UMii BRIEF INITIAL FINDINGS
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Today, most cities recognise innovation as one of the main solutions to improve their sustainability and liveability.

However, some of them appear to be more successful in fostering innovation, in particular for urban mobility services, than others.

At the same time, innovation can be perceived as disruptive, bringing more challenges for cities. Digitalisation, Automation, Clean Vehicles are most of the time the words that come to our mind when we think about innovation.

Conversely, innovation means much more than adopting new technologies. Innovative cities implement new types of governance, adapted processes of regulation and different ways to create, plan and collaborate.

Although innovations do not have to be game changers or new worldwide solutions as innovation is contextual, “innovation has increasingly a global character”, which means that benefit of innovation can also be shared and therefore the capacity of innovation to be augmented1.

This brief presents the initial findings of applying UMii - a framework that assesses the maturity of the innovation ecosystem in urban mobility through a collection of indicators that capture multiple features of the innovation value chain - in 30 cities worldwide. Based on those initial findings, some preliminary recommendations have already been drawn and will be further developed in the final report.

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1 Francis Gurry, Director General, WIPO; Global innovation index.
DO CITIES HAVE A CLEAR AND HOLISTIC STRATEGIC VISION AND A PLAN FOR MOBILITY INNOVATION?

Whilst most cities do have an established strategy for urban mobility, research shows these are frequently a statement of ambitions and guiding principles rather than a roadmap set out to address concrete local challenges, informed by comprehensive data.

Developing a mobility strategy is the beginning of an innovation process, as it offers a tangible commitment towards all city users, providing the space for meaningful dialogue with stakeholders in the search for common ground, alongside with achieving shared responsibility for a successful implementation of the strategy.

More advanced cities are already breaking policy silos and adopting multi-disciplinary approaches, but examples of cities going beyond recognising it and effectively looking at urban mobility in the wider context of sustainable urban planning are still sporadic. Accessibility as the ability to reach opportunities is yet an unexplored concept to most cities as strategies are frequently standalone processes with relatively poor stakeholder engagement (particularly from non-traditional mobility areas).

Action plans tend to be a collection of potentially impactful interventions, although it is often difficult to understand how they will contribute to the overarching targets. Most plans lack a sound baseline analysis and quantification of potential benefits of the proposed interventions, as well as a monitoring framework, making it very difficult for cities to track progress of the interventions and to measure change over time.

In the case of cities in earlier stages of development, innovation is fundamentally incremental and frequently not even recognised as such. Cities where the mobility system is deficient have their (often informal) strategies revolve around the provision of core infrastructure such as BRT systems.

Conversely, in the case of cities in advanced stages of development, there is a stronger manifestation of high-technology innovation to improve their urban mobility system, as strategies shift towards a more service-based innovation focus to address the challenges of intelligent mobility.

Barcelona City Hall has a dedicated Mobility Department focusing on the development of urban mobility. The Metropolitan Plan of Urban Mobility outlines the foundations for the future of urban mobility in the region, which is supplemented by a local Urban Mobility Plan developed in an inclusive, transparent process with stakeholders.

The city conducted a very comprehensive baseline that covers supply and demand of the mobility options available in the city (including freight and logistics), followed by thorough plan of action that considers multiple scenarios and magnitude of benefits.
DO CITIES HAVE THE SKILLS REQUIRED TO TEST, DEPLOY AND IMPLEMENT MOBILITY INNOVATION?

In order to work towards a mobility strategy, a city must secure the appropriate institutional and human capacity and the right set of capabilities to create an innovation-friendly environment that invites innovators to experiment in the city.

Most cities refer to their limited internal capacity to address innovation in urban mobility effectively. To cope with the demanding future of cities, and in an effort to build a network of talent they can draw upon, some cities have created autonomous structures dedicated to urban innovation such as innovation labs, and others stakeholder platforms that work together towards a common vision. Less advanced cities have established partnerships or collaboration agreements with universities and industry.

Overall, research reveals the significant skills’ gap and lack of capabilities as one of the key obstacles to address the challenges intelligent mobility impose.

On the other hand, to counterbalance the deficit in city-level competences, cities have been seeking to create welcoming environments to enable experimentation by building an open innovation ecosystem. There are already some examples of cities that have embraced the concept of a living lab, promoting co-creation processes for innovators to experiment new solutions in a real-world context. However, despite engaging the users in innovation processes, this is not yet an embedded approach for most cities.

