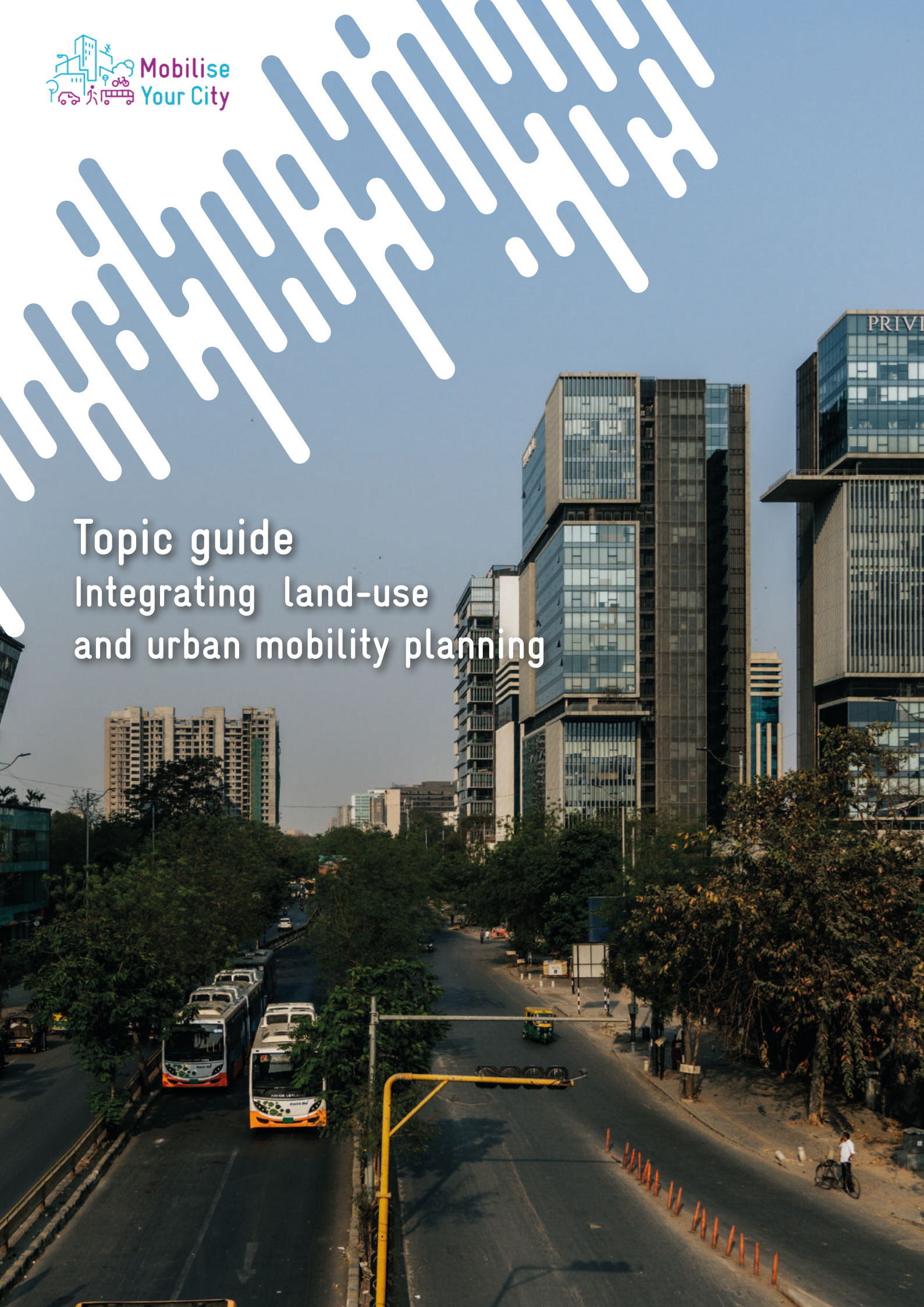
Mobilise Your City

Topic guide

Integrating land-use and urban mobility planning



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Introduction

The MobiliseYourCity Partnership

Launched at COP21 in Paris, the MobiliseYourCity Partnership is a leading global Partnership for sustainable mobility of nearly 100 partners, including 69 member cities and 15 member countries. It is jointly co-financed by the European Commission's Directorate-General for International Partnerships (DG INTPA), the German Federal Ministry for Economic Cooperation and Development (BMZ), the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV), the Agence Française de Développement (AFD), the French Facility for Global Environment (FFEM), and the French Ministry of Ecological Transition (MTE). AFD, GIZ, ADEME, Cerema, CODATU, EBRD, KFW, and Wuppertal Institute implement the Partnership.

