than ever, and overtaking many other cities globally. More of Oslo and Norway's graduates are sticking around. The city is on the radar of more top tech talent. Green tech, the circular economy, fintech and maritime have all seen a step change.

The innovation quest, however, is not won. Competition for funding, talent and impact is fiercer. More cities are having life science booms and are succeeding in AI faster than Oslo. The region is not yet widely viewed as a leader in the way knowledge translates into commercial outcomes, new startups, or social impacts. There is a 'narrative gap' about 'what' or 'where' Oslo's innovation economy is.

Oslo's 'green' credentials need to be backed up. After years of effective policy and positioning, they are now well established in the international mind. They surface in even more areas this year. Yet there are some important gaps emerging. As a city and also a region, it needs to look at how it can deliver on clean air, the future of public transport, and sustainable fashion especially.

Internationally, **Oslo is still not widely viewed by enough people as a flexible, welcoming and affordable city.** Oslo is seen to be a place to sample cultural excellence, but not yet as somewhere where people can have rich and meaningful cultural experiences as standard. So Oslo is not yet a top-choice city for those talent and consumers, who wish to combine business, travel and leisure.

The metrics point to a need to continue to build the City of Oslo's profile as a vibrant, safe and culturally rich place that is differentiated from other cities and from the digital alternatives.

At the same time it points to the role that the region as a whole can play to provide the choice, cohesion and connectivity.

How is Oslo doing in 2022

This spidergram captures the overall picture of how Oslo is performing in the wider world of cities.

Overall the gap between perception and performance is closing. Oslo is getting better recognised as a place where innovation is happening, and its values are more admired.

The dark blue line shows Oslo's objective performance in each of the 10 themes, compared to the other 50 cities in its wider peer group.

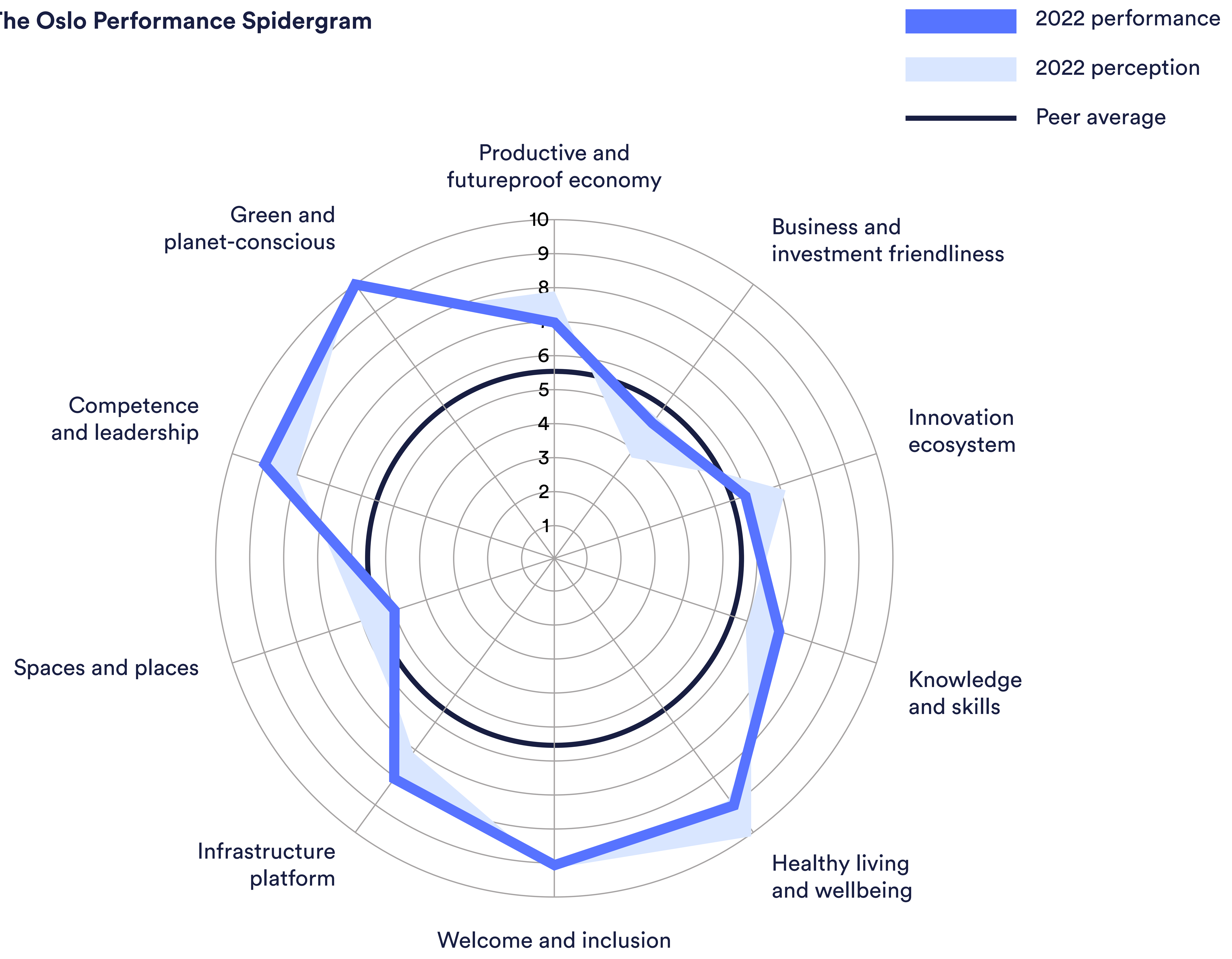
In light blue are the areas where there is also data on perceptions about Oslo.

Where the dark blue score is higher than the light blue, it means Oslo is actually performing better than it is perceived to be. The opposite means Oslo's reputation is better than its real performance. Oslo's position is calculated by an algorithm based on all the input benchmarks in that theme.

A city should strive for a good balance between the 'brand' and the 'product'.

Source: The Business of Cities research. Scores calculated according to an ELO algorithm (see Appendix for full explanation).

The Oslo Performance Spidergram



Future priorities

The data and findings suggest that Oslo should now be very proactive at telling its own story of innovation, culture, and sustainability. In a world where the competition is as likely to be online as it is to be other cities, this story should be grounded more clearly in the things that make Oslo special and compelling – its places, people, prowess and partnership.

Innovation

- Work out how Oslo's recent unicorns and most iconic innovations can be more clearly and creatively tied to the city itself. Make the world realise these companies have Oslo's DNA.

- Resist promoting too many 'innovation districts' at once. Prioritise those with the most assets, momentum and potential to deliver.

- Enable business leaders, entrepreneurs and civic innovators to take the lead confidently on key innovation projects.

Sustainability

- Keep growing the identity as the world's fastest mover towards sustainability – not just transport, but waste, industry, tourism and innovation. Use major events and showcases to capture the global imagination.

- Make sure that Oslo's green leadership communicates the opportunity for businesses, investors and for citizens. Showcase that sustainability is not 'done to' a city but made 'with and for' it.

- Create collaborative working groups to confront perceived gaps around pollution, buildings, fashion. etc, that might erode confidence in Oslo's green journey.

Culture

- The 'people' side of culture should come out more. The urban experience and conviviality of Oslo's culture should be front and centre, developing out from the success of the city's heritage, art and 'high culture' initiatives.

- Develop clearer offers for how the whole Oslo region offers a unique combination for families, wellness, and city meets nature.

- Renewed upskilling and accreditation with shops, venues, and tourism amenities, to make sure what is offered is truly distinctive, sustainable and high-value.

Promotion

- Continue to widen the base of organisations and leaders licensed and encouraged to promote and communicate Oslo's identity.

- Create a single innovation narrative. Co-ordinate the story and relationships of the unicorns, the startups, the research, the institutions, and the city itself. Avoid telling the story in silos.

Oslo's story should be grounded in the things that make it special and compelling - its places, people, prowess and partnership.

Introduction

This is the 7th edition of this ‘outside-in’ review, conceived by Oslo Business Region in collaboration with the City of Oslo, that provides a window into how the world sees Oslo. Using all the city benchmarks and ranking studies, it assesses Oslo’s strengths and reputation on the international stage.

Tracking Oslo's aggregate performance across the whole universe of benchmarks and data tells us the big picture about how Oslo is performing and how it is perceived by investors, residents, entrepreneurs and visitors, when compared to its real peer group of cities internationally (see below and full Table in Appendix). We look at objective indicators and at subjective perception studies, to illuminate the differences between how Oslo is performing in reality, and what people think of the city, in comparison to this group of 50 cities. The group includes:

- Cities that are similarly sized and have strongly comparable productivity, assets and strategic imperatives (e.g. Helsinki, Perth, Calgary)

- Cities with comparable economic and innovation assets and strategic imperatives, but which are different size and scale (e.g. Vienna, Tel Aviv, San Diego)

- Cities of comparable size and wealth, but which have fewer similar assets or strategic imperatives (e.g. Raleigh, Prague, Manchester)

This work draws on the more than 330 benchmarks, rankings and data metrics that Oslo has featured in in 2022, encompassing a wide variety of datasets from conventional sources, surveys, real-time datasets and crowdsourced data. For this new edition, all data points have been updated to the most recent available post-Covid data, unless otherwise specified as pre-Covid. The report assesses Oslo’s performance across 10 themes, for each of which its competitiveness is compared to all other comparator cities.

This approach responds to the new post-pandemic and geo-political context – where different things matter in different ways to the choices people make about cities. Benchmarks tell us what the world cares about. They shape the choices of businesses and investors. And they inform peoples’ decisions about which cities to visit or consider moving to after the pandemic subsides.

As in the past editions, unless otherwise specified, references to “Oslo” or “the city”, refer to Oslo Region. Only explicit mentions of the “City of Oslo” refer to Oslo municipality.

This report:

1. Provides a full review of Oslo’s comparative performance since May 2021.
2. Calculates aggregate performance and perception of the Oslo Region across different themes.
3. Highlights where international and local perception diverges from reality.
4. Looks in detail at the innovation ecosystem and the sustainability of the visitor economy.
5. Summarises the implications and actionable priorities for different stakeholder groups in Oslo.
6. Helps different parts of the ecosystem (government, businesses, start-ups, universities and others) see how they can contribute.

The analytical framework underpinning this report:

1	Opportunity	How recognised is Oslo as a region that is prosperous and open for business?	1.1 Productive and future-proof economy 1.2 Business and investment friendliness
2	Innovation	How is Oslo regarded for its capability to build companies and its access to specialist skills?	2.1 Innovation ecosystem 2.2 Knowledge and skills
3	People	How well is Oslo known for what it offers people in terms of health, lifestyle and warm welcome?	3.1 Healthy living 3.2 Welcome and inclusion
4	Place	What is the day-to-day physical experience like in Oslo, of working, living and travelling in the region?	4.1 Infrastructure platform 4.2 Spaces and places
5	Preparedness	How well is Oslo know for being ready and bold about the 21st century future?	5.1 Competence and leadership 5.2 Green and planet-conscious

Explanation of 10-point scale

As in previous years, we detail Oslo's position in each theme along a 10-point scale, calculated by an algorithm based on all the input benchmarks. Where there are sufficient indicators in both the performance and perception categories, Oslo's position is shown twice to reflect how performance and perception compare. The scale is explained in more detail in the appendix.

This is an example scale.

Infographic

Oslo's Performance in Data

Attention on Oslo grows

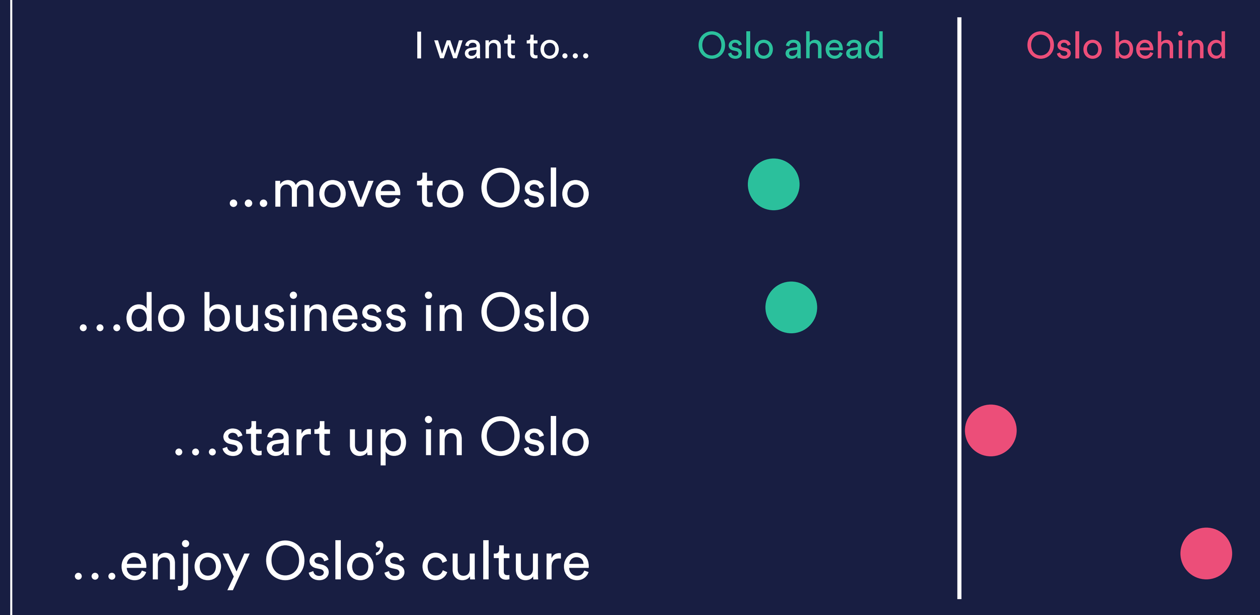
Oslo is in
332
city benchmarks in 2022

Up 15 places
for visibility since 2016 (now 32nd globally)

4th
most profiled small city in the world

Source: The Business of Cities research

Perceptions of Oslo



Sources (from top to bottom): European Commission; Start-upHeatMap Europe; StartupHeatMap Europe; Resonance[1]

The brand is catching up to the product

Perception ≥ Reality
60% of the time

Up 10%

since 2021

Source: The Business of Cities research

Rated world-class more often

Now world

No. 1

in 16 measures of how cities perform

(as opposed to what people think about cities)

Source: The Business of Cities research

Upswing in tech

+5
Unicorns since 2019*

(now 6 in total)[2]

Top 30 globally
For the first time for appeal to digital experts[3]

Up 4 places
for fintech size and scale (now 60th)[4]

*No. of $1bn companies created. Includes $1bn exits and companies that have since dropped below the $1bn mark after going public.

Talent breakthroughs

5th of 50 cities
for how many graduates stay in the city for work

(April 2022)[5]

Top 2%
for the lifestyle ingredients that people factor into their decisions about whether to stay in the city or move elsewhere

(environmental quality, safety, happiness and congestion)[6]

Wake up calls for Oslo

14th / 15
for no. of new professional jobs forecast to be created in next 5 years*[7]

Outside top 100
for what visitors, students and locals think of the cultural offer[8]

-42%
less clothing waste recycled vs rest of Europe[9]

*Jobs that would normally be done in an office - among 15 major European cities

Not quite 'back to normal'

Sharper drop in transport, retail and office visits

-2%

compared to pre-Covid, relative to the average city

(March 2020 to May 2022)

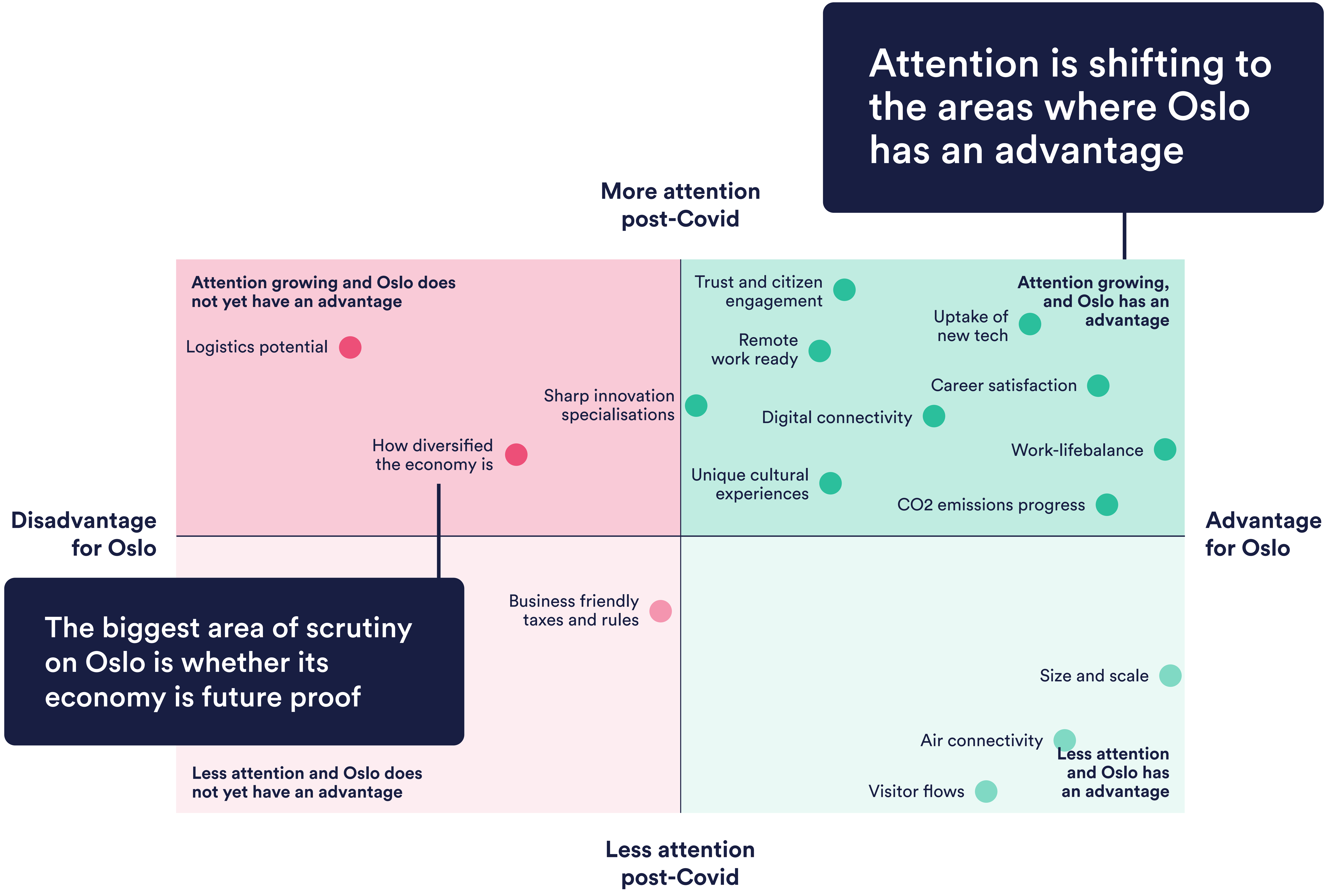
Source: The Business of Cities research, based on Google COVID19 Community Mobility Reports (see Appendix for details)

Oslo after Covid-19

How is the world thinking fresh about cities?

What does this mean for Oslo?

Covid-19 exposes the advantage of some cities and the weaknesses of others. Hybrid living and working means there is more attention on how connected cities are digitally, the work-life balance they offer, and the unique elements of their cultural experience. These are all areas where Oslo has some advantages over other cities. However, it also means talent and investors are looking for cities that have a truly resilient economy and a track record of innovation in distinct sectors. Here Oslo has work still to do.



Source: Based on the changing balance of 800 benchmark studies produced about cities globally, and Oslo's aggregate scores.

Oslo's headline Covid-relevant benchmarks

The features that made Oslo a resilient economy during the pandemic – productivity, innovation and skills – underpin a positive outlook for the future.

