Financing safe, affordable, and **sustainable metropolitan transport**

Main findings of the Metropolis **City Managers** Community 2022

metropolis

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About the City Managers' Community

Written by
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The Metropolis City Managers' Community is an annual initiative funded by the Metropolitan Area of Barcelona, convening a distinguished group of senior public managers (C-level) responsible for overseeing the day-to-day operations of major cities and metropolitan areas. This exclusive community serves as a unique platform for peer-to-peer engagement, enabling participants to exchange best practices, identifying common challenges, and devise collective solutions in a secure environment.

Since 2016, these gatherings have been hosted in Barcelona, with each year focusing on a specific thematic such as Public Finances, Digitalisation, Green Infrastructure, and 5G Development. The events combine expert discussions, interactive workshops, and insightful on-site visits, ensuring a well-rounded experience.

The Metropolis City Managers' Community delivers numerous benefits for Metropolis, its member participants and the Metropolitan Area of Barcelona. It fosters a space for thought leaders to tackle cutting-edge issues and cultivates a strong community of practice. As the coordinating entity, Metropolis, actively encourages member participation and prioritizes topics of relevance to both the Metropolitan Area of Barcelona and community members.

Methodology and road map of the City Managers' Community 2022

In 2022, the 7th edition of the City Managers' Community focused on financing safe, affordable, and sustainable metropolitan transport. This report presents a comprehensive overview of the background, key findings, methodology, roadmap, and answers to guiding questions collected from members. It, furthermore, includes the outcomes of the final in-person workshop. The report aims to share knowledge and expertise gained during the 2022 edition, offering practices, recommendations, and potential solutions for metropolitan governments to address this critical topic.

Acknowledging the significant impact of the COVID-19 pandemic on global mobility, the Metropolitan Area of Barcelona and Metropolis directed this edition of the City Managers' Community towards the pressing issue of financing sustainable transportation. The community included senior representatives from various metropolises such as Aracaju, Barcelona Metropolitan Area, Barcelona City Council, Belo Horizonte, Bogotá, Brussels, Guadalajara, Madrid, Medellín and Aburra Valley (Colombia), Montevideo, Quito, São Paulo, Tehran, Toulouse and Zaragoza, ensuring a diverse and engaged participation in the 2022 City Managers' Community edition

Metropolis City Managers Community 2022
(Credit: Metropolis)

To delve into the multifaceted aspects of mobility, this edition encouraged participants to respond to guiding questions, offering comprehensive insights into their respective metropolises. Through interactive dialogues, members openly shared their experiences, challenges and uncertainties within a safe and supportive environment, facilitating the collaborative development of innovative recommendations and solutions. Consequently, the City Managers' Community generated a collection of invaluable insights and practical strategies/solutions for realizing sustainable transportation objectives.

20 September

Kick-of webinar to set the scene, to present and learn from the state-of-affairs of the Metropolis members, to discuss and delimit the topic further for next activity

14 November

Interactive on-site at the AMB headquarters in Barcelona to share inspiring experiences, in a safe environment of trust, which shall foster the collective elaboration of innovative and creative solutions

14 Novembre

A field visit in the afternoon to facilities of the AMB +

15 - 17 November
Celebration of the Smart City World Expo 2022

Main Guiding Questions

Preparatory webinar (20 September 2022)

➔ What are your current transport systems and which finance model(s) do you apply? Are they affordable for people and self-sustaining for the public administration?

(Written) Homework (October-November):

➔ Which future changes in mobility do you foresee in your metropolitan area? How are these changes likely to affect the budget of your institution?

Final private workshop (14 November 2022) - Two challenges

➔ Dichotomy between the costs for the user (fare-box revenues) and the general taxpayer revenues. What best mix of funding is preferable? (In the context of the changing citizen's demands and revenue streams of public transport)

➔ Challenges of different financing models: what works, what does not, what can be improved? (incl. public-private investment)

Insights from the City Managers' Community 2022

As highlighted by the members of the City Managers' Community 2022, the Covid19 quarantines had a profound impact on public transport ridership, with a significant decline observed. Members expressed shared concerns similar to those discussed by industry analysts, contemplating the shape of the *"new normal"*. Factors such as the normalization of teleworking, environmental considerations, supply chain fragility awareness, and, increasing apprehensions regarding energy source reliability are anticipated to contribute to a sustained decrease in public transport usage compared to pre-2020 levels. The meeting further emphasized that these changes have the potential to not only affect overall travel time but also alter travel modalities and timing. For instance, there has been an upswing in bike usage as a substitute for cars or buses, and the traditional "office hours" travel patterns – early mornings and late afternoon/evening – are diminished due to the widespread adoption of teleworking in certain countries.

