GLOBAL TAXI & RIDE-HAILING BENCHMARKING STUDY 2019-21

APRIL | 2023

INTRODUCTION

Digitalisation, decarbonisation, mobility transition, climate emergency and pandemic crisis... How is the taxi sector evolving? By focusing on the data available to local public authorities, this Brief sheds light on the latest trends in the taxi sector.

Given the nature of their publicly available services, taxis make up a component of public transport. They are an integral element in the sustainable multimodal mobility chain, which relies upon efficient mass public transport and a range of complementary travel solutions.

We observe two contradictions: first, the growing digitalisation of these services does not necessar-

ily translate into more public data. Second, the increased focus of authorities on integrated sustainable mobility does not match the local public competence, which in some places is even shrinking.

OBJECTIVES AND APPROACH

Taxis are well known for operating 24/7 and offering a point-to-point service. This ensures full area and time coverage, high flexibility and convenience for low transport volumes at high costs.

The entry into the market of new players, often called 'Transport Network Companies' (TNCs), have prompted the development of app-based services. Also known as 'ride-hailing' services, they are usually based on vehicles rented or owned by independent drivers that get paid via the app-company.

The objectives of this statistics brief are:

❯ To provide a picture of taxi and ride-hailing services in different cities worldwide

❯ To understand the evolution of the sector during the COVID-years (2019-21)

❯ To gain insights into the most important trends in the sector, such as the energy transition and digitalisation.

For the data collection, only local public authorities were targeted to gather public data available on metropolitan scale for both taxis and TNCs on a set of quantitative and qualitative indicators. These covered infrastructure, vehicles, drivers, aspects related to operations, services, technology and payment.

A FRAGMENTED DATA LANDSCAPE FOR LOCAL REGULATORS

The cities involved offer different profiles in terms of land use, mobility patterns, governance and transport policies. As a result, local regulators do not use a standard set of indicators for the sector.

Regulators shared data on:

❯ 42% of the indicators required

❯ 70% of them relating to taxis.

Since almost all indicators were asked for both for taxis and TNC vehicles, it means that TNC information is often not available to local authorities.

Data availability

Data not collected by cities (potentially available):
58%

Data on taxis:
29%

Data on TNCs:
13%

World map showing participating cities

Which service is required to share data with the local regulator

CITY	TAXI	TNC
Budapest	Yes	-
Casablanca	Yes	-
Chicago	Yes	Yes
Dubai	Yes	Yes
Istanbul	Yes	-
Lagos	-	-
London	-	Yes
Montreal	Yes	-
San Francisco	Yes	-
Singapore	Yes	Yes

For Lagos and Casablanca, the competent body for taxis is at national level, while in London the competence lies with the local authority. In Montreal, the competence was moved from a local to a national level in a new governance model for both taxis and TNCs.

