Imperatives to shape extended mobility ecosystems of tomorrow

The Future of Urban Mobility 2.0

*Imperatives to shape extended mobility ecosystems of tomorrow*
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The Urban Mobility Index 2.0 was developed by Arthur D. Little; the UITP is independent of this index, which does not necessarily reflect its opinion. Strategic imperatives for cities have been developed together with the UITP.
Mobility has significantly evolved in the past, under the influence of industrial evolutions. Following the first industrial revolution enabled by the invention of steam powered technology, the railway industry emerged. The second industrial revolution with mass production enabled the emergence of the automobile industry and, closer to us, the third industrial revolution with digitalization enabled the emergence of computer-aided travelling (for example GPS in a car). Today we are entering what could be called a fourth industrial revolution, represented by industry and technology convergence, leading to the emergence of for example clean energy vehicles or connected mobility solutions. This evolution is particularly noticeable over past years in network industries (such as telecommunication and media, utilities and the mobility industry) as well as in B2C industries (such as retail and healthcare) where, driven by evolving customer needs and enabled by rapidly evolving technology, business models are continuously evolving.

In this new world, in order to meet the key challenges of today and the future, organizations cannot only rely on optimizing their operations or pushing the next products generation to market. To be successful and meet evolving customer’ needs, they need to adapt to this new changing world by continuously finding ways to reinvent themselves. This successful transformation can only be enabled by system-level collaboration and innovation.

As a global management consultancy, linking strategy, technology and innovation, Arthur D. Little aims to help its clients succeed in this “new world of innovation.” The Future of Urban Mobility (FUM) Lab is our contribution to tackle the urban mobility challenge. With its FUM studies, Arthur D. Little aims to support cities and nations in shaping the extended mobility ecosystems of tomorrow and facilitate an open dialogue between urban mobility stakeholders. Our Mobility Lab initiative has reached a new dimension in 2013, with the signature of an exclusive partnering agreement with the International Association of Public Transport (UITP) for the co-development of future of urban mobility studies; which in our view constitutes the ideal partner due to its global representation amongst mobility actors and the depth of expertise of its practitioners in the field of mobility.

With the release of this second edition of the Future of Urban Mobility study, our aim is to provide mobility decision-makers and stakeholders with reflections and guidance on devising sustainable strategies that are meeting current and future evolving mobility challenges. We hope you will find this report useful and we would be pleased to discuss its conclusions and the implications for your organization.

Sincerely

Ignacio Garcia-Alves    François-Joseph Van Audenhove
Arthur D. Little Global CEO    Partner
The Arthur D. Little study “The Future of Urban Mobility – Towards networked, multimodal cities of 2050” had triggered the interest and attention of UITP when it was released in 2011; and for us it was natural to feature it in the main plenary session of our World Congress last May.

When we were approached by Arthur D. Little to work together on a second edition of the study, the UITP immediately saw a great opportunity to further convey its own messages developed since 2009 in our PTx2 strategy, later labeled “Grow with public transport.”

This strategy for the public transport sector sets out the ambitious aim to double the market share of public transport worldwide by 2025 and pinpoints the key areas where action is urgently needed.

Current trends indicate that more people will choose to use private motorized transport, leading to a staggering 6.2 billion private motorized trips every day in cities of the world. If the world fails to change its mobility habits, the future of our planet looks decidedly bleak. By 2025, worldwide transport-related greenhouse gas emissions will be 30% higher than 2005 levels. Transport energy bills will also skyrocket and higher levels of energy consumption could pose a threat to global energy security. Traffic congestion will bring cities worldwide to a standstill. Most alarmingly, half a million people will be killed in road traffic accidents every year.

Thankfully, more and improved public transport offers a route to a better future. By doubling the market share of public transport worldwide by 2025, cities will be able to boost growth, help fight climate change and create pleasant urban environments where people and businesses can thrive. Doubling the market share of public transport will enable the stabilization of urban transport greenhouse gas emissions and energy consumption despite overall mobility increase. In 2025, 60,000 lives will be saved, as a more balanced mobility mix will lead to fewer urban traffic fatalities. Doubling the market share of public transport would also create seven million green, local jobs.

We took the city ranking proposed by Arthur D. Little as a starting point to perform and refine our analysis of today’s mobility situation in view of tomorrow’s requirements. Cities are clustered around their development stage and are given a series of strategic recommendations to overcome current limitations to achieve the objective of “networked mobility.”

I would like to thank Arthur D. Little for their fruitful cooperation and welcome this joint effort by two prestigious and reputable organizations. I hope that our joint study will inspire and help many decision-makers and readers.