Nevertheless, it is improbable that the of time passed since the pandemic will completely diminish these concerns. Some individuals may seek to maintain the flexibility afforded by teleworking, while an increasing number of companies may prioritize hiring individuals based on their specific skillsets rather than their geographical location

An OECD study exploring the implications of increased remote working on place-based policies, considered various scenarios for potential new settlement patterns in the post-COVID era. These scenarios encompassed both structural changes in the movement of highly skilled workers away from city centers and increased attention towards intermediate areas and their transportation systems[1]. Those scenarios, not exclusive, could have a direct impact on metropolitan areas and their transport systems. Additionally, the study identified several factors that could influence these settlement patterns. Rising living costs, particularly in urban areas, including escalating gas prices, along with uncertainties related to long-term purchasing power due to currency devaluations, volatile markets (such as stock index funds), and fluctuations in commodity prices were all cited as potential drivers for investment in more affordable real estate locates outside densely populated urban regions. **Consequently, mobility pattern in major cities and their extended metropolitan areas are currently experiencing notable changes.**

Alexander Heichlinger

The evolving mobility patterns in metropolitan areas can bring about a shift towards a greater prominence of rail transportation for mid- and long-distance travel. Additionally, urban spaces may witness a transformation in mobility requirements, marked by an increased reliance on individual modes of transportation. These changing needs necessitate the development of diverse (green) infrastructures, such as **dedicated bike, and e-scooter lanes** *(e.g. Bogota, Barcelona)*.

Echoing a forecast of the United Nations Economic Commission for Europe (UNECE), which predicts a substantial decline in vehicle demand in the foreseeable future[2], participants of the City Managers' Community 2022 concur that environmental concerns will lead to a reduction in **private car ownership in the upcoming years.** Should this projection materialize and become a prevailing trend, the expansion and availability of car-sharing initiatives in remote and cost-effective areas will pose significant challenges, necessitating community-driven effort to overcome them.

The City Managers' Community 2022 also deliberated on various related issues, including how the implementation of integrated planning and the adoption of integrated travel tickets travel cards for multi-journeys on different public transport services at a unified price – can lead to a reduction of administrative costs and increased sales. Several members of the City Managers' Community 2022, such as Madrid and Medellín, are already pursuing such strategies, showcasing their commitment to efficient and sustainable mobility planning.

1- "Implications of remote working adoption on place based policies: A focus on G7 countries report", OECD, 2021, https://www.oecd.org/regional/PH-Remote-working-G7.pdf

2- "UNECE NEXUS Sustainable Mobility and Smart Connectivity", p 35, United Nations, 2021, https://unece.org/sites/default/files/2021-04/2015779_E_web.pdf

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Metropolitan Area of Barcelona

To facilitate integrated planning, and ensure connectivity across various modes of transportation, policy makers recognize the importance of having personnel situated at the intersections of different transportation systems. This entails sharing information, including user data, and may require the establishment of teams dispersed throughout a city or metropolitan area's pertinent functions (bus services, trains, and road maintenance, and coordination with trucker unions, etc.). Achieving such coordinated calls for cost optimization and revenue maximization, ideally achieved through a metropolitan perspective that can better establish and manage these integrated efforts. This approach aims to create the transportation system, which functions "as a network of connecting services[3]".

Ensuring the financial sustainability of public transport and securing funding in alignment with environmental policies, **including those targeting green energy and net-zero CO2 emissions**, is of utmost importance. To address these challenges, the utilization of Energy Systems Modelling (ESM) becomes instrumental. ESM employs mathematical models to represent energy-related complexities and offers a valuable tool for exploring city and metropolitan transport policies related to alternative energy systems. For instance, the viability of hydrogen fuel cell electric vehicles (FCEV), can be tested out through solution algorithms. ESM aims to show the impact of different policies in relation to future demand projections and environmental targets, they "provides a scientific basis for the prospective evaluation of energy systems based on technical and economic factors across time"[4].

The **green hydrogen buses** exemplify the unwavering commitment by the *Metropolitan Area of Barcelona (AMB)* towards decarbonisation. Aligned with the principles of the Agenda 2030 and the Paris Agreement, AMB metropolitan plan of urban mobility sets forth ambitious objectives, including the target of achieving a composition of 58% electric and hybrid vehicles in its bus fleet by 2024. These buses connect the squares of Francesc Macià and Glòries, traversing the district of Eixample. Within this line, eight of the buses operate using electric propulsion powered by green hydrogen, resulting in public transport that operates with net-zero carbon emissions.

