Competition and Regulation in the Provision of Local Transportation Services

OECD Competition Policy Roundtable Background Note

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Foreword

While competition *for* the market is traditionally considered the best model for the provision of local urban transport, launching tenders is not sufficient as such to secure the benefits of strong competition. Regulators and public transport authorities need to ensure sufficient competition at the tender stage, by reducing barriers to entry arising from asset ownership, definition of the lots subject to tenders or the duration of concessions, in particular when an incumbent public transport operator is present. The development of technologies, in particular *Mobility as a Service* platforms, has expanded the room for multimodal and intermodal competition. However, given the nascent nature of this market and the presence of fragile business models, competition authorities need to be particularly careful to avoid that market entry regulations and anticompetitive practices, in particular those involving access to and sharing of data by the incumbents, hamper their development and stifle innovation.

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1. Introduction

Efficient transport services are crucial for many aspects of citizens' daily lives. They have an impact on labour markets, for example by increasing or reducing the geographic radius of workers' mobility, on real estate markets, through their accommodation prices, or on traffic congestion as they affect the use rate of cars and other private transport modes. In addition, since transport is a major contributor to CO_2 emissions, efficient transport services also play an essential role in meeting climate change and environmental goals.[1]

Working Party No. 2 (WP2) has already examined the topic of transportation services on several occasions. In 2013, it discussed features of local bus transport services that make competition *for* the market more appropriate than competition *in* the market (OECD, 2013[1]). The debate focussed on designing tender procedures, reducing barriers to entry (such as long and large-scale contracts, asset ownership, and risk allocation), defining ways to minimise likelihood of collusion, and strengthening advocacy efforts by competition authorities. In 2016, WP2 held a roundtable on innovation in land transport, discussing how new technologies could affect land passenger and freight transport by road and rail (OECD, 2016[2]).

However, recent developments, including technological advancements and policy changes make a re-examination of the topic of urban transport timely. Many cities still struggle to find ways to ensure cost-efficient high-quality services that help meet climate change and environmental goals. Furthermore, the Covid-19 pandemic had a significant impact on local mobility and service providers, many of which already encountered economic difficulties in meeting public expectations and fulfilling contracts while ensuring profitability. Its potential (though still uncertain) long-term impact on mobility patterns and service profitability could be a determinant factor in future tenders. Finally, the sharing economy and the development of new technologies such as *Mobility as a service* (MaaS) has brought (or expanded the use of) new transport services into the market that could either complement or compete against traditional public transport.

To adapt the provision of transportation services to these challenges, regulators have different models at their disposal. They can provide them directly or task a private or public operator with their provision. The latter can be an in house firm or an external service provider, selected via different methods. Generally, as also discussed in (OECD, 2013[1]), competition *for* the market in which tenders are organised to select one or more service providers is deemed the most appropriate means of ensuring efficient provision of transport services, compared to direct awards with strict regulations of operators or competition in the market among several firms. Indeed, provided that there is a sufficient number of qualified and non-collusive bidders, a market solution to award a contract to the lowest price bidder is a way to obtain results similar to those achieved through competition in the market, thus reducing monopoly profits without the shortcomings arising from direct and detailed regulations (Demesetz, 1968[3]).

However, even when competition for the market is preferred, it does not as such eliminate the need for regulations with a view to ensuring effective competition (Williamson, 1976[4]). This is due to a number of reasons:

- There are often uncertainties with respect to future local demand and supply conditions, costs, inflation or technology, which make it challenging to draft comprehensive long-term contracts that take into account all existing uncertainties susceptible of having an impact on prices;

- Concluding long-term contracts with the supplier that offers the lowest price does not as such impose any actual commitment upon the latter in the absence of well-defined quality obligations that limit the incentives to reduce quality to cut costs;
- Winners of original tenders might have an advantage (e.g. information, equipment, experience, sunk costs and investments already realised) over prospective new bidders at the stage of contract renewal. Hence, whenever the assumption of parity among bidders does not translate into reality (which is likely to be the case at the stage of contract renewal, in the absence of specific regulations (Section 4. below)), meaningful competition among bidders after an initial competitive round may be upset and not deliver the advantages expected from competitive bidding.

For these reasons, State intervention through regulations that delimit the action of and provide incentives to efficiency-oriented actors may still be necessary to ensure that competition for the market delivers the expected advantages.

However, recent technological changes have blurred this clear theoretical framework. The development of new technologies and in particular *Mobility as a Service* (MaaS) applications that combine different (public and private) mobility services, tailoring transport solutions to the customer's preferences and needs, has broadened the room for multimodal transport and inter-modal competition, thus enabling to a certain extent stronger competition *in* the market. Furthermore, these technologies have facilitated monitoring of service quality, both by authorities and customers.

Based on such considerations and recent developments, this background note will discuss competition issues in the market for the provision of transportation services (bus, metro, tramway) at the urban level.

Section 2. will discuss the aspect of governance and the institutional framework for the management of local transportation services. The development of new technologies and MaaS apps have raised challenges for current institutional frameworks, which are often fragmented by activity or mode of transport. In order to benefit from complementarity, authorities need to plan transport services in a co-ordinated manner, expanding their remit and enhancing their financial and human resources. National experiences show different models to support authorities' expertise and complement their resources, in particular by establishing public-private quality partnerships. While these hybrid and private-public co-operative institutional settings are important to ensure that public transport contributes to broader public policy objectives (such as reduction of pollution and traffic congestion), they may also give rise to antitrust concerns.

Section 3. will discuss how new technologies and in particular *Mobility as a Service* (MaaS) have expanded the room for competition *in* the market between different modes of transport (inter-modal competition), enhancing cross-modal complementarities and eroding some of the reasons whereby competition *for* the market is deemed preferable. While they have facilitated multi-modal transport and enhanced inter-modal competition, MaaS markets are still at an early stage of development, thus competition authorities must be particularly vigilant to detect anticompetitive practices that would hamper a vibrant nascent market. While this section will discuss competitive issues related to the upstream MaaS platforms, it will not cover issues related to downstream services such as taxis and ride-sourcing that were already discussed by Working Party No. 2 in 2018 (OECD, 2018[5]).

Finally, Section 4. will discuss issues related to competition *for* the market in the provision of urban public transport services, in particular barriers to entry at the tender stage. While competition for the market is generally the preferred model for the provision of public transportation services, merely organising tenders is not sufficient to ensure effective competition, especially when an incumbent public transport operator is present. Hence, public authorities need to introduce specific measures to reduce barriers to entry and ensure intensity of competition.

2. Governance and institutional aspects

The institutional set up and the governance of the local transport sector are key to ensure that competition (in the form chosen by the regulators, see section 3.1) in local transport services brings benefits to consumers and contributes to achieving broader public policy objectives. The authorities' role is not only to define and plan transport services but more generally, to ensure that private or public operators deliver good quality services in an efficient way and that they contribute to achieving broader public goals such as reduction of congestion or pollution, or the provision of minimum services to all citizens.

Jurisdictions have different options at their disposal when defining their institutional set up for local transport, involving multiple national departments or agencies at distinct levels of governments.

- They can task a municipal authority to regulate and organise local public transport services, without any direct close supervision by other regional or national authorities (e.g. Transport for London). Such authority can have full independence in defining the infrastructure, the scope of services (coverage, frequency, schedules) and the prices. Its regulatory responsibilities can possibly cover also competing or complementary modes of transport. Municipalities can then provide the public service directly, establish a fully owned operator or run tenders to select the private service provider.
- Rather than tasking municipal authorities with regulatory functions, regional or inter-municipal authorities can be in charge of managing transport at local level (e.g. in France through the *autorités organisatrices de la mobilité* that can be responsible for transport within *and* between different municipalities; or in Oslo, where since 2007 Ruter is the public transport authority responsible for buses, metro and trams in the municipality as well as the surrounding county).
- There may be a national transport authority with the role of enforcing national legislation, issuing regulations and assisting municipalities in the organisation of local transport services, including the organisation of tenders (e.g. Ireland,[2] or Italy[3]).

Furthermore, the development of new sharing economy modes of transport multiplies the crossroads between these and other regulators (e.g. those responsible for managing public space and roads).

Although this is a purely institutional decision and thus outside the scope of this note, an optimal allocation of competences between local, regional and national authorities can help ensure both competitive markets and efficient systems of local transport in several ways. *First*, it helps ensure a level playing field, addressing potential issues of regulatory capture or conflicts of interests that may arise for instance when municipalities are at the same time regulators and shareholders of the local transport operators (AGCM, 2016, p. 64[6]). *Second*, in light of authorities' different goals and the crosscutting importance of transport for different aspects of citizens' lives, defining the right distribution of competences facilitates co-ordination and planning and helps ensure that operators provide minimum affordable good quality services to all citizens without undermining other policy objectives, such as reduction of pollution and congestion. *Finally,* setting the right boundaries between different authorities avoids excessive regulatory fragmentation while ensuring that they possess the necessary expertise to carry out their tasks.

Building on discussions on governance and institutional structure in previous roundtables, this section briefly explores how public authorities complement their expertise by involving private operators in the design and planning of transport systems. It also explores potential antitrust risks brought about by these models.

2.1. Challenges related to governance and institutional set-up

Previous roundtables (OECD, 2013[1]) (OECD, 2016[2]) discussed selected issues related to governance, including risks of regulatory capture, conflicts of interests due to ownership of transport service providers by local administrations, and the lack of sufficient expertise by small local authorities to organise tenders and to provide and monitor incentives for high-quality services. Delegates discussed the need for national regulators in a system where the management of urban public transport has been often decentralised to local authorities.

When considering the institutional framework for public transport, one of the main issues that was not discussed concerns the authorities' financial and human resources. Authorities need to have sufficient expertise to plan transport services, organise tenders, supervise service delivery, or ensure compliance with pre-defined quality obligations. To this aim, some jurisdictions have developed innovative institutional models that leverage private operators' expertise to complement authorities' resources. (OECD, 2016[2]) already noted that in the near future innovative partnerships "*between the public and private sectors going beyond today's simple supplier-client relationship may become more usual*." The remainder of Section 2. builds on such prior OECD work and explores how public authorities have found new ways to complement their expertise by involving private operators in the decision-making, which is an issue that affects in several ways the intensity of competition.

Another institutional issue, which however will not be analysed in detail in this note, is the remit of transport authorities with regards to different modes of transport and their complementarity, and whether the authorities' current regulatory boundaries allow them to plan transport in an integrated manner, especially in light of recent technological developments. As it will be analysed in depth below (section 3.1), the development of new technologies has blurred the boundaries between public and private transport and has widened the scope for inter-modal and multi-modal competition. In particular, the development of micro-mobility services and of *Mobility as a Service* (MaaS) platforms that allow combining public and private modes of transport in a one-stop-shop app has increased the opportunities for passengers to complement public transport with other mobility services and to use transport solutions that are adjusted to their preferences and needs at any given time.[4] However, these technological developments also create challenges for the very organisation of the institutions that deal with local public transport. Regulations are often fragmented, e.g. by mode of transport, nature of the service (e.g. public vs private) or by activity (e.g. transport services vs management of road infrastructure and public space). Thus, while passenger transport moves towards multi-modality, transport authorities' tasks often remain mostly limited to public transport, reducing the possibility to plan transport services in a user-centric multimodal manner. For this reason, some commentators call for a transformation of public transport authorities into multimodal mobility authorities (MMA) (Crozet, 2020[7]). This requires an "outward" expansion of their scope to extend their remit to new missions beyond public transport. As noted below (section 3.2), public transport authorities can play a major role in developing MaaS and ensuring that it brings benefits to customers and contributes to public policy goals more broadly. An expansion of their mandate would allow them to organise new and old transport services, for example running tenders for the provision of special transport services (e.g. new on-demand transport services for persons with reduced mobility), managing public space to ensure fair access to all competitors in the market or planning a local transport system integrating all possible complementarities.