Sincerely

Alain Flausch
UITP Secretary General
1. Executive Summary

Arthur D. Little, the Global Management Consultancy, launched its “Future of Urban Mobility” lab in 2010 and in 2011 released its first global study highlighting the mobility challenges cities face on a worldwide basis. This report introduced the first Arthur D. Little Urban Mobility Index, which assessed the mobility maturity and performance of 66 cities worldwide, and triggered high interest within the mobility industry and in the media on a global scale.

January 2014 sees Arthur D. Little release the second version of the “Future of Urban Mobility” study, including an updated version of the Urban Mobility Index, with an extended scope of 84 cities worldwide as well as an extended set of criteria. The index finds most cities are still badly equipped to cope with the challenges ahead indicating there is still significant potential for improvement.

Arthur D. Little highlights what is holding cities back, and, together with its partner the UITP – the International Association of Public Transport – identifies three strategic directions for cities to better shape the future of urban mobility. The study also describes 25 imperatives to consider when defining sustainable urban mobility policies and case studies of cities demonstrating good practice.
1.1. Arthur D. Little Urban Mobility Index 2.0 – The most comprehensive global urban mobility benchmarking study

Plotting the trend

Urban mobility is one of the toughest challenges that cities face today as existing mobility systems are close to breakdown.

The world’s population is increasingly city-based. 53% of the population currently lives in urban areas and by 2050 this number is expected to reach 67%. Today, 64% of all travel made is within urban environments and the total amount of urban kilometers travelled is expected to triple by 2050. Delivering urban mobility to cope with this increasing demand will thus require massive investment in the future.

In addition to the increasing demand for urban mobility, mobility needs are evolving. Changing travel habits, demand for services to increase convenience, speed and predictability, as well as evolving customer expectations toward individualization and sustainability will require mobility services portfolio extension as well as business model transformation, while specialized players from other sectors are assessing opportunities to play a role in the extended mobility ecosystem.

Moreover, in order to reach UITP’s objective of “doubling the market share of public transport worldwide by 2025” (compared to the 2005 level), public transport stakeholders are working hard to improve attractiveness, capacity and efficiency of mobility systems despite growing limitations of public financing, demonstrating the need for system level innovation.

Methodology

Using 19 criteria Arthur D. Little assessed the mobility maturity and performance of 84 cities worldwide. The mobility score per city ranges from 0 to 100 index points; the maximum of 100 points is defined by the best performance of any city in the sample for each criteria. In addition, Arthur D. Little has reviewed policy initiatives undertaken by cities to improve the performance of urban mobility systems.

Where are we now?

The overall results find most cities are still badly equipped to cope with the challenges ahead. The global average score is 43.9 points, meaning that, on average, the 84 cities achieve less than half of the potential that could be reached today if applying best practices across all operations.

Only 11 cities score above 52 points (the top 20% of the score range). The highest score (58.2 points) went to Hong Kong followed closely by Stockholm (57.4 points) and Amsterdam (57.2 points), still indicating potential for improvement.

There are big differences between the top- and low-end performers in various regions:

- Europe achieves the highest average score of the six world regions surveyed, with an average of 49.8 points (51.5 points for Western Europe and 45.2 for (South)-Eastern Europe) and nine out of the 26 analyzed European cities scoring above 52 points. European urban mobility systems are the most mature ones as of today and lead the way in mobility performance. Stockholm (57.4), Amsterdam (57.2) and Copenhagen (56.4 points) head the table – while Athens (40.0 points), Rome (40.9 points) and Lisbon (41.3) are the worst European cities in the sample.

- Latin American and Asian Pacific cities show slightly below average performance. The continents’ average scores are well below Western Europe (43.9 and 42.8 points respectively) but outperform other regions in public transport-related criteria (financial attractiveness of PT, share of modal split, smart cards). Most cities in Latin America show an average performance of between 40 and 47 points, while Asian Pacific cities show the broadest range in performance, from Hong Kong and Singapore with scores of 58.2 and 55.6 respectively – sitting at the top of the global table – down to Hanoi with 30.9 points.

- USA/Canada shows average performance with 39.5 points. Given their orientation towards cars, USA/Canadian cities rank bottom worldwide in terms of maturity. In terms of performance, they perform above average overall, but show poor results with regard to number of cars per capita and CO2 emissions. New York leads the way with 45.6 points, followed closely by Montreal with 45.4 points.

- Africa and the Middle East are the lowest performing regions with respective average point totals of 37.1 and 34.1. Whilst urban mobility systems in Africa perform well on several criteria due to the lower number of cars, they are still at an evolving stage and haven’t reached sufficient maturity yet. Middle East cities have high levels of cars per capita and are expected to invest in development of environmental modes of transport in the mid-term perspective.

What is holding back change?