Looking back

Economy hit less hard

- 5th smallest hit to GDP in 2020 among 30 major European regions[10]

Early adopter of health innovations

- Top 20 among smaller cities globally for business-led innovations to tackle Covid-19 (June 2021 data)[11]
- 18th out of 50 global cities for how effective its measures have been to combat the pandemic (Q2 2021 data)[12]

Top talent has stayed and started up

- 7th out of 44 peers for how many top-tier global graduates from universities in other cities live in Oslo compared to September 2020 (April 2022 data)[13]
- Innovation ecosystem has grown nearly 50% faster than on average among peers[14]

Looking forward

Faster recovery forecast

- 6th out of 15 leading European cities for medium-term growth outlook, ahead of Berlin, Copenhagen and Paris (2022-2026)[15]

Slower jobs bounce back

- Only 9th of 15 for next 5 years of jobs growth[16]
- 14th out of 15 for how many new office-based jobs are expected to be created up to 2026 (fewer than any other major European city except Sofia)[17]

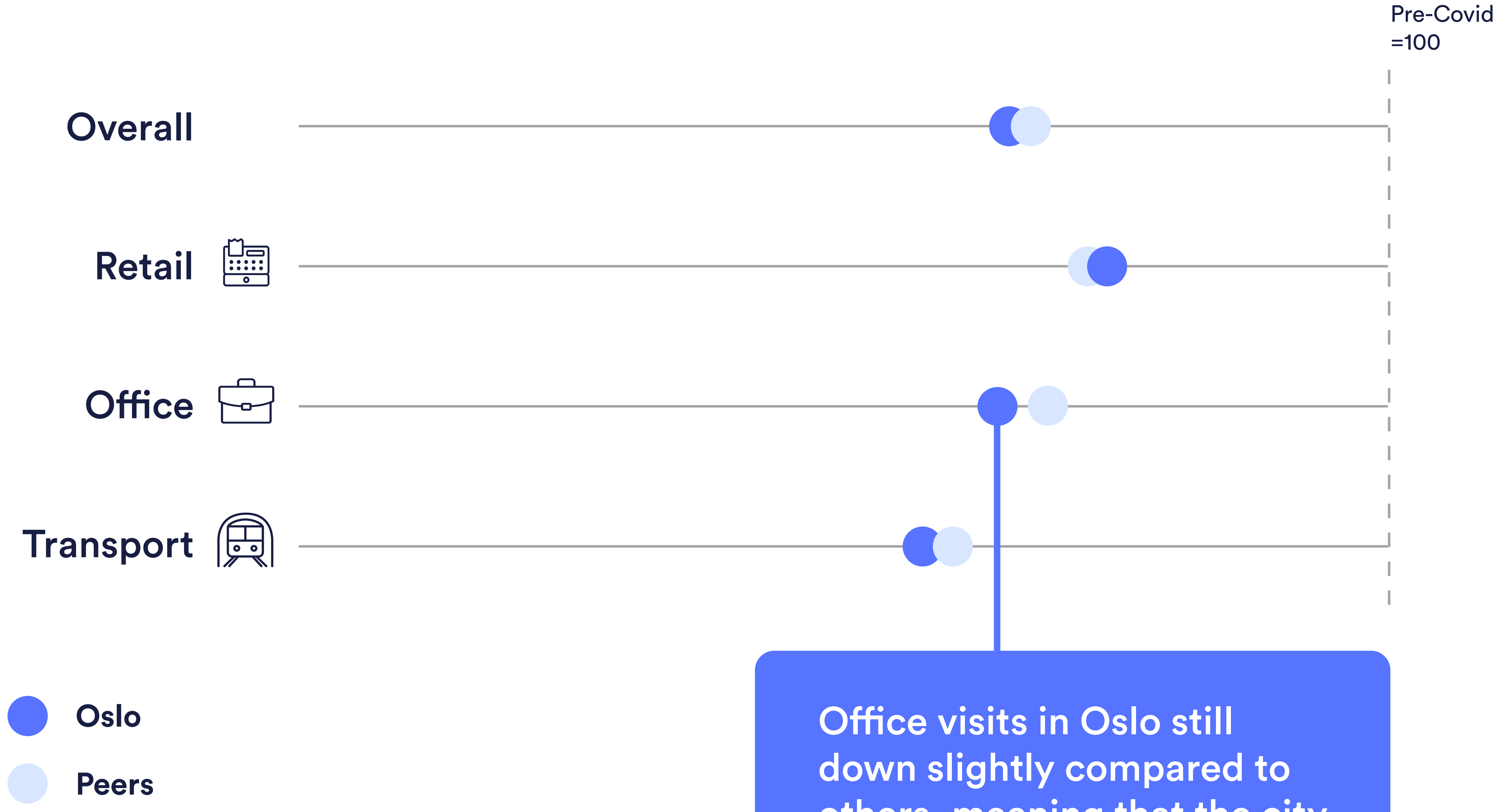
Skills and productivity to drive growth

- Oslo's economic prospects are forecast to be driven more by its productive talent base, than by population growth alone[18]

How has Oslo fared through Covid-19?

Overall since the start of Covid-19, how much has activity in Oslo been affected?

Average activity, March 2020 to May 2022, City of Oslo



Office visits in Oslo still down slightly compared to others, meaning that the city centre has to adapt

Source: Google COVID-19 Community Mobility Reports. Data up to 26th May 2022. [19]

How "back to normal" is Oslo today for...

Average activity in May 2022, compared to pre-pandemic baseline, City of Oslo

Office footfall?

-7%

11th / 24 peers

Using public transport?

-20%

18th / 24 peers

Shopping and fun?

+3%

5th / 24 peers

Visits to recreation, retail and office in City of Oslo have now returned to pre-pandemic levels

Traffic congestion?

-37%

4th / 29 peers

Despite slower return to public transport, congestion is still well down – suggesting more stay-at-home, walking and cycling

Sources: Google COVID-19 Community Mobility Reports, TomTom Global Traffic Index. Data up to 26th May 2022., except for traffic congestion (data up to 25th April 2022) [20]

How robust have Covid restrictions been in Oslo?

On average, March 2020 to April 2022

High trust and respect for rules means lockdown rules were overall less stringent in Oslo

Source: Our World in Data (National data) [21]

Oslo on the World Stage

How is Oslo's visibility changing?

Oslo continues to attract global attention for its leadership in sustainability, the quality of its city-making, and new successes in its innovation economy.

Oslo continues to benefit from the post-2020 shift in global focus towards climate and well-being. Overall it appears in 43% of the world's studies that compare cities.

	2016	2020	2021	2022
Global visibility rank	48th	48th	33rd	32nd ↑
% of studies featured in	39%	42%	46%	**43%**
Visibility rank among peers	18th	20th	14th	**16th**

In 2022, Oslo is the world no. 32 in terms of attention on how it is doing

Why does it matter?

Visibility in benchmarks shows how important a city is in the world's consciousness. It reflects how much Oslo features in people's global 'mental map' and gauges whether people see Oslo as being important enough to warrant inclusion among a much larger group of cities.

So by this measure Oslo is Europe's 16th most visible city. It stands out as the 4th most profiled small city globally and as investors and businesses look away from more established and traditionally 'in-demand' cities, Oslo is well placed to attract even more of the attention.

Breakthroughs

Oslo makes new appearances in some high-calibre indexes such as:

- **The Oliver Wyman Urban Readiness in Transport index as it cements its reputation for sustainable mobility** [22]
- **Tholons' study of cities with the best potential for business outsourcing, due to digital improvements** [23]

In 2022, Oslo is the world no. 32 city for how much international attention it receives on how it is doing

Key highlights: where is Oslo ahead and behind in 2022?

Oslo is being recognised as a global leader more than ever before – for access to healthcare, sustainable transport, digital infrastructure to support the remote working shift and the maritime economy.

Benchmark	Source	Global rank
Citizen adoption of new tech and apps*	App Ranking Directories, Startup Directories	1^{st}/50
Access to good quality healthcare	European Commission, The Lancet, World Health Organisation	1^{st}/80
Standard 5G download speeds	Ookla	1^{st}/109
Concentration of rail stations given population size**	CityTransitData	1^{st}/19
Adoption of and investment in sustainable transport modes	Oliver Wyman	1^{st}/60
Low-carbon policies – scale and ambition***	Clean Cities Campaign	1^{st}/36
Expert confidence in maritime industry's green transition	Menon	1^{st}/50

*No. and per-person concentration of startups in healthcare, lifestyle and internet services, plus no. of app downloads in food, navigation, travel, education and financial services
**Metro and suburban rail stops relative to population size, excludes light rail and trams
***Climate action plans, policies phasing out emissions producing vehicles and encouraging public and active transport

How often is Oslo ranked best in the world?

2020-2021

5% of the time

6^{th} / 50 peers

→

2021-2022

6% of the time

3^{rd} / 50 peers

But Oslo is still behind in some important areas, including R&D in science and technology, city centre population, resident and worker experience, and sustainable fashion.

Benchmark	Source	Global rank
Share of people worried about crime increasing	Numbeo	13th / 24
Prospects for good value real estate investment, as rated by investors	PwC / ULI	27th / 30
Top-rated university degree courses for computer science/engineering	EasyPark (based on University Rankings directories)	47th / 50
What people think of the cultural, culinary and entertainment scene	Resonance	130th / 300
How many co-working spaces there are, like-for-like (relative to population)	GoogleMyBusiness, desksnear.me	19th / 30
How many people live in the city centre*	WorldPop	40th / 50
Transition to sustainable fashion**	Reebok	19th / 20

*Population within 1km of city centre, as estimated using satellite imaging of building height and density.
**How much textiles waste is recycled compared to how much goes to landfill, the size of the local fast fashion industry, and local interest in sustainable fashion.

Where has Oslo has improved and declined, over time?

Oslo's 3 most consistently positive and negative changes since 2018

Benchmark	Source	Change in global rank
Innovation ecosystem size, scale and growth	StartupBlink	+20 since June 2019
Financial industry performance and reputation among experts	Z/Yen	+22 since March 2020
Fintech ecosystem strength as seen by experts	Z/Yen	+9 since September 2020
Jobs share in high-tech	Eurostat	-7 since 2018
Perceived real estate investment value for money	PwC/ULI	-13 since 2019
Depth and variety of cultural product	Resonance	-12 since January 2020

Where has Oslo really improved and why?

Oslo has improved for innovation because:

- More companies are successfully **scaling up and attracting capital.** Oslo is near the top of the charts for growth in unicorns, VC investment and high-value exits over the past 3-5 years.
- More people see Oslo as a place where **oil & gas expertise can translate into tech and low carbon ventures.**
- The readiness of government and citizens to adopt new technologies means Oslo's start-ups have **a stronger domestic pool of customers.**
- Its **specialisations and niches are becoming clearer** – in servicing maritime innovation (2nd globally according to maritime experts), fintech (in the global top 60), and renewable energy (3rd highest specialisation in low carbon technologies among peers). [24]
- **Deployment of IoT and other tech** is helping to upgrade the performance and resilience of more established industries.

Where has Oslo slipped and why?

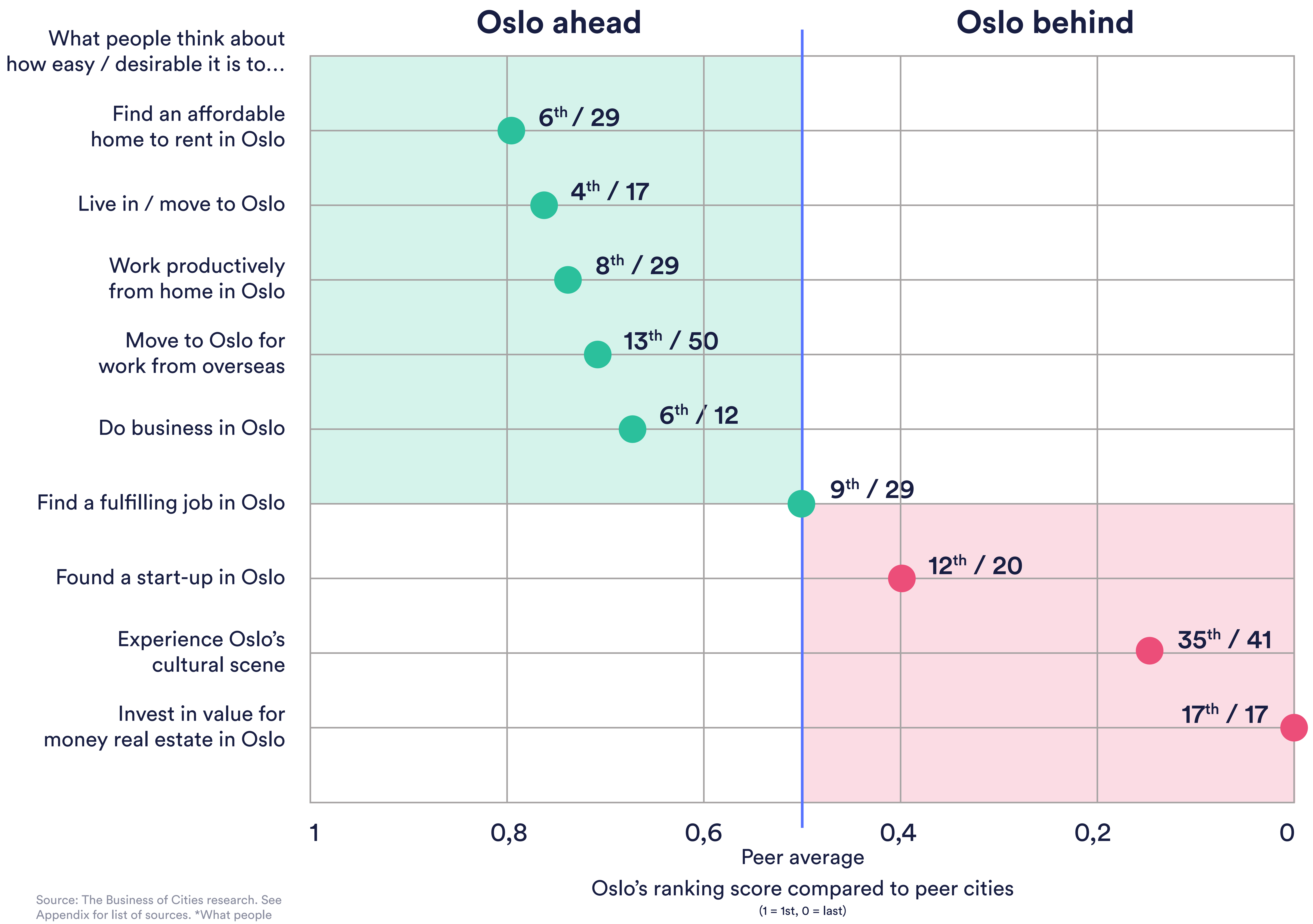
The world is looking for vibrancy throughout a city and region:

- Variety and choice is seen to matter more to which cities talent, businesses and prospective visitors want to spend time in – **Oslo's depth of cultural assets and amenities is growing,** but gradually – and from a low base.
- There is **more interest in quality of spaces & places** in all parts of the city – not just the centre.
- There is **more emphasis on variety, mix and experience outside the city centre.**

What do people now think about Oslo?

Perception measures at a glance

Figure 1: Oslo's ranking score relative to peer cities in the best perception measure for different themes*



Source: The Business of Cities research. See Appendix for list of sources. *What people think about the city, as opposed to how the city performs in reality.

Oslo is ahead for perceptions of:

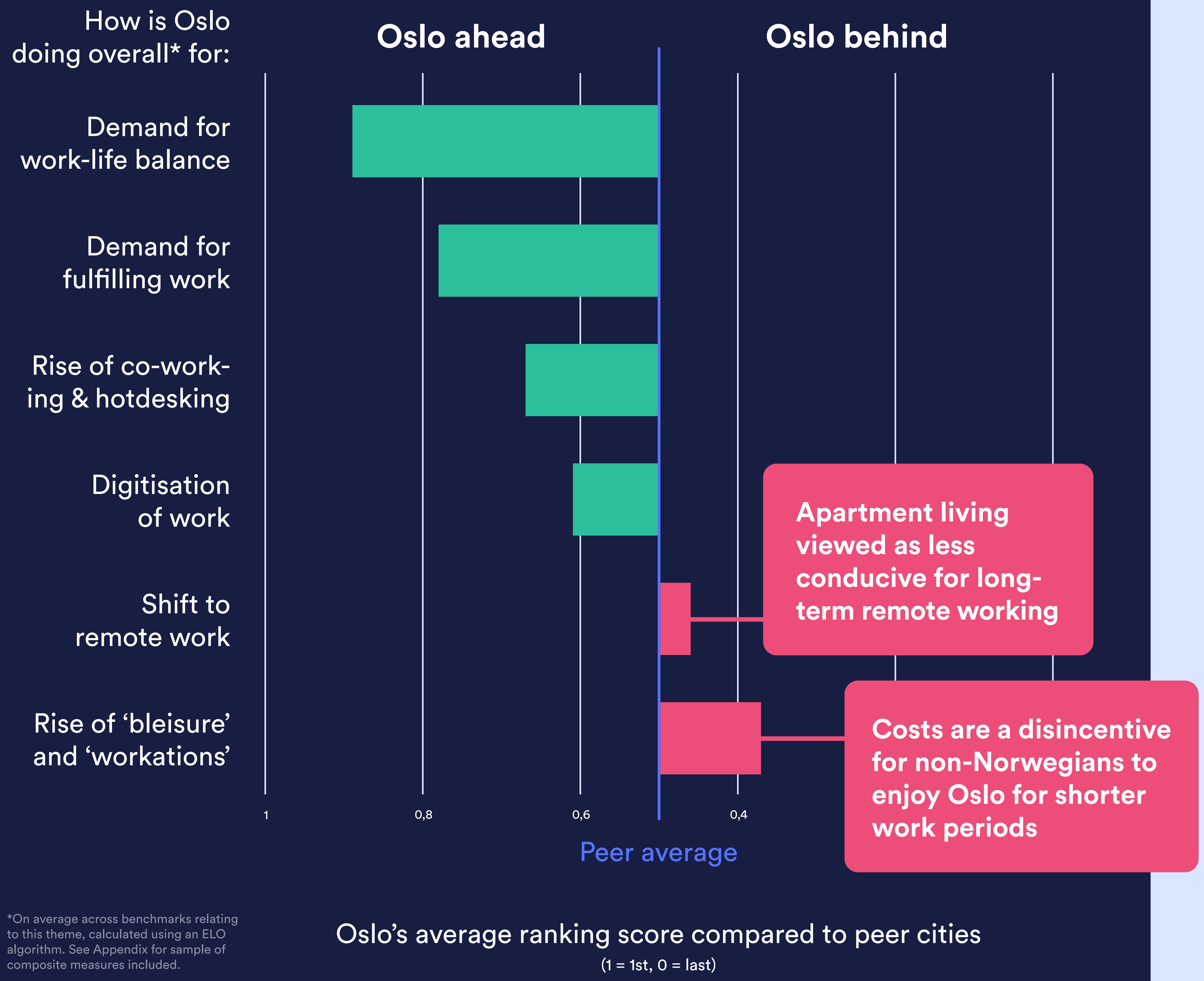
- Fulfilling employment
- Internet speed and reliability
- How easy it is to find an affordable home to rent
- Ease of doing business

But is still behind for external perceptions of:

- Well priced real estate investment
- Desirability among international students
- Founding a start-up
- Cultural vibrancy and appeal

The future of work in Oslo

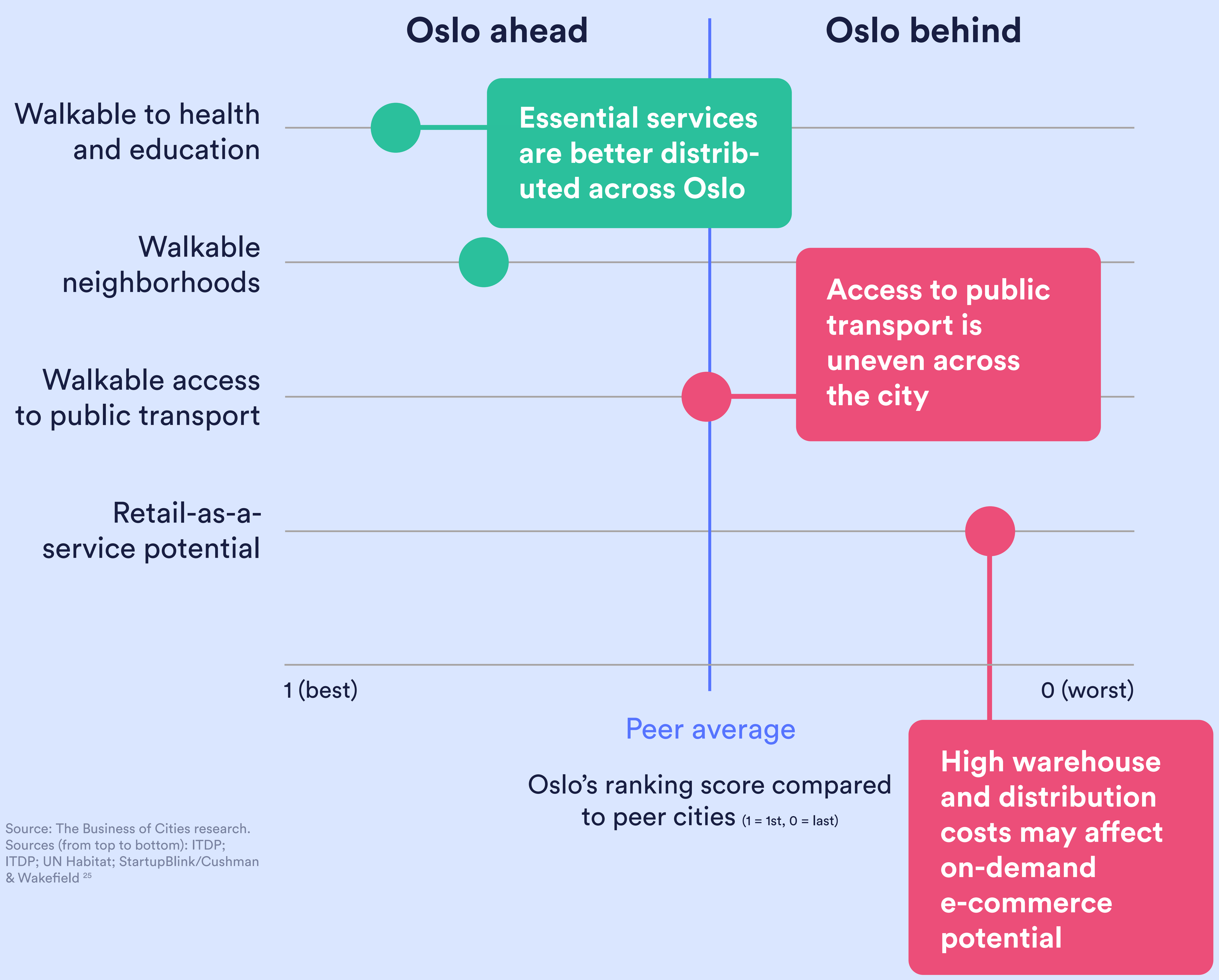
Oslo is well placed to become a hub for corporate talent. But the city's expense means its ability to attract workers who are more footloose and want to blur work and leisure, faces more of a challenge.