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MONTREAL

LONDON

SAN FRANCISCO

CHICAGO

BUDAPEST

ISTANBUL

DALLAS
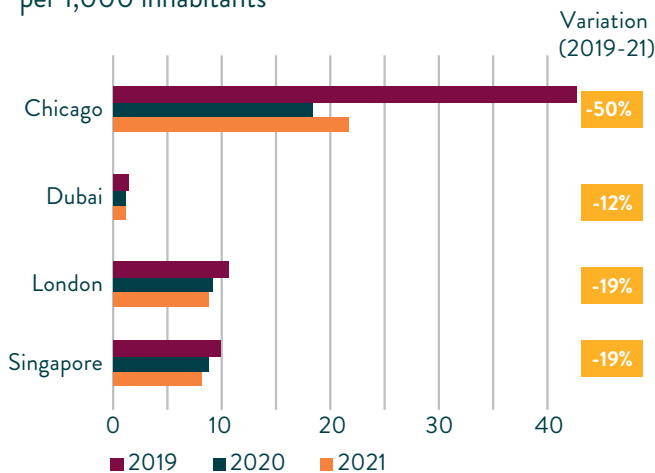
CASABLANCA

DUBAI

LAGOS

SINGAPORE

A FALL IN VEHICLES, DRIVERS AND RIDERSHIP FROM 2019-21

Without suggesting any simple causal relationship, we can see that the three years of the health crisis have seen a general decrease in the number of vehicles, drivers and ridership between 2019-21.
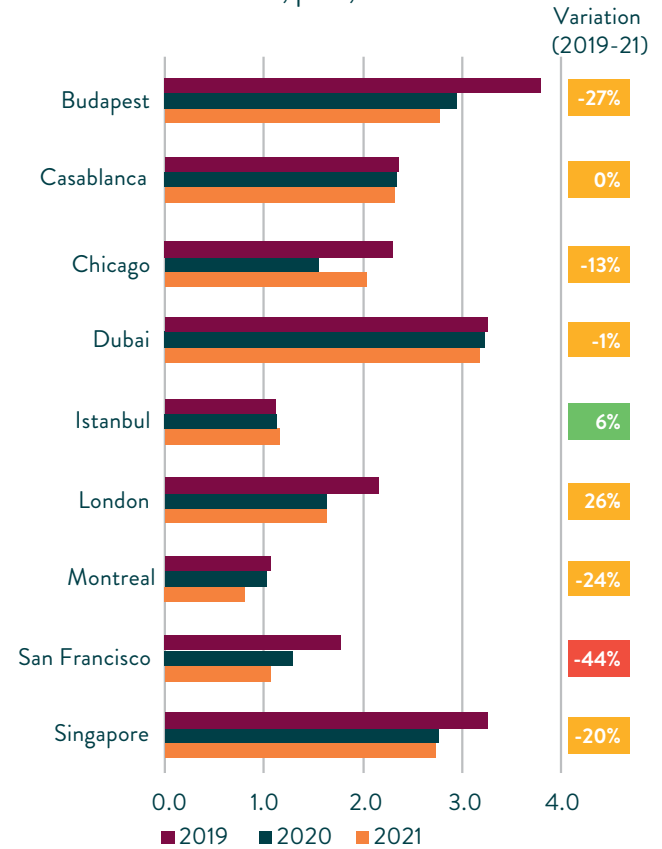
Taxi and TNC vehicles

Concerning the number of TNCs vehicles, four cities declared an important decrease. However, except for Dubai where it was already low, the number of TNCs vehicles remained several times higher than taxis.

Transport Network company vehicles, per 1,000 inhabitants

Variation (2019-21)

City	Variation
Chicago	-50%
Dubai	-12%
London	-19%
Singapore	-19%

■ 2019 ■ 2020 ■ 2021

The total number of taxi vehicles decreased on average by 13%.

Number of taxi vehicles, per 1,000 inhabitants

Variation (2019-21)

| City	Variation
Budapest	-27%
Casablanca	0%
Chicago	-13%
Dubai	-1%
Istanbul	6%
London	26%
Montreal	-24%
San Francisco	-44%
Singapore	-20%

■ 2019 ■ 2020 ■ 2021

Taxi ridership

COVID-19 had a huge impact on the Taxi and Ride-Hailing market, with the numbers of riders dropping by 74% in 2020 in Chicago, 56% in Casablanca, 59% in San Francisco and 39% in Dubai. As of the end of 2021, all four cities had not recovered to previous levels of ridership, registering an average of 84% of pre-COVID trips.

The graph below shows the annual variation in the number of daily trips undertaken by taxi. The number of trips have drastically reduced in line with demand, even if it has been slightly dampened by the fewer number of vehicles available. In San Francisco, the number of vehicles fell by 44% between 2019-21.

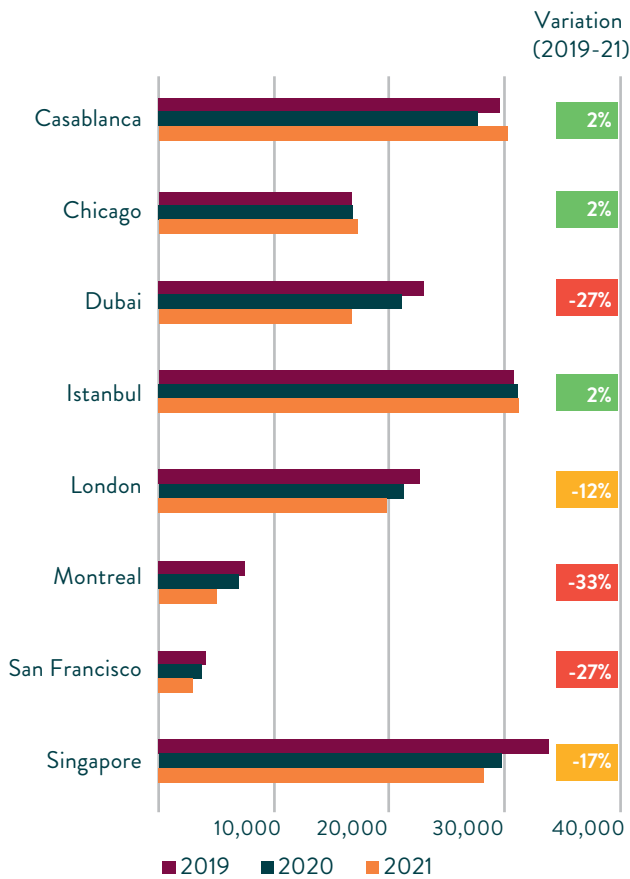Number of trips with passengers per taxi per day