2.2. Models to leverage private expertise and complement public authorities' resources

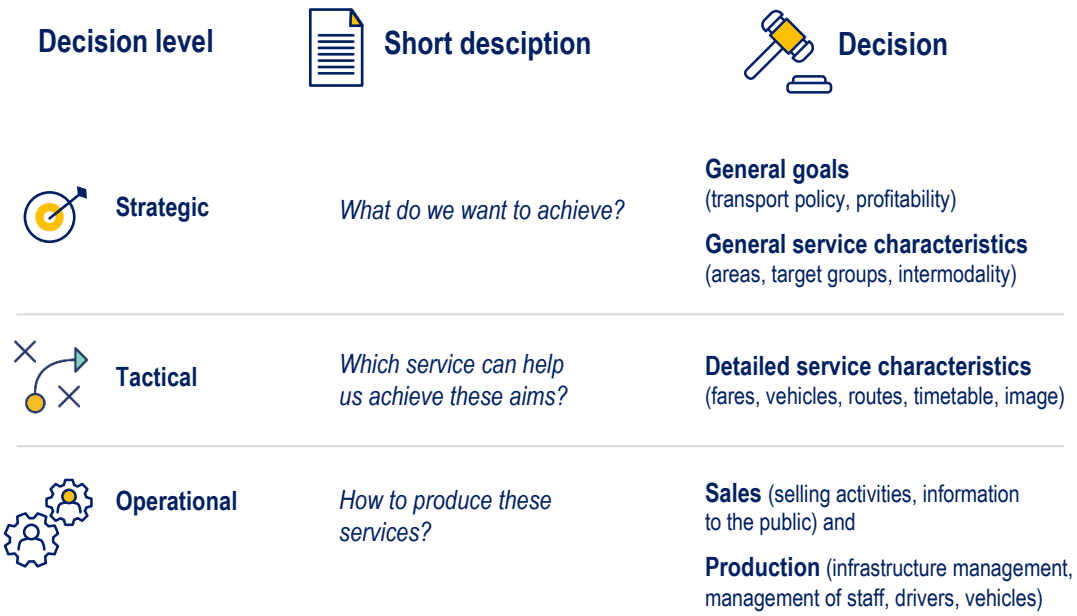
Organising competitive tenders, selecting the transport operators and/or monitoring their activities require significant human and financial resources. The effectiveness, efficiency and expertise of public authorities in providing, regulating and/or monitoring transport services can in turn significantly affect the level of competition in the market.

Empirical studies, comparing urban public transport in France and the UK, have shown that weak public authorities' expertise and control coupled with excessive discretionary powers result in lower intensity of competition in public transport markets, with consequences on prices and quality (Amaral, Saussier and Yvrande-Billon, 2009[8]) (AGCM, 2016, p. 106[6]). Furthermore, as explained in detail in Section 4.4 below, the availability of financial and human resources within public authorities affects the choice of the contract model for public transport, which in turn has an impact on operators' incentives to minimise costs and provide high-quality services.

In light of the importance of transport authorities' expertise to ensure intensity of competition with a view to decreasing prices towards efficiency prices and increasing service quality, several regulators have tried to leverage private operators' experience and involve them in the decision-making as a way to complement their own resources. The goal of public-private co-operative partnerships is, on the one hand, to facilitate authorities' tasks, and, on the other hand, to align private operators' incentives with those of transport authorities.

At the outset and before looking at national experiences on this point, it is useful to define the "levels" of decision-making in which different public and private actors could theoretically be involved. (Van de Velde, 1999[9]) developed a framework to capture the different activities and levels of decision-making in public transport with regards to the creation, conception and provision of transport services.[5] Figure 1 provides a graphical overview of this framework.

Figure 1. Framework on the levels of planning and control in public transport



Source: (Van de Velde, 1999[9]).

For the purposes of this note, this framework identifies three main levels of planning and decision-making to provide transport services:

- A strategic level, which concerns the identification of goals and the means to achieve them. This level includes decisions on which services to provide, the definition of the area of supply and of the target groups, taking into account substitutability and complementarity between different modes of transport (inter-modality), or setting broader public policy goals such as fighting against climate change and reducing CO_2 emissions;
- The tactical level involves decisions on the acquisition of means of transport and how to use them efficiently, or decisions on routes, timetables, and fares;
- The operational level is about delivering the service and monitoring it, e.g. managing drivers and assets.

Regulators may decide to complement their expertise by involving private operators to different extents at each level of decision-making. For example, a public transport authority may decide to set only the general strategic goals (strategic level), leaving their implementation to the awarding bidder, or it can shape precisely the structure of the transport network by defining sub-areas of service or even routes (tactical level). Similarly, focussing on the tactical level, national regulators may grant local transport authorities the power to define autonomously fares, routes and timetables, or to discuss, define and agree them with private operators.

Rather than defining "black and white" solutions, in which each (public or private) actor is entrusted with the full power to adopt a decision independently, recent national experiences show that hybrid models involving both public stakeholders and private service providers at each decision-making level may yield positive results. The advantages of such models are twofold. On the one hand, they allow authorities to complement their expertise, and define and monitor their roles and objectives with the help of operators on the ground. On the other hand, hybrid decision-making in which private service providers have a say to minimise the risk of unrealistic expectations may contribute to avoiding the traditional shortcomings of competitive tendering, in which bidders tend to under-estimate future uncertainties that may affect their chances to win the tender, and over-emphasise their ability to deliver high-quality cost-efficient services.

The experiences of the UK and Norway with co-operative agreements and quality partnerships between public transport authorities and bus operators are enlightening (Box 1).

Box 1. Norway and the UK: quality partnerships and public-private co-operation in local transport

In the UK, informal quality partnerships between local public transport authorities and bus operators developed spontaneously, before being first regulated by the Transport Act of 2000. The latter introduced more formal arrangements known as Statutory Quality Partnerships (SQPs) in which authorities specified minimum standards for operators and vehicles, that could be higher than those laid down in the law (White, 2018[10]). Besides quality partnership schemes, the reform of the Bus Services Act 2017 added the following complementary instruments:

- Advanced Quality Partnerships (AQPs), which lay down precise obligations to provide passenger information or define maximum fares for specific routes, frequencies and timetables. As a safeguard against unrealistic conditions imposed upon operators, AQPs can only enter into force if the relevant operators do not raise any admissible substantiated objection.[6]

- Enhanced Partnerships (EPs) that can set bus improvement objectives, emission standards for vehicles or obligations on their appearance.

Norway is another interesting case study, in particular the experience of Ruter (the government-owned company responsible for planning, co-ordinating and marketing public transport in Oslo) with public-private co-operation. Ruter notes that "*innovative public procurement requires closer dialog between the client and different market participants than a default public administration procurement process prepares for*."[7] This is why competitive tenders provide operators with several opportunities to discuss with Ruter. In the pre-qualification phase, potential bidders can ask questions to Ruter; then, once pre-qualified, bidders are invited to a conference with Ruter to better inform their bids and have a tour of the depots that they will use once awarded the bid. Finally, once they have won the tender, Ruter holds monthly "co-operation meetings" to address service quality, compliance and performance metrics (ENO Center for Transportation and TransitCenter, 2017, pp. 64-65[11]).

Source: (White, 2018[10]) (ENO Center for Transportation and TransitCenter, 2017[11]).

However, while partnerships defining agreed objectives and outputs (on both public and private sides) can bring benefits to passengers, e.g. in terms of better integrated networks or information management, they may also raise antitrust risks (CMA, 2016[12]). The following should be duly taken into account.

- Risk of raising barriers to entry. While involving current operators in network planning can bring the above-mentioned benefits, it might affect competition if transport firms manage to limit the extent to which new or existing operators can provide new services and enter the market. For example, the authorisation of new operators or the approval of new services may be subject to a so-called test of non-impairment of the incumbent operator's services (AGCM, 2016, p. 142[6]) (CMA, 2016[12]), which may limit the deployment of innovative services. As part of this risk, the concern of setting too high entry requirements is particularly serious. For example, fixing high quality minimum standards for buses can benefit passengers in terms of service quality but may reduce the number of operators meeting the requirements to run local bus services;
- Risk of geographic segregation, if operators express an interest at the planning stage in running certain routes or "core territories", thus reducing the scope for potential or actual competition. Market sharing concerns may arise, for example, if entry requirements are different and tailored to each lot subject to tender;
- Risk of sharing commercially sensitive information between competitors. For example, defining multi-operator ticketing schemes requires exchange of certain minimum information on service frequency, time schedules, capacity and targeted discounts that may increase transparency and facilitate tacit collusion or monitoring of competitors' conduct.

The CMA has provided guidance to local transport authorities to strike an appropriate balance between competition and co-operation.[8] It provides for a block exemption of multi-operator ticketing schemes, even when they cover aspects such as fare zones within a local area or common definition of passenger groups (e.g. students for discounted rates) provided that (i) they produce economic benefits outweighing the restriction; (ii) these benefits are shared with consumers; and (iii) they do not unnecessarily impose restrictions or give rise to the possible elimination of competition (CMA, 2016[12]).

3. Competition in the market and the opportunities brought by new technologies

With very few notable exceptions,[9] most OECD jurisdictions have excluded competition *in* the market between different urban public transport service providers. The effectiveness of a public transport network with different operators competing in the market was discussed in depth at the OECD WP2 Roundtable in 2013 (OECD, 2013[1]). However, for the sake of completeness and without purporting to be exhaustive, this section provides a brief overview of the reasons why competitive tendering rather than competition in the market is often considered the most appropriate form of competition in this sector (Section 3.1).

In the context of a discussion of competition *in* the market, the impact of new technologies and in particular aggregator apps and Mobility as a Service (MaaS) platforms on urban public transport warrants a more in depth analysis (Section 3.2), with particular focus on regulatory considerations (Section 3.3) and competition concerns (Section 3.4). These new services are becoming more widespread, competing with or complementing traditional modes of transport. They bring the potential to reshape urban transport services and have attracted increasing scrutiny by competition authorities since the latest WP2 roundtable.

3.1. Competition in and for the market

(OECD, 2013[1]) provided several arguments in support of competitive tendering for the provision of local public transport services.

First, transport fares are usually regulated and different service providers (e.g. competing bus companies) do not compete on price. Users of public transport services are often more interested in the timing of the service rather than other factors. This means that, to a certain extent, passengers will tend to use the first available service, irrespective of other factors (e.g. quality of the bus). Hence, introducing competition *in* the market could potentially give rise to opportunistic behaviour by the operators instead of creating incentives for service differentiation and quality improvement. For example, competing bus operators would have an incentive to change their timetables, drive aggressively and arrive at the stations before their competitors in order to embark users; or they might have an incentive to stop outside pre-defined stops or skip stations when this is more profitable. At the extreme, some operators may even stop providing the service when demand is low, thus affecting the reliability of time schedules. Overall, it is adduced that competition in the market would create risks for safety and result in unreliability of public transport.