*On average across benchmarks relating to this theme, calculated using an ELO algorithm. See Appendix for sample of composite measures included.

Oslo's progress towards the "15 minute" city

More people see the promise in a '15 minute city' model, where essential amenities, health facilities and green spaces are within safe walking distance or an easy public transport journey from where people live. Oslo has made good progress in some of these areas, and emerges ahead of its peers for access to essential services and walkability. But Oslo has more work to do in others (access to public transport, progress for 'retail-as-a-service') if it is to become a true '15 minute city'.



Source: The Business of Cities research. Sources (from top to bottom): ITDP; ITDP; UN Habitat; StartupBlink/Cushman & Wakefield [25]

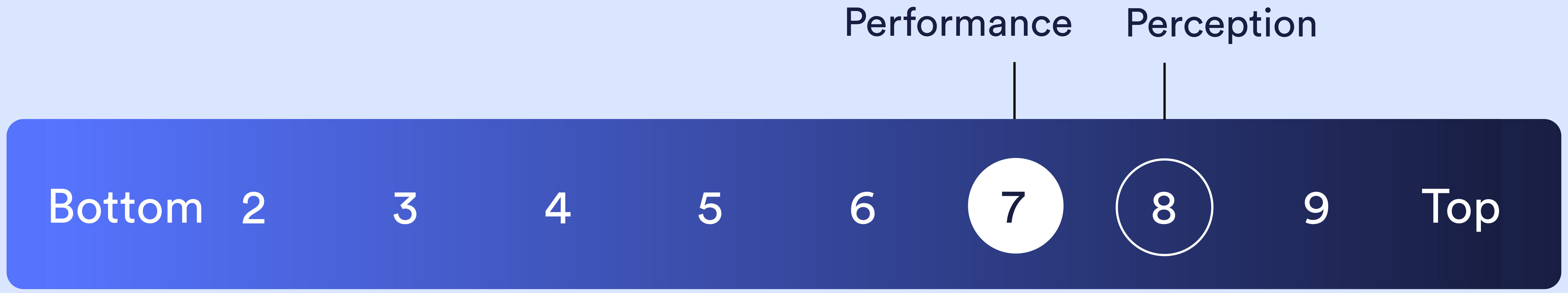
1 Opportunity

How recognised is Oslo as a region that is prosperous and open for business?

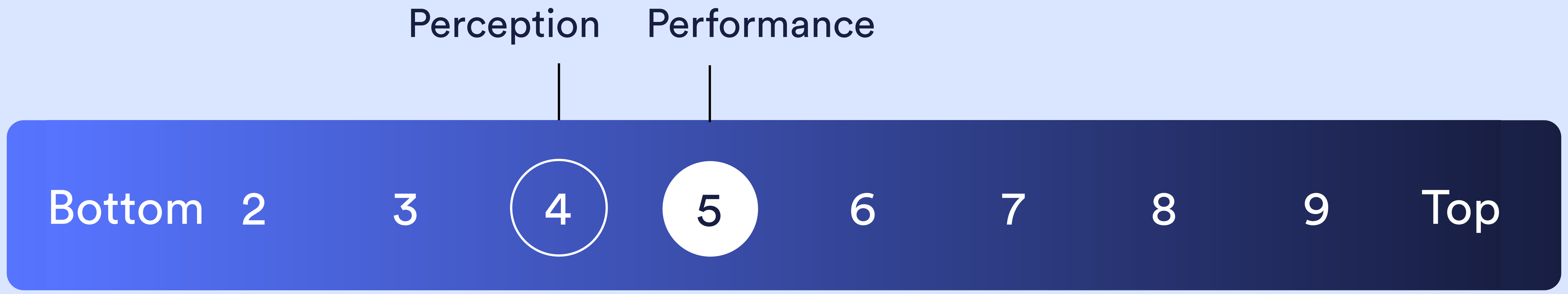
What it means for Oslo

1. Make sure existing industries are supported to become digital and low-carbon more quickly
2. Workplaces, placemaking and whole neighbourhoods need to more regularly meet the requirements of the future of work
3. Oslo’s strengths and success stories need to be shared in innovative ways with global audiences to overcome doubts and misperceptions

1.1 Productive and future proof economy



1.2 Business and investment friendliness



1.1 Productive and future proof economy

What is ‘productive and future proof economy’ and why does it matter?

Having a productive and future proof economy means having an economy that is able to stay open to trade, business, talent and opportunity in a context where sudden disruptions to economic circumstances are liable to be caused by pandemics, geopolitics or climate change. Being productive and future proof means ensuring a flexible workforce, being ready for new growth sectors, building contingency for risks, and maintaining progress in high value sectors.

Performance	Perception
7/10	8/10

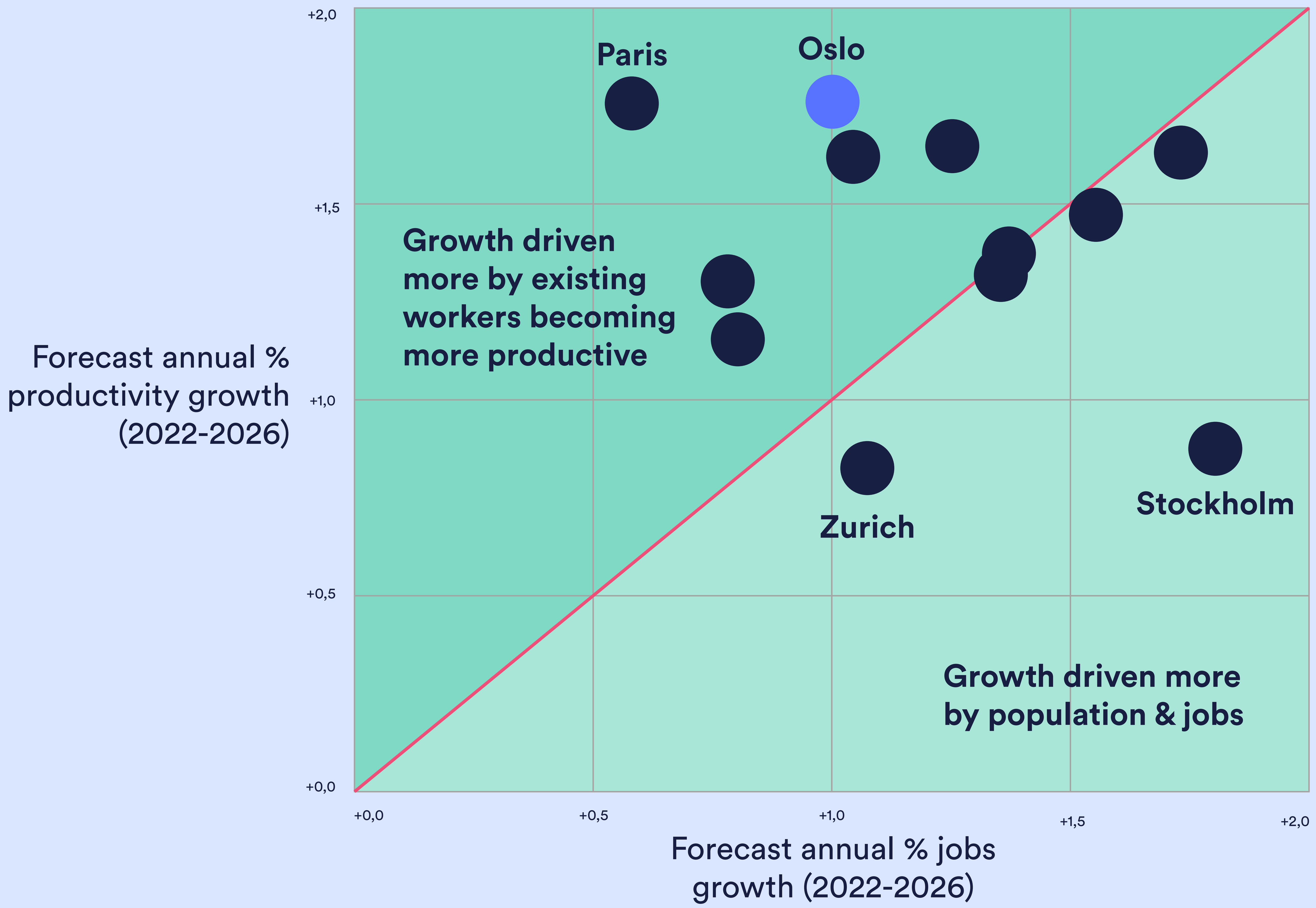
How is Oslo doing?

In 2022, Oslo:

- Stands out for its **resilient economy during the pandemic.**
- Continues to grow its influence as a regional hub but **others are becoming more globally connected** more quickly.
- **Has become more visible for its role servicing national industries** such as maritime.
- Faces **new affordability challenges especially around co-working** that might harm its ability to adapt to and thrive in the future world of hybrid work.

Productivity gains are viewed to contribute more to Oslo's medium-term outlook

Figure 2: Forecast annual productivity and jobs growth in selected major European cities, 2022-2026



Source: Oxford Economics [26]

Performance

- **Oslo is seen as a reliable and capable city for maritime.** Oslo is ranked in the top 5 globally for its development of maritime technology, expertise in maritime finance and law and its future as a maritime centre. [27]
- **Productivity is growing strongly.** Oslo has overtaken 20 cities for productivity as a result of its pandemic resilience. Its 5-year forecast growth puts it 6th among 15 leading European cities. [28]
- **Oslo faces fewer environment risks than most cities.** Oslo is increasingly rated a safer bet than other cities, with one key study showing a lower exposure to environmental risks than any other city globally. [29]
- **Oslo has to keep up progress in the knowledge economy.** Oslo surprisingly ranks 2nd last for forecast office-based jobs among 15 leading European cities, partly due to its current economic mix. [30]
- **Flexible ways of working are in some ways harder in Oslo.** The city is the bottom 50% for how expensive it is to hotdesk. [31]

Perception

- **Job satisfaction remains high.** Oslo is in the top 30% of peers for the share of local people who agree that finding fulfilling employment is not an issue. [32]

1.2 Business and investment friendliness

What is 'business and investment friendliness' and why does it matter?

Sustaining an attractive business and investment climate is crucial for new jobs and capital attraction. As cities recover from the pandemic, and capital flows back to cities, governments are competing to demonstrate value and reliability to investors, reduce costs for businesses and facilitate access to talent.

Performance	Perception
5/10	4/10

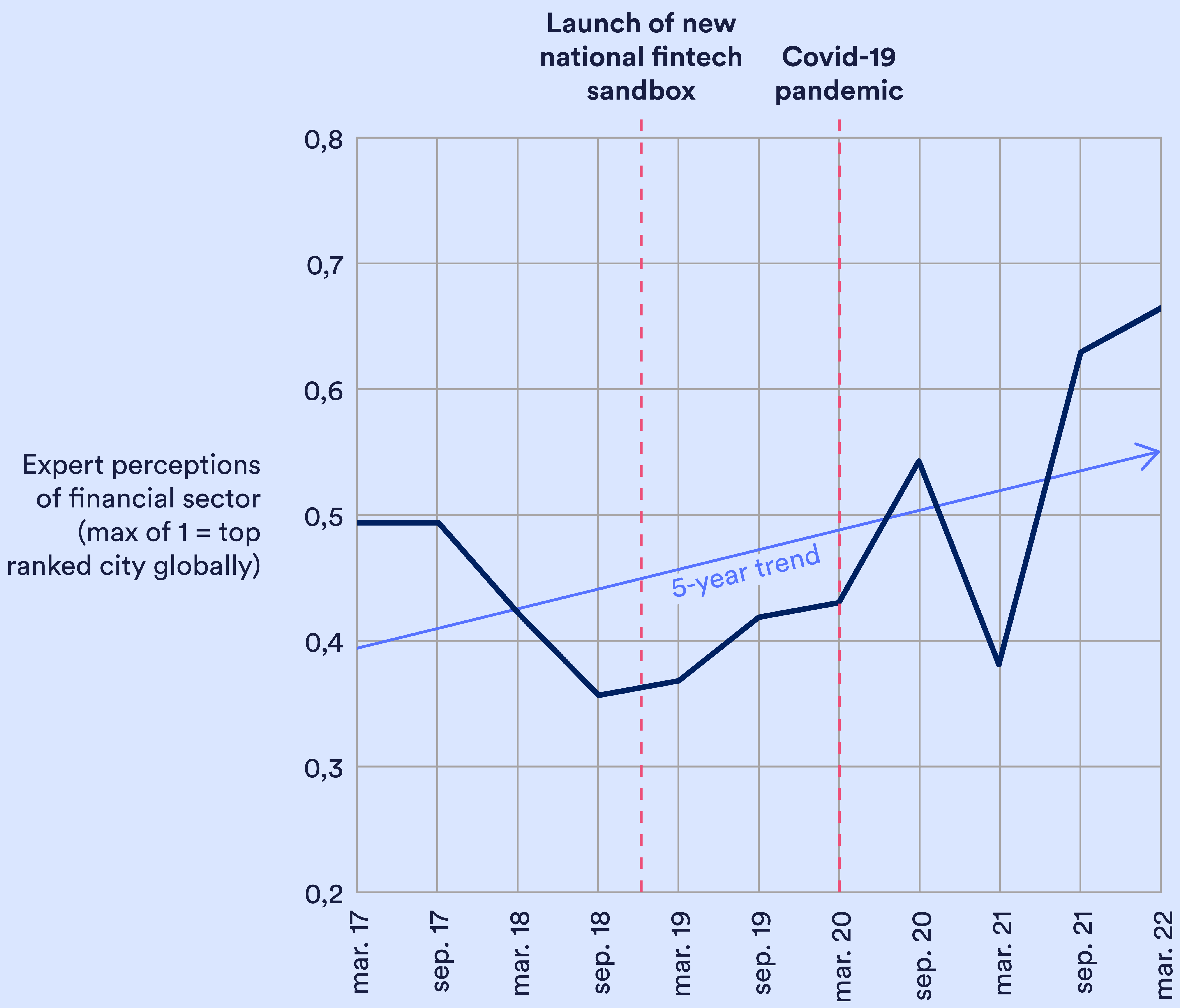
How is Oslo doing?

In 2022, Oslo:

- Remains a **highly attractive market for global businesses and investment** across many sectors.
- Is becoming more highly regarded as a **key regional finance hub.**
- Still attracts **less FDI than would be expected** given its size.
- Has a **less international real estate market,** which makes it more resilient to global capital swings but less visible among key investor circles.
- **Has cost and space barriers** which inhibit the rise of urban logistics.

Confidence in Oslo's financial sector is growing

Figure 3: 5-year change in expert perceptions of Oslo's financial sector



Source: Z/Yen Global Financial Centres Index. [33]

Performance

- **Oslo's appeal to global companies is robust.** Oslo punches well above its weight for how many corporate HQs there are. [34]
- **Less success translating ease of doing business into foreign investment activity.** Oslo is in the top 15% of cities globally for ease of doing business, but ranks 5th out of 8 smaller-sized peers for FDI projects, given its population size. [35]
- **Oslo's logistics functions are not yet as well established.** The city is 48th out of 75 cities for the efficiency and reliability of logistics infrastructure to support globally trading businesses. It also has the 8th most expensive warehouse rental costs out of 250 cities. [36]

Perception

- **Viewed as an expensive proposition for investors.** Oslo currently ranks 27th out of 30 European cities for what the real estate community perceive as prospects for good value investment. Investors are upbeat about the city's political stability, growth trajectory, and growing appeal to talent, but see limitations in its scale and presence of global investors. [37]
- **Confidence in the financial sector is growing.** Despite some year-on-year flux, confidence in Oslo's financial sector among financial sector experts has grown over the medium term, from a low point of 64th out of 100 cities in September 2018 to 39th in a larger pool of 119 cities today. [38]

Foto: Kristoffer Hunstad

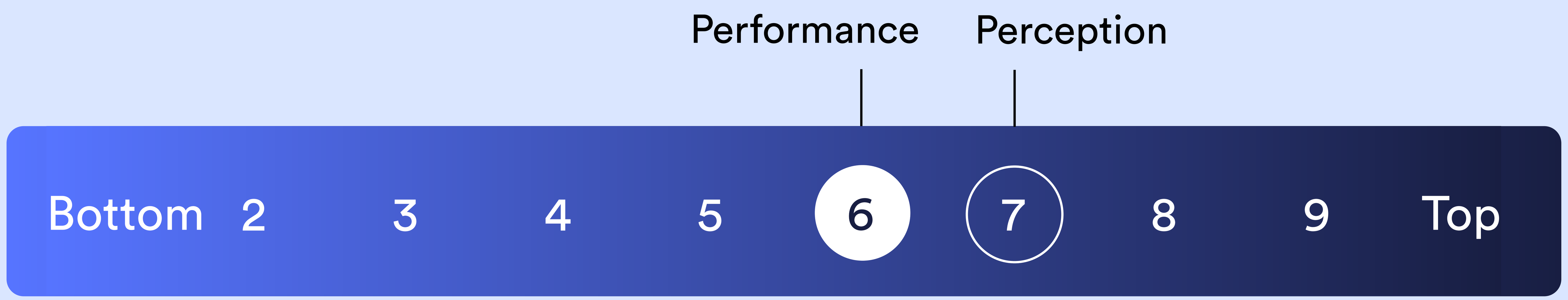
2 Innovation

How is Oslo regarded for its capability to build companies and access to specialist skills?

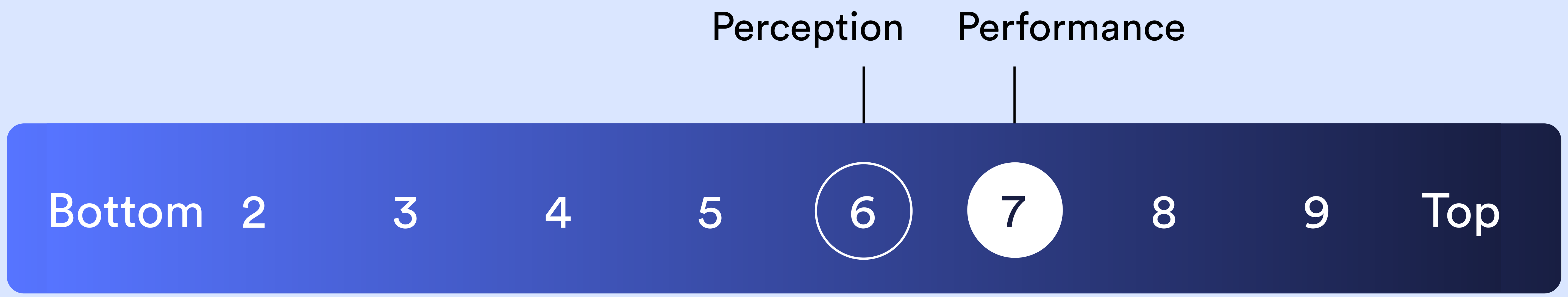
What it means for Oslo

1. More work should be done to connect the research and start-up ends of the ecosystem.
2. A spatial strategy for innovation should be developed that takes into account the real progress and potential of different places.
3. Explore what else Oslo can influence on start up propensity and commercialisation.