With 40.7 million euros to support technical assistance and project preparation in 31 cities and nine countries, the first projects completed in 2019 have mobilised 1.7 billion euros for concrete sustainable mobility projects.

General approach

This topic guide aims to support practitioners (local authorities, mobility experts, consultants, and international development officials) in gaining knowledge regarding the interlinkages between land use and urban mobility planning and understand strategies to integrate both processes, especially when preparing a Sustainable Urban Mobility Plan (SUMP). This topic guide is based on an extensive literature review and the support of practical case studies from African, Asian and Latin American cities. The topic guide provides insights into how land use and urban mobility planning processes interact and complement each other and suggests measures and critical elements to consider for successful coordination between different planning documents. Accordingly, the purpose of this document is not to provide ready-to-use solutions to replicate in every context. Instead, this topic note proposes a methodology of reflection and a set of critical elements to consider when building a coherent, realistic, and locally-based SUMP that integrates land use planning and interventions. The document includes four different sections:

- A section provides a theoretical basis for the interconnection between land use and urban mobility planning, focusing on the Global South.
- A state-of-the-art section outlines current land-use and urban mobility planning integration levels and describes possible tools to integrate the two.
- A third section depicts a complete list of actions for integrating land-use planning processes when preparing and developing a SUMP, detailing tools and instruments to mobilise at various steps of the elaboration of a SUMP.
- The final section focuses on the main conclusions of the topic guide and provides insights into the relevance of SUMPs to influence land use planning and the ideal moment to do so.

Land use and mobility planning interlinkages

Historical land use and mobility planning processes

The link or relation between land use and mobility has sufficiently been studied from various perspectives. There is a clear link, even though it is not as easy to describe as initially imagined. Sole infrastructure might shape urban spaces though no direct cause-effect interpretations are confirmed. While there are distinct phases in the land use/mobility relation, many variables are at play, thus supporting the idea of cities being open complex systems (Miralles-Guasch, 2002).

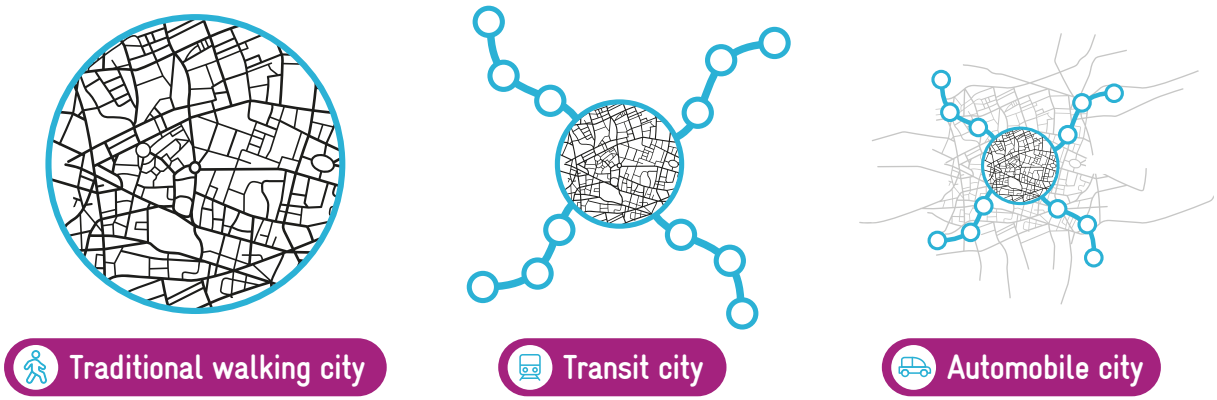

Figure 1. City typology depends on ghd urban form/structure and available transport modes
(Source: Newmann & Kenworthy, 1995)