Second, the exclusion of competition in the market is often justified by the presence of natural monopoly elements in certain transport service markets, such as metro and tramways that require an extensive physical infrastructure. Due to the existence of economies of scale and scope (see section 4.2 on economies of scale for local public transport), there might be room for only one service provider for reasons of efficiency (OECD, 2019[13]), which would explain recourse to competitive tendering to identify the sole operator.

Third, providing transport services on certain routes, at certain hours or in certain low-density or peripheral urban areas may not be commercially viable. Yet, authorities need to ensure minimum services covering the whole urban area, given the importance of public local transport for citizens. This often requires State intervention through subsidies or compensation for services on non-commercial routes. However, when operator(s) receive public funds for non-economic segments of their activities, the introduction of competition in the market could entail a risk of cross-subsidisation of activities on commercially viable routes, with subsequent distortion of competition and sub-optimal use of public resources (OECD, 2019[13]).

Fourth, in the presence of non-profitable areas or routes, the introduction of competition in the market between operators may give rise to a risk of cream skimming or cherry picking, with operators providing services only on the most profitable routes or areas. In the presence of public service obligations to guarantee minimum services to all citizens, this commercially rational behaviour may however reduce the expected revenues (e.g. from ticket sales) for the operators subject to public service obligations and thus require increased public support, aggravating the financial burden on public authorities. For this reason, in an attempt to leave some room for a model with on-road competition instead of excluding it a priori, certain jurisdictions theoretically allow it but make it subject to the fulfilment of a so-called test of impairment of concessions, which requires new operators to show that their entry into the market will not affect expected revenues of operators tasked with public service obligations (AGCM, 2016, p. 142[6]). However, such a test, especially when highly discretionary, is tantamount to making it practically impossible for new operators to enter the market.

Finally, public transport produces positive and negative externalities. It can have a significant impact on labour markets (increasing or reducing the geographic radius of workers' mobility), real estate markets, or traffic congestion (Mocetti and Roma, 2021[14]). Given these externalities, authorities may wish to keep control over public transport whereas introducing competition in the market may result, for example, in congestion of more profitable central areas, thus entailing broader consequences in terms of pollution.

Yet, although competitive tendering is usually deemed the most appropriate form of competition in urban public transport, there may still be room for competition *in* the market between different modes of public transport (buses, metro, and tramway) as well as between public transport and traditional modes of transport (e.g. taxis and private cars) or new app-based "private" transport services.

A first form of competition in the market takes place between different modes of urban public transport (inter-modal competition). This may be more or less significant, depending on context-specific factors, such as users' more or less ingrained habits or the coverage of the different networks. (Fearnley et al., 2018[15]) conducted a study on the degree of substitutability between different modes of transport at urban level, recording 174 different cross-elasticities estimates between public transport modes. They found "moderately robust insights" on cross-elasticities between buses and light rail for short trips, thus showing that some (though limited) substitutability exists from the point of view of users. Their study highlights that travel time is the most important factor for inter-modal competition, followed by fares, access and transfer time and the number of interchanges, whereas waiting time seems to be the least relevant criterion for users' choice.[10]

Most importantly, the development of new technologies may have partially eroded the reasons justifying the preference for competitive tendering and may widen the scope of competition in the market.

Indeed, the development of new means of transport, such as shared e-bikes and free-floating scooters, has blurred the boundaries between private and public modes, with potentially opposite effects on public transport. Customers can use a vehicle without owning it, paying for their one-off use as they do when purchasing a bus or metro ticket; they have at their disposal door-to-door means of transport that often do not need a paid subscription. Empirical studies conducted in two mid-sized US cities (namely Raleigh, North Carolina and Portland, Oregon) show that half of micro-mobility trips (e.g. with e-scooters) are used to replace public transport or active modes of transport (e.g. cycling or walking), thus confirming that app-based mobility services represent a significant competitive threat to public transport rather than merely

being “add-ons” for first- and last-mile connections (Liao and Correira, 2020[16]) (Hollingsworth, Copeland and Johnson, 2019[17]). At the same time, new share mobility modes of transport may result in the abandonment of private car use and lead to an increased use of public transport combined with bike-sharing or other mobility services for certain legs of the journey (OECD, 2016, p. 12[2]).

Furthermore, MaaS apps that combine different mobility services, tailoring transport solutions to the customer’s preferences and needs at a given point in time, may enhance multimodal transport and inter-modal competition, both between different public transport modes, and between the latter and the new app-based means of transport.

The adoption of MaaS apps by passengers may not only bring benefits to them but also to authorities in charge of public transport, eroding the reasons justifying the preference for competition for the market. For example, in the long-run, aggregator apps may reduce the need for subsidies of less commercially viable services, as they may enable the provision of on-demand services replacing regular pre-determined time scheduled services. They may also facilitate the monitoring and evaluation of public transport services through a customer rating system, reducing the above-mentioned risk of opportunistic behaviour (OECD, 2016, p. 14[2]). Potential advantages for public authorities are even more significant in the aftermath of the Covid-19 pandemic that has changed transport habits, certainly in the short term but with potential long-term impact on customers’ transportation patterns (Mocetti and Roma, 2021[14]). Changes in daily habits, such as the obligation to keep distance and the possibility to work from home, have resulted in higher use of private means of transport and have given workers more flexibility to determine their own individual daily schedules, possibly affecting congestion of public transport at peak hours. A recent survey conducted on 5 000 residents of major cities in the US, People’s Republic of China, France, Germany, Italy, Spain and the UK shows that 30% of respondents expect to use public transport less frequently, reducing the centrality of the latter as the (almost exclusive) backbone of urban transport.[11] Public authorities therefore will have to take such changes into account when planning public transport and urban mobility more generally, considering that a long-term move away from public transport may increase urban congestion and affect the achievement of public policy goals (e.g. sustainable urban mobility and climate-related objectives).

The following sub-sections will focus on the MaaS platforms that seek to enhance the transport system as a whole by facilitating seamless cross-modal aggregation and strengthening competition in the market while possibly responding to broader public policy objectives pursued by governments.

3.2. What is Mobility as a Service?

Despite the existence of various models with different characteristics, it is possible to identify a shared core common to all *Mobility as a Service* (MaaS) platforms. The International Transport Forum has adopted the following definition:

> *Mobility as a Service (MaaS) is a distribution model for mobility services that uses shared data and a digital interface to efficiently source and manage the provision of transport related services into a seamless offer. It is typically delivered via a MaaS app, which is a single, digital, customer interface that sources and manages travel related services and improves the ease of planning, booking and making journeys in a region. MaaS joins different transport, information and payment services into a smooth and reliable digital customer experience. It enables the integration of public transport (PT) modes, commercial transport services such as ridesourcing, bike and carsharing, and taxis into a comprehensive mobility offer (International Transport Forum, 2021[18]).*

Thus, at the core of MaaS is the provision of a one-stop-shop platform that combines public and private modes of transport, tailoring the service to the preferences and needs of the user at a given point in time. Besides providing information on the best combination of transport modes, MaaS can provide additional layers of services, allowing passengers to purchase their tickets or integrated subscriptions (to use with

different mobility service providers) or even contributing to public policy objectives, for instance by taking into account environmental considerations when combining mobility services (Sochor et al., 2018[19]).

MaaS involves several actors at different levels, namely:

- A public authority, that regulates public transport, the use of public space and possibly the platform providing MaaS;
- Transport service providers, including public transport operators and private service providers, such as new mobility service providers;
- An aggregator digital platform, possibly provided by one of the above-mentioned stakeholders or a distinct entity.

Issues related to the first two points (e.g. regulatory capture and anticompetitive regulations raising barriers to entry for new mobility providers) were discussed by WP2 in 2016 (OECD, 2016[2]) and therefore will not be covered in depth here. Box 2 provides a brief snapshot of the main issues discussed by WP2 in 2016 concerning innovation in land transport at urban level.

Box 2. Competition and innovation in land transport

In a number of countries around the world technology-driven innovation in the public transport industry has encouraged multimodal transport as well as enabled monitoring performance and enhanced competition overall. At the same time, novel challenges for competition enforcement have arisen in these markets.

The introduction of new technology has seemingly expanded the room to introduce competition in the market as opposed to competition for the market, which is historically more common in this sector. While the latter was often preferred because it meant that market players competed in bids and tenders, ensuring that the best contender would provide less commercially viable services, possibly with the support of public funding, digitisation has introduced the possibility to create demand-based public transport services. These might potentially or at least partially ensure better allocation of resources, eliminating the need for one player to win a contract and provide commercially unattractive services with public financial support. Aspects such as security and quality are still maintained, as most sharing economy service-providers allow users to rate and evaluate their services.

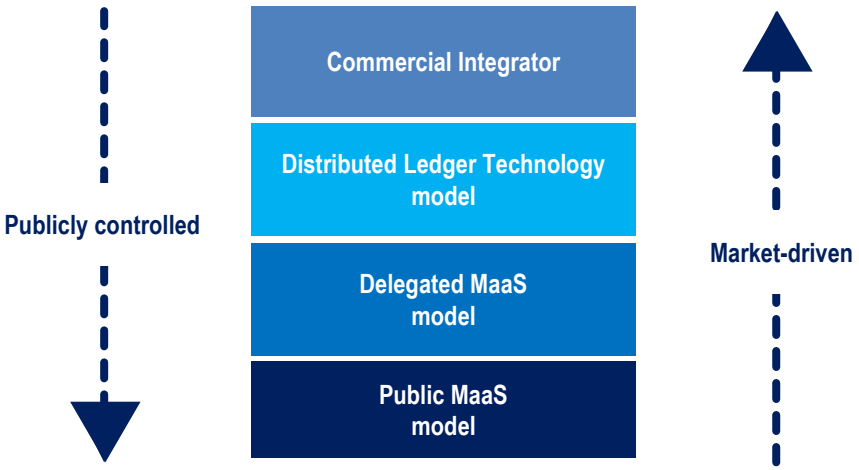
In addition, technology can be used to monitor performance of local transport services. For instance, Singapore uses Wi-Fi based localisation in order to monitor and analyse local data within Mass Rapid Transit stations.

However, this evolution has also revealed a number of challenges. There are a number of barriers to entry, due to intrinsic characteristics of these markets but also to regulations. One of the main concerns, when it comes to the digital economy, is the advantages naturally granted to first movers, who may become gatekeepers of different markets, for example controlling access of mobility service providers to customers. Data protection concerns are also relevant in the digital economy. More broadly, regulations should be carefully considered; competition agencies may attempt to regulate the digital economy, but will often want to avoid over-intervention, which may hinder innovation. A similar challenge is developing an integrated transport network, as this requires interoperability standards, which are often challenging to set. Finally, competition authorities may have to balance the need to ensure the maintenance of a level playing field in this sector avoiding market tipping and the necessity to create sufficient incentives for operators to invest and benefit from economies of scale and scope.

Source: adapted from (OECD, 2016[2]).

Different models exist for the design, provision and deployment of MaaS apps. They differ from each other for the level of involvement of public authorities as opposed to private market players, as shown in Figure 2.

Figure 2. Models for the provision of MaaS



Source: OECD Secretariat.

- Under a commercial integrator model (bottom-up approach), the MaaS platform is established and run by a private operator. The latter signs contracts with mobility service providers (possibly also with the public transport operator(s), which is fundamental to a successful MaaS platform), so as to show their services on the platform in response to a user's query. The public transport authority's involvement is very limited, both in terms of control and in terms of investment. This is the model adopted in Helsinki (Finland), where MaaS Global offers its own application (Whim) and has concluded agreements with transport operators (Box 3).