2.1 Innovation ecosystem



2.2 Knowledge and skills



SPECIAL FEATURE

Oslo's innovation ecosystem

– Where does it stand?

This chapter was made with the support from Oslo Region Alliance

Oslo's innovation ecosystem

Internationally, the focus on innovation in cities has intensified because of the pandemic.

While the digital acceleration has seen some industries become more distributed, many others have become much more hungry for the collaboration, capital and proximity that cities provide. A third group of growth industries (from batteries to carbon capture) rely on land and expertise found in a city's wider region.

Many cities – from Glasgow to Fukuoka - are joining the race for innovation in frontier sectors. Others – such as Ottawa and Bilbao - are seeing their nations or regions confront head-on the reasons innovation across the wider business base has fallen short.

This special feature looks at the wider landscape - from startups to research to institutions to investment to business behaviour and adoption.

Performance
6/10

Perception
7/10

Key findings

- **The start-up dimension of innovation has really broken through in Oslo.** After many years of steady progress Oslo's performance in frontier sectors has now entered the top 25 in Europe. The region is now starting to excel in gaming, fintech, edtech and energy. Perceptions are also catching up. Oslo is more often on 'the radar' of more start-up founders, investors and innovation experts: it now ranks in the top 20% cities in 23% of the innovation studies it appears in, compared to 18% in 2021. [40]

- **Oslo's excellence across the value chain for innovation is not as visible internationally.** Some top performances can be found in upstream science and foundational technologies (eg University of Oslo is 34th globally for computer science and engineering, in the global top 50 for geology, geophysics and earth sciences, and top 100 for medicine). But Oslo's many other knowledge strengths do not yet register as much on the international radar. The momentum of Oslo Science City highlights the importance of connecting 'upstream' and 'downstream' innovation, and making sure they complement and reinforce each other. [41]

- **Liveability and talent remain fundamental** to Oslo's ecosystem progress. Access to talent is still seen as one of the most important drivers of investment and success, appearing in more than 60% of all comparative studies of cities' innovation progress and potential. There are more signs that the investment and confidence in Oslo's powers of discovery is underpinned by the expertise that resides in the region, the demand to live in Oslo, and the appetite of people locally to test new innovative products and services. [42]

- **Oslo's progress would be supercharged by an even better environment to commercialise knowledge.** The frameworks to translate research advantages into spin-offs and commercial outcomes, are still rated as behind in several industry areas - especially health and medicine, where Oslo is still outside the global top 150 for success scaling innovation firms. [43]

- **The story and cohesion of Oslo's ecosystem is not yet as joined up as other regions.** Oslo now has a rich knowledge and innovation landscape. But many of the regions globally that are excelling are doing more to visualise and communicate how different locations and sectors reinforce each other.

What's changed since Covid-19

Oslo is recording superb results not only in terms of high value exits and promising new start ups, but also in terms of how eager citizens are to try out new tech.

+ 2000

new local tech-enabled firm HQs since 2019 in Oslo Business Region (OBR)
(from 1270 to 3270) [44]

+ 29

internationally recognised, high performing scale-ups* in OBR
(268 scale-ups in total, up from 239 in 2019) [45]

Overtaken Auckland, Rotterdam and Ottawa

for all-round innovation performance [46]

Like-for-like, Oslo has attracted more venture capital than its European peer cities in nearly

9/10 industries [47]

*Number of tech-enabled firm HQs ranked in the top 100,000 globally (according to Crunchbase's aggregate measure of M&A activity, investment momentum, innovation commercialisation and online visibility)

Where is Oslo doing well?

Weaker performance — Stronger performance

Measure	Oslo's global rank	Rank among peers	Trend
Citizen adoption of new tech and apps [48]	1st /50	1st / 21	
Expert confidence in maritime industry's innovation potential [49]	2nd /50	1st / 3	→
Growth in unicorns and $1bn exits since 2019 [50]	-	1st / 32	
Fintech ecosystem strength, as seen by experts [51]	46th / 113	-	
Growth in VC funding since 2019 [52]	-	8th / 47	↑
Growth in no. of local tech-enabled firm HQs since Covid-19 [53]	-	8th / 32	
Retail innovation and funding [54]	37th / 100	13th / 37	↑
VC funding raised since 2010 [55]	39th / 100	14th / 37	
Popularity as a place to start up among start-up founders [56]	27th / 94	13th / 20	

Oslo is a world leader for:

- Digital adoption
- Servicing maritime innovation

It is becoming more recognised as a place for:

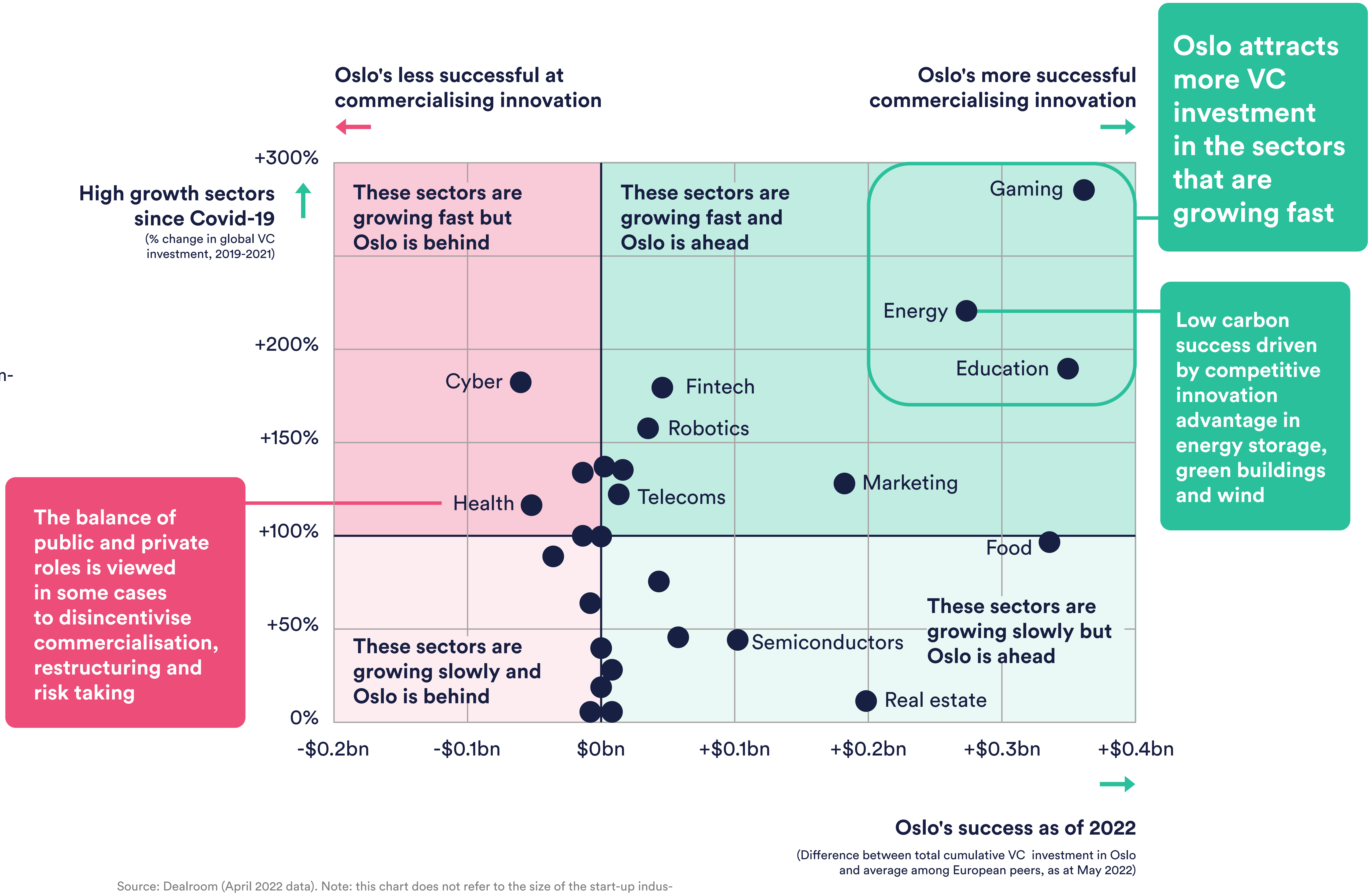
- Scaling innovation up to international scale
- Fintech & services
- Starting up

Oslo's Innovation Edges

Oslo is riding a wave of post-pandemic innovation

Figure 4: How successful at commercialising innovation is Oslo in fast-growing sectors, compared to its European peers?

e.g. With nearly 300% increase in global VC investment, Gaming has been among the fastest growing sectors since Covid-19. Up to 2022, Oslo's gaming sector has attracted $400m more VC than its European peers.



Source: Dealroom (April 2022 data). Note: this chart does not refer to the size of the start-up industry in different sectors. For information on level of specialisation of start-ups, see Figure 5.

After many years when Oslo was underperforming, Oslo has been catching up for scale ups in a variety of sectors. Given the boom happening in life sciences across cities around the world, Oslo's own track record of commercialisation has, overall, been more modest despite some success stories. Other cities are more firmly established as leaders in all things *data*.

Areas for progress

Weaker performance — Stronger performance

Measure	Oslo's global rank	Rank among peers	Trend
Patent concentration [57]	43rd / 155	17th / 31	→
No. of globally influential local tech-enabled firm HQs [58]	-	15th / 32	→
Success of start ups at achieving real scale [59]	112th / 1000	35th / 50	↑
Success of software and data start ups at achieving real scale [60]	144th / 1000	41st / 50	↓
Number and scaling success of health-tech start ups [61]	186th / 1000	42nd / 50	↓
What start up founders think about ecosystem value for money [62]	-	13th / 13	→

Observing Oslo's industry make-up compared to other regions, it is striking that there are a lot of capabilities and incentives to grow companies that innovate in the energy, telecoms and deeptech sectors. Many other sectors are more noticeably shaped by larger companies and corporates – notably engineering, and health.

The overall picture, when compared to other cities, is that Oslo has:

- An increasingly diversified and resilient mix of companies starting and scaling up.
- Potential to grow more/larger companies that serve the improvement of key city services and experience.

Other cities are moving ahead for:

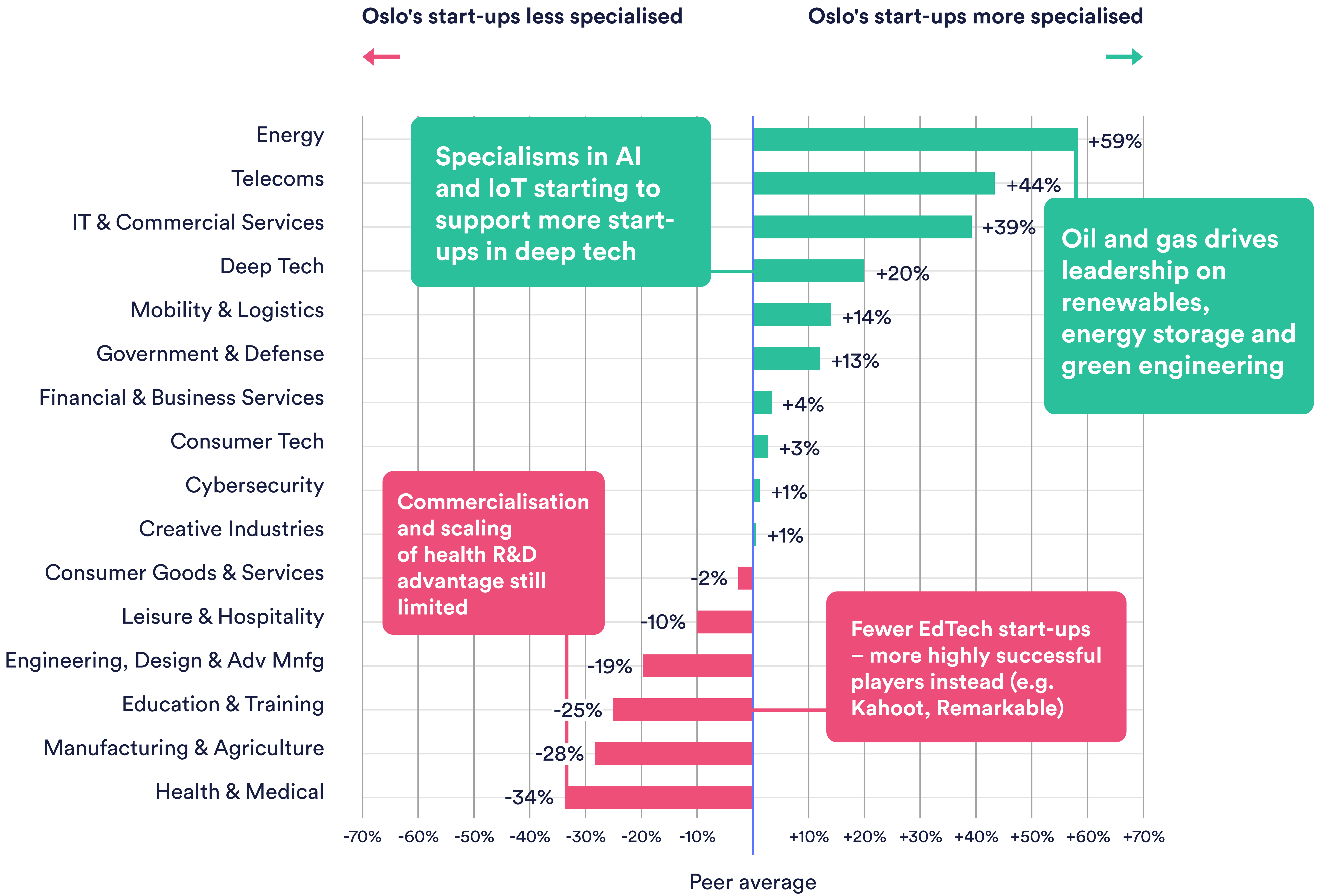
- Turning health clusters into healthtech commercialisation
- Creating world-leading data and software firms

Oslo’s start up ecosystem is seen as more oriented than most towards energy, telecoms, AI and IoT

Figure 5: How large is the local start-up presence in different industries in Oslo vs. its peers in 2022?

e.g. On average, there are 59% more start-ups with a specialism in Energy in Oslo than on average across peer cities.

e.g. The level of specialisation of Oslo’s start-ups in creative industries is roughly on par with that of its peers. This does not reflect how much VC investment these firms attract or how successful they are at commercialising innovation.



Source: Crunchbase (January 2022 data). See Appendix for methodology.

Compared to other cities, Oslo has an increasingly diversified and resilient mix of companies starting and scaling up.

Oslo's Progress across the Value Chain

When people talk about the innovation economy they often talk about startups. But cities host different kinds of activities along the innovation value chain. Each part of the chain wants and needs something different in terms of the locations they want to be in and the kind of companies or people they want to be around.

Oslo has excellence 'upstream' – in scientific discovery and enabling technologies for innovation – dotted around the region in places like Kongsberg. It also has a start up economy 'downstream' that gravitates in the city centre. When scaling up, innovation firms often stay near the inner city.

All parts of the Oslo ecosystem support the rest. It is increasingly important to:

- Build these links and relationships further
- Develop an overarching narrative to tell the story of the whole value chain

Big unicorn success stories in:

- **SaaS (Kahoot, Link Mobility Group, Gelato)**
- **Mobile (Opera, Remarkable)**
- **Deliveries (Oda)**

Source: The Business of Cities research. Advantages and opportunities identified according to university R&D strengths, start-up specialisations, VC attraction, and online recognition and visibility. Green buildings specialism based on no. of tags relating to green buildings as a share of all tags associated with local tech-enabled firm HQs present in the city (Crunchbase data, Jan 2022)

Upstream

Oslo's universities and institutes have international advantages in medicine, energy sciences and earth sciences.

Oslo Science City is a major cluster for upstream capability.

Scientific Discovery

- Medicine
- Energy Science
- Earth Science
- Computer science & engineering

Enabling Technologies

- Sensors
- Renewable energy & energy storage
- Artificial Intelligence
- Satellites
- Blockchain
- Photonics

Oslo is recognised for sensors and renewables, and, increasingly, blockchain and satellites.

Recent start-up successes include satellite data firm Glint Solar

In 2022 NMBU launches Norway's first Master's in Photonics

Oslo's technology and research strengths support micro-mobility, VR and AR to thrive.

Market Applications

- Micro mobility
- VR & AR
- EVs, self-driving
- SaaS
- Mobile comms, payments & devices
- IoT

IoT has taken off, fuelled by demand in oil, gas & maritime industries

These innovations produce many improvements to Oslo's city systems - smart homes, fleet management platforms, and mobility testbeds.

Oslo is 5th among similar cities for firms specialising in green buildings.

City Systems Applications

- Transport, Logistics & Delivery
- Green Buildings

New Urban Economies

- Sharing & App Economy
- Circular Economy

Oslo's AI ecosystem is set to grow the circular economy. eg. Volur (the meat industry) and eSmart Systems (for critical infrastructures)

Waste and sustainable startups on the rise - such as Empower, Total Ctrl, and rewards app Fauna

Downstream

Observed global advantage for Oslo

Emerging specialism or opportunity

Innovation Enablers

Turning one cycle of success into continuous excellence is no accident.

Internationally, ecosystems are *enabled* to succeed over the long term when there are improvements to the business and start-up climate, when institutions adapt to behave as self-conscious 'anchors', and when there is continuous investment in sustainability, housing and all the things that service the growth of the region.

Oslo is at least on a par in all of the areas needed for the ecosystem to thrive

Figure 6: How is Oslo doing across the different factors that enable innovation ecosystems to thrive?

Oslo's performance	Example metrics
Housing and Land Use	- **5th / 50** for local perceptions of rental affordability
Larger Firms and Future Growth Sectors	- In global **top 100** for scaling success in 6/8 future-facing industries
Capital & Climate for Enterprise	- **39th / 100** for VC attracted since 2010 - **50th** globally for ease of doing business
Knowledge anchors, R&D	- **12th** for city contribution to national science citations - **60th** for % of science publications in most cited
ESG- and Future-proof Investments	- **1st / 36** European cities for low carbon policy scale and ambition

KEY – Oslo's performance

- Oslo on a par with peers
- Oslo doing better than peers
- Oslo a leader among peers

Commercialisation outcomes for fast growing sectors such as health and life sciences are behind others, despite large sums spent on research

Source for Oslo's performance: The Business of Cities research. Aggregate position in each theme calculated according to an ELO algorithm that computes all of the relevant input benchmarks. Sources for example metrics (from top to bottom): IMD; StartupBlink; FINOM; StartupBlink; Nature; CWTS Leiden Ranking; CleanCities. [63]

What are other regions and their national/provincial governments doing?

Building government's awareness of the links between innovation and place

Glasgow and Scotland are working together to make sure that government support on innovation is not siloed from what different places and districts need. Development agency ScottishEnterprise has reformed itself to create teams specialised to ensure that innovation investment is tailored to each innovation district.

A bigger role for business leadership

Ottawa, Toronto and other major cities in **Canada** are now benefiting from an updated national 'supercluster' initiative that will be more business-led. It focuses on 5 sectors led by a non-profit entity, each with its own industry-led board of directors responsible strategic priorities and project selection.

Ensuring the region's use of land is pro-innovation

Auckland Region and **New Zealand** are working more effectively together to ensure that land use is more conducive to future innovation. New legislation commits to new development being a higher level of density and well connected by public transport, which will help to keep prices manageable.