The links between the different evolutions are undeniable, from the earlier walking cities, through transit cities, to automobile cities (cf. Newmann, 1995). Each relation is the result of overlapping models and demographic and territorial growth. As walking and transit cities provide a relatively straightforward image of the connection, automobile cities show more complex dynamics, with ever-more expanding territories and blurred urban limits. Some territories express singular historical choices and the importance of a specific transport solution during more dynamic periods. Historical decisions substantially impact the current shape and structure of cities, including in terms of energy consumption for transport (see Figure 2 on the next page).

For most cities, strategic planning processes appear in later phases of the relationship when systems are already highly complex.

Historically, many cities have had an urban expansion that followed the construction of roads, with urban planning adapting to the spatial dynamics in progress. In most recent models, cars were then, and still are in many cases, valued as the essential mode of transport. This car-oriented planning led to a continuous spread of economic activities and housing, increasing trip distances and associated pollution. These choices have strongly impacted the environment and cities' sustainability.

To reduce the adverse effects of automobile dependency, planners initially focused on optimising or modifying existing relationships between Density, Diversity and Design (Cervero & Kockelman, 1997), given the reshaping demand. Concretely, the objectives included reducing the quantity of motorised travel, reducing motorised travel distances, and improving places for non-motorised travel. The 3-D concept has emerged as the basis for further analyses of the link between land use and mobility. This concept can be found in others, such as Transit-Oriented Development (TOD) or the 15-minute city (see below).

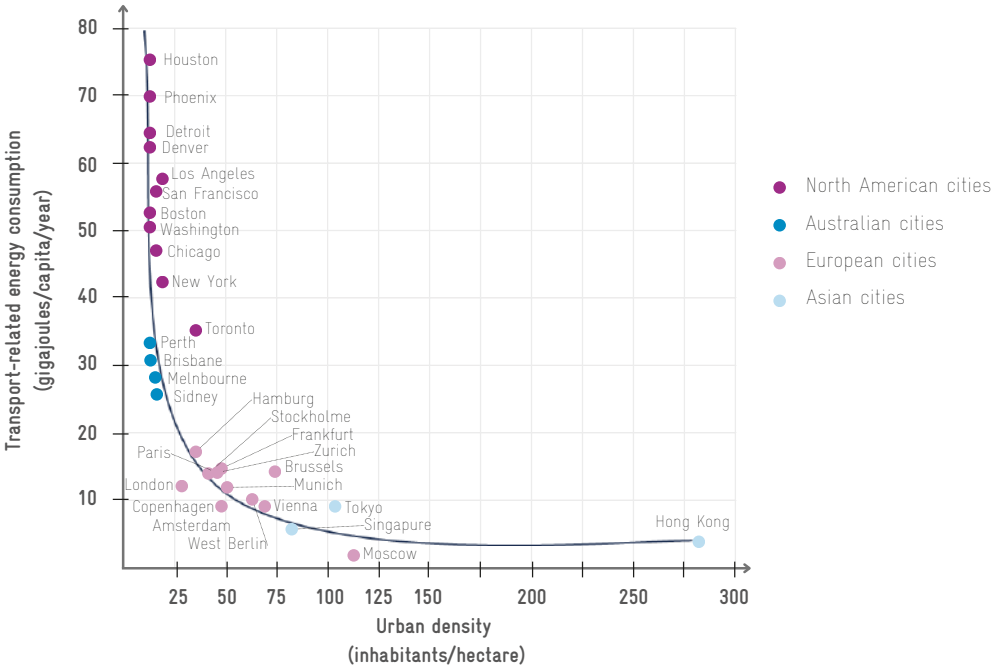

Figure 2. Urban density and transport-related energy consumption

(Source: Newmann & Kenworthy, 1999, in Lefèvre & Mainguy, 2009)

Indeed, as cities grow and their population increases, so does the need to plan mobility. Until recently, the planning process broadly focused on providing relief by building infrastructures and increasing service supply. Depending on the urgency, the planning process and its documents were adapted. Offner (2009) identified three distinct stages in the transport planning / urban planning relation: first, a stage where authorities and planners attempt to answer growing demand by increasing supply, either for individual motorised modes or for public transport modes; a second stage, which focuses on trip planning processes based on modelling efforts; and, a third current stage, where the focus has shifted towards managing demand and optimising existing supply (including services and infrastructures). The move from the second to the third stage also corresponds to the shift from 'transport planning' to 'mobility planning'. In Europe, planning documents from the 1980s often intended to provide answers to the oil crisis by increasing investment in public transport systems.