HOW IS DATA USED TO INFORM AND ENABLE MOBILITY-ENHANCING INNOVATION IN CITIES?

Quantity of data available is increasing and there has been a remarkable progress on the collection of different types of data at city level, from manual collection, to service provider generation and sensor-derived, static and real time.

Research shows most data collected by urban mobility authorities focuses on transport related data, most common being information on ticketing systems, vehicle location (GPS) and cameras (used either for licence plate recognition or for security purposes). There are also some examples of crowdsourcing through mobile applications, as well as some cities that extend data collection beyond transport data to cover areas such as demographics and environment.

One of the key challenges identified lays in ensuring the quality of the data collected as well as the adoption of standardised ways of collecting and sharing the data.

There is little evidence to support cities are exploring the data collected for internal purposes. Data analytics capabilities in city authorities are rather limited and the extent to which data is used to inform city processes is not easily demonstrated.

However, high-performing cities are finding ways to turn this data into smart data for instance by providing open access in structured databases which can be accessed by external stakeholders through APIs. Similarly, cities have been promoting its usage for research purposes by establishing agreements with universities.

But while there are many interesting examples of how cities are collecting data and promoting data-driven innovation by sharing it to third-parties, evidence suggests an interesting paradigm: on one hand, there is an incredible value that remains untapped as cities are still relatively immature in using data to inform decision and policy making in the city. On the other hand, there is a risk of data overflow as considerable investments are being made in the ‘instrumentalisation’ of cities to collect the most diverse type of data when the full potential of its value is still to be established.

Although cases of cities encouraging data usage by communities of innovators are easy to find, there are yet not many concrete examples of the value added by such service in the development of new urban mobility solutions by third-parties.

Singapore’s advanced data collection and data analytics has helped the city to foster innovation by making more informed decisions. The city has developed predictive modelling capabilities to enhance its mobility system. The development of Singapore’s Common Fleet Management system, designed to turn traditional bus timetables into a flexible, real time response system highlights how data can be used in an innovative way.

The city’s open approach to data has also encouraged local industries to develop new solutions and innovations that are being deployed across the city. APIs provide open access to a wide variety of real-time data across the city, which led to the development of multiple innovations by third party developers and even citizens.
In a fast-paced innovation age, cities must have a proactive approach in identifying obstacles to innovation and responding to those challenges so to make space for new solutions to be rolled-out and thrive.

Yet research revealed most cities have a reactive and passive response to regulatory barriers, particularly towards more disruptive innovations as these explore new, unknown, ground which city authorities are not familiar with. Moreover, this type of innovation tends to be undertaken primarily by new entrants with whom they do not have pre established channels of communication.

Given that most regulatory frameworks are designed at national or federal level, cities need to be creative to act within the boundaries of their institutional power. Several cities have been working with central governments, advocating for change at national level (the most common example being Uber and Careem).

Equally, cities have also been creative in adapting their own rigid and bureaucratic processes: challenge or outcomes-based procurement processes have starter to emerge (including procurement of innovation mechanisms such as Pre-Commercial Procurement and Public Procurement of Innovative Solutions), though not commonly known.

Helsinki’s ability to support and foster innovation has been boosted by the Finnish Transport Code which has the potential to accelerate the development of mobility innovation in Helsinki.

The Code aims to remove regulatory and legislative barriers to innovation in urban mobility. By working closely with stakeholders to identify the obstacles, the regulatory environment is changing to support innovation.

Helsinki’s developments towards Mobility as a Service reflects the benefits of this pro-active approach to the removal of barriers and bottlenecks to innovation. The ‘Whim’ app gives users a single point to manage everything from travel planning and routes, to bookings, tickets and payments across multiple modes of transport, all from a mobile phone.

Dubai has embraced a leading by example strategy to leverage investment in innovation. Among other initiatives, RTA has created a ‘Scientific Research Award’ and the ‘Innovation Race’ targeted at its employees to promote a culture of innovation from within the organisation.

Looking at promoting innovation by third-parties, Dubai has also established several initiatives to promote a more innovative community, such as the ‘Dubai Award for Sustainable Transportation’. But Dubai’s vision for innovation goes beyond the cities’ community of innovators: Dubai Future Accelerators aims at fostering innovation beyond the UAE community by providing the space where innovators from across the world can explore new solutions together with local entities, which will then be turned into a on the ground funded project.