ONE WAY
56
6x
6x
SHOTS
3
MULTIPLIER
X1.0
SCORE
0
TOP SCORE
0

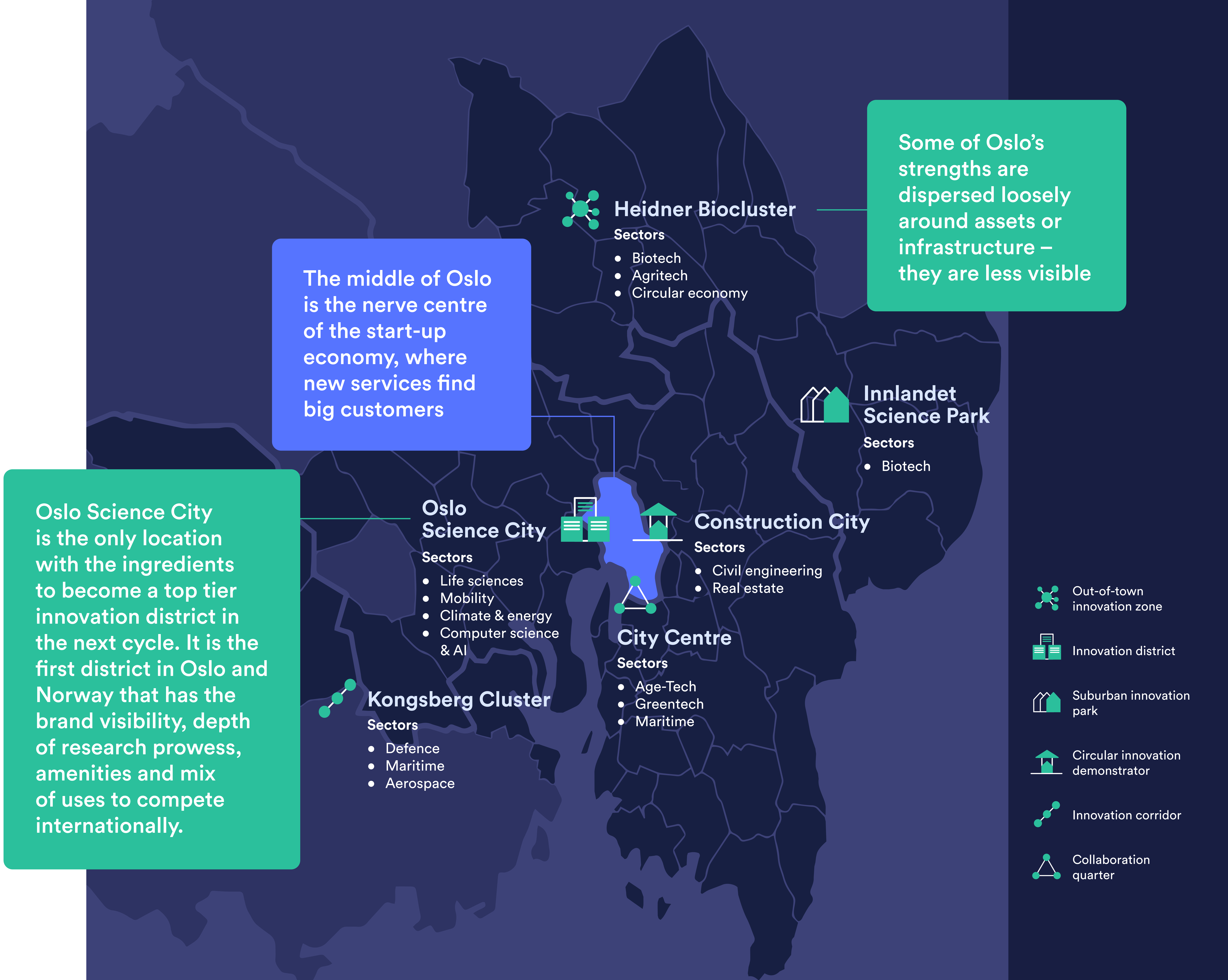
Towards an Innovation Map for Oslo

Oslo's regional innovation ecosystem is now made up of several complementary hubs, clusters and districts. Each play a role upstream or further downstream in the ecosystem. There are many different types of location, each of which brings different advantages, opportunities and complementarities.

Hubs around Kongsberg and Heidner are recognised for their progress and potential in fostering scientific discovery and scaling enabling technologies needed to support the wider ecosystem, whereas the middle of Oslo is where the start-up economy and services innovation are concentrated.

In other regions like Oslo, more purposeful relationships between these different locations are being established, so that the flow of ideas, knowledge, talent and capital between them is more efficient.

As part of its innovation proposition to the world, Oslo should develop a clear map that communicates the different types, stages and opportunities these locations present.



Oslo's Innovation Narrative?

Innovation is now firmly established as a part of Oslo's internal identity and external positioning. Performance is clearly tracking in the right direction.

However outside perceptions are still patchy and fragmented. The whole story of Oslo, its industries and places, does not yet register in the way its performance deserves.

This appears to be linked to the fact that:

- The start-up economy and the research, science and technology infrastructure are quite disconnected.
- The region's main innovation locations are not yet associated with 1-2 particular specialisms. Instead many niches are promoted, partly out of a desire to include everyone.
- There is not yet any vehicle or 'single front door' for promoting the innovation districts collectively – and so efforts are more fragmented.
- Many cluster initiatives do not have a clear approach to place or clear incentives to connect strategically to other clusters.
- The organisations who promote different strands of innovation (R&D, startups, impact investment) have separate stories and communities of interest.

Oslo needs a stronger collective innovation narrative. International evidence suggests that this should:

- Benefit from confident input and shaping by the region's best business leaders, entrepreneurs and civic innovators.
- Be grounded more clearly in the districts where innovation comes alive and where a version of the 'quadruple helix' is a reality.

Such a narrative will help Oslo communicate the value proposition to foreign investors, talent, media and citizens and take the next step in addressing the perception gap.

What Oslo should consider

- Bring together a coalition of business, start-up and investors to craft a complete narrative. Create some devoted capacity to tie it together with the wider story for talent and sustainability.
- Decisively promote those locations that are most advanced as the pioneers and conveners of the new kind of collaboration and placemaking that is required. This will help better signpost where the current opportunity is, and provide confidence and direction for other locations.
- Create a map that shows where the opportunities for innovation investment and co-location are, and where the future demand is, not just research and public funding 'inputs'.

2.2 Knowledge and skills

What is 'knowledge and skills' and why does it matter?

Skills and talent are the lifeblood of a city economy like Oslo's looking to complete a transition to an advanced knowledge economy. The war for scarce talent is heating up in booming industries where technology, software and science converge. Many cities also face profound risks of a chronic absence of key workers that can affect infrastructure, education, quality of life and much more.

Performance	Perception
7/10	6/10

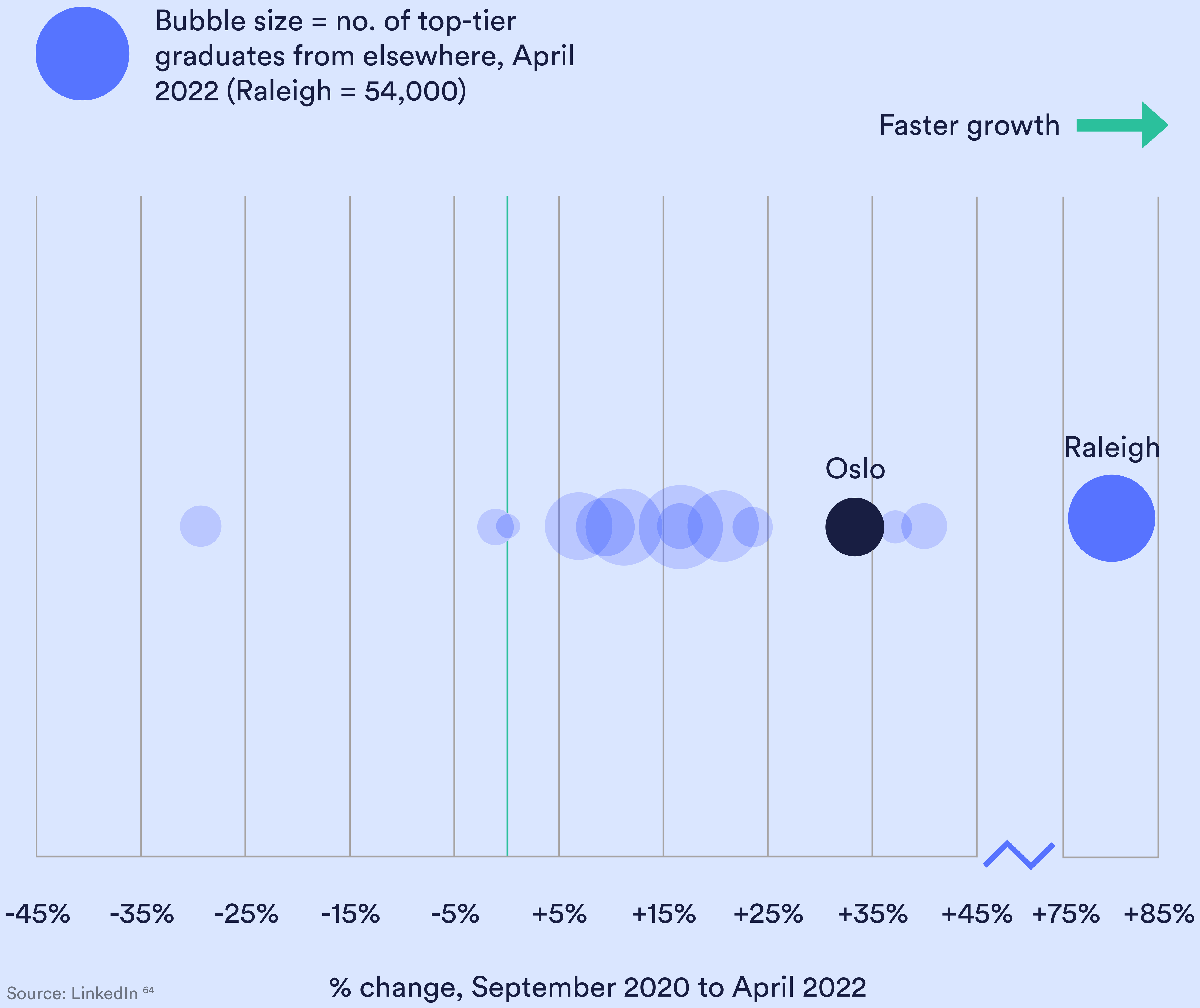
How is Oslo doing?

In 2022, Oslo:

- Remains one of **Europe's most highly educated cities,** partly because so many people who study in the city choose to stay there.
- Is starting to be viewed as a more serious **contender city for the world's footloose digital talent,** as people re-evaluate what they value post-Covid (work-life balance, access to nature, etc.)
- Has **not yet developed a critical mass of skills** in many key technology and engineering areas, with the risk that it is unable to make the most of globally impactful research.

Oslo's ability to attract top-tier graduates is growing

Figure 7: % change in no. of top-tier graduates working in the city but who studied elsewhere, since Covid-19*, selected peers



Source: LinkedIn [64]

Performance

- **Oslo's workforce is highly educated.** The city is in the top 5% of European regions for the share of adults with at least a degree-level qualification. [65]
- **More people who study in Oslo, are staying in Oslo.** Oslo is rated 5th in its peer group for the share of graduates staying in the city. [66]
- **Oslo's ability to attract top graduates from abroad is growing, from a lower base.** In 2022, Oslo is up 4 places to 23rd among similar cities for how many people who went to a globally renowned university elsewhere, are now working in the region. [67]
- **Oslo's universities are not as often recognised as world-class in parts of STEM.** There are fewer internationally top-rated university degree courses for computer science and engineering in Oslo than in any other mid-sized city in Oslo's wider group. [68]

Perception

- **As globally mobile workers consider their options again, Oslo's appeal is improving.** Oslo was for the first time rated among the global top 30 for the share of digitally skilled people living abroad willing to move to the city for work. [69]
- **Oslo's is not as visible as a top international student city.** The city surprisingly still does not yet appear as one of top 115 cities for students. This may be a risk given the role these assessments play in informing the decisions of prospective students. [70]

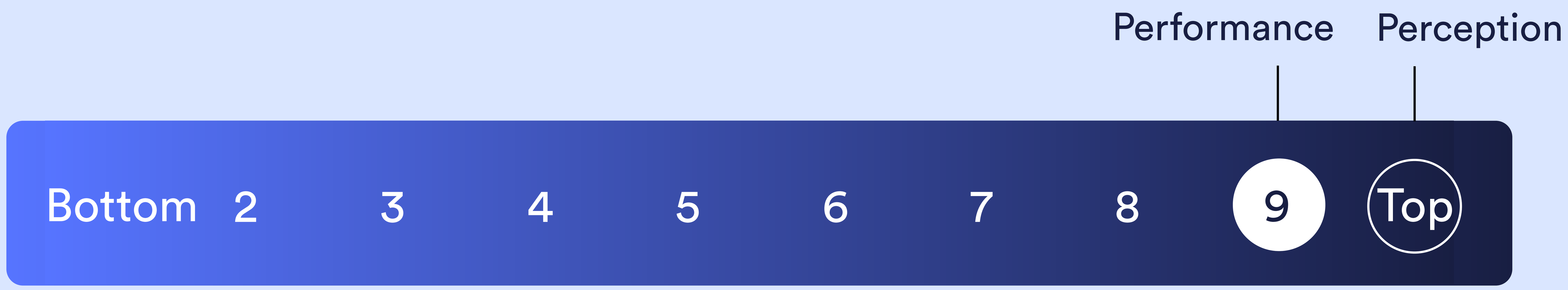
3 People

How well is Oslo known for what it offers people, in terms of health, lifestyle and warm welcome?

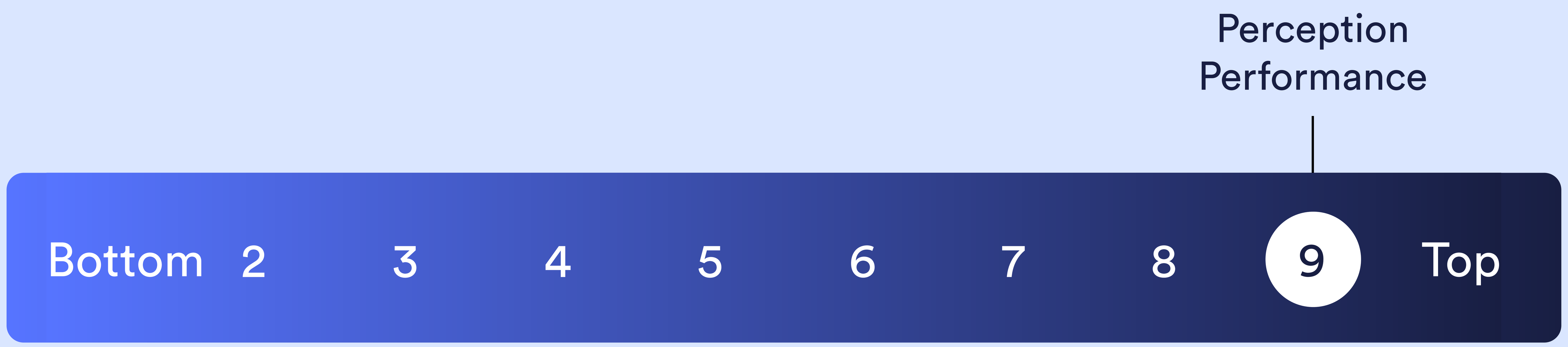
What it means for Oslo

1. Be bolder about the advantages Oslo now has a place where people find fulfilment, happiness, community and balance.
2. Provide the tools and encourage more people in Oslo to become confident ambassadors of the city's quality of life and opportunity.
3. Focus on addressing perceptions (and reality) about crime and safety in Oslo, to prevent it becoming a concern for the city's international reputation.

3.1 Healthy living



3.2 Welcome and inclusion



3.1 Healthy living

What is 'healthy living' and why does it matter?

Cities that have long competed on quality of life increasingly have to demonstrate that they cater for the desire for work-life balance, access to good affordable healthcare, useable green space, and outdoor lifestyle.

Performance	Perception
9/10	10/10

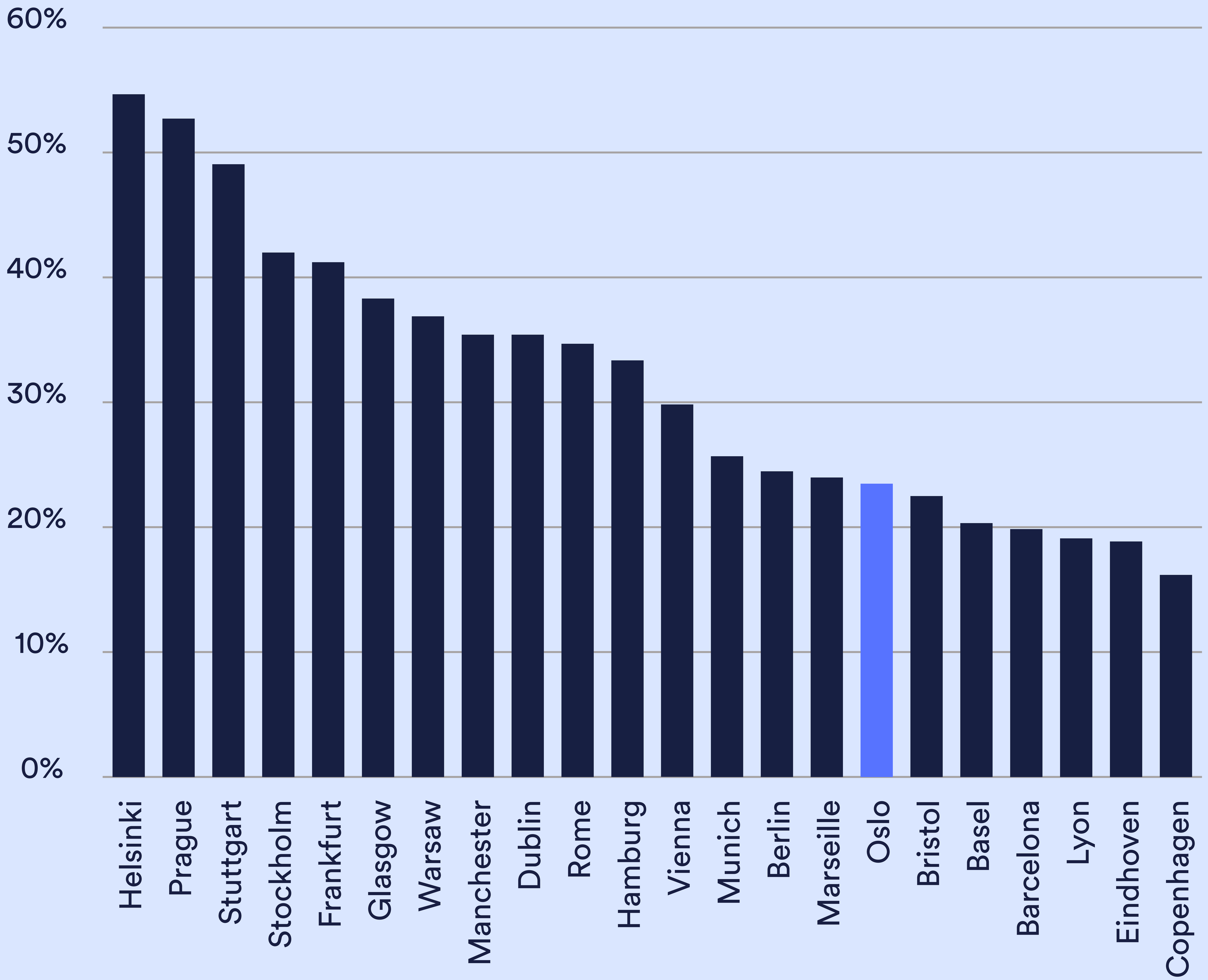
How is Oslo doing?

In 2022, Oslo:

- Has more of the **lifestyle ingredients** to thrive in the post-Covid world of cities.
- Benefits from a **world-class healthcare system.**
- Is **more affordable for local people** looking to find somewhere to live.
- Is more often **penalised by the high expectations of people** living in the city.