Similarly, during the 1990s, documents called 'Transport Plans'[1] continued seeking to improve public transport services. Notably, these high-capacity systems included metros, tramways, and BRTs[2]. By the 2000s, environmental issues started to feature in mobility planning documents. Several new or

[1] In French speaking countries, these plans are called Plans de Déplacements Urbains (often referred by its acronym, PDU) and in Spanish speaking contexts, they are Planes de Transporte.

[2] BRT: Bus Rapid Transit.

redefined concepts became more present, like walkability (a vital topic in, for instance, Strasbourg's[3] planning processes in 2012) or accessibility (the guiding subject in, for example, Montpellier's 2012 plan). It would not be wrong to state here that for a long time, mobility and transport planning have had a subordinate place in the development of urban planning documents. Only recently have these key aspects become central and, as a result, have received more consideration in preparing urban planning documents.

While this is a logical response to mobility problems, this paradigm shift often occurs in cities with a specific and sometimes complex urban fabric already reaching a critical mass. From this point of view, implementing or adapting infrastructure to support this new mobility is a complicated exercise for planners and developers.

Planning documents in the Global South have had similar evolutions. Often due to importing practices from abroad, countries in the Global South have developed comparable efforts with varying degrees of success when implementing plans. In Senegal, Dakar produced an initial Transport Plan in 2007. This ***Plan de Déplacements Urbains de Dakar*** –PDUD– of 2007 was aligned with the second stage, as presented above, focusing on increasing infrastructure and service provision. It offered a clear vision for the city but did not achieve it. The plan fell short of its intended objectives, with many flagship projects being delayed or abandoned altogether because of the lack of political support for strategic implementation. Other cities, such as Nouakchott (2006) or Marrakech (2009), to name two of many, had similar fates.

[3] France was one of the earliest countries to introduce mandatory transport plans for its population of over 100,000 inhabitants. This was achieved in 1996 (law 96-1236 of 1996)

Mobility planning documents

Transport Plans were strategic documents that defined a vision for urban transport supply and management. Transport Plans took off from, when available, strategic land-use plans, the latter often introducing broad principles for mobility and ideally linking them with the vision of the future city. However, they do not define the urban mobility vision.

Recently, Transport Plans have evolved into Mobility Plans, particularly Sustainable Urban Mobility Plans (or SUMPs). SUMPs, in its most basic conception, should seek to improve the accessibility of the urban territory by providing multimodal high-quality and sustainable mobility to all inhabitants:

BOX 1 Sustainable Urban Mobility Plan (SUMP) definition

A Sustainable Urban Mobility Plan is a strategic plan designed to satisfy the mobility needs of people and businesses in cities and their surroundings for a better quality of life. It builds on existing planning practices and takes due consideration of integration, participation, and evaluation principles.

Source: MobiliseYourCity, 2019

SUMPs also introduce a more crucial environmental component to the planning process. Indeed, SUMPs in the MobiliseYourCity partnership highlight the importance of reducing CO_2 emissions and pollution directly linked to transport usage. Within this framework, the ideal sustainable mobility system includes:

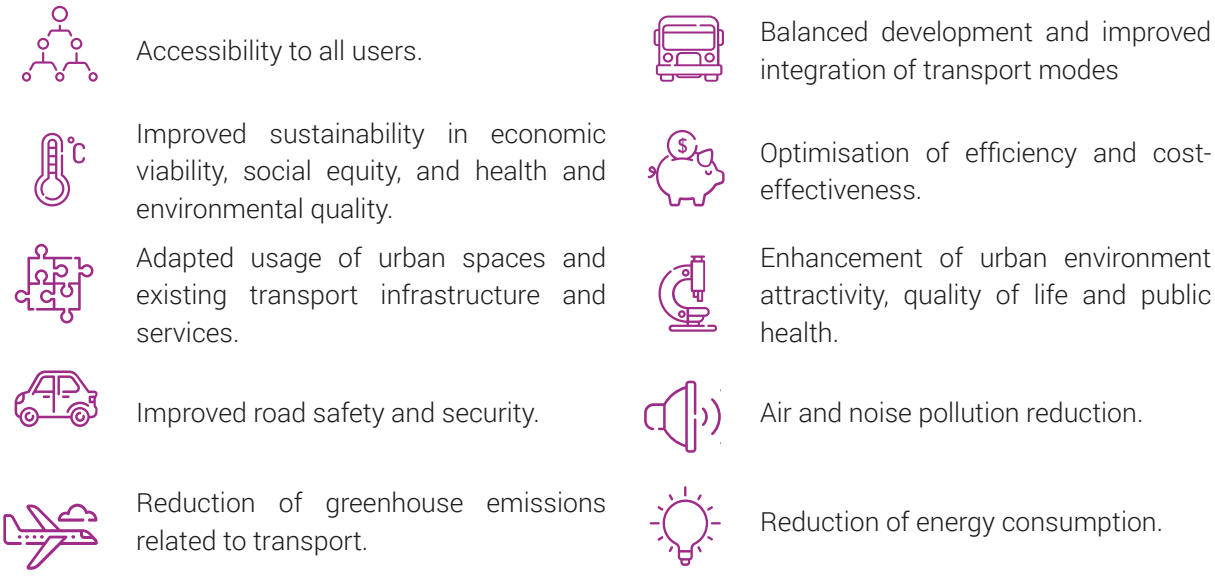

Figure 3. Elements of sustainable urban mobility systems

Within the EASI[4] conceptual framework (see below), SUMPs are vital in improving land-use efficiency, i.e. the Avoid pillar. More concretely, the broad objective is to minimise the need for individual motorised travel and give the most virtuous modes –environmental friendliness – a more important place in the system.

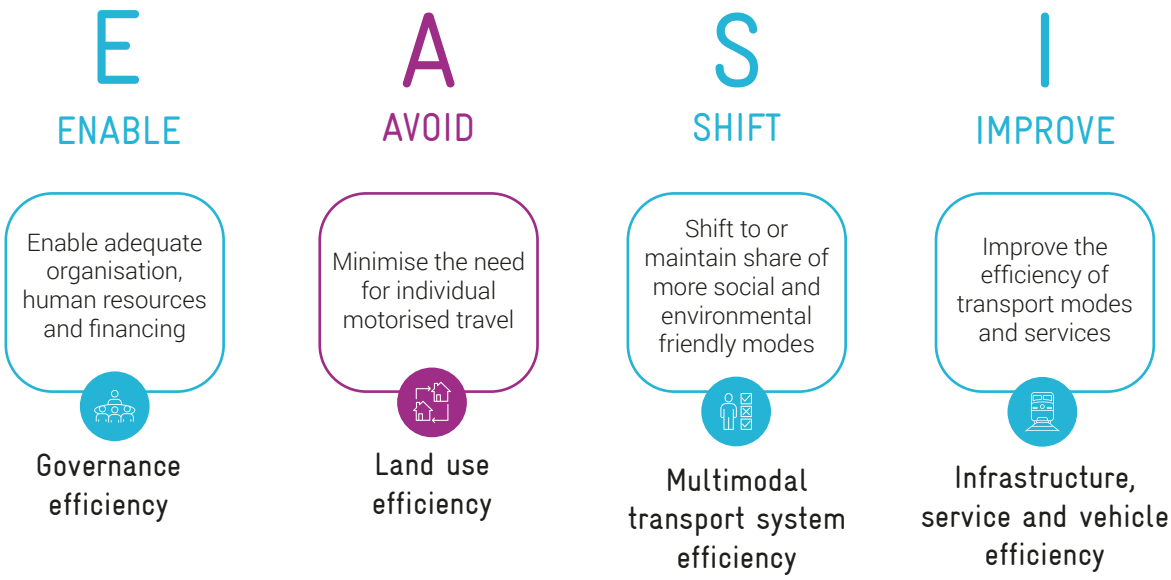

Figure 4. The Enable-Avoid-Shift-Improve (EASI) concept

The vision defined in Strategic Land-Use Plans (often called Master Plans) should guide SUMPs when this vision is available. They remain at the strategic level (see below) and configure initial directives for more sectorial plans taking various forms.