— Casablanca   — Chicago   — Dubai   — San Francisco
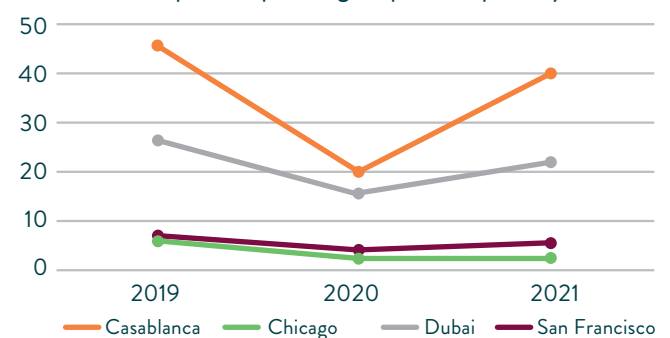
During this period, the length of the average taxi trips is significantly different, with 10.4km in Dubai and 5km in San Francisco.

Taxi drivers

According to the declarations by authorities, the total number of licensed taxi drivers decreased by 9.8%, from 168,513 drivers in 2019 to 152,005 in 2021.

Total number of taxi drivers

Variation (2019-21)

City	Variation (2019-21)
Casablanca	2%
Chicago	2%
Dubai	-27%
Istanbul	2%
London	-12%
Montreal	-33%
San Francisco	-27%
Singapore	-17%

■ 2019 ■ 2020 ■ 2021

We also see that the recruitment of new taxi drivers slowed down.

Renewal rate: New taxi drivers over total number of drivers

— Casablanca — Chicago — London
— San Francisco — Singapore
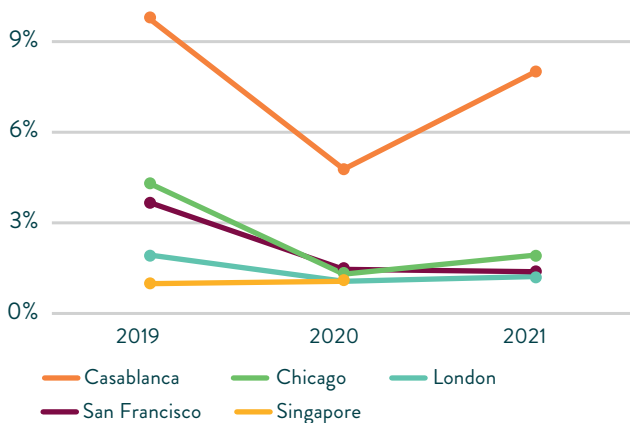
DECARBONISATION

Clean taxi vehicles

Summarising up the alternative propulsion types, in seven cities out of 10 (Lagos missing, Budapest and Chicago are N/A) cleaner taxi vehicles (natural gas, BEV, PHEV, FHEV) increased by 15% (+3703 vehicles), while petrol and diesel vehicles decreased by 24% (-13,208 vehicles).

Number of clean taxi vehicles

■ Clean (BEV+FHEV+PHEV+Natural Gas)
■ Not clean (Diesel+Petrol) ■ N/A
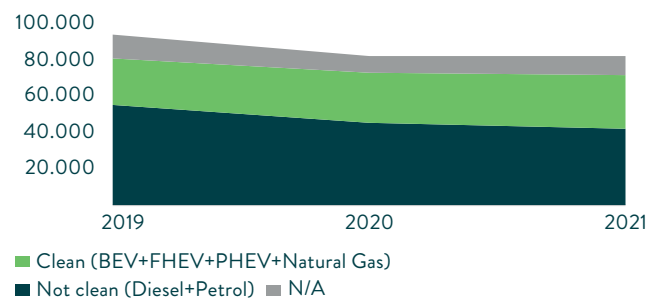
Looking at Battery Electric Vehicles (BEVs), these have increased by 66% over the last three years, but still only represent less than 1% of total fleet.