People living in Oslo have less green space located very close to their homes

Figure 8: % of neighbourhoods* with WHO-recommended green space cover



Source: ISGlobal Ranking of Cities. *250m sq. blocks.[71]

Performance

- **Oslo's healthcare is second to none.** Oslo is ranked 1st out of 80 cities for how easy it is for local people to access good quality healthcare services. [72]
- **Work-life balance is improving in some cities and remains exceptional in Oslo.** Oslo is ranked the best city for work-life balance out of 100 global cities and the 6th least stressful city to live in out of 100 global cities. [73]
- **On paper, people who live in Oslo find more of what they are looking for in life.** The city is in the global top 2% for the lifestyle ingredients people would factor into their decisions about whether to stay in the city or move elsewhere (environmental quality, safety, happiness and congestion). [74]
- **Oslo is closer to nature.** Oslo is 5th among similar cities for how easy it is to access forested areas. [75]
- **But within the city, fewer people are in easy walking distance of green space.** Despite being fringed by large swathes of forest, Oslo is outside the top 30% in Europe for the number of neighbourhoods that meet the WHO's target for green space coverage (parks, gardens, etc.). [76]
- **Air is not as clean as it could be.** For year-round exposure to air pollution, Oslo is not yet in the top third of its peer group, and is behind Stockholm, Helsinki and Dublin. [77]

Perception

- **People who live in Oslo are happy and fulfilled.** The city is in the top 5% globally for how happy local people are with their day-to-day lives. [78]
- **Easy for local people to find affordable rentals.** Oslo ranks in the top 20% among similar cities for how easy local people think it is to find affordable rental accommodation. [79]
- **More people are worried about safety.** Online crowdsourced data suggests that 60% of local people in Oslo think crime has been increasing over the past 3 years – higher than in Helsinki (58%), Copenhagen (55%) and Glasgow (48%). [80]
- **Air pollution concerns are growing.** Oslo is only in the middle of its peers for the share of local people who identify air pollution as a key challenge for the city. [81]

3.2 Welcome and inclusion

What are 'welcome and inclusion' and why do they matter?

The strength of the social contract between different income groups, and between long-time residents and new arrivals, is now a difference-maker for many cities. It separates those who can adapt to crisis, build consensus around future changes, and combat economic and cultural polarisation, from those that are not. This relies on a city's shared values and being welcoming to outsiders.

Performance	Perception
9/10	9/10

How is Oslo doing?

In 2022, Oslo:

- Has one of the **most gender-equal employment systems.**
- Benefits from **higher levels of social cohesion** and solidarity.
- Is still only recently a truly international city and locally many people perceive **social mobility** as a problem.

Peace and democracy still loom large in the global imagination of what Oslo stands for

Figure 9: Which aspects of Oslo's values do the global public talk about online?

Sources: Twitter, Google, and 100 of the world's most influential news outlets (2021). Includes words used by general public, journalists and social media influencers.

Performance

- **Oslo is a leader for equal workforce participation.** Oslo has the smallest gap in employment between men and women among similar European cities. [82]
- **Social solidarity in Oslo is well established.** The city is 2nd out of all European cities for how easy it is for local people to access public utilities and social support when they need it. [83]
- **Oslo's population is becoming more international but it is not automatically seen as a capital of diversity.** Oslo is 40th out of 99 cities for the share of people born abroad. [84]

Perception

- **Strong shared sense that minorities are welcome in Oslo.** Oslo is 4th out of 28 peers for the share of local people who think that minorities feel welcome. [85]
- **Social mobility is seen as a key challenge.** More local people identify social mobility as a key challenge in Oslo than in almost any city in Europe. This reflects high resident expectations and awareness of the need to live up to social democratic ideals. [86]


Øvre Slottsgate
Triumph
13 Bekkestua
158
107
OLIMB & CO
FRISØR
GELATERIA
Øvre Slottsgate

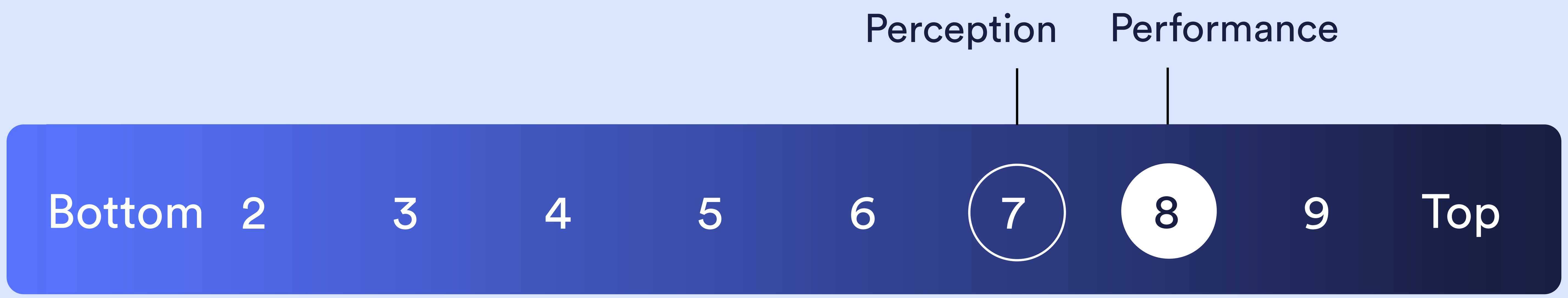
4 Place

What is the day-to-day physical experience like in Oslo, of working, living and travelling in the region?

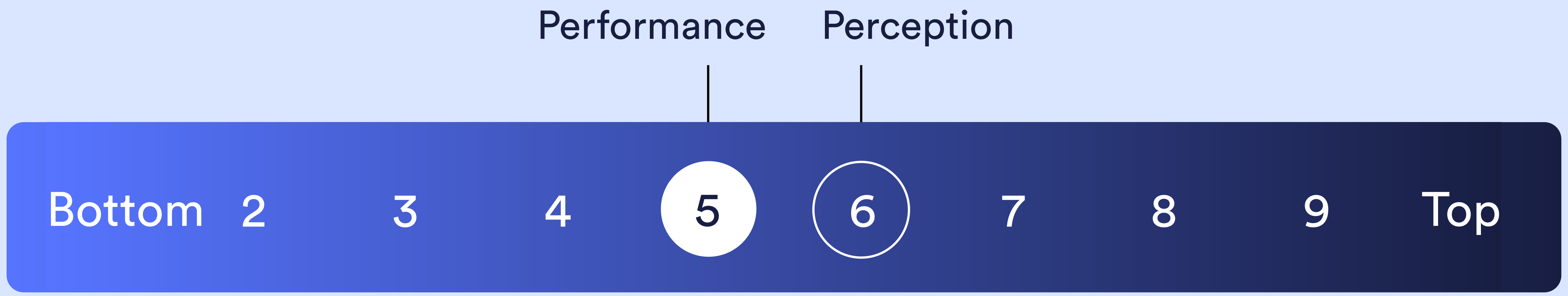
What it means for Oslo

1. Assess honestly whether mobility, public space, and other city factors are best equipped to ensure Oslo can appeal to ‘floating’ customers who have new preferences and habits.
2. The city centre population should continue to grow where possible, as a way to enhance resilience and provide a customer base for urban experiences.
3. Identify what else can be done to organise and promote the region for families and wellbeing – including for visitors.

4.1 Infrastructure platform



4.2 Spaces and places



4.1 Infrastructure platform

What is ‘infrastructure platform’ and why does it matter?

A productive, efficient and well functioning infrastructure platform – both transport and digital – is essential for a fast-growing metropolis like Oslo, whose liveability and productivity advantage rests on speed, reliability and flexibility for its growing base of people, goods, clients, customers and services.

Performance	Perception
8/10	7/10

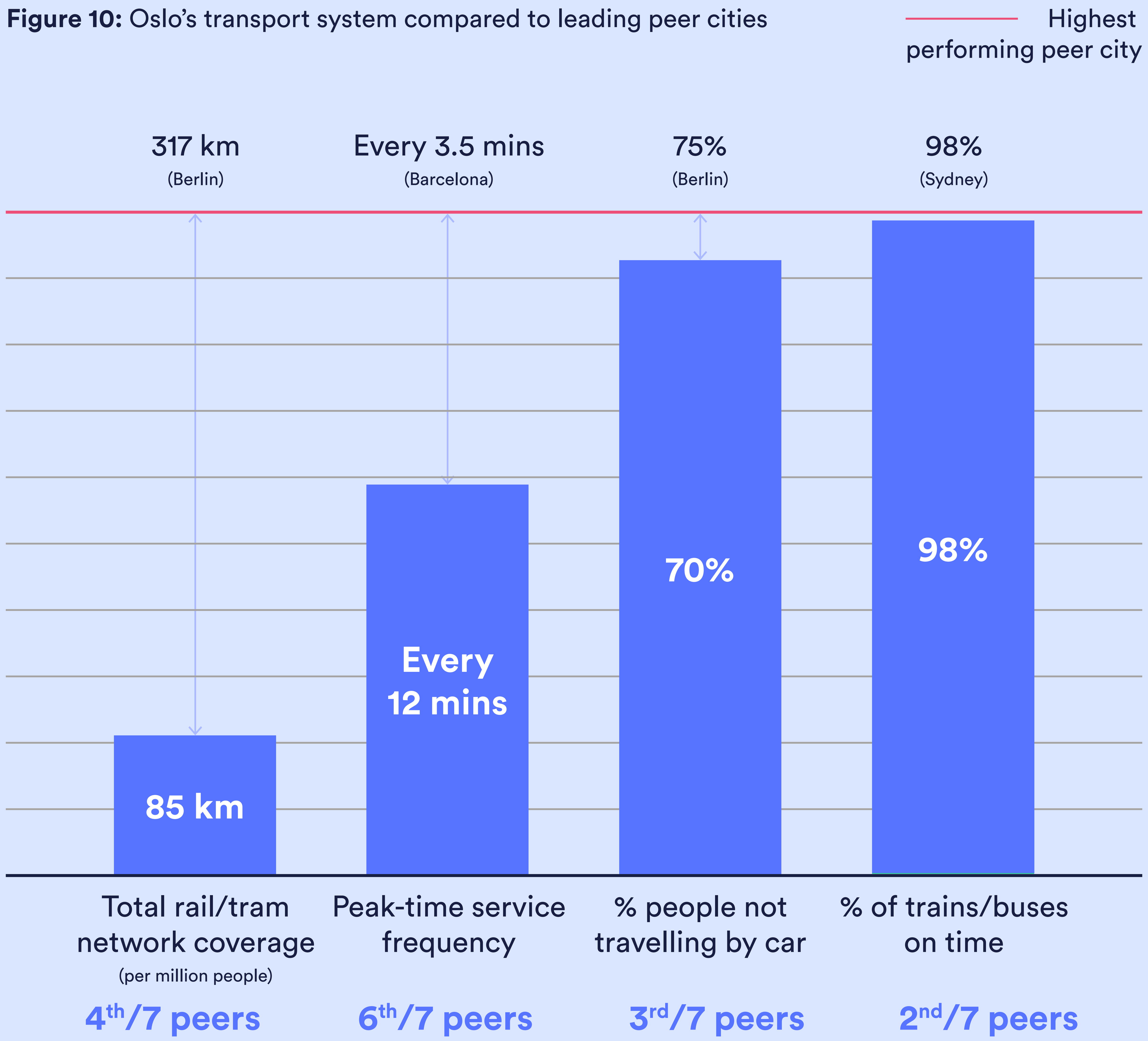
How is Oslo doing?

In 2022, Oslo:

- Has one of the **most reliable and punctual public transport infrastructure systems.**
- Benefits from **world-leading internet speed and 5G investments** so that people and businesses are still productive as working patterns shift.
- Has been **much faster to adopt multi-modal transport.**
- May need to find ways to make the overall **public transport system** more responsive to changing habits and preferences.

Oslo's core transport system has some way to go to catch up to global leaders

Figure 10: Oslo's transport system compared to leading peer cities



Source: City Transit Data [87]

Performance

Public transport

- **Oslo has a dense public transport network.** The city is 1st out of 13 top global cities for how many stations there are relative to population size. [88]
- **But public transport stops are not always near to where people live.** Oslo is only 10th out of 20 peers for the share of residents within easy walking distance of public transport stops. [89]

Digital infrastructure

- **World-leading 5G capability.** Fastest average 5G internet speeds among 109 cities worldwide. [90]
- **Ultra fast broadband.** For average fixed broadband speeds, Oslo ranks just outside the top 10% of cities globally (out of 150 cities). [91]

Perception

Public transport

- **Appetite to improve public transport.** Many more residents in Oslo identify public transport as a key challenge for the city. [92]

Digital infrastructure

- **Digitally ready for remote work.** Top 25% among similar cities for the share of residents who think that internet speed and reliability is good enough for life and work. [93]

4.2 Spaces and places

What are 'spaces and places' and why do they matter?

In a post Covid context where more time is spent working or consuming from home and away from city centres, the significance of spaces and places takes on a new meaning. Cities will increasingly succeed not only through the number of events they host, but in staging the inspirational environments, convivial public spaces and seamless ways of using urban spaces, that make experiences special and worth paying for. So cities have to pay attention to how all types of places, in all parts of the city, are really performing.

Performance	Perception
5/10	6/10

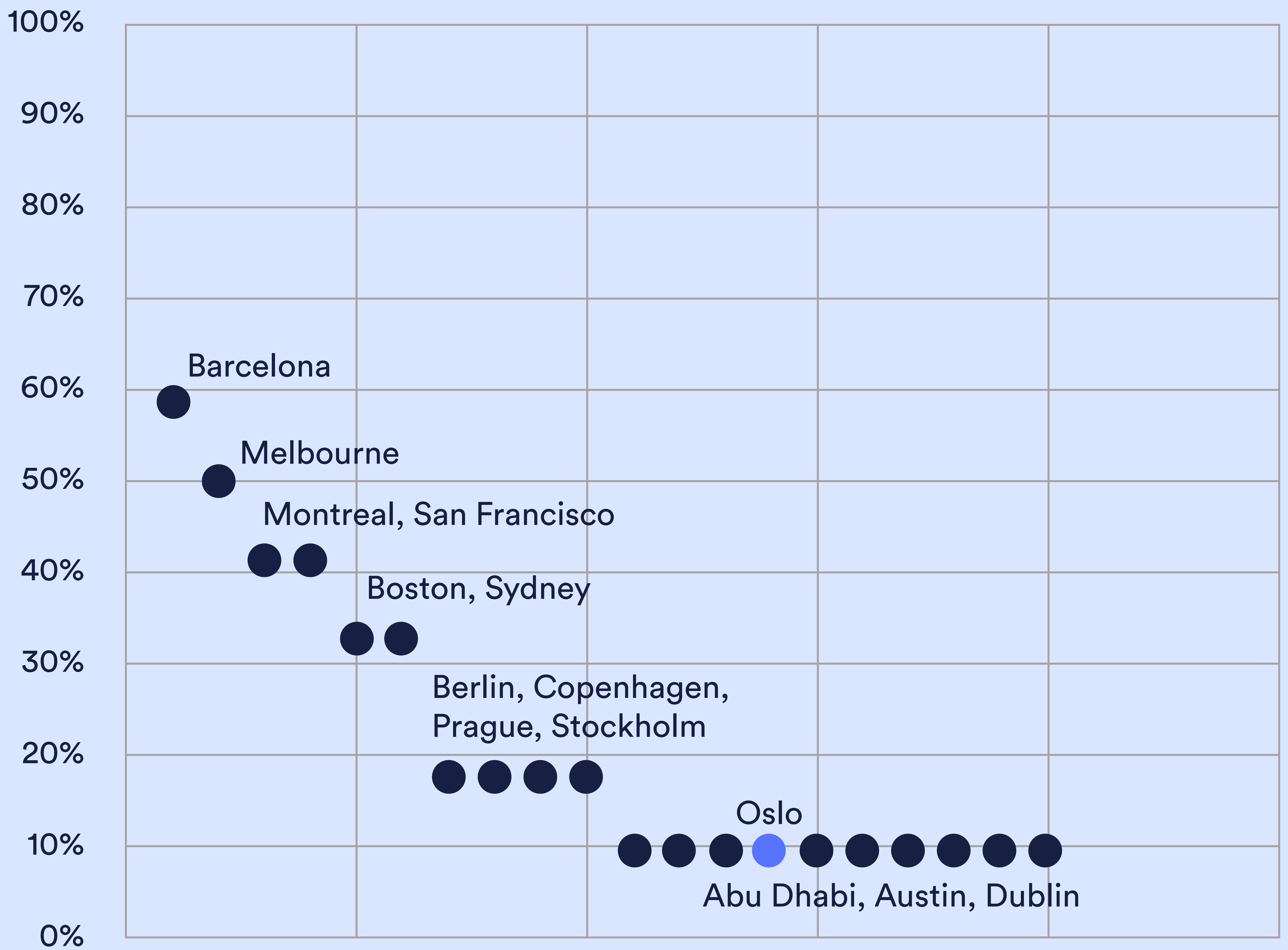
How is Oslo doing?

In 2022, Oslo:

- Is becoming more recognised as a place that **offers some choice for different audiences,** but is not yet viewed to stand out for cultural experience in any one area.
- Continues to be **disadvantaged by a focus on quantity over quality,** although does receive recognition for being more walkable and cyclable.
- Still has a **smaller overall residential population** in its city centre and less visible neighbourhoods in the public conversation.

Oslo is not yet as recognised for the quality of its spaces and places

Figure 11: How often cities feature in global surveys and lists of the world's best streets, neighbourhoods and co-working spaces



*Global travel writers, travellers and tourism experts. See Appendix for list of sources consulted.

Performance

- **Well set up for walking and cycling.** In the top 20% of European cities for how much space is given over to pedestrians and cycle lanes compared to roads. [94]
- **The depth of Oslo's cultural assets is not as well established.** In the bottom half compared to similar size cities for the depth and variety of its cultural product. [95]
- **Access to co-working is rated as tougher in Oslo.** The city is 19th out of 30 for how many co-working spaces there are, like for like versus others. [96]
- **Fewer people live in the city centre.** Around 50% fewer people live in Oslo's inner city compared to on average in Stockholm, Helsinki and Copenhagen. [97]

Perception

- **People are happy with the culture on offer.** Oslo is in the top half of its peer group for how satisfied local people are with cultural activities. [98]
- **More people are starting to recognise what Oslo has to offer.** Oslo is up 20 places since 2020 for visitor, student and local perceptions of the cultural, culinary and entertainment scene, but is still outside the top 100 globally. [99]
- **Oslo is not yet seen as a top city for space and place enjoyment.** 10 of the cities Oslo competes with for visitors and mobile talent appear in more features and surveys of 'top cities' for streets, neighbourhoods, co-working experience and 'coolness' (see also Figure 11). [100]

SPECIAL FEATURE

A sustainable visitor economy for Oslo

– Resilience in the new Global Context

Oslo's Visitor Economy

The visitor economy is returning to the world's cities. But it has experienced a permanent shift in character and customers. The data tells us that prospective visitors are making different kinds of choices about the purpose, duration and value they attach to the places they wish to spend time in. At the same time, more people are becoming 'part time' members of cities, and visit cities from a wider region or a commutable city.

Some cities will be winners from this shake-up and some will be losers. Given the comparative evidence and following facts, Oslo is well set-up to respond to some of these big shifts:

The shift to green tourism. Oslo is becoming known as one of Europe's most sustainable destinations. It is recognised for its practical and forward-thinking approach to reducing carbon intensity across the whole visitor supply chain.

Tourism blending in well with everyday life. More Norwegians are discovering what Oslo has to offer: Norwegians accounted for more than double the share of tourism nights spent in the city last year compared to pre-Covid. Boundaries are being more successfully negotiated between the tourism offer and what residents seek.

Shift to meaningful experiences and high-grade products. A more well regarded food scene is establishing Oslo on the European luxury tourism map. New art and cultural venues are crafting a new appeal among influencers. Oslo is now more often 'on the radar' as a top city to visit after Covid-19.

Nature-based urban/rural tourism. Oslo has seen a larger shift in visitor preference for rural experience. The region is well placed to meet increased demand for for fjords, forests and 'escapes'. This trend is supported by platforms aimed at rural visitors (e.g. Campanyon).

But compared to other cities there are some important gaps:

- The full spectrum of Oslo's cultural offer is gradually becoming more well known but is still a smaller part of the story the world understands and refers to when talking about Oslo as a place to visit.
- More seasonal interest. Online search interest in visiting Oslo indicates that there is a higher summer peak compared to other Nordic capitals as well as European locations. The culture and experience for a year-round offer needs continuous investment.
- Tourism as a driver of innovation. Despite several innovation success stories in the tourism sharing economy, such as Campanyon, Skitude and Outtt, Oslo is home to fewer tech companies specialising in the visitor economy and sustainable tourism. This may mean that there is less innovation over time.

Oslo is now a sweet spot city for the portion of the visitor economy that demands responsible and authentic forms of tourism that respect the city's people and reinvest in the planet. The challenge is to deliver this consistently, tell the story in new channels, and ensure coherence between the urban and non-urban preferences of future visitors.

What's changed in Oslo since Covid-19?