[4] The EASI conceptual framework is an acronym of four pillars for improving urban mobility systems in the Global South. The four pillars are: Enable, seeking governance efficiency; Avoid, seeking land-use efficiency; Shift, seeking multimodal transport system efficiency; and Improve, seeking infrastructure, services and vehicle efficiency.

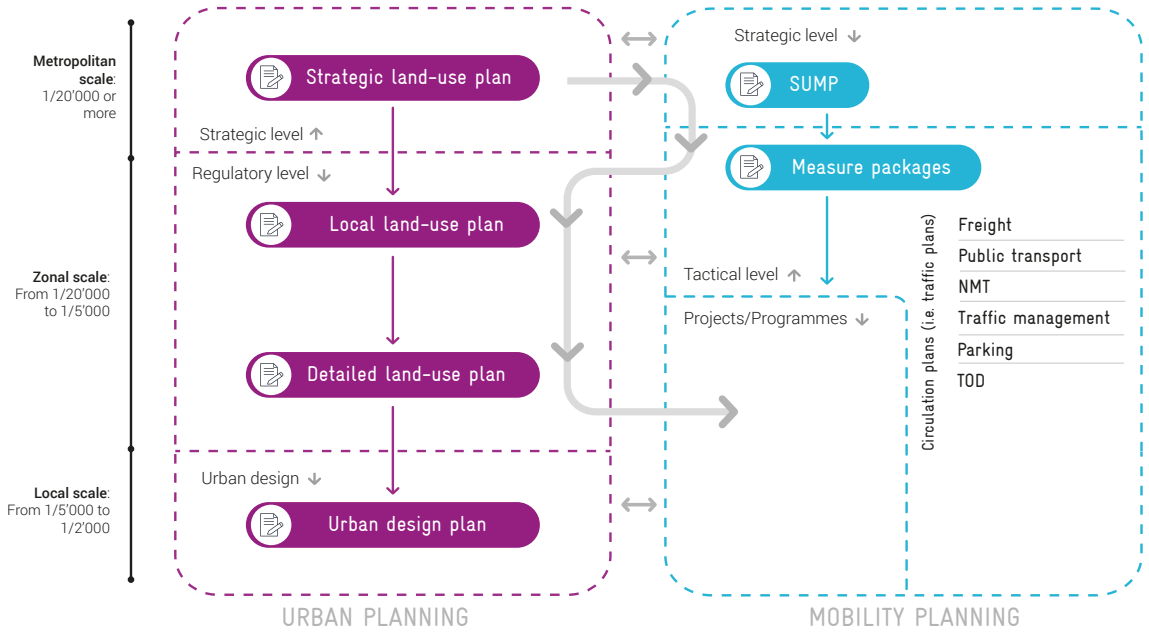

Figure 5. Linkages between land-use and mobility planning documents

Measures packages[5] are tools that operationalise SUMP scenarios. They, therefore, have more detail compared to SUMPs. Measure packages can focus on one specific topic for the entire urban territory. Still, they can also provide elements on local-scale decisions (for instance, with Circulation Plans, also referred to as Traffic Plans). These packages must follow the SUMP's directives and elaborate on the identified sectorial measures. Still, they must also align with local and detailed land-use plans. Once this coordination is in place, implementing plans or programmes holds the promise of fulfilling the vision stated in the SUMP and, hence, introducing initiatives that will help optimise the urban mobility system.

[5] From the SUMP guidelines: "A measure package combines different measures to contribute more effectively to the objectives and to increase their acceptability. A way to proceed is to think about what can be proposed for each SUMP objective according to the different types of measures that can be contemplated (…). Other frameworks can be used as a control to see if a city identifies all relevant areas to address a certain challenge".