Box 3. Bottom-up approach: the example of Helsinki

Whim is a MaaS application in the Helsinki region, developed and launched by a private firm (MaaS Global) in 2016-2017. Besides direct access to public transport, it integrates access to bike-sharing, car-sharing and even taxis and conventional rental cars. It also offers the possibility to book and pay directly via the application. In addition, the service offers several multimodal package offers, including a non-subscription formula, a basic subscription with fixed maximum charges per journey and a full-range subscription with unlimited access to all integrated transport services.

A 2018 study of Whim service showed that its users had more frequent recourse to public transport and taxis than the population average.

Source: (CEREMA, 2019[20]), (Ramboll, 2019[21]).

- Under a public MaaS model (top-down approach), the transport authority sets up the platform. It can also decide to delegate its development and operation to the public transport operator (delegated MaaS model), as has been done in Hannover and in Vienna, where Wiener Lienen, the public transport operator, offers the MaaS WienMobil service. Yet, the local authority in Vienna was involved in building a database with information (e.g. pricing, timetables) on various mobility services, thus potentially allowing private operators to develop their own tools relying on the public database (Box 4).

Box 4. Top-down approach: the example of Vienna

In Vienna, the local transport authority set up a database with data from various mobility services. Operators can use these data to develop their own app. Today, the local transport operator Wiener Linien has developed its own MaaS WienMobil Service, after establishing a subsidiary (Upstream Mobility) specifically dedicated to MaaS in 2016. The MaaS app today shows all means of transport in Vienna, including electric scooters, bike-sharing, car-sharing and taxis.

Source: (CEREMA, 2019[20])

- Finally, instead of creating a single platform that aggregates mobility service providers, operators can rely on a distributed ledger technology so that they can execute smart contracts directly between them as well as use other providers' resources and services to offer integrated tickets and billing to their own respective customers (International Transport Forum, 2021, p. 11[22]).

3.3. Regulations and market entry

MaaS tools are two-sided platforms**.** In their simplest form,[12] they offer users a (often) free service by providing information on combining different modes of transport in a manner tailored to their preferences and needs at a given point in time. They monetise data on users' preferences on the other side of the platform and offer mobility providers an additional advertising and sale channel for their services. The success of MaaS platforms and the value they bring to users and mobility providers largely depends on their scale, e.g. how many different services they can show and combine through the platform, and how important (in terms of access to additional customers) such a sale channel is for mobility providers.

Regulations on market entry play an essential role in ensuring a competitive environment with efficient MaaS providers. On the one hand, they should allow MaaS platforms to achieve a critical mass in order to benefit from network effects and economies of scale. On the other hand, they should ensure that the market remains competitive, avoiding barriers to entry, winner-takes-all or market tipping dynamics and the creation of a private gatekeeper that acts as a bottleneck controlling users' access to transport services (and vice versa). Furthermore, given the importance of urban transport services for broader public policy objectives (e.g. quality of life, environment), public authorities sometimes wish to avoid that MaaS platforms undermine them while prioritising their own commercial goals.

The OECD *Competition Assessment Toolkit* can provide useful guidance in balancing such conflicting interests. By urging regulators to adopt a pro-competitive stance, it recommends limiting restrictions of competition only to situations where it is necessary to achieve a public policy objective that cannot be effectively achieved in another less restrictive way (OECD, 2019[23]). In light of this principle, one can ask, for example, whether an obligation to obtain a licence (which usually applies to mobility service providers in order to give regulators a means to manage public space) should also be extended to MaaS platforms that do not add new vehicles to the city. Some commentators argue that licensing MaaS platforms may constitute an unnecessary and potentially costly intervention in terms of impact on competition (International Transport Forum, 2021[22]). In light of these principles, certain jurisdictions have limited public intervention to the need to ensure innovation, competition and the achievement of public policy goals. An example is the *Flemish MaaS Agreement Framework*, developed under the Basic Accessibility Decree and approved by the Flemish government, which has the goal of ensuring basic accessibility and an open ecosystem, while granting flexibility on how these principles are implemented.

More broadly, as MaaS is a nascent market that still sees the presence of fragile business models, a permissive regulatory approach with planned reviews of regulations and their outcomes seems opportune (International Transport Forum, 2021, p. 17[22]). As discussed in the following section, through advocacy and enforcement, competition authorities can play a major role in ensuring a regulatory and business environment supportive of competition and innovation.

3.4. Possible competition concerns and the role of competition authorities

MaaS markets are still at an early stage of development but may have significant potential to promote a shift in urban mobility, with positive externalities for broader public policy objectives. Competition authorities must be particularly vigilant to detect anticompetitive practices that would hamper a vibrant nascent market. This sub-section briefly covers possible competition concerns and the (so far, very limited) competition authorities' decisional practice to address them.

3.4.1. Access and sharing of data

A first group of competition concerns arises from access to and sharing of data. To provide the best multimodal transport solution, MaaS platforms heavily rely on data. In particular, data necessary for their effective functioning include:

- Static data, such as time schedules, standard fare structures of public transport and other mobility service providers, or bike sharing stations;
- Dynamic data, e.g. real-time data on circulation, disruptions, delays, cancellations, availability of bikes or scooters at stations or availability of parking space;
- Historical data, for example on customers' habits, or congestion levels of certain routes at peak hours.

While static data are essential for information and planning purposes before the trip, dynamic travel data enable platforms to provide the best solution at any point in time to ensure time saving. However, if MaaS platforms cannot access such data in a machine-readable and interoperable form, it becomes impossible to provide cost-effective and efficient services. This risk is particularly serious under a commercial integrator or delegated model, in which a vertically integrated public transport operator develops the MaaS platform and may have an incentive to deny access to its data to competing MaaS providers. Similarly, even in the absence of vertical integration, the public transport operator may deny access to its static and dynamic data to the extent that it perceives MaaS platforms and new mobility services as a competitive threat (which is often the case as explained above and noted by (Liao and Correira, 2020[16])). The seriousness of this concern was also highlighted by respondents to a recent call for evidence launched in the UK in the framework of the *Future of Transport Regulatory Review* (Department for Transport, 2020, p. 58[24]). In particular, respondents stressed the danger that refusal to share data would have for a level playing field and open market entry.

In light of this risk, certain jurisdictions, such as the EU, have already introduced regulatory obligations to set up national access points (databases, data warehouses, repositories or web portals) with a view to facilitating the exchange and re-use of data, thus enabling the provision of multimodal transport information and services.[13] Finland has been a pioneer in this field, introducing comprehensive legislation that requires all mobility operators to make information on their services (as well as ticket sales interfaces) available to third parties in a standard format.[14] Careful consideration should be given, however, to the risk that extensive sharing of sensitive information (e.g. on prices, availabilities, areas of activity) enhance the likelihood of collusion and price increases for consumers.

3.4.2. Access to public operators' services

A second group of potential concerns for MaaS services may arise from refusing access to favourable rates or to the services offered by the public transport operator. In an urban context, the services of the latter will most likely constitute a substantial part of the MaaS offer, thus it is important that MaaS platforms can have access to them and possibly negotiate prices for the resale of their tickets if they wish to offer an integrated and attractive purchasing service. However, public transport operators may be unable or unwilling to negotiate the prices of their services. This might be the case because regulatory or contractual arrangements under which public transport providers operate restrict the terms on which they can offer access to their services (International Transport Forum, 2021, p. 56[18]). Some public transport operators also raise concerns that providing discounted rates on their transport services to MaaS platforms may undermine their revenue stream (Authority for Consumers & Markets, 2021[25]) or may result in diverting public funding towards private MaaS providers that manage to negotiate discounted rates, thus translating into an indirect subsidy to the latter (International Transport Forum, 2021, p. 21[22]). Such risks are exacerbated when the public transport operator is vertically integrated and has its own MaaS platform in addition to providing mobility services. In such a case, in order to attract customers on its own MaaS platform, it may have an incentive to refuse access to discounted rates for competing MaaS providers. As noted by (International Transport Forum, 2021, p. 105[18]), minimising these risks and maximising the potential for effective private sector competition to arise require sophisticated regulatory frameworks, in particular on separating MaaS and public transport activities within public transport operators and laying down clear competitive neutrality obligations. This risk was also one of the vertical foreclosure theories of harm developed in the Dutch Authority for Consumers and Markets (ACM)'s assessment of the JV between Pon Netherlands B.V and the Dutch rail operator NS Groep N.V. (see Box 5).

Box 5. ACM's conditional clearance of the joint venture between Dutch Railways NS and Pon

On 20 May 2020, the ACM cleared a joint venture between public transport operator Dutch Railways NS and mobility service provider Pon. The ACM assessed the transaction following a referral by the European Commission. The latter briefly assessed the transaction in January 2020, concluding that it might threaten competition in "the retail distribution of (MaaS) transport/mobility services" in certain cities in the Netherlands. Hence, it decided to refer the case to the ACM (Case M.9545 – NS GROEP/PON NETHERLANDS/JV).

The parties' activities overlapped in several markets, namely the local city markets for bike-sharing services, the national or local city markets for car-sharing services, and the national market for retail distribution of integrated mobility services through an application. While neither of the parties involved held a dominant position in any of those markets, ACM found that the transaction might give rise to effects on vertically related markets. This new company would indeed operate a MaaS application that allows consumers to plan and book multi-modal trips, combining different mobility services of both the parties and other firms. According to the ACM, a risk existed that the parties would foreclose access to their mobility services (which included train and bike-sharing services) by competing MaaS apps providers or offer them their transport services at higher prices or under conditions that are more unfavourable than those of their own joint venture. Therefore, the clearance was subject to the condition that NS offers access to its transport services to the new JV's competitors under the same terms and conditions, allowing them to create similar MaaS applications in the future. This condition would only become enforceable once the JV's application integrates these services itself.

Source: European Commission's decision in Case M.9545 – NS GROEP/PON NETHERLANDS/JV; ACM's decision ACM/20/038614 / Document Nr. ACM/UIT/534638, https://www.acm.nl/sites/default/files/documents/2020-08/concentratiebesluit-pon-en-ns-mogen-onder-voorwaarden-een-nieuwe-onderneming-starten.pdf.

Yet, if MaaS providers do not have access to the offer of public transport services or only have access to the most expensive fares offered by public transport operators (e.g. hourly or daily tickets), this may hinder their development and ability to offer attractive services. Eventually, the incentive for public transport operators to engage in negotiations and offer discounted rates to MaaS providers will largely depend on the revenues (more passengers) or cost savings (more efficient sales and distribution) they expect from having an additional sales channel compared to the costs they may have to bear (International Transport Forum, 2021, p. 56[18]). Hence, at off-peak hours, the marginal costs they would bear for having more passengers thanks to the MaaS providers are likely to be very low, creating significant scope to offer discounted rates and increase their revenues. By contrast, because of capacity constraints, offering discounted rates at peak hours may not be profitable (International Transport Forum, 2021, p. 22[22]).