Number of taxi vehicles per propulsion type

■ Diesel ■ Petrol ■ Other hybrids
■ BEV ■ FHEV ■ Natural gas ■ PHEV
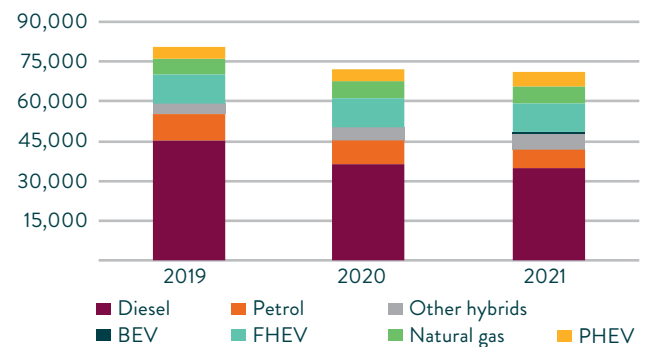
Data on taxis from: Casablanca, Dubai, Istanbul, London, Montreal, San Francisco, Singapore

Share of clean taxi vehicles by city in 2021

■ Not clean (Diesel+Petrol)
■ Clean (BEV+FHEV+PHEV+Natural Gas)
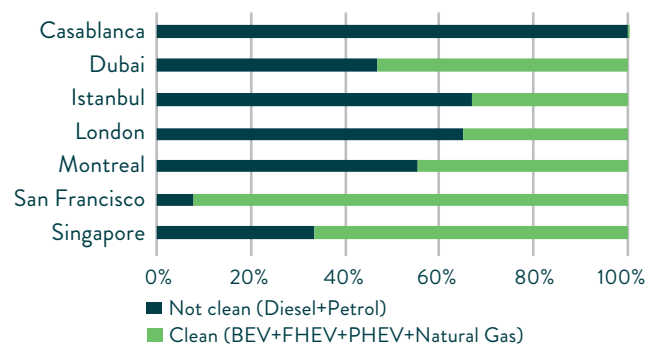
In 2021, San Francisco was the city with the cleanest fleet, composed mainly of Plug-in Hybrid Electric Vehicles (PHEVs). This was followed by Singapore, with a larger number of BEVs.

Fleet age

The age of the fleet is an important parameter in determining the quality of taxi services in the city, as well as their impact on environment and the capacity for fleet renewal. This is important, as taxi and ride-hailing vehicles have the highest energy and greenhouse gas (GHG) emission impacts per passenger kilometre of all urban mobility . They are also among the vehicles registering the highest lifetime mileage.

San Francisco is the only city where there is a maximum mileage limit for vehicles, imposed by the regulator at 425,000 miles (700,000 km).

Taxi and TNC age limit

TNC age limit   Taxi age limit
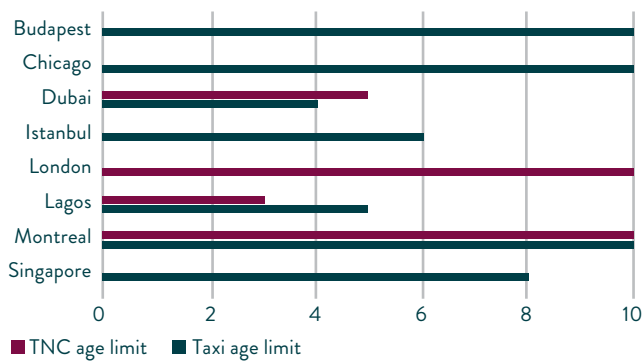
In general, regulators have good visibility of taxi fleets (numbers of vehicles, means of propulsion, age limit). However, the average age of vehicles is not well known, perhaps indicating a need for enforcement.

NEW TAXI-AGE REGULATION IN LONDON TO TACKLE AIR POLLUTION AND THE CLIMATE EMERGENCY

- From 1 November 2019, a maximum operating age for taxis has been mandated, meaning no taxi will be licensed to operate past its relevant age limit.