The three scales of the mobility planning process

When schematically planning mobility, there are three main scales in the planning process: Metropolitan, Zonal or Corridor, and Local. Scales might differ from one city to another. They can also be different in shape and size. Depending on the planning objective, more categories spread from each scale. The goals for each scale are not the same, but they need to be aligned.

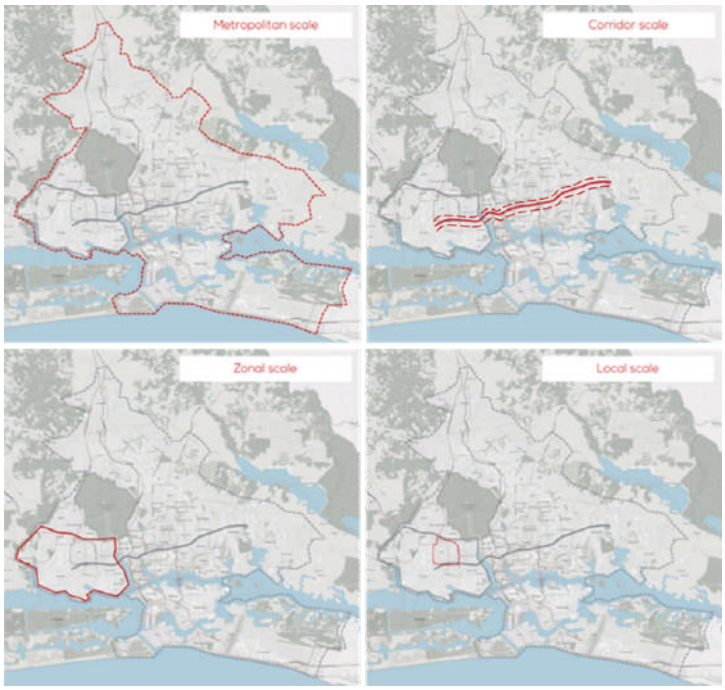

Figure 6. Simplified planning scales, based on the city of Abidjan territory

The metropolitan scale

The Metropolitan Scale pertains to planning directives for the functional urban territory. According to the SUMP guidelines[6], this area is the 'functional urban area' whose definition is 'the footprint of current mobility patterns'. It is often translated into planning for conurbations or urban agglomerations, sometimes going over administrative limits. The Metropolitan Scale is critical in major cities; it is the scale where the strategic vision is set and developed.

Strategic Land-Use Plans and SUMPs represent the primary planning documents for this scale. Besides defining main strategic choices, they set a framework for regulatory planning documents at the city scale (Urban Plan, the first level of regulatory planning document) or lower scales. Sectorial plans or measure packages for mobility planning are also necessary at this scale; they can set citywide concrete actions to implement programmes or initiatives. For instance, Freight Management Plans or High-Capacity Citywide Public Transport Plans are most relevant at this scale.

[6] To know more, consult the MobiliseYourCity SUMP Guidelines

The zonal or corridor scale

At this scale, the planning documents are mostly regulatory documents, defining urban rules for a well-defined zone that can either be an area within the city (i.e., a set of neighbourhood units, an internal relatively sizeable administrative division, or similar) or a corridor. The latter is most often used in mobility planning exercises that seek to implement higher capacity public transport solutions (including, but not limited to, tramway, BRT and BHLS[7] programmes) or awarding a slower, more urban characteristic to an infrastructure.

Thus, this scale focuses on introducing contextual elements to promote coordinated growth best, manage investment and determine desired urban characteristics. This scale's most relevant planning documents are (i) District or Zonal Land-Use Plans and Detailed Land-Use Plans and (ii) Sectorial Plans when they define specific corridors or areas to implement mobility projects.

Case 1 | Curitiba's land-use planning based on high-capacity bus corridor development

Starting with the creation of IPPUC[8], Curitiba's Planning Authority, in 1965 and later, the operationalisation of URBS[9], the transport authority, in 1966, the city embarked on a process of urban development based on an earlier plan that defined main urban corridors, where higher density would be encouraged. The implementation of the Urban Plan, beginning in 1966, set the principles for land usage and – coupled with zoning elements – defined a framework upon which investments would be carried out.