However, incentivizing electric vehicles, including the green hydrogen buses, could present its own set of challenges such as those vehicles increased complexity in repairs compared to than traditional cars, and the potential impact of rising electricity prices on the reliability and affordability of electric vehicles. On the basis of the City Managers' Community 2022 participants' feedback, we can observe a clear trend and message that green infrastructures will slowly and gradually increase; however, **car dominance remains high in the metropolitan areas.**

A clear consensus emerged among participants regarding the **potential negative impact on their social relations, if citizens lose mobility as well as purchasing power.** As a consequence, all cities and metropolises involved confirmed that they froze tariffs during the COVID-19 pandemic, even in cases where tariffs had not been increased for many years *(e.g. Brussels, Guadalajara, Quito).* In addition, mea-

3- "UNECE NEXUS Sustainable Mobility and Smart Connectivity", p 89, United Nations, 2021, https://unece.org/sites/default/files/2021-04/2015779_E_web.pdf

4- Bhattacharyya, S. C., and Timilsina, G. R. (2010). A Review of Energy System Models. Int. *J. Energy Sect. Manage* 4, 494–518. doi:10.1108/17506221011092742

sures such as solidarity tickets or special conditions (discounts) for vulnerable groups of societies have been implemented across all territories to ensure equitable access to mobility *(e.g. Brussels).*

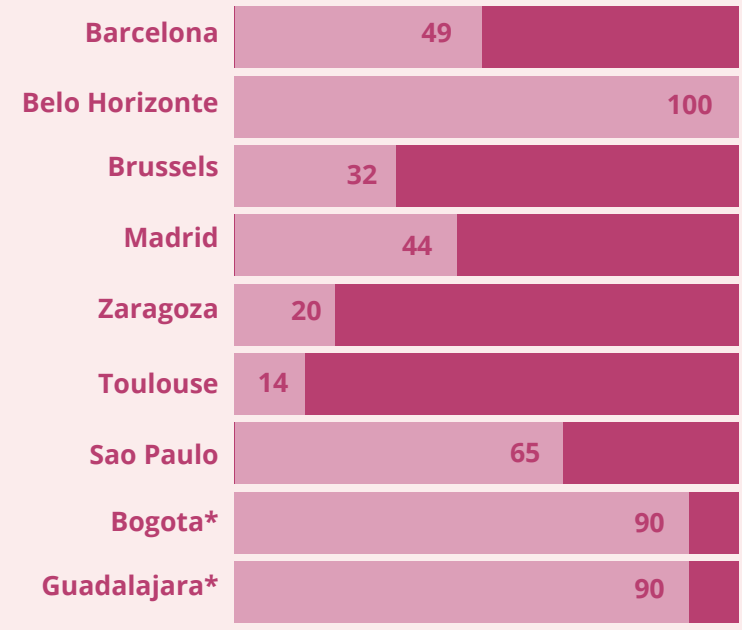
In Europe, several governments *(e.g. Madrid in 2022[5], Barcelona in 2017[6] or Tallinn in 2013[7])* have implemented stringent measures to promote the utilization of public rail transportation, discouraging car usage, foster social coherence and mitigate greenhouse emissions. However, it is important to acknowledge that these initiatives may potentially contribute to deficits and revenue shortages.

Given this observation, the City Managers' Community 2022 reflected on the critical question of how to finance a secure, environmentally friendly, and financially sustainable public transport system in the future. If current and future public transportation systems are to remain attractive, how much should the average taxpayer be expected to subsidize? Should a current full or partial user-payment based model be maintained? Indeed, can it be?

The responses and discussions within the City Managers' Community 2022 revealed a very diverse range of approaches in how the participating members finance their public transport systems and determine the proportion of fare-box revenues. The results varied significantly, showcasing a wide array of practices. However, there was a general consensus among participants that public transport should not be free, as this would potentially diminish its perceived value among users. Consequently, the majority of the financial burden and budget allocation, currently is, and will continue to be, reliant on (significant) subsidies or funding composition stemming from the state, regional and/or international administrations (including e.g. credits), in addition to other formulas with private investment, corporate taxation (e.g. *Toulouse*), borrowings as well as an increasing reliance on advertising revenue.

Repartition of transport financing mechanisms of the CMC-22 members.