Finally, under a commercial integrator (bottom-up) model or (even more) a delegated MaaS model, the MaaS provider may have an incentive to foreclose potentially competing MaaS platforms or mobility services. This may be the case when the main MaaS provider imposes exclusivity obligations to mobility service providers, thus possibly foreclosing other MaaS platforms. The vertically integrated public transport operator may also have an incentive to discriminate against external mobility services and grant a more favourable treatment to its own mobility services (self-preferencing). This could be the case not only when the MaaS provider blatantly favours its own mobility services but also, for example, when competing mobility services (e.g. bike sharing, free floating scooters) are only treated as "add-ons" to the core public transport service offered by the operator running the MaaS platform. This issue was raised by the EC in its decision to refer to the ACM the assessment of the creation of a JV by Dutch Railways NS and the municipal public-transportation companies in the three largest Dutch cities (Amsterdam (GVB), Rotterdam (RET) and The Hague (HTM)). The EC observed that the MaaS service provider may have an incentive to discriminate or prevent competing mobility service providers from accessing its MaaS platform, especially when it is also active as a mobility provider (e.g. bikes, public transport).[15] As explained in Box 6, upon referral by the EC, the ACM conditionally cleared the establishment of the JV.

Box 6. ACM's conditional clearance of the joint venture between Dutch Railways NS and public transport companies in Amsterdam, Rotterdam, and The Hague

In July 2020, the ACM conditionally cleared the establishment of a joint venture between Dutch Railway NS and public transport companies in the three Dutch cities of Amsterdam (Gemeente Vervoerbedrijf), Rotterdam (Rotterdamse Elektrische Tram), and The Hague (HTM Personenvervoer NV), allowing them to create a platform that aggregates mobility services of different transport market players for users. The case was referred to the ACM by the European Commission, that assessed the transaction in early 2020 and found that there may be risks of market foreclosure due to the position of the parties in the markets for public transport, namely through exclusivity practices.

The ACM granted clearance subject to the condition that the four market players offer other mobility providers as well as other MaaS providers access to the platform under equal conditions. The commitments also included a prohibition to impose exclusivity obligations on market players using their platform, and the obligation to make their traditional transport services (bus, tram, subway, and train) accessible to other MaaS app providers. Finally, to avoid anticompetitive exchanges of information, the ACM required the parties to ensure that undertakings using the platforms, including the four undertakings themselves, do not have access to commercially sensitive information.

Source: European Commission's decision in Case M.9250 – GVB/HTM/NS/RET/JV; ACM's decision ACM/20/039644 / Document Nr. ACM/UIT/537588, https://www.acm.nl/sites/default/files/documents/2020-07/concentratiebesluit-gvb-htm-ns-ret-mogen-samen-onder-voorwaarden-nieuwe-onderneming-starten.pdf.

4. Competition *for* the market: ensuring a competitive bidding process and reducing barriers to entry

As noted in Section 3.1 above, competition for the market is often deemed the most appropriate model for the provision of local *public* transport (OECD, 2013[1]). However, organising a tender is not sufficient to ensure that competition *for* the market brings the same intensity of rivalry and the same results as competition *in* the market.

Already (Williamson, 1976[4]) considered this issue and observed that, even when authorities run tenders, regulations are still needed for the following reasons:

- Once authorities have selected the winning bidder, they need to conclude a contract setting obligations on both sides, including measurements of service delivery and sanctions for non-compliance. However, there are often uncertainties with respect to future local demand and supply conditions, costs, or inflation. Hence, it is difficult to draft comprehensive long-term contracts that take into account all possible uncertainties susceptible of having an impact on service prices. In such circumstances, renegotiations of long-term concessions may be necessary but they may be unsatisfactory for authorities and consumers as they might sweep away the benefits of the initial competitive bidding.
- Concluding long-term contracts with the supplier that offers the lowest per-unit price does not impose any actual commitment upon the latter in the absence of well-defined quality obligations and associated measurements laid down in regulations. Indeed, in the absence of precisely defined quality obligations, concessions based on the lowest price provide concessionaires with an incentive to cut quality to reduce costs or, to put it in more general terms, “accords latitude to franchisees during contract execution” (Williamson, 1976, p. 82[4]). At the same time, determining quality obligations ex ante and ensuring effective monitoring procedures is not an easy task, especially when the above-mentioned uncertainties as well as information asymmetries between firms and authorities are present, for example with regards to actual costs or demand factors.
- Winners of original tenders might have an advantage (e.g. information, equipment, experience, sunk costs, investments already realised) over prospective new bidders at the stage of contract renewal. Hence, whenever the assumption of parity among bidders does not hold (which is likely to be the case at the stage of contract renewal, in the absence of specific regulatory countervailing measures), meaningful competition among bidders after an initial competitive round may not be realistic and therefore the tender would not deliver the advantages expected from competitive bidding.

The following sub-sections consider some of the main factors to take into account in order to ensure intense competition at the tender stage for the provision of local public transport services.

4.1. Assets and human capital as barriers to entry and exit

The ownership of assets (vehicles, depots, maintenance equipment, available drivers) is an important factor to ensure competition at the tender stage. Indeed, requiring bidders to own all the assets needed to provide transport services might raise significant barriers to entry. Yet, policy-makers need to balance the interest of ensuring wide participation in the tender with other objectives, including environmental goals and innovation incentives, which might steer decisions in the opposite direction.

The decision on asset ownership may give rise to obstacles for new potential bidders on two fronts. On the one hand, new bidders, faced with the intrinsic uncertainty on the future award of the tender, may not find it profitable to make significant investments in acquiring assets. On the other hand, once these investments have been made and the contract is awarded, the incumbent owning vehicles and other assets might enjoy a substantial advantage vis-à-vis other bidders at the moment of contract renewals (i.e. after the first round of tenders).

Studies have been conducted on the actual advantage granted to the incumbent by the ownership of specific assets, such as garages for bus parking and storage. (Iossa, Rey and Waterson, 2019[26]) studied the London bus market and found that in 47% of the tenders, the contract is won by the bidder with a garage closest to the route subject to tender, while in 22% of the cases, the winner is the second closest firm. (Yvrande-Billon, 2009[27]) explored the impact that investments in specific physical and human assets have on the renewal of incumbents' contracts in urban public transport. She looked at 191 tenders in France and found that as long as vehicles can be re-deployed in other tenders (subject to minimal changes, e.g. bus colour) and there are clauses for their transfer at the expiry of the concession (which was the case in most of the contracts assessed), ownership of vehicles does not grant any significant advantage to the incumbent.

These apparently contrasting results raise the question of the conditions under which ownership of assets grants the incumbent a competitive advantage. There are several factors to consider:

- *First*, the existence of significant sunk costs and the specificity of the investment made by the bidders, meaning that this is not easily deployable for other tenders, due to the nature of the assets or the tender requirements (non-fungibility of assets). This means that, for example, once a firm has made investments to acquire specific vehicles, it will enjoy a cost advantage over other bidders upon renewal, i.e., after the first round of tenders. While, generally, buses are "assets on wheels", hence they will normally be easily deployable in other tenders if the incumbent or new bidders lose successive tenders, other assets may be more specific and therefore their ownership by the incumbent may constitute a significant advantage. Even with regards to buses, however, tenders may require specific tailor-made assets (e.g. specific environmental standards, specific number of doors), thus reducing the extent to which they can be used in other tenders.[16] Finally, even when specific buy-back clauses to transfer the assets to successor firms are included in the contracts, it may be challenging to negotiate and determine the purchase value of such assets, taking into account obsolescence and maintenance costs, or depreciation. A different but related issue concerns human resources, the transfer of which is regulated by labour laws with regards to several aspects (e.g. wages and conditions upon transfer) and may hence not be possible without incurring significant social and human costs.
- *Second*, the lifespan of the assets, i.e. whether the life of the assets is not exhausted during the contract execution. This largely depends on two factors: (i) the maximum age of vehicles that awarding authorities require as a condition to submit a bid; and (ii) the duration of concessions (see section 4.4 below). Environmental considerations will affect the required lifespan of vehicles, since ensuring that the latter comply with the latest low-emission standards may significantly reduce the extent to which they can be re-deployed in other tenders after the expiry of the contract.

- *Finally*, the absence of a well-functioning secondary market that gives new entrants access to cheap vehicles and equipment is also relevant.

The theoretical thinking on the topic of asset ownership has evolved over time, but the debate is not yet settled (Wong and Hensher, 2018[28]). Still today, two competing models exist for asset ownership: public or private.

In an effort to structure the debate on the competition issues arising from asset ownership, Table 1 provides an overview of these models by reference to the different assets involved in the provision of transport services.

Table 1. Asset ownership models in transport contracts

	PUBLIC OWNERSHIP	PRIVATE OWNERSHIP
BUSES/ROLLING STOCK	Public authority owns buses and rolling stock and leases them to the winning bidder. It can be less expensive for agencies to purchase in bulk.	Private contractor procures its own assets. Duration of concession must enable the contractor to recover costs. A problem arises upon expiry of the contract, with the private contractor facing the risk of not winning a new contract after purchasing its assets.
DEPOTS/GARAGES	The public sector owns the real estate and buildings for storing and maintaining assets and lets a single or multiple contractors use them. This helps reduce barriers to entry in regions with high real estate costs and/or high-density population with land scarcity.	The private contractor secures land and buildings to store and maintain its assets. This limits the ability of new transport companies (different from the incumbent) to enter the market.
MAINTENANCE EQUIPMENT	The public sector owns the tools, parts, and equipment needed to maintain the assets and lets the private contractors use them as part of the contract. This is not strictly dependent on public authority owning the depots.	The private contractor must buy its own equipment. This does increase barriers to entry, but it could also allow the contractor to use more efficient methods of maintaining the vehicles.
INFRASTRUCTURE	The public sector owns the road and rail infrastructure, stations, and other assets. This is by far the most common approach in service contracting, as it would be very difficult to for a contractor to own such infrastructure during a 5- to 10-year agreement.	The private sector would own the infrastructure (or at least be responsible for its maintenance and condition) over a set period of time. There are instances of public-private partnerships when designing and building a new system, but the public sector generally remains the ultimate owner.

Source: Adapted by OECD Secretariat from (ENO Center for Transportation and TransitCenter, 2017[11]).

It is worth noting that this is not necessarily a binary choice, as different hybrid models exist to encourage competition and innovation on the margin (e.g. the public authority only owns some assets, thus operators can provide additional capacity) (Nash and Bray, 2014[29]). However, this schematisation can help simplify the discussion while allowing capturing the main trade-offs that authorities and policy-makers need to consider.

4.1.1. Model with public ownership

Although other considerations may play a role (e.g. environmental goals and the need to renew the bus fleet towards low-emissions vehicles), the choice of public ownership of assets is mostly driven by the desire to lower barriers to entry and increase the number of interested bidders in competitive tenders. For example, the requirement to own depots for vehicles (or build new ones from scratch) in high-density cities where real estate prices are high may significantly favour incumbents or large operators with capital strength and reduce the number of bidders. Similarly, the need to own buses before submitting a bid may reduce the number of interested bidders, which would face a cost-disadvantage vis-à-vis the incumbents.

This explains the impetus for introducing government asset ownership. For example, in light of these considerations, the French Competition Authority, in a recent opinion (issued upon request of Ile-de-France Mobilités (IDFM)),[17] recommended that IDFM (i) purchase and make available to the winning bidder at least one strategic depot per lot subject to tender; and (ii) purchase from incumbents all vehicles at their net carrying value (Autorité de la concurrence, 2020[30]). The *Autorité* extended these considerations also to human resources,[18] whose recruitment and employment can raise barriers to entry. Thus, pursuant to the recent *Loi d'orientation des mobilités*, employees can be automatically transferred from the exiting incumbent to the new operator on the basis of an agreement concluded by employer and worker representatives.[19] As a result, the awarding bidder would not be urged to recruit all the necessary human resources in a short timeframe (i.e., between the award and the launch of the operations).