Shift in how people are seeing Oslo's cultural offer

Greater global visibility

+4

internationally recognised cultural icons completed since Covid-19*

*Munch Museum, Opera Stranden beach, Deichman Library, National Museum

Increased satisfaction among public audiences

+20

places for what visitors, students and locals think of cultural offer

(from 150th to 130th out of 300 cities) [101]

Shift in where, when and how people are travelling to Oslo

Shift to nature-based tourism

+21%

increase in international visitors' demand for campsites, cabins and hostels**

(decline in international nights spent in hotels from 91% to 70% post-Covid) [102]

Less interest among the global public in visiting Oslo, post-pandemic

-4%

steeper drop in search interest in Oslo compared to other European cities

(-48% vs. -44% European average) [103]

Fewer international visitors

-18%

fewer international visitors as share of total visitors

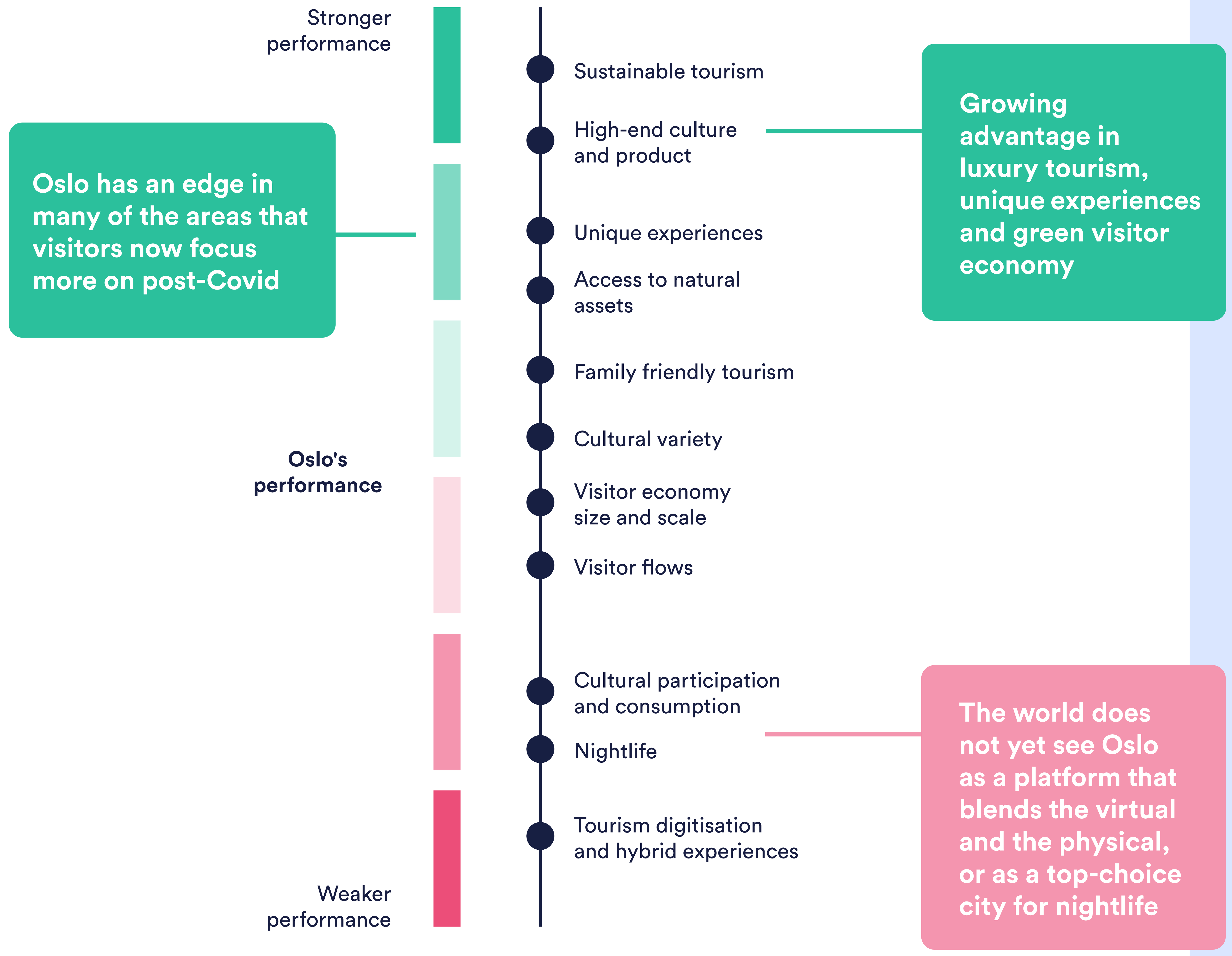
(from a share of 35% of all visitors to 18%) [104]

For industry specialists, Oslo is more on the radar as a city to visit than it used to be before Covid-19.

= 7th most visible city / 50

In expert lists of the top cities to visit after Covid-19

What elements make up the post-Covid visitor economy and how is Oslo doing overall in these areas?



Where is Oslo now ahead of the curve?

Weaker performance — Stronger performance

Ranking / benchmark	Oslo's global rank	Rank among peers
No. of unique art and culture experiences [105]	7^{th} globally	4^{th} / 50
Concentration of luxury visitor amenities [106]	11^{th} in Europe	5^{th} / 24
What residents think of cultural amenities [107]	-	12^{th} / 29

Locals are happy with the cultural offer

Now a leader for unique and luxury experiences

Source: The Business of Cities research.

How is Oslo's Tourism Economy performing?

Where is Oslo doing well?

Oslo is far ahead of the curve for building a sustainable conference, hotel and marketing system that fully complies with sustainability. At the same time, the city is widely associated for its access to nature which is a key driver of appeal currently.

Oslo's sustainable tourism setup is strong

Figure 12: How much of Oslo's visitor economy infrastructure is sustainability certified, compared to similar cities?

Hotels

+55%

compared to peers

(94% in Oslo, 39% on average)

Conference venues

+35%

compared to peers

(100% in Oslo, 65% on average)

Marketing organisations

+71%

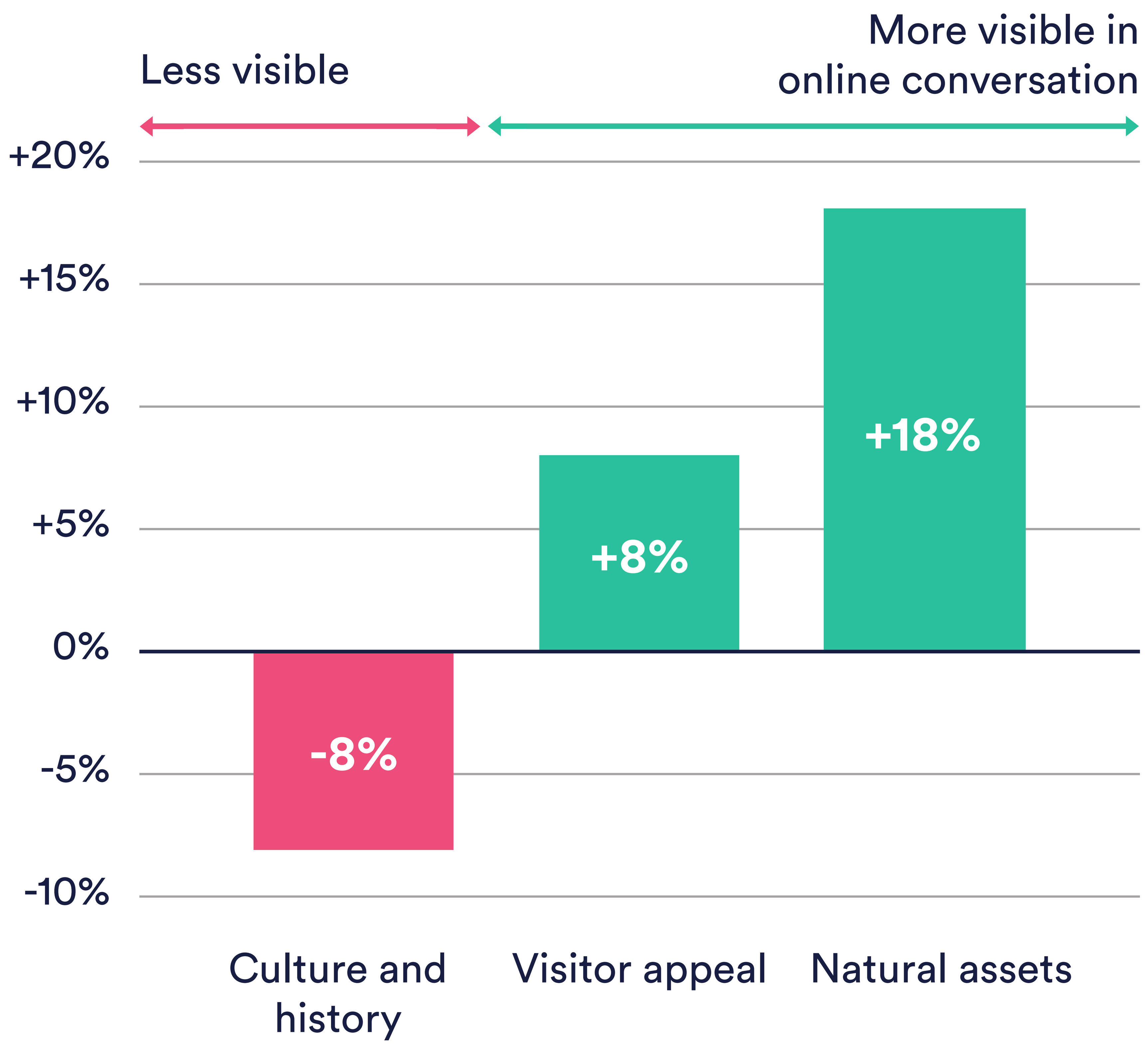
compared to peers

(89% in Oslo, 18% on average)

Source: Global Destination Sustainability Index [108]

There is stronger online interest in Oslo's natural assets

Figure 13: Difference in share of online conversation, Oslo compared to Scandinavian capitals



Source: The Business of Cities research, based on words used to describe Oslo in the online conversation (Twitter, influential global media outlets and Google) in 2021. See Appendix for methodology.

Areas for progress

Respect and regard for the kind of culture, food and entertainment on offer in Oslo is improving, which is helping to establish Oslo as a shortlisted destination for cities to visit after Covid. However, this has long been an area where Oslo's reputation is weak, and so more consistent communication is required to really strengthen global public demand.

Ranking / benchmark	Oslo's global rank	Rank among peers	Trend
Number and diversity of cultural amenities (museums and galleries, sports venues, restaurants and bars) [109]	47th / 80	21st / 27	
Cultural, culinary and entertainment scene, as rated by locals, students and visitors [110]	130th / 300	35th / 41	↑
Appeal to short-term remote workers ("workationers") [111]	138th / 150	36th / 39	
How much the city is talked about online [112]	147th / 300	36th / 41	↓

What people think of the cultural offer is improving

Major cultural openings not yet translated into digital visibility bounce

Weaker performance Stronger performance

Digital innovation to serve tourism is not yet as established

15th / 31

Share of locally based tech firms specialising in tourism and visitor economy

Source: The Business of Cities research, based on Crunchbase. See Appendix for methodology.

Interest in visiting Oslo seems to be more seasonal

Bigger difference in interest in Oslo between peak and non-peak

51%

more interest among global public in visiting Oslo during summer months than the rest of the year, vs 32% for Scandinavian cities, vs 20% for European cities on average

Source: Google Trends. Compares average online search interest in visiting the city during peak summer months and rest of year, on average, past 5 years.

What does the world now think about and expect from Oslo?

In 2022, online commentary about Oslo's all-round appeal as a place to visit has focused mainly on the opening of the city's new cultural icons, such as the Munch Museum and soon-to-be completed National Museum, and what their arrival means for the city's appeal: to art enthusiasts, culture lovers, and weekend trippers.

Around the world, ideas vary about Oslo's visitor economy. Finland and Denmark now focus commonly on Oslo's arts, culture, museums and architecture. Mediterranean countries like Italy and Spain still tend to highlight Oslo's natural assets (fjords, forests, coastline). The conventional tourism offer (food, nightlife, events) is more often commented on in countries far away, like Australia and Hong Kong.[113]

Overall the richness of Oslo's wider scene – its music, cultural diversity and distinctive neighbourhoods - is not yet as visible. It is less visible than in other Nordic and European capitals. Oslo is still seen by many as a place for scripted rather than spontaneous culture.

When people talk online about Oslo's cultural and visitor offer, they tend to highlight the city's:

- Museums, galleries and art
- Culinary scene
- Natural beauty and assets

The parts of Oslo's offer that are not yet as visible online relate to its:

- Architecture and design strengths
- Cultural vibrancy and diversity
- Varied neighbourhoods
- Music and festival culture

Figure 14: Words most commonly used to describe Oslo's culture and tourism offer in online commentary about the city, 2021*

*Words used to describe Oslo on Google, Twitter, and in 100 leading global media outlets (by general public, journalists and influencers) in 2021.
See Appendix for methodology.

Figure 15: High-profile quotes about Oslo's culture and tourism offering in the global media, 2022

A palatial museum of Edvard Munch's art opens in Oslo

The Economist

48 hours in Oslo, our guide to a weekend in the green city

Le Figaro

But in terms of travel, 2022 marks the year when Oslo finally comes of age. Copenhagen and Stockholm are already Scandinavian must sees. Now the Norwegian capital is out to claim its spot as the most interesting destination in the Nordics.

Robb Report

Art Trends 2022: Major museum openings in Oslo and Glasgow throw focus on northern Europe

euronews

The colossus of Munch: in Oslo a new museum with 28 thousand works for the painter of "L'urlo"

la Repubblica

Towards a Sustainable Tourism Platform

International Visitor Strategies

Internationally, cities recognise that after the pandemic, tourism has the potential and imperative to become more responsible and sustainable – for residents, the planet and for visitors themselves. In a post-Covid, more digital world, where more time is spent working or consuming from home or on the internet, residents and visitors are looking for a level of city experience that they will not usually find. Cities are working to better spread around visitors, integrate the 'tourist' offer with everyday culture, and promote their natural assets as part of their tourism package.

Strategies of Oslo's Competitor Cities	Examples	What it Could Mean for Oslo
Sustainable **Flows** of Tourism • Improving flows of people between different parts of the City & Region • Spreading people and attractions around the City & Region	**Prague** is investing in new tourism routes outside the city centre, including 2% of the city budget for art purchases to make these areas more appealing **Boston's** main visitor agency has a campaign targeting higher resident and tourist visitor numbers in under-visited neighbourhoods that have cultural vibrancy. A user reward redemption app is supporting SMEs in these places.	Creating a dedicated fund for cultural and artistic displays in areas outside the city centre can help unlock a wider variety of neighbourhoods into distinctive tourist destinations.
Sustainable **Character & Culture** of Tourism • Authenticity & Community • Values & Culture • Heritage & Architecture	**Vancouver's tourism body** has signed a long-term partnership with an indigenous tourism organisation to promote indigenous businesses. It involves sharing of experience, resources and training to promote indigenous people as key to Vancouver's story and character.	Formal partnerships with heritage organisations across Oslo and Norway can underpin tourism that connects in to the region and nation's history and DNA.
Sustainable **Environmental Performance** of Urban Tourism • Improving the Performance of Visitor Assets • Making sure visitors can move around the city using sustainable transport modes • Monitoring Progress	**Glasgow** has created toolkits for conference organisers looking to host events in the city to choose the most sustainable options. These highlight sustainable venues, transport options and activities for delegates. **Prague** City Tourism is providing hundreds of hours of training for its official guides, offering corporate clients tailor-made courses and lectures.	Easy-access one stop shops will help many kinds of events and activities assess how to explore the green options for their event.
Co-ordination and Investment to make Tourism **less carbon-intensive** • Better and more durable jobs for tourist workers • Making more things digital and efficient	**Copenhagen** has developed an app promoting tourist attractions to visitors across environmental, social and economic themes. The app includes virtual guides for those visiting freshwater swimming zones, green public areas and shops selling locally produced goods, among others.	More co-ordination with shops, venues, and tourism amenities, can help ensure a consistently distinctive and high-value Oslo experience. Accreditation schemes and upskilling opportunities can be considered.
Growth of **Green** Tourism • Promoting Nature and Environment as a stronger part of the city package (low carbon and green experiences)	**Milan** aims to plant 3m trees by 2030, increasing the green canopy to 20%. This includes transforming disused railway lines into parks and planting rooftop gardens, many in key tourist areas. **Abu Dhabi's** investment office has recently provided attractive financial incentives including land lease exemptions and tax waivers for ecotourism-oriented projects in three of its main visitor neighbourhoods.	Redevelopment projects can be incentivised to create new urban natural environments by ring-fencing space for tree planting and greenery, and consider innovative re-use of infrastructure for tourists to enjoy.

Oslo's Visitor Economy in the Next Cycle

Inspiring urban design meant Bilbao and Barcelona became winning cities for tourism in the 1990s. Sport and culture propelled Manchester and Prague into the top tier of visitor locations in the 2000s. The hipster and nightlife profile of Berlin and Lisbon drove their success in the 2010s.

Oslo has opportunities to become synonymous with a 2020s visitor economy defined by personalisation, premium experience and responsible stewardship.

Oslo should keep going on:

- Being a **demonstrator and leader of progress** to deliver Norway's national target for a 50% reduction in tourism-related emissions by 2030
- A **full-spectrum decarbonisation** of the visitor economy, beyond individual buildings to include how people move between them, whole industries and events
- **Cross-cutting partnerships** like those with FutureBuilt, to ensure that all new visitor economy buildings are designed according to climate-friendly standards

Other cities are moving faster than Oslo on:

- Projects and places that **blend the 'virtual' and 'physical'** and make for more seamless experiences – such as the new 'market square' model being piloted at Gardermoen airport.
- **Dispersing visitors and events throughout more of the year,** in order to avoid the risk that Oslo comes to be seen as only a 'summer' and 'Christmas' destination

Achievable but ambitious targets for Oslo to aim for include:

- Twice the frequency of high value appearances each year in 'top' global lists according to industry perceptions (top cities to visit after Covid, top cities for cuisine, most beautiful cities, etc.)
- Global top 50 for what locals, students and visitors think of the cultural scene

Oslo may benefit from strategies that work across sectors and as a whole region to become a leader for:

- Family friendly tourism that blends access to nature with safety and child-friendly activities
- Wellness and wellbeing tourism, capitalising on the region's saunas and natural assets and leveraging the shift to healthy food and living
- Aesthetic experience – Oslo as a leader for spectacle
- Art and design in a Nordic setting


Foto: Eirik Skarstein

Oslo has opportunities to become synonymous with a 2020s visitor economy defined by personalisation, premium experience and responsible stewardship.

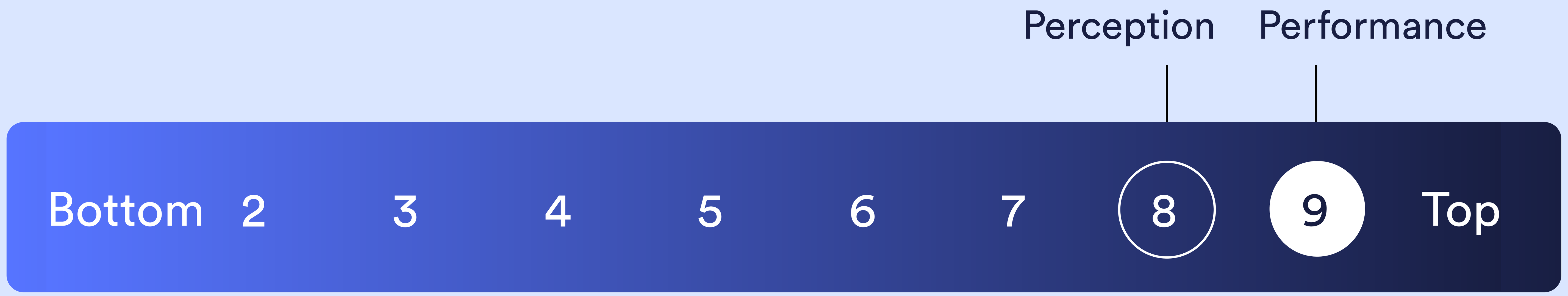
5 Preparedness

How well is Oslo known for being ready for and bold about the 21st century future?