In light orange, weight of operating costs paid through passengers' fares (fare-box revenues) (in %)
In dark orange, weight of operating costs paid through subsidies or other mechanisms (state/regional/international subsidies; private investment; corporate taxe) (in %)



Source: Authors, 2022 / * Approximations

5- https://www.lavanguardia.com/local/madrid/20220818/8472213/autobuses-emt-madrid-gratis-1-7-8-septiembre.html
6- https://www.amb.cat/en/web/mobilitat/projectes-oberts/detall/-/projecteobert/t-verda-metropolitana/6395163/11704
7- https://use.metropolis.org/case-studies/free-public-transport-in-tallinn

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Key findings and takeaways

Upon the conclusion of the City Managers' Community 2022, a set of noteworthy statements, proposals and recommendations emerged from the highly interactive dialogues and discussion rounds. These contributions can be categorized into three district areas, **namely financial strategies, digital advancements, and integrated mobility solutions.**

FINANCIAL SOLUTIONS:

➔ Public's willingness to bear costs exists and will persist, contingent upon the progressive nature of fares, considering factors such as age, income, mobility capacity, and social pricing.

➔ There should be emphasis on personalized fare structures, catering to individual needs such as personal, inclusive, family, and tourist fares.

➔ The provision of a better service often holds greater importance and benefits than simply reducing the ticket prices. It is not feasible for the public administration to shoulder the entire burden of public transportation costs.

➔ An overreliance on fare revenues, commonly known as "fare-box", undermines its resilience during crises like the recent pandemic.

➔ Consequently, funding models need to be "flexible enough to scale with demand". A diverse range of funding sources is preferable, including general taxpayer revenues, farebox contributions, specific tax revenues, and costs levied on road users.

➔ To augment financing/funding, it is advisable to explore alternative or additional sources, which may include:

> Higher taxation on motorcycle, as they potentially reduce the number of public transport users and contribute to accidents and pollution.

> Introduction of a traffic tax and road use fee, which is currently in its early stages of discussion, particularly in low emissions zones and congestion charges.

> Charging a fee or taxes for parking lots or public space usage (especially for larger delivery companies) can be explored to generate revenue for public transport.

> A corporation tax (as implemented in Toulouse) or levies on economic activities, particularly for companies with more than 11 employees commuting to/from their workspaces, can be considered.

> Financial instruments that capture land use value associated with public infrastructure projects (as seen in Medellin) can be utilized to capitalize on land price increases.

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DIGITAL SOLUTIONS:

➔ Further digitization of public transport access tokens (such as tickets, cards, QR codes) should be pursued, coupled with the gradual adoption of Account Based Ticketing (ABT) models to replace traditional fare-box tickets.

➔ Leveraging advanced technologies and information systems, it becomes possible to capture and analyse usage metrics of citizens. In this context, big data emerges as a promising solution.

➔ By comprehensively understanding how individuals navigate within a given city through a robust big data platform, policy makers and stakeholders can develop targeted policies and pilot projects that address the diverse needs of commuters. This encompasses the implementation of progressive and tailored fare structures, as well as enhanced integration of various modes of transportation.

INTEGRATED MOBILITY SOLUTIONS:

➔ Further integration and optimization of mobility modes and services should be pursued, adopting a comprehensive approach that encourages individual participation in a range of mobility options and emphasizes intramodality. This approach aims to seamlessly connect public transportation with other services, such as personal mobility vehicles, "Park &Ride" parking lots, car sharing, and taxis, among others.

➔ One notable recommendation is the conversion of public transportation into the employees' company car through a system that settles public transport usage with the employer (to the full extent or covering a high amount). This can be achieved by employing clearing systems combined with post-payment mechanisms, such as Account Based Ticketing (ABT), which can bring about disruptive changes.

➔ The implementation of this practice can be customized to either cover the 'in itinere' usage or extend to the entire city, depending on the private sector's willingness to participate. This approach offers several compelling advantages, including tax benefits for companies and workers, the ability to introduce progressive policies, and the potential extension of labour benefits to the employee's family.

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Acknowledgements

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Metropolis members that engaged in the City Managers Community in 2022:

1. Aracaju
2. Barcelona Metropolitan Area (AMB)
3. Barcelona City Council
4. Belo Horizonte
5. Bogotá
6. Brussels
7. Guadalajara
8. Madrid
9. Medellín
10. Aburra Valley (Colombia)
11. Montevideo
12. Quito
13. São Paulo
14. Tehran
15. Toulouse
16. Zaragoza

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