HOW DO CITIES APPROACH REGULATION TO INFLUENCE INNOVATION?

Non-financial market barriers to innovation such as regulatory and contractual rigidity or high set-up costs hamper the development of new urban mobility solutions by increasing the burden and costs of innovation, which are particularly weighty on SMEs and start-ups.

WHAT IS THE CITIES’ CAPACITY TO INVEST AND ATTRACT INVESTMENT FOR INNOVATIVE MOBILITY PROJECTS?

R&D investments are crucial to address societal challenges and improve wellbeing. Thus, investment is necessary to boost excellence and support innovation.

High-performing cities have a combination of dedicated funding for internal investment and grants for external stakeholders.

Ring fenced budgets for internal investment are often restricted to capital expenditure (for instance for the expansion of the cycling network, bus fleet renovation or core transport infrastructure), whereas other R&D investments are typically subject to funding on a project by project basis, either going through a local or regional/national approval process or a competitive innovation grant that also promotes collaboration with third-parties.

Budgets allocated to grants are usually channelled to local innovation competitions or used as kick-start money for start-ups. Equally, some cities actively promote external innovation through the creation of innovation awards and other competitions.

Cities’ ability to attract private funding for innovative mobility projects also varies significantly. Establishing close partnerships between the public and private sectors to co-create innovative mobility solutions is a key principle of many cities’ mobility strategies.
User engagement has become an increasingly common practice among city planners, designers and many other professionals to harness the knowledge of communities by opening their processes to the different stakeholders. Governments, businesses, civil society and academia, work together to tackle complex problems in a more effective way - though often a more resource intensive and time consuming one - gathering insights from the concerned parties, besides building trust and gaining support in the solutions proposed.

The lifecycle of user engagement should begin at the development of the city’s strategic mobility plan, engaging in meaningful dialogue with the users of the city to gather insights on their needs and preferences. However, achieving active citizen participation in cities is not yet standard practice as many restrict this engagement to information or consultation processes (usually done with community workshops). Overall, lots of engagement is happening but it is very difficult to assess the quality of the dialogue. Equally, active participation in which planning and decision making responsibilities are shared with the users - for instance by calling for ideas, through collaborative design methods or deliberative campaigns - is still an unusual practice among the cities.

Likewise, feedback on user experience remains often collected through paper-based surveys as cities lack automated systems to capture this type data. Nonetheless, there are some examples of cities using this intelligence to improve local services and drive local innovation, although fewer cases exist in which these insights are fed into the planning process, creating a feedback loop to update the city’s course of action.

Even more advanced cities still have a narrow conception of the user as the passenger or customer of the transport network, instead of looking at the user as any person who benefits from any opportunity the city provides, user or non user of the mobility services available.

Overall, most cities undertake some level of engagement, but there is lack of evidence of embedding user-centred design principles for innovation in urban mobility.

**HOW DO CITIES ENGAGE WITH AND ACT UPON USER INSIGHT AND EXPERIENCE?**

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**HOW DO CITIES ENCOURAGE SEAMLESS AND INTEGRATED MOBILITY?**

In order to develop innovative transport systems the city must take a holistic approach to joining up infrastructure across the city, but seamlessness includes developing both physical and digital connectedness.

Currently, most cities ensure physical integration through integrated, interoperable ticketing systems. Whist it is common for cities to have contactless ticketing systems and intermodal transport facilities, there is no evidence of cities investing in deploying barrier-free systems in the near future.

As for digital integration, transport operators are using their data mainly to improve their operations, but integration of the different mobility solutions offered at the digital level (e.g mobility-as-a-service) is still at a very early stage of trialing or small scale piloting.

Similarly, in most cities wayfinding is a functional tool to ensure users reach their destinations rather than to actively promote an efficient and effective end-to-end journey.
HOW EASY IS FOR USERS TO CHOOSE HEALTHY AND RESPONSIBLE TRAVEL HABITS IN CITIES?

A more liveable city invariably involves increasing the share of walking and cycling.

Most of cities recognise the societal value of healthy modes of transport for urban mobility, but as cities have until now been built around cars, efforts required today to ensure the security of pedestrians and cyclists are considerable.