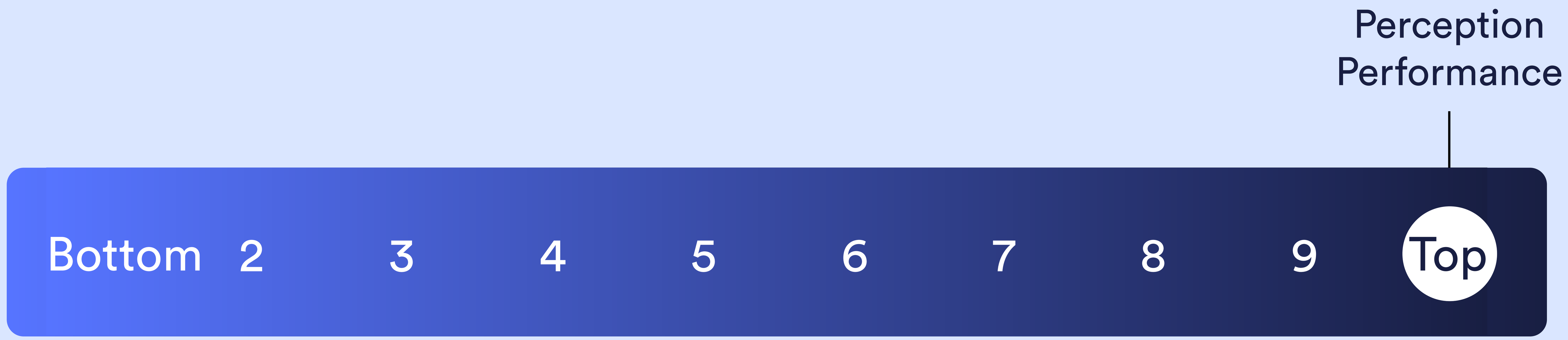
What it means for Oslo

1. Build the ‘green capital’ story and the action well beyond sustainable transport.
2. Demonstrate more clearly that Oslo grasps green as a financial opportunity – for inbound investors and outbound companies.
3. Convene more dialogue about the hard choices and compromises ahead on climate change – marrying Oslo’s green leadership with its diplomatic track record.

5.1 Competence and leadership



5.2 Green and planet-conscious



5.1 Competence and leadership

What is 'competence and leadership' and why does it matter?

Competence and leadership is viewed as decisive in producing trust among citizens as well as confidence among businesses and talent. Governments at city and national level are being assessed for how well they improve delivery of public services, increase public role in decision-making and ensure new technologies support freedom and quality of life.

Performance	Perception
9/10	8/10

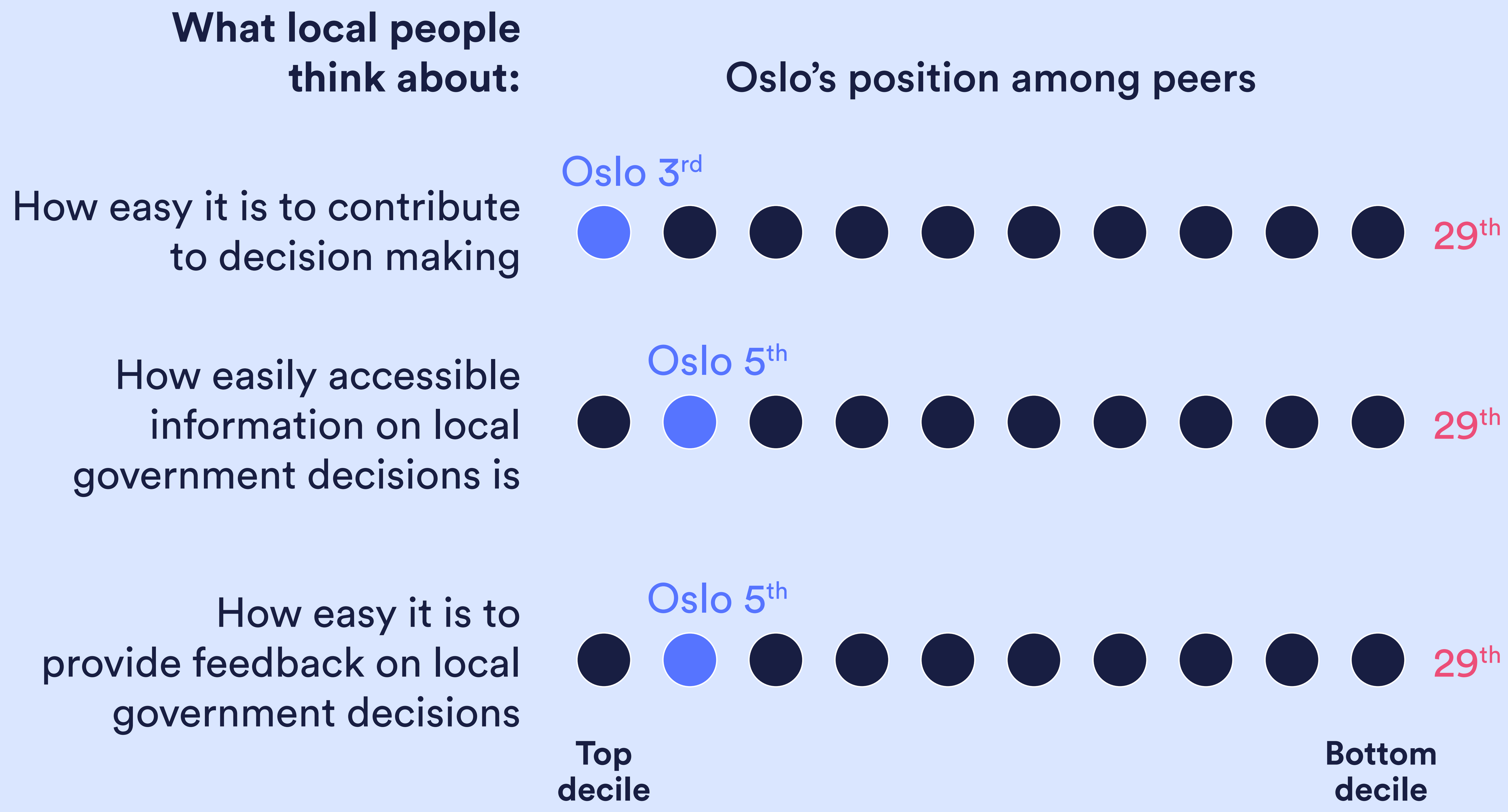
How is Oslo doing?

In 2022, Oslo:

- Has renewed its reputation for an overall **governance system** that is more geared towards people, transparency and fairness.
- Is among early public and citizen **adopters of new technologies.**
- Has to meet **higher citizen expectations** than most cities to be engaged with fully in choices and decisions.

Locals praise city leadership

Figure 16: Oslo's rank among peer cities for what locals think about selected aspects of local government competence and leadership



Source: IMD Smart City Index. [114]

Performance

- **Early adopter of new technologies.** 1st out of 50 medium-sized cities globally for government appetite to adopt new technologies [115]
- **Covid-19 measures have been less strict in Oslo.** Oslo is in the bottom 50% of its peer group for the stringency of the government response to Covid-19 [116]

Perception

- **People feel able to shape government decisions.** At 61%, Oslo ranks 3rd among 29 peers for the share of local people that feel they are able to contribute to local government decision making. [117]
- **It is getting easier to track government priorities.** The city has risen 8 places compared to similar cities for perceptions of how easy it is to access and understand local government decisions. [118]
- **Corruption is not seen as a major issue.** 5th lowest share of local people who think that corruption is an issue, out of 29 peers. [119]
- **Concerns around citizen participation are growing.** Oslo ranks in the top 20% of cities globally for the share of residents who think citizen engagement is one of the main issues facing the city [120]

5.2 Green and planet-conscious

What is 'green and planet-conscious' and why does it matter?

Cities that have long competed on being 'green' increasingly have to demonstrate that they are committed to this in the long run. They are being judged on how quickly they decarbonise and diversify the economy from fossil-fuel hungry sectors. Residents and investors alike are looking for greener products, incentives and options in all aspects of city life.

Performance	Perception
10/10	10/10

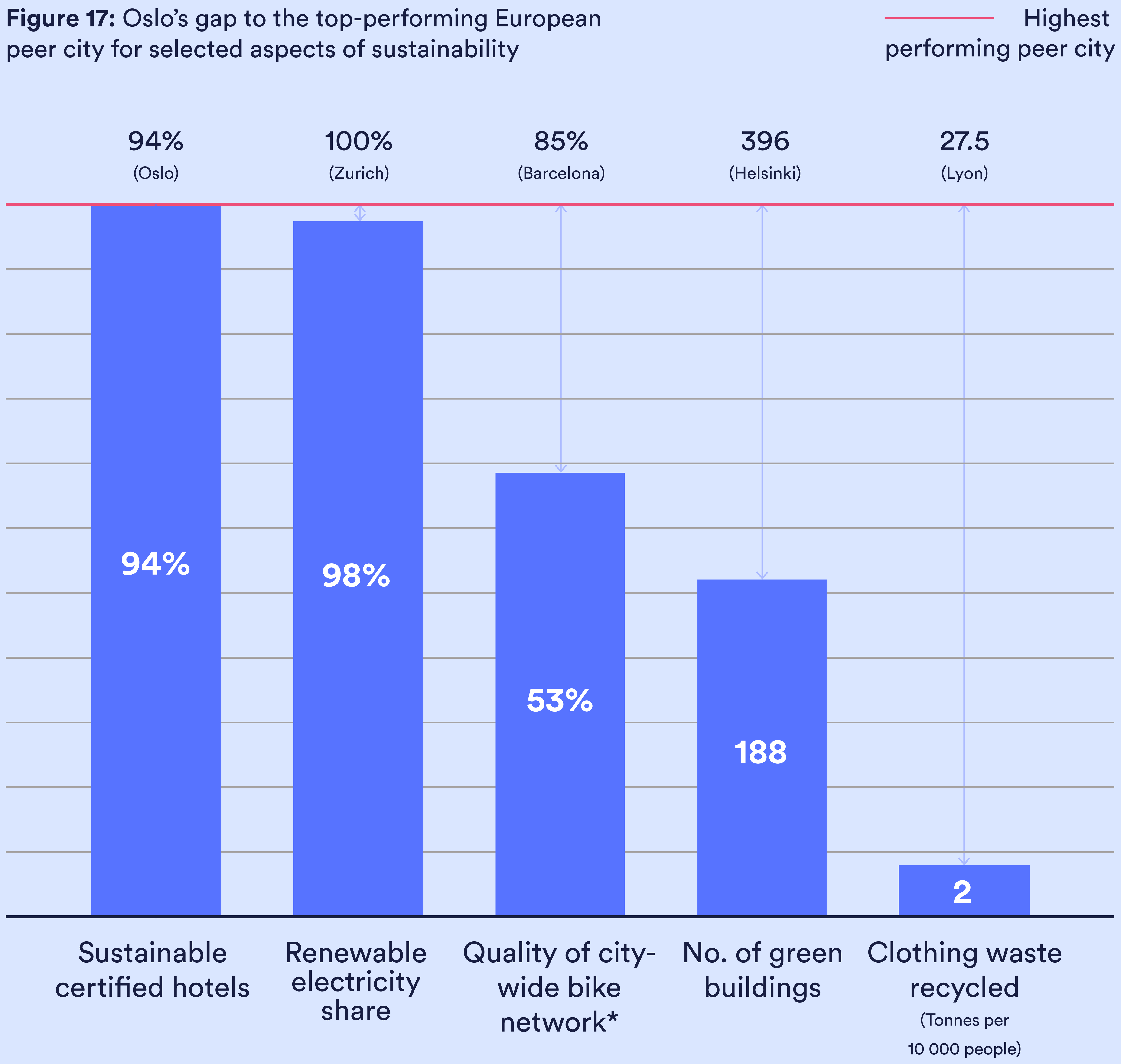
How is Oslo doing?

In 2022, Oslo:

- Has established itself as a true global leader for **sustainable transport.**
- Is leading the **green maritime transformation and transition to circular economy.**
- Maintains a **global reputation for sustainability.**
- Is cementing its position as one of Europe's **leading green finance centres,** and has an innovation economy that innovates more on **oil and gas.**
- Can better serve **a shift to clean air, sustainable fashion and textiles, green buildings and safe routes for bikes.**

Oslo's green credentials against Europe's leaders

Figure 17: Oslo's gap to the top-performing European peer city for selected aspects of sustainability



Sources (from top to bottom): GDS, EIU, PeopleforBikes, Green Building Information Gateway, Reebok. *Share of destinations in the city that can be easily reached using only low-stress (protected) bike lanes. [121]

Performance

- **Committed to innovation around the car.** Oslo is regularly the best performing city in the world for the level of investment in structural changes to create cleaner transport systems, including investment in EV infrastructure and the take-up of alternative modes of transport. [122]
- **Pioneering the green transformation of the maritime economy.** Oslo is ranked 1st globally for its potential to lead in the maritime green transition. [123]
- **Vibrant circular economy.** Oslo is 3rd among its wider group of cities for how much VC it has attracted in the circular economy, like-for-like. [124]
- **Fewer green buildings.** Oslo is so far only 8th among European peers for the number of registered green buildings projects, behind both Stockholm and Helsinki. [125]
- **Other cities are ahead of Oslo for bike lanes.** The city only ranks 8th among 32 peers for how many destinations can easily be reached using only low-stress cycling routes. [126]
- **Slower transition to sustainable fashion and textiles.** Oslo is 2nd last among 20 European cities for how much textiles waste is recycled compared to how much goes to landfill, the size of the local fast fashion industry, and local interest in sustainable fashion. [127]

Perception

- **Waste management systems are highly efficient.** Top 15% among similar cities for how satisfied local people are with recycling services. [128]
- **Globally renowned for sustainability.** Oslo is 4th in the world for the number of global citizens identifying it as a top 10 city for sustainability. [129]
- **Green financial sector.** 9th globally for the depth and quality of green finance tools. [130]

Appendix

Full list of Oslo's peers

Strongly comparable in many areas	Comparable global assets or strategy, but different size and scale	Comparable size and wealth, fewer similar assets or strategic imperatives
Austin	Abu Dhabi	Adelaide
Basel	Barcelona	Bristol
Brisbane	Berlin	Cleveland
Calgary	Boston	Eindhoven
Dublin	Copenhagen	Gothenburg
Glasgow	Detroit	Las Vegas
Helsinki	Frankfurt	Lyon
Ottawa	Hamburg	Manchester
Perth	Kuwait City	Marseille
Portland	Melbourne	Minneapolis
Vancouver	Montreal	New Orleans
Zurich	Munich	Orlando
	Rome	Prague
	San Diego	Raleigh
	San Francisco	San Jose
	Seattle	
	Stockholm	
	Stuttgart	
	Sydney	
	Tel Aviv	
	Vienna	
	Warsaw	

Methodology for overall scores across the 10 dimensions

For each of the 10 themes, Oslo has been evaluated in multiple comparative indexes, benchmarks and metrics.

For each theme, Oslo's competitiveness has been graded on a 10-point scale, based on its performance relative to all other comparator cities that appeared in at least one index, benchmark or metric within each theme.

For each index, benchmark or metric, rankings were inputted to our ELO algorithm which is used to compute the overall performance of all the measured comparator cities for each theme. The ELO algorithm rates cities or regions by comparing their performance in every possible permutation against a list of other cities/regions. The system produces the most accurate comparative assessment of city/region performance, as it accounts for the fact that some cities/regions appear in more rankings than do others, and that each ranking measures a different number of cities.

For themes where there was more than one perception-based measure, two ELO algorithm runs were undertaken - one using all the rankings taken from purely performance-based measures, and another for all measures containing a perceptual element. For these themes, Oslo receives a score for both performance and perception. Any of the 50 cities not appearing in at least one index, benchmark or metric were discounted from any ELO algorithm runs.

Oslo's final score for each theme is based on its overall score, where Oslo's rank compared to all other measured cities within that theme determines the decile in which it falls. A score of 0.9-1 would put Oslo in the top decile, 0.8-0.9 in the 2nd decile, and so on.

- *e.g.* In performance only measures, if Oslo ranked 29th out of 50 comparator cities for Innovation Ecosystem, it would get a score of 1 - (29/50) = 0.42, putting Oslo in the 6th decile for Innovation performance.

- *e.g.* In measures with a perception element, if Oslo ranked 13th out of 45 comparator cities for Places and Spaces, it would get a score of 1 – (13/50) = 0.71, putting Oslo in the 3rd decile for Spaces and Places perceptions.

Notes to individual figures

How Oslo has fared through Covid-19 (page 13, page 17)

Average activity scores based on daily averages of retail, office and transport activity compared to the pre-pandemic baseline. Activity measured by anonymised mobile phone location tracking. Data for whole period = from 1st March 2020 to 26th May 2022. Data for 'today' = from 1st May 2022 to 26th May 2022. Baseline day = median daily value for 5 week period from 3rd January to 6th February 2020.

List of sources consulted for figure 1

From top to bottom: IMD Smart Cities Index, European Commission EU Barometer Quality of Life in European Cities, IMD Smart Cities Index, Boston Consulting Group Decoding Digital Talent, StartupHeatmap Europe, IMD Smart Cities Index, StartupHeatmap Europe, Resonance World's Best Cities, PwC/ULI Emerging Trends in Real Estate Europe

List of examples metrics for page 24

Demand for work-life balance: All-round work-life balance (weekly overtime worked, reported burnout, etc.), happiness and life satisfaction, etc.

Demand for fulfilling work: What residents think about how easy it is to find a fulfilling job
Rise of co-working and hotdesking: Number and density of co-working spaces, cost of hotdesking, etc.

Digitisation of work: Appeal to overseas digital workers, share of SMEs/businesses regularly adopting digital technologies, etc.

Shift to remote work: Legal and regulatory barriers to remote working (digital nomad visas etc.), internet speeds, share of housing stock with available office spaces, etc.

Rise of ' bleisure' and 'workations': Concentration of unique visitor experiences, no. and variety of cultural attractions, affordability of visiting and working in the city, no. of coffee shops and third spaces, etc.

Start-up ecosystem specialisms, page 38

Sectoral start-up specialisations calculated using Crunchbase data on the total number of tech-enabled firm HQs in the region. To correct for the fact that many firms span more than one category, we counted all the categories assigned by Crunchbase to a given firm (e.g. a financial firm specialising in digital payments would result in a mention for finance, digital technology and payments). All Crunchbase-assigned categories that were too vague were discounted (e.g. "security", "service industry", "internet") from the analysis at this stage. All categories were then organised into broad category groups, giving a total number (total across all category groups and for each group) for all comparator regions. We calculated the share of each category group as a percentage of total innovative firm activity for each city, and compared Oslo to the average among peers for which data is available (Adelaide, Barcelona, Boston, Brisbane, Bristol, Calgary, Cleveland, Copenhagen, Detroit, Dublin, Glasgow, Hamburg, Helsinki, Manchester, Melbourne, Minneapolis, Montreal, Munich, Ottawa, Perth, Prague, Raleigh, San Diego, San Francisco, Seattle, Stockholm, Sydney, Tel Aviv, Vancouver, Zurich)

List of global media outlets, for pages 52 and 65

ABC, AFR, Aftonbladet, Al Jazeera, America Economia, Asahi Shimbun, BBC News, Bild, Bloomberg, Canal+, CBC, CBSN, China Daily, Chosun Ilbo, CNBC, CNET, CNN, CNN-News18, Corren, CTV News, Dagens Industri, De Telegraaf, Der Spiegel, Die Welt, Die Zeit, DongA-Ilbo, DW, Economic Daily, El Mundo, El Pais, Engadget, Euro News, Financial Express, Fox News, France 24, FT, Gizmodo, Helsingin Sanomat, Hurriyet, India Today, Komsomolskaya Pravda, Korea Economic Daily, L'Obs, La Repubblica, Le Figaro, Le Monde, Malayala Manorama, MDR, Moskovskiy Komsomolets, NBC News, NDTV India, New York Times, NRK, Nyteknik, O Globo, Politiken, Reddit, Reuters, Rossiyskaya Gazeta, RT, RTL Nederland, RTL Today, Sky News, South China Morning Post, Stuff, SVT, TechCrunch, The Age, The Conversation, The Daily Mail, The Daily Telegraph, The Economic Times, The Economist, The Globe and Mail, The Guardian, The Hindu, The Independent, The Jerusalem Post, The Next Web, The Sydney Morning Herald, The Times of India, The Toronto Star, The Verge, TV 2 News, VentureBeat, Wall Street Journal, Washington Post, WION, Wired, ZDF

List of sources consulted for figure 11

A Broken Backpack – Top 10 Coworking Spaces in the World
AD-46 – 46 of the Most Beautiful Streets in the World
CB – 8 of the world's coolest coworking spaces
Digital Nomad Soul – 31 Best coworking spaces worldwide for smart remote workers
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