- The maximum age limit is 15 years for zero-emission capable (ZEC) taxis, Euro 6 diesel taxis and new conversions to liquid petroleum gas (LPG). The maximum age for taxis converted to LPG before 1 November 2019 is 20 years.

- The maximum age limit for Euro 3, 4 and 5 diesel taxis was reduced to 12 years on 1 November 2022.

Efficiency of taxi operations

There are several ways of measuring the performance of taxi vehicles. Those cities with good taxi systems have high levels of utilisation, with taxis operating double shifts.

Another measure is distance driven with passengers on board. Ride-hailing companies are looking to reduce the idle run or deadheading (running without passengers) percentage by increasing vehicle utilisation. Another way is to allow drivers to take rides near home when approaching the end of shift.

In the benchmark, only four cities dispose of the share of driven kilometre with passengers and on average taxis run with passengers for 62% of kilometre driven. In general, taxis are used also for private usage, or total Veh-Km are not registered. This means it is not possible to accurately calculate the efficiency of taxi service.

Share of kilometre driven by taxi with passengers

km driven with passengers   Deadheading
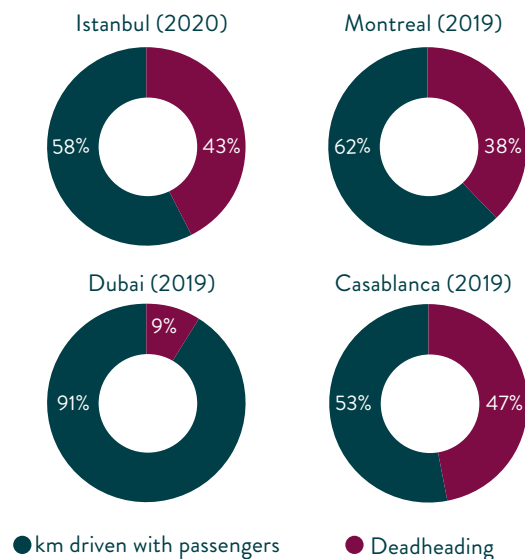
Percentage of taxi vehicles operating in double shift

Yes   No
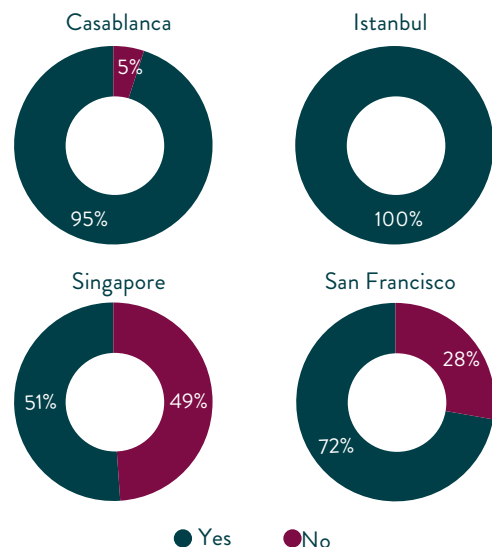
DIGITALISATION

Digital apps and payments are no longer the monopoly of TNCs. Taxis are catching up, even if it is often through third parties such as dispatchers.

### NEW TNCS - TAXIS PARTNERSHIPS

Uber is signing partnerships with third parties to dispatch Uber rides through taxis, as is already the case in New York, Italy, Hong Kong, San Francisco and many other countries, with the idea to "include every taxi on its Uber app by 2025".

In all cities - excluding Lagos - taxis are available on online platforms and/or mobile apps.

Fares, taxi meters and payments

It is only in Lagos and Singapore that taxi fares are not regulated. Meanwhile, this seems to be the norm for TNCs, whose fares are regulated only in Dubai.

Cities defining taxi and TNC fares
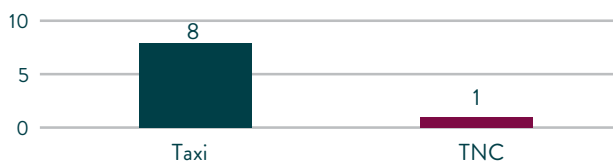
In all cities - excluding Lagos - regulation imposes the use of a taxi meter integrated into taxi vehicles. However, in three cities - Chicago, Dubai and Montreal - it is permissible to use smartphones as a taxi meter.