However, safety along with fairness are both key elements of city users’ wellbeing and happiness.

Albeit in more advanced cities users have at their disposal a relatively wide range of alternative mobility solutions to conventional public transportation such as shared and community based solutions as bike sharing, carsharing, carpooling and pedibus, coverage of such options is quite diverse among cities as well as the quality of the service provided (elements not covered by UMii).

On the other hand, the relatively good performance of some cities on indicators of quality of life and fairness is likely to be a result of the lack of options available to users (in particular in less developed economies), rather than a reflection of an effective and efficient mobility system.

Nonetheless, research showed there is a big gap in data collection, and in particular accessibility and fairness are overall very difficult to assess. Particularly for cities that have an apparently good performance in soundness and engagement, this finding raises the question on whether the data being used to inform the strategy is effectively suffice. Understanding the quality of life of the users is critical.

HOW WELL ARE CITIES PERFORMING AS FOR ENERGY CONSUMPTION AND AIR QUALITY?

Interestingly, although concerns with air quality is a common challenge in most cities regardless of their economic development stage, research suggest there is a disconnection between the strategies cities are implementing to address poor levels of air quality and the assessment of such parameters.

Similarly to the lever, there is a big gap in data collection and integration of indicators around energy consumption and air quality, suggesting cities do not have an integrated, inter-disciplinary, monitoring system that allows them to analyse the causality of the local interventions and their environmental impacts.

There are a number of well-established alternative mobility solutions available to users in Chicago, making it easy to choose healthy and responsible mobility options. Implemented by Chicago Department of Transport, Divvy is a well-integrated and extensive bike sharing system with over 6,000 bikes available across the city. The availability of bikes at docking stations can be viewed in real time, a function that is also available through the Divvy mobile app which also gives users the ability to purchase passes and unlock bikes. Users also have full access to an extensive network of on-demand car sharing and car-pooling services, all of which can be accessed through mobile phone apps.
Whilst there is a contextual dimension that needs to be considered when looking at innovation, evidence points out to the existence of common threads. The richness of the information UMii gathered in the 30 cities enabled identifying not only current practices but also uncovering obstacles to innovation in urban mobility that despite the cross-site differences are largely common in cities across the world.

By exploring key policy features, the index should serve not only as a guide for city leaders to improve innovation in the urban mobility arena but as way to catalyst for more cooperation between city leaders with mobility providers, practitioners and innovators from traditional and non-traditional mobility sectors to working together to make cities better.

UITP, Future Cities Catapult and RTA will promote UMii findings and recommendations amongst its members and will carry on developing knowledge on urban mobility innovation.
We are confident that UMii will provide a better understanding of what innovation for urban mobility means for city leaders and the role cities can play to enhance innovation, and we can already highlight some of the key messages the findings have pointed out:

1. **Share the load.** Bring stakeholders together from both traditional and non-traditional domains to create an ecosystem and embrace co-design approaches. Innovation should be a shared process and you will gain from sharing the ownership of your city strategy with the ones that will benefit from it.

2. **Break the silos.** Look at urban mobility in the wider context of sustainable urban planning as it is not just a transport challenge. A multi-disciplinary approach is key to work towards more liveable cities. Cities must look at combined strategies to improve accessibility to services and facilities, which might not necessarily mean improving mobility.

3. **Embed user-centred innovation and expand your crowd.** Take the user as any person who benefits from any opportunity the city provides and focus on user needs and preferences.

4. **Focus on challenges rather than prescribing solutions.** Innovation comes from very different places and you don’t always have to know the answer to your problems. Enable the community of innovators to help you by creating an open innovation environment.

5. **Recognise the value of data-driven innovation.** There is an incredible value that data can bring to support your decisions and development of new solutions, but don’t fall into the trap of big data. There is a difference between big and rich data.

6. **Build up your community skills.** Establish networks of capabilities you can draw upon you as you can’t do it all by yourself.

7. **Create a more flexible regulatory environment.** It is important for cities to develop a proportionate and well measured response given innovations are quite often hindered by the existing regulatory environments.

8. **Keep track of the progress and evaluate impacts.** Be specific with your targets, monitor and follow-up.

A detailed report including individual city’s innovation profiles will be launched later in the year 2017 as well as a Policy Paper including final recommendations and key enablers for innovation in urban mobility.