Since 2016, this is also the new Bus Contracting Model (BCM) adopted in Singapore, where the government owns all buses and bus infrastructure, and bus operators bid to run bus routes at service standards defined by the Land Transport Authority (LTA). One year after the new BCM started, LTA reported the presence of four competing operators, and buses at peak hours 75% less crowded than before (Land Transport Authority, 2018, p. 51[31]).

4.1.2. Model with private ownership

Implementing a system with public ownership of assets requires *ex ante* political decisions, strong institutional capability and a precise definition of the criteria for the purchase of assets (e.g. criteria to determine the purchase value, taking into account obsolescence and maintenance costs, or depreciation accounting procedures). To circumvent these issues, while some commentators propose a hybrid model, in which the public authority only owns some assets while operators can provide additional capacity (Nash and Bray, 2014[29]), others opt for fully private ownership of assets. However, this latter model raises different concerns. In particular, when the concession held by the incumbent expires, authorities may have to deal with the issue of its physical assets and especially human resources.

Implementing a model with private asset ownership requires some countervailing mechanisms. On the one hand, a model with private asset ownership may create incentives for firms to invest, for example in the renewal of their bus fleet, as long as consumers are in a position to evaluate quality, and gaining reputation as an efficient high-quality service provider entails financial benefits. On the other hand, this model requires introducing mechanisms to ensure that asset ownership does not raise barriers to entry by reducing the number of interested bidders or granting an advantage to the incumbents.

A look at the national experience of Chile with private asset ownership shows the challenges raised by this model and the measures adopted to counteract the risks of raising barriers to entry. The city of Santiago has gone through several reforms (Box 7).

Box 7. Santiago (Chile): overview of the historical evolution of bus transport service provision

The city of Santiago has moved from a decentralised planning system with very limited public intervention to regulated and competitively tendered concessions with precise measures to ensure competition among bidders at the tender stage.

In **1979**, Santiago implemented a system with full liberalisation of bus transport services and very limited public intervention. Private firms were responsible for planning the routes, setting the fares and then delivering the services. While this led to an increase of supply and reduced waiting times, concerns remained as to the low occupancy rates, poor bus quality and high levels of congestion.

In **1990**, the reform granted the government a more prominent role at the planning stage. Concessions were granted following open and competitive tenders. The government determined minimum service

frequency, maximum vehicle age as well as a maximum fleet size. Despite competitive tendering, however, on-road competition continued, as the winning bidders were in fact co-operatives that managed their own revenues, thus competing even on the same lines. This yielded uncertainty in waiting and travel times and high accident rates.

A new reform was implemented in **2007**. Its main goal was to replace competition in the market with competition for the market. The Secretariat for Transport Planning within the Ministry of Transport was tasked with determining service structure, fleet and frequencies. However, the tender eventually required the provision of fewer buses than those actually needed, which was justified by the desire to put a truly self-financing system in place (that, despite the attempts, had failed to materialise under the previous system) and put an end to unnecessarily high costs due to overlapping inefficient bus routes. This led to congestion of passengers at stops and long waiting times. Although the reform managed to eliminate on-road competition, it led to huge financial shortfalls (due to minimum and maximum constraints on bid prices as well as fares set at zero for an initial period which then increased subsequent rates of fare evasion), which in turn required public intervention in the form of subsidies (that rose by 69.6% between 2012 and 2018 while covering a relatively stable proportion of the system costs).

Subsequent reforms in **2012** to provide quality and investment incentives did not deliver the results expected. Despite the reforms (e.g. linking contract payments to the number of buses, the number of bus-kilometres travelled and the passenger journeys, and introducing precise performance indexes), deficits continued to increase and the number of passenger trips stagnated.

Santiago seized the opportunity of the expiry of contracts with operators in **2016-2018** to assess these shortcomings and address them in the new call for bids.

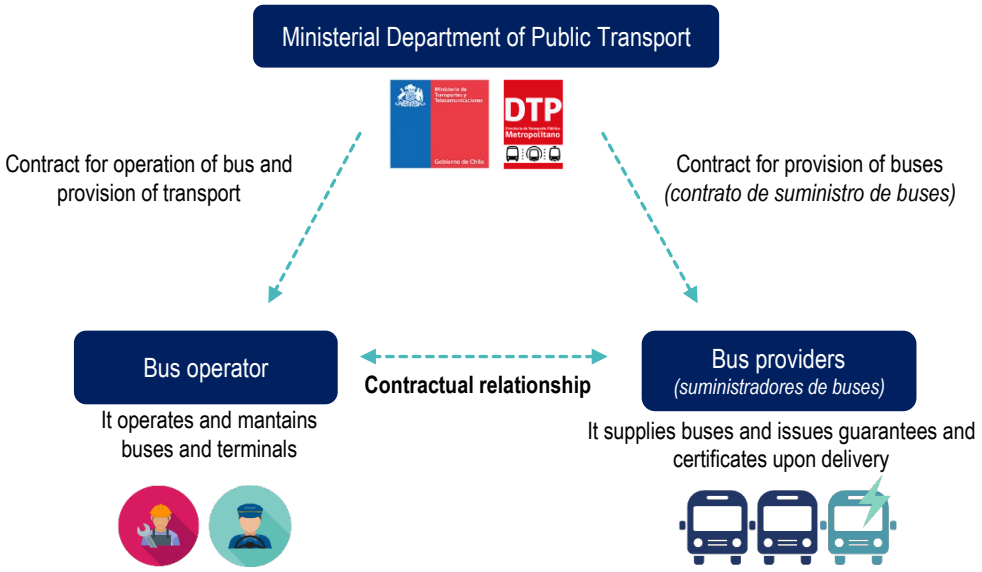
Source: (International Transport Forum, 2020[32])

The success of the new tender process launched in 2021 will largely depend on the intensity of competition at the tender stage. In this regard, the existence of barriers to entry for new bidders, in particular those arising from incumbents' ownership of terminals and the obligation to own vehicles, seemed particularly problematic.[20] Following the cancellation of the first tender, as a result of the lawsuit filed by two prospective bidders, a new bidding process was organised in 2021. Taking into account the two above-mentioned issues, the new tender rules provided:

- Public ownership (or leasing) of depots and garages. Hence, the State would purchase (or, in the absence of sufficient resources, lease on a long-term basis) terminals from current operators and commissioned real estate appraisal studies for this purpose (Hurtubia and Leonhardt, 2021[33]); and
- Separation of operations and ownership of buses, with the establishment of the new figure of private providers of buses ("*suministrador de buses*") distinct from the winning bidder that would eventually provide transport services and run the operations. Thus, the incumbent will keep ownership of the assets but will have the possibility to submit bids in a specific tender to become supplier of vehicles ("*suministrador de buses*") to new operators that will run transport services. Winning bidders will sign a contract ("*contrato de suministro*") with the Ministry for the future supply of buses to new operators. The latter will only be able to procure their vehicles from those specific bus suppliers.[21] This avoids the need for public authorities to purchase the vehicles while at the same time ensuring continuity in bus provision.

Figure 3 graphically shows the structure of the new model in Santiago.

Figure 3. The new model for the provision of bus transport services in Santiago (Chile) (2021)



Source: Chilean Ministry of Transport and Telecommunications, Department of public metropolitan transport, https://www.dtpm.cl/descargas/licitacion21/Contenido%20Esencial%20de%20Vias%202021.pdf

While it is too early to draw conclusions on the success of this model, there is undoubtedly an attempt to address the above-mentioned shortcomings of a model with competitive tendering when an incumbent operator is present. This new set-up shows several advantages:

- It circumvents the need for difficult political and economic decisions *ex ante* under the public ownership model. Yet, it keeps certain advantages of the latter, for example, by enabling flexible adjustments of the number of buses, depending on the operators' needs;
- It guarantees parity among bidders and avoids the issue of incumbents' comparative advantages stemming from the ownership of vehicles. In particular, it avoids the problems raised by the transfer of ownership of the incumbent's assets, whose estimate poses challenges due to information asymmetries between the incumbent and the private acquirer and/or public authority;
- It ensures continuity in bus service provision when there is an incumbent operator (i.e. after the first round of tenders). The vehicles of the existing operator will indeed continue to run with the new bus service provider, if the incumbent manages to win the tender as a "*suministrador de buses*" and thus can transfer the use of its vehicle to the new bus operator.

4.2. Size of the lots

The determination of the optimal size of the lots subject to tender can significantly influence the intensity of competition. Different factors come into consideration when public authorities must determine whether a tender will encompass the whole urban network or only sub-sets of it, determined by reference to a specific sub-area or specific routes.

On the one hand, when providing transport services for large lots, operators can arguably benefit from economies of scale. For example, purchasing a bigger number of vehicles may lead to lower prices per unit, or operators may decide to use a depot or maintenance equipment for more buses, thus reducing their average unitary costs. In addition, defining large lots and thus limiting the number of concessions to

manage and supervise facilitates the tasks of the authorities, leading to lower transaction costs. Operators may also bear lower co-ordination costs, for example, when they need to set an integrated fare system or agree on correspondences and time schedules. Finally, despite the often-observed public transport operators' purely local or regional vocation (AGCM, 2016, p. 16[6]), tendering large network areas (e.g. encompassing multiple small municipalities) may increase the value of the concession and enhance the participation to the bidding process (e.g. by foreign operators) while allowing operators to achieve an efficien scale to provide better services for users at lower costs.

On the other hand, for large metropolitan areas, having an urban network split across several contracts may increase the number of bidders (especially smaller firms) at the tender stage. It may also avoid favouring incumbents that control the necessary physical and human resources and have the financial strength to provide services on larger areas. This applies in both the short- and the long-term, given that the presence of more operators in the present may translate into wider participation in future tenders, thanks to the acquired expertise and assets availability by a larger number of firms. Furthermore, the presence of several operators in different sub-areas of the network may increase the room for yardstick competition, enabling supervising authorities to compare costs and efficiency across operators and, possibly, impose penalties on those that do not meet certain quality thresholds. The presence of more contractors would also increase the credibility of the threat to replace an operator with another in case of breach of contracts (which is often included as a contractual clause), thus working as a further incentive to invest in quality and customer satisfaction.

It is clear from the above that, among the diverse considerations that awarding authorities must consider when determining the optimal size of the lots subject to tender, economies of scale play a particularly crucial role. While urban public transport operators often call for increasing the size of the lots in order to benefit from alleged efficiency gains (Autorité de la concurrence, 2020, p. 19[30]), the advantages of economies of scale arising from tendering larger lots does not find unanimous confirmation in economic studies. Indeed, a review of the economic literature shows a significant agreement on the existence of economies of scale in small and medium-sized cities, whereas it reaches less clear conclusions on their presence on the long run in larger metropolitan areas.