Taxi services available online by type of platforms/app ownership

City	IN-HOUSE (taxi operators have their own platform/app)	MIXED (operators have in-house and/or external platform/app)	EXTERNAL (platform/app not owned by a taxi operator)
Budapest	✔		
Casablanca			✔
Chicago		✔	
Dubai		✔	
Istanbul			✔
London		✔	
Montreal	✔		
San Francisco		✔	
Singapore		✔	

Type of payments available

Cash is the only payment method supported for taxi services in all cities. It is also on option for TNCs in four cities: Dubai, Lagos, London and Singapore.

With the exceptions of Casablanca and Lagos, where only cash payments are possible for taxis, at least two further payment solutions are available in all the cities.

THE AVERAGE TAXI TARIFF (IN €) FOR ONE KILOMETRE IS:

(The question asked concerned the average taxi price per kilometre considering the following parameters: urban trip; daytime fare; fluid traffic; normal conditions; without additional fees nor starting fee)

Budapest	0.98	Istanbul	1.42
Casablanca	0.23	London	3.55
Chicago	3.00	Montreal	1.23
Dubai	0.49	Singapore	0.42

Type of payments available for Taxi and TNC users

City	Cash payment	Credit/ Debit payment	Free ride vouchers/ discount codes	Mobile payment	Pre-paid card	Public Transport card
			TAXI			
Budapest	✔	✔		✔	✔	
Casablanca	✔					
Chicago	✔	✔	✔	✔	✔	✔
Dubai	✔	✔		✔		✔
Istanbul	✔	✔				✔
Lagos	✔					
London	✔	✔	✔	✔	✔	
Montreal	✔	✔	✔	✔	✔	
San Francisco	✔	✔	✔	✔	✔	
Singapore	✔	✔	✔	✔	✔	✔
City			TNC			
Chicago				✔		
Dubai	✔	✔	✔			
Lagos	✔		✔	✔		
London	✔	✔	✔	✔	✔	
Montreal		✔		✔		
Singapore	✔		✔	✔		

EVOLVING ROLE IN MOBILITY

Taxis and ride-hailing services are the safety net of mobility, with a strong social value that should be cultivated.

It is often said that if public transport is the backbone of urban mobility, then taxis and ride-hailing services are its safety net, providing a fast, reliable, 24-hour service, thus complementing mass public transport. In many countries, taxis are considered as a public service and have a strong social value, providing tailored services for different types of needs.

Cities where regulation allows, or does not preclude, targeted services to taxis and TNCs
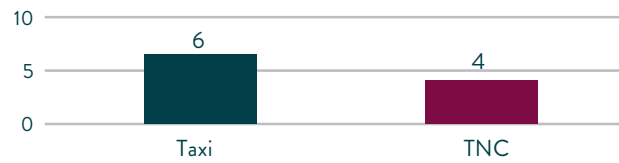
However, data - when available to regulators – show that there is a extremely limited percentage of wheelchair-accessible vehicles, with the notable exception of London.

Percentage of wheelchair accessible vehicles in 2021

| City	TAXIS	TNCs
Casablanca	0.02%	-
Chicago	8.6%	0.15%
Dubai	0.25%	-
London	100%	0.64%
Montreal	8.57%	-
San Francisco	3.56%	-
Singapore	0.18%	0.02%

Targeted services performed by Taxi and TNC

Service for City	Delivery	Elderly	Women and families	People with reduced mobility	Students
			TAXI		
Casablanca				✔	
Dubai		✔		✔	
Lagos				✔	
London				✔	
Montreal				✔	
San Francisco	✔			✔	
Singapore				✔	

City			TNC		
Montreal	✔			✔	✔
Singapore			✔	✔	

Local public authorities can contract taxi and TNCs vehicles for specific services

We can see that local public authorities, even when they cannot regulate taxi and ride-hailing services, can contract their vehicles for specific services. These include transport for people with reduced mobility (frequently known as 'paratransit services' in North America) or to complement a Demand-Responsive Transport (DRT) scheme.