A comprehensive review of technologies and urban mobility business models reveals sufficient availability of solutions to address the mobility challenges. In its 2011 study, Arthur D. Little identified three long-term business models archetypes
for mobility suppliers (the “Amazon”, “Apple” and “Dell” of urban mobility). Those business models still hold true today and each have interesting development potential. However, these solutions and archetypes are currently not being applied comprehensively.

There is a clear trend towards shared mobility: in complement to conventional public transport, more cars and bikes are being shared in cities, both via peer-to-peer and business-to-consumer models, but many of those concepts haven’t yet managed to take off as providers are still testing different business models.

Why is the innovation potential not being unleashed? There is a key reason: the management of urban mobility operates in an environment that is too fragmented and hostile to innovation. Our urban management systems do not allow market players to compete and establish business models that bring demand and supply into a natural balance. It is one of the toughest system-level challenges facing actors of the mobility ecosystems. There are plenty of solutions and business models available, but very few have managed to smartly integrate them to unleash their full business potential. What is needed is system-level collaboration between all stakeholders of the mobility ecosystem to come up with innovative and integrated business models.

Moreover, many mature cities do not yet have a clear vision and strategy on how their mobility systems should look in the future. The lack of synergies between isolated initiatives leads to a sub-optimal outcome in terms of mobility performance, which calls for a more holistic approach. At a different level, integration between regional mobility systems still remains very low in comparison to other parts of the economy as transport infrastructures were historically designed to serve regional rather than supra-regional goals. In that context, there is a need for stronger alignment between regional mobility strategies while respecting each others accountabilities and ensuring solutions are adapted to local contexts.

1.2. Strategic imperatives for cities to shape extended mobility systems of tomorrow

Three strategic directions for cities

To meet the urban mobility challenge, cities need to implement one of the following three strategies dependent on their maturity and the share of sustainable transport in their modal split:

- **Rethink the System**: Cities in mature countries with a high proportion of motorized individual transport need to shape political agendas to fundamentally redesign their mobility systems so that they become more orientated towards public transport and sustainability. The majority of cities in the index (53 out of 84) belong to this group.

- **Network the System**: For mature cities with a high share of sustainable transport modes, the next step must be to fully integrate the travel value chain to foster seamless, multimodal mobility while ensuring “one face to the customer” and to increase the overall attractiveness of public transport by service extension. This group contains the majority of cities in Europe as well as Hong Kong, Singapore, Seoul, Tokyo, Toronto and Buenos Aires.

- **Establish Sustainable Core**: For cities in emerging countries with partly underdeveloped mobility systems, the aim must be to establish a sustainable mobility core that can satisfy short term demand at a reasonable cost without replicating mistakes from developed countries. With access to emerging transport infrastructure and technologies, these cities have the opportunity to become the test-bed and breeding ground for tomorrow’s urban mobility systems.

Four dimensions for cities to consider when defining sustainable urban mobility policies

- **Visionary Strategy and Ecosystem**: Establishing sustainable urban mobility policies requires cities to develop a political vision and urban mobility objectives based on strategic alignment between all key public and private stakeholders of the extended mobility ecosystem. This should inform a visionary urban mobility strategy (priorities and investments to achieve mobility objectives), which ensures the right balance between stretch and achievability.

- **Mobility Supply (solutions and lifestyles)**: Responding to increasing demand for urban mobility and to consumer and business needs for seamless, multimodal urban mobility requires cities to extend their public transport offering and adapt it from “delivering transport” to “delivering solutions.” This transformation can be achieved through a combination of quality improvements to the current public transport offering and an increase of customer experience via service offering extension through partnerships and alliances with third parties.

- **Mobility Demand Management**: The limited capacity of current mobility systems and the level of investment required for the development of transport infrastructure means mobility service extension must also be complemented with measures to manage the demand side. Mobility demand management is a delicate discipline which can easily meet strong resistance if not properly planned and executed. However, a number of measures exist and some of these have already derived clear benefits, the relevance of which should be assessed by cities against the local context.
Public Transport Financing: Devising the right funding mix for public transport is a critical priority for cities to ensure its financial viability, particularly given that funding needs are increasing significantly due to growing supply, rising quality expectations and the rising cost of production factors. As fare revenues do not always evolve in line with the costs of production factors and the public debt crisis is increasing pressure on public resources, transport authorities and operators need to assess opportunities to derive additional revenues from aggregation of third party services and to perceive charges from indirect beneficiaries of public transport.

A system-level approach across these four dimensions is critical: sustainable improvements of a city’s mobility performance requires simultaneous improvement on each of the four dimensions as the weakest link will influence overall mobility performance.

In this study Arthur D. Little and the UITP elaborate further on those dimensions and identify 25 imperatives for cities to consider when defining sustainable urban mobility policies. The study also includes case studies of cities demonstrating good practice.