(Boitani, Nicolini and Scarpa, 2013[34]) conducted a study on 77 public transport firms operating in 15 large cities in nine different European countries.[22] With regards to firms only active in ground transportation,[23] they found decreasing returns to scale. These conclusions hold true also when considering the larger sample of firms providing both underground and ground transportation services. Subsequent studies conducted in specific countries have also confirmed these findings. In Italy, (Avenali et al., 2014[35]) carried out an empirical study focussing on 45 operators active in 13 Italian regions, providing public transport services, either at the urban level only or together with (or exclusively for) extra-urban areas. The econometric model used takes into account specific environmental variables that affect the costs of provision of public transport services, namely (i) traffic congestion (measured in terms of average commercial speed, i.e. number of km driven/total amount of service hours) that affects drivers' productivity and unit costs; and (ii) users' density in relation to kilometres served. They find that the cost function has a U shape, thus first decreasing and then increasing in relation to the increase in kilometres served. Hence, their study shows the presence of economies of scale up to a specific threshold (that they estimate at four million kilometres, i.e., less than the service level in a neighbourhood of Milan or Naples), while the further increase in the area served by one operator leads to diseconomies of scale. More broadly, their findings confirm that economies of scale are not particularly significant and change into diseconomies of scale at relatively low thresholds (Boitani and Ramella, 2017, p. 43[36]). According to (Fraquelli, Piacenza and Abrate, 2001[37]), a partial explanation can be found in the higher costs linked to the management of larger structures, which steadily increase when passing from a medium to a large-size firm, and the fact that large operators are often tasked by public authorities with delegated planning, control and co-ordination functions.

By contrast, other studies conclude that economies of scale exist for both small-medium operators as well as large firms serving extended networks. (Cambini et al., 2007[38]) conducted a study on 33 local public transport operators, including firms of different size, observed over seven years. As the above-mentioned research, they took into account certain context-related variables that significantly influence operators' productivity (i.e. traffic congestion and users' density) and found evidence of economies of scale and declining unit average costs (in particular for labour) also for operators running large networks. The authors conclude that authorities should tender large transport networks, corresponding to the whole urban network in large metropolitan areas or the urban and extra-urban network in smaller cities, in order to benefit from average production unit costs savings. The study, however, warns authorities about giving too much weight to economies of scale in the definition of lots' size, since the success of tenders in reducing costs also depends on other factors, in particular bidders' wide participation and parity treatment between incumbents and new potential operators, which are both negatively affected by the increase in size of the lots subject to tender.

The lack of conclusive findings in the economic literature may explain the diversity of national experiences when it comes to the definition of the optimal size of concessions. Table 2 provides an overview of the models observable across cities.

Table 2. Geographic structure models

	CONTRACTOR'S ROLE	AUTHORITY'S ROLE	RISK IMPLICATIONS
AREA CONTRACT	Plans service within specific area	Approves contractor's plans	Operator has more route control and bears higher risk
ROUTE CONTRACT	Operates service on routes planned by authority	Plans routes and defines service levels thereof	Depending on the payment structure model, contractor or authority bear more risks.
PRIVATE OPERATOR OVER URBAN AREA	Similar to area contract extended to all urban area, operator plans overall network service	Approves contractor's plans	Operators has more control and bears higher risk

Source: Adapted from TransitCenter and ENO Center for Transportation, *A Bid for Better Transit – Improving service with contracted operations* (2017); and World Bank and Public Private Infrastructure Advisory Facility, Urban Bus Toolkit: Tools and options for reforming urban bus systems, 2011, <https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/UrbanBusToolkit/assets/home.html>

The experience in London is significant in this regard. The city bus network is unbundled and its 675 bus routes are tendered separately. While operators can submit bids on any number of routes or route packages, they are mostly required to express bids at single route level. Approximately one-sixth of the routes are tendered every year and this has resulted in enhanced pressure on bid prices while giving operators that have lost a tender the opportunity to re-enter the market in the short term (Currie and Fournier, 2021[39]). This model was discussed in depth at the OECD WP2 Roundtable in 2013 and more details can be found in the summary of discussion and the United Kingdom's submission.[24]

The city of Stockholm adopted a very different model, splitting the network in sub-areas, so that winning private bidders would be responsible for planning and delivering transport services in a specific area rather than bidding on routes pre-defined by the public authority (ENO Center for Transportation and TransitCenter, 2017[11]).

Lying in the middle between the two previous models, the city of Paris recently changed the way it tenders out concessions for bus transport. When commenting on the optimal size of lots, the (Autorité de la concurrence, 2020, p. 18[30]) specifically took into account the trade-offs between, on the one hand, the benefits arising from economies of scale and lower co-ordination costs for operators, and, on the other hand, the decline in the intensity of competition as a result of the reduced number of bidders. It supported the reduction in the number of lots from 138 to 39, at an average level that would still be attractive for a majority of operators. The *Autorité* acknowledged that this might potentially reduce the number of bidders,

excluding smaller operators (albeit not completely, as they could still create temporary associations among smaller operator and submit together a single bid) but potentially attracting foreign bigger firms so as to enhance competition for the market, as it has happened in Stockholm with the entry of French and English operators (ENO Center for Transportation and TransitCenter, 2017, pp. 49-50[11]).

4.3. Timing of the tenders

Albeit often neglected, when the network is divided in several lots, the distribution of tenders over time can have a significant impact on the intensity of competition. The process for submitting a bid is resource-intensive and time-consuming, especially for new entrants that suffer from information asymmetries and learning disadvantages compared to the incumbents. When resources (e.g. expertise, staff) are scarce, concentrating several tender procedures within a short timeframe may subject smaller or new potential operators to significant pressure and possibly prevent them from taking part in one or more tenders. By contrast, having several contracts tendered out every year in a staggered manner can facilitate participation and, on the long-run, it may be a way to ensure continuous competitive pressure. Indeed, operators that have lost a tender may re-enter the market within a short timeframe, rather than exiting the market and thus reducing the number of potential bidders in successive tenders (Currie and Fournier, 2021, p. 14[39]).

Empirical studies by (Vigren, 2017[40]) confirm that the number of simultaneous tenders is one of the factors that affects the most the number of bidders. The author conducted a study on 72 tenders and 268 active public bus transport contracts in Sweden. He found a difference of 1.8 bidders between the two extreme scenarios analysed (one with two and one with 15 simultaneous tenders), which is significant when considering that on average 3.4 operators placed a bid for public bus transport tenders over the same period.

Despite the importance of this aspect for competitive tendering, as noted by (Iossa, Rey and Waterson, 2019[26]), the relative merits of staggered and synchronous tenders have not been sufficiently explored in the economic literature. In one of the few available recent studies, (Iossa, Rey and Waterson, 2019[26]) study a model with two markets put up for tender and find that staggered tenders are not always the best solution to enhance competition, given that the optimal distribution of tenders over time depends on specific factors, such as the initial market structure, the tendering regime or the level of sunk costs. They find that synchronous tenders are preferable when monopolisation is expected, since they enhance the pressure that potential new entrants exercise on the incumbent. The prospect of winning both tenders and immediately replacing the incumbent (rather than waiting for the second tender to take place) results in more aggressive bidding. By contrast, when several firms remain active on the market, their study shows that it is preferable to maximise the competitive pressure exercised by each of them over the others by running staggered tenders.

While ascertaining whether a market moves towards monopolisation can be difficult, intuitively the number and size of concessions as well as the importance of the incumbent's advantages play a role.

National experiences in this regards are interesting. One of the major features of the London bus contracting model is the significant number of contracts tendered out yearly, with tenders every 2-4 weeks on a rotating basis and 90-120 routes contracted every year.

In France, following the redefinition of the size of concessions, the (Autorité de la concurrence, 2020[30]) also recommended staggering the award of contracts over time, with waves of no more than four contracts awarded simultaneously. The *Autorité* highlights that the timing of tenders can itself raise barriers to entry, given the scarcity of human assets specialised in the organisation of large transport network. Interestingly, with a view to supporting wide participation, the (Autorité de la concurrence, 2020[30]) also recommends facilitating predictability of tenders, by making available a provisional calendar over a period of six months.

4.4. Determining the right duration of concessions

Determining the right duration of public transport contracts is crucial to ensure competitive bidding processes and high-quality service delivery.

On the one hand, when sunk costs and costs associated with submitting a bid are low, short-term contracts ensure a higher frequency of competitive tendering and are more likely to bring results similar to competition *in* the market (Heimler, 2007[41]). Furthermore, short-term contracts mitigate the risks of incomplete contracts. Indeed, uncertainties as to future local demand and supply conditions, costs, inflation or technology exist in local public transport markets and make it difficult to draft comprehensive contracts that take into account all possible future contingencies. In this regard, short-term contracts have the advantage of facilitating adaptive and sequential decision-making, thus reducing the pressure on authorities to pre-determine all possible contingencies over a long period of time and reducing the risks and consequences of incompleteness.

On the other hand, when sunk costs are significant, longer-term contracts may increase firms' incentives to submit a bid and then invest in quality throughout the duration of the contract. On the latter aspect, however, caution is warranted. Even with long-term contracts, if sunk costs exist, incentives to invest may be high at the beginning of the contract, but they decrease towards the end of it. While some investments in improving quality can be recouped as new entrants may pay them back, others (e.g. non-capital investments, such as staff training) will be harder to recoup in the remaining short timeframe. As explained below, national experiences provide interesting insights on ways to counter declining incentives to invest as the end of the contract approaches.

A study by (Iossa, Rey and Waterson, 2019[26]) investigated whether price increases are somehow related to contract length. While the authors found a correlation between contract duration and price increases, which were the lowest in relation to 7-year contracts compared to shorter contracts, they concluded that the observed differences were not sufficiently significant. A reason for this correlation may lie in the impact that the duration of contracts has on the advantages of incumbents vis-à-vis new entrants. More specifically, in a model with private ownership of assets (in particular buses), aligning the duration of contracts to the average vehicle life ensures symmetry between new entrants and incumbents, as they will both need to purchase the necessary assets when submitting a bid.

When looking at real-life examples, all these considerations played a crucial role in the reform of the duration of bus concessions in Stockholm (ENO Center for Transportation and TransitCenter, 2017, p. 51[11]). Initially, bus contracts had a three-year duration, with options of two one-year extensions in order to allow the agency to gain experience with competitive tendering and contracting with private companies. However, such short-term contracts attracted little interest from private firms, in light of the significant costs involved in submitting bids, coupled with the need to purchase vehicles. A subsequent reform extended bus contract length to the current eight-year duration, with a possible four-year extension if the operator meets certain performance targets. This duration was determined by reference to the typical vehicle life of buses in Stockholm, while still allowing the authority to be able to update incentives and adjust to changing factors over time.

As mentioned, in addition to ensuring sufficiently wide participation at the tender stage, authorities have also leveraged contract duration as a tool to provide incentives to operators to invest in quality, especially towards the end of their contract. For example, London provides for two-year extensions of concessions based on the authority's evaluation of agreed performance metrics (ENO Center for Transportation and TransitCenter, 2017[11]). When looking at the effects produced in London, (Currie and Fournier, 2021, p. 14[39]) found that this has been a powerful incentive for bus operators, about half of which have managed to achieve the targets to obtain a two-year extension of their 5-year contracts.

Authorities have also other tools at their disposal to provide incentives to invest in quality services. Box 8 below provides an analysis of how authorities may use the allocation of risks and the choice between

gross-cost or net-cost contracts as an additional tool to provide incentives for operators to compete and ensure quality of transport services.[25]

Box 8. The choice of the contracting model for the provision of high-quality local public transport

When regulators choose to provide transport services through competitive tendering (see section 3.1), they must determine how best to ensure that selected operators deliver the desired level of service quality. A key choice in this respect concerns the allocation of product (cost) and revenue risks at the stage of contract design. Authorities (possibly with operators) need to determine who will bear the financial consequences of a decline in the number of customers, a reduction in revenues or changes in the price of fuel or other inputs. The allocation of risks (e.g. with regards to a decrease in demand) indeed may have a significant impact on firms' incentives to invest and provide good quality services (e.g. to attract new passengers, increase quality or reduce their costs).