Number of cities where regulation allows or not preclude DRT/microtransit/on-demand with taxi and/or TNC vehicles
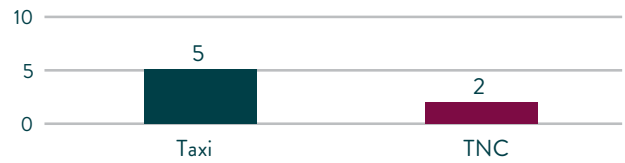
One interesting example is provided by the public transport agency Dallas Area Rapid Transit (DART). DART does not regulate taxis or TNCs, but it has three on-demand programmes for people with special needs that use taxi or TNCs.

This is to supplement the ADA Paratransit, Rider Assistance Programs (RAP) and an on-demand pilot (ODP). For all riders, DART also has GoLink, another on-demand service supplemented by taxis and TNCs. It is available within GoLink zones, with integrated booking and payment on the GoPass app.

Contribution of Taxis & TNCs in terms of number of trips in Dallas in 2021

■ Paratransit ■ GoLink ■ RAP ■ ODP
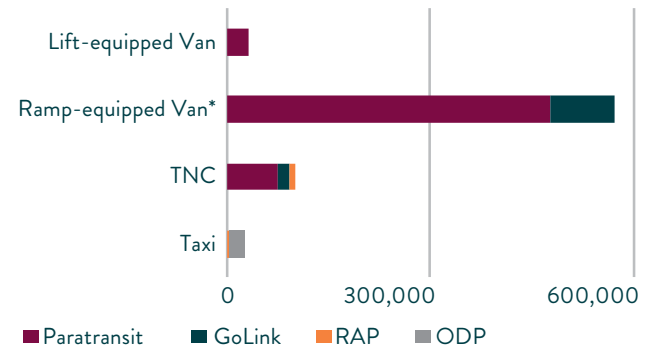
*GoLink ramp-equipped van includes smaller taxi size vehicle which is dedicated to GoLink service and with ramp equipped.

In 2021, GoLink ridership was 111,342, which was a full pandemic year. Since January 2022, GoLink has been expanded from 17 to 30 zones as part of DART's bus network redesign. This resulted a significant increase in GoLink ridership; in 2022 it reached 333,763. Typically, three-quarters of GoLink ridership destinations were to public transport hubs.

Taxi & TNCs are part of multimodal apps

We see a diversification and integration of taxi and ride-hailing services within urban mobility. Digitalisation has opened up the possibility of integrating on-demand trips within a multimodal journey - as in MaaS apps - through new data specifications. These include GT-FS-OnDemand extension developed by MobilityData), Application Programming Interfaces (French taxi API as a public digital infrastructure and Montreal Taxi Registry) - also by a public authority.

However, despite the progressive digitalisation of the sector, data are lacking for some aspects, such as on trips. This would support a better understanding of the roles played by these vehicles in different cities around the world. It would highlight whether they act as a genuine safety net or if they intersect commuting flows and intervene increasingly into daily mobility. As we know, this is a domain where mass public transport and other transport modes are in general more efficient and sustainable.

Availability of Taxi and TNC service in MaaS/Super Apps including the following services

City	Public Transport	Public transport & other mobility services	Other mobility services	Other non-mobility services
		TAXI		
Dubai		✔		
Lagos				✔
London	✔	✔	✔	✔
Singapore		✔	✔	✔

City		TNC		
London	✔	✔	✔	✔
Montreal		✔		

NUMBER OF TAXI TRIPS

None of the cities that participated in the research have a global overview on the total number of requests for taxis and ride-hailing (including trips requested via platform or hailed in the street). Nevertheless, in nine cities out of 10, taxis are available through online platforms and/or mobile apps, but the regulators do not have visibility of the number of the trips pre-booked in advance or taken in real time. This might be a path worth exploring for regulators to allow them to gather more data and gain a better understanding of the role played by taxi and TNCs vehicles in daily mobility.

CONCLUSION

Taxi and TNCs vehicles are regularly used to complement mass public transport as a 'safety net of mobility', providing fast, reliable, 24-hour service. They are also targeted at specific groups, such as people with reduced mobility. They can also be part of other on-demand services, such as DRT schemes and of MaaS schemes, helping to sustain the shift towards a multimodal lifestyle and away from privately used and owned cars.

However, to make this happen, local public authorities must overcome the observable lack of available data as well as the undermining of local competence, in order to shape a more-integrated, inclusive and sustainable mobility system.

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