In this regard, based on national experiences and the economic literature, it is possible to identify two main models, namely, gross cost and net cost contracts. Table 3 provides an overview of these models and their respective trade-off.

Table 3. Payment and risk models

	CONTRACTOR'S ROLE	AUTHORITY'S ROLE	RISK IMPLICATIONS
NET-COST	Plans and operates service; retains all revenue	Oversees contract and pays fixed subsidy; pays a subsidy if the service is unprofitable (low-density areas, additional services at peak hours). More limited role in service amendment as they have financial consequences on revenues and contract balance.	Revenue and operating cost (maintenance, fuel price, traffic-related costs) risks lie with operator.
GROSS-COST	Operates the service for a fixed fee and/or variable fee depending on service provided. Limited role in bus circulation planning.	Oversees contract and plans the service; pays a sum to the contractor for the service; receives all revenues (fares and others)	Revenue risk lies with authority. Operator only bears risk associated with operating costs but has no incentives to control that users purchase their tickets.

Source: Adapted from TransitCenter and ENO Center for Transportation, A Bid for Better Transit – Improving service with contracted operations (2017); World Bank and Public Private Infrastructure Advisory Facility, Urban Bus Toolkit: Tools and options for reforming urban bus systems, 2011, https://ppiaf.org/sites/ppiaf.org/files/documents/toolkits/UrbanBusToolkit/assets/home.html; and Vand de Velde, D.M., W.W. Veeneman and L. Lutje Schipholt, Competitive tendering in The Netherlands: Central planning vs. functional specifications, Transportation Research Part A: Policy and Practice, 2008, vol. 42, p. 1152–1162.

As shown in the table, gross cost contracts reduce the risks borne by the operator and give public authorities a major role in the definition and planning of services. The operator receives a pre-defined compensation for its services calculated in light of its own cost forecasts, while the authority collects all revenues and bears the main risks. While this makes such contracts easier to manage, the public authority must have the human and financial resources as well as the capability and expertise to define transport plans (e.g. routes, areas, service levels) and monitor compliance by operators. Most importantly, unless they include specific performance metrics and penalties attached for non-compliance, purely gross cost contracts provide no incentives to the operator to attract additional customers by means of better quality services, given that this would bring no benefits in terms of higher profits.

This is one of the main arguments to support the use of net cost contracts. Under this model, operators retain cash flows from the collection of fares and bear the revenue and operating risks, for instance

those related to demand. On the one hand, such a risk allocation may reduce the number of bidders at the tender stage, as also shown by empirical studies (Aarhaug et al., 2018[42]). This is because risks such as those related to demand are not entirely under the operator's control and largely depend on exogenous factors (e.g. cities' urban planning policies, environmental policies, traffic congestion). In addition, information asymmetries between new potential entrants and incumbents, for example about revenues and costs, may further reduce participation in tenders. On the other hand, allocating demand risk to the operator creates an incentive to attract additional customers in order to increase revenues. Yet, experiences show that without any specific performance obligations, operators under purely net cost contracts may decide to increase ridership by reducing costs and focussing on captive customers that have no alternative to public transport. In other words, instead of investing in quality services, net cost contracts may create incentives to reduce costs by decreasing quality. This is what happened in London, where the change from gross cost to net cost contracts failed to address service quality issues and created instead incentives for cutting costs and focussing on delivering services to those who had no alternatives to public transport (ENO Center for Transportation and TransitCenter, 2017, p. 36[11]) (Currie and Fournier, 2021[39]).

It is worth noting that reality is in fact more complex and the allocation of risks is not a binary choice between purely gross cost and net cost contracts. This means that operators can bear a greater or smaller share of risk rather than all or nothing. Studies have also shown that a greater share of risk does not necessarily and proportionally translate into stronger incentives and, for example, operators can be more innovative and provide higher quality services when bearing certain but not all risks **Invalid source specified.**.

The experience of public transport reforms in London shows that merely relying on risk allocation may not be sufficient to ensure service quality. Under both gross cost contracts introduced in 1984 and net cost contracts adopted in 1993, service quality did not improve and cost reductions remained operators' primary focus (Currie and Fournier, 2021, p. 12[39]).

Since the turn of the century the issue of performance incentives has become a major focus of experts and transport authorities, who increasingly try to align operators' goals with their own priorities by setting specific service quality indicators (Wong and Hensher, 2018[28]). However, performance incentives need metrics and measurements, and the latter depend again on public authorities' resources, effectiveness and expertise.

Source: OECD Secretariat.

5. Conclusions

While transport is a major contributor to CO_2 emissions, many cities still struggle to find ways to ensure cost-efficient high-quality services that help meet climate change and environmental goals. Recent policy and technological developments have raised challenges and opportunities for the provision of transportation services at the urban level.

The development of technologies, in particular MaaS platforms, has expanded the room for multimodal and inter-modal competition, widening the scope of competition in the market while partially eroding the reasons justifying the preference for competitive tendering. Their use and integration in overall transport policy planning will be particularly important in the aftermath of the Covid-19 pandemic that has changed transport habits, possibly affecting transportation patterns and congestion of public transport at peak hours. Different models have emerged for the provision of MaaS services, with a more or less strong involvement of public transport authorities and incumbent public transport operators. Given the nascent nature of this market, competition authorities need to be particularly careful to avoid that market entry regulations and anticompetitive practices (especially by incumbents) hamper their development and stifle innovation. In this regard, access to different types of data (static, dynamic and historical) in a machine-readable and interoperable form is essential to ensure competition. This has already prompted certain jurisdictions to introduce regulatory obligations to set up national databases or repositories to facilitate the exchange and re-use of data, thus enabling the provision of multimodal transport information and services.

With regards to urban public transport services, past OECD discussions have showed that competition *for* the market is often the most appropriate model for the provision of local public transport (OECD, 2013[1]). However, organising tenders is not sufficient to ensure that competition for the market brings the same intensity of rivalry and the same results as competition in the market. Regulators and public transport authorities need to ensure sufficient competition at the tender stage, by reducing barriers to entry arising from asset ownership, definition of the lots subject to tenders or the duration of concessions. Barriers to entry may be particularly significant when there is already an incumbent public transport operator, prompting the need for stronger intervention.

Endnotes

[1] The United Nations' Agenda 2030 emphasises the importance of transport for several Sustainable Development Goals, contributing directly to five targets (e.g. energy efficiency or urban access) and indirectly to seven other targets (e.g. sustainable cities and climate change mitigation).

[2] The Dublin Transport Authority Act 2008 and the Transport Regulation Act 2009 established the National Transport Authority as the statutory regulator for public passenger land transport services including bus, rail and taxi.

[3] In Italy, the Transport Regulation Authority has the role amongst others to develop model tenders for local transport and identify minimum conditions for public transport services.

[4] For a detailed discussion on MaaS, see Section 3. below.

[5] The continuous relevance of this model in framing and comparing reforms was recently confirmed by (Wong and Hensher, 2018[43]).

[6] Section 113E(7) of the Bus Services Act 2017.

[7] https://ruter.no/globalassets/kollektivanbud/moter/2016-01-14-supplier-conference-regarding-passenger-counting-solutions/invitation-to-supplier-conference---passenger-counting.pdf

[8] Letter from the CMA to local transport authorities on bus partnerships arrangements (29 February 2016).

[9] For example, in 1979, Santiago (Chile) implemented a system with full liberalisation of bus transport services and limited public intervention. It is only with subsequent reforms in 1990 and 2007 that on-road competition was replaced with competition *for* the market (for further details, see Box 7 below). Japan also had a model with on-road competition and an authorisation system in place (OECD, 2013[1]).

[10] However, the authors note that this might be due to the scope of the study, limited to urban transport where service frequencies in general are likely to be high.

[11] Boston Consulting Group, *How COVID-19 Will Shape Urban Mobility* (2020), https://www.bcg.com/it-it/publications/2020/how-covid-19-will-shape-urban-mobility.

[12] There are different levels of integration of mobility services into the MaaS platform. They span from a minimum level (in which the platform only provides information on multimodal transport) to a maximum level (in which the platform allows passengers to purchase tickets or a subscription and also takes into account broader societal objectives when showing passengers the best multimodal transport solution) (CEREMA, 2019[20]) (Sochor et al., 2018[19]).

[13] European Commission's delegated regulation No. 2017/1926 of 31 May 2017 supplementing Directive 2010/40/EU of the European Parliament and of the Council with regard to the provision of EU-wide multimodal travel information services.

[14] See 2018 Finnish Transport Services Act.

[15] European Commission, Case M.9545 *NS GROEP/PON NETHERLANDS*/JV of 15 January 2020, recital 82.

[16] This has been a recurrent criticism by operators in London, complaining that buses are over-specified and operators losing a tender in London cannot easily deploy them elsewhere. For example, London buses have two doors (one for entry and one for exit) which is not usual outside London (Iossa, Rey and Waterson, 2019[26]). More generally, the specificity of assets must be assessed not only in relation to the nature of the asset, but under different dimensions (e.g. location, temporal dimension) **Invalid source specified.**. These authors provide a concise structured overview of the dimensions of asset specificity in bus operations. These are the following: (i) physical asset specificity (i.e. investments in physical assets tailored to a specific transaction and with few alternative uses due to their design); (ii) site specificity (e.g. the location of depots and garages based on the definition of the lots); (iii) human asset specificity, (iv) dedicated asset specificity (e.g. investments in assets of general purpose but made for a particular tender that result in over-capacity in case of withdrawal of the buyer); (v) brand capital specificity (e.g. reputational investment or advertising expenditure); and (vi) temporal specificity.

[17] IDFM is the authority responsible for organising, coordinating and financing public transport in Ile-de-France.

[18] As long as they are specifically affected to the bus operations by more than 50% of their time.

[19] In the absence of such agreements, the provisions of the Labour Code will apply. They provide that the transfer of personnel is automatic when it concerns an incumbent's autonomous economic entity, i.e. an entity with its own specifically dedicated and organised personnel.

[20] As noted by the Department of Public Transport (DPT), the ownership of terminals provided incumbents with a significant competitive advantage in future tenders. A similar issue arose with regards to the ownership of vehicles, since, under previous schemes, operators were required to procure their own buses, which implied a need to have strong capital backing (International Transport Forum, 2020, p. 41[32]).

[21] It is interesting to note that the system also provides for specific mechanisms to prevent the creation of market power in the hands of the identified bus suppliers. To this aim, the Ministry maintains the possibility to call new bids for the supply of buses.

[22] Large cities are defined as those which either have more than 300 000 inhabitants or which are part of a metropolitan area with more than 1 million inhabitants. The analysis focuses on cities in EU15 countries, considering that East European countries are still in a transition phase and this would reduce comparability of data and findings.

[23] This sub-sample of firms excludes those providing underground (metro) transportation services or both ground and underground services.

[24] https://www.oecd.org/daf/competition/ContractAllocationforLocalTransportation.pdf.

[25] In essence, under a gross-cost contract, the authority pays the operator a specified sum to provide a specified service for a defined period, while all revenue collected go to the authority. Under a net-cost contract, the operator provides a specified service for a specified period but retains all revenue and thus also certain demand-related risks.

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