The Land-Use Plan had two key elements in setting the scene for mobility plans and programmes. First, it defined a central area accessible only to active and public transport modes (besides emergency vehicles and lighter freight vehicles). And second, it based city growth on a radial, linear pattern selecting five corridors with higher densities, commercial activities intense enough, and the availability of metropolitan services and amenities sufficient.

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7 BHLS: Bus with High Level of Service.

8 IPPUC: Instituto de Pesquisa e Planejamento Urbano de Curitiba, or Institute for Research and Planning of Curitiba, in English.

9 URBS: Urbanização de Curitiba. It was initially established in 1963 to manage infrastructure implementation in the city. It is only in 1986 that URBS becomes effectively the transport authority having received responsibilities pertaining to the management of the public transport system.

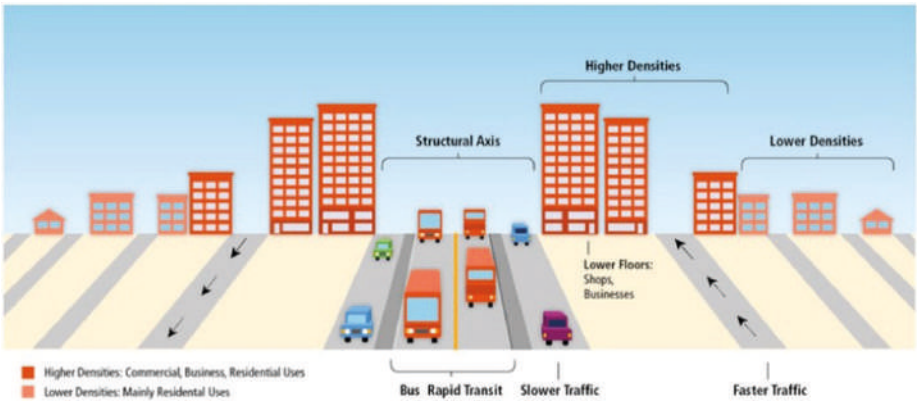

Figure 7. Trinary system of Curitiba

(Source: Pierer & Creutzig, 2019)

It is fascinating how corridors created a robust link between land use and mobility. Schematically, initial corridors presented high or very high residential densities[10] and dynamic commercial activities in lower levels of buildings within the corridor. In 1972, corridors developed infrastructures that could accommodate the implementation of high-capacity public transport services; this marked the start of the 'trinary system'. In this system, the central high-capacity bus corridor, well-known for its BRT system, is surrounded on both sides by the following elements (in order): (1) a high-density area with mixed residential and commercial uses; (2) one-way streets where secondary bus services run in parallel to the high-capacity system, but have more stops and lower commercial speeds; (3) primarily residential areas with comparatively lower densities; and (4) local roads and residential areas that show decreasing densities as the gain distance from the central corridor.

Often presented as a TOD[11] best practice, Curitiba's model created a lasting link between land use and mobility options. The link is a strong coherence between land uses, population and activity densities, and linear growth along public transport corridors. These elements still currently stand out in the city.

The local scale

When introducing the land-use planning process, planning documents include urban design plans for the local scale. The latter can propose refined urban rules that respect the urban management of the broader scale documents (land-use or local land-use plans). Therefore, at this scale, it is typical for authorities to carry out detailed work on developing public spaces at the street level, particularly concerning mobility.

Mobility-related planning documents often consist of neighbourhood-based programmes or projects related to public transport hubs and follow-up on strategies in the zonal or corridor scale documents. Further, at this scale, walking and cycling planning, or NMT[12] planning, becomes more concrete, requiring particular attention. Ideally, all planning documents (or tools) should align and integrate to fully harmonise land-use planning decisions and mobility planning decisions.

[10] Population densities in corridors reach 294 inhab/ha, while feeder areas' densities fluctuate between 76 inhab/ha and 164 inhab/ha.

[11] TOD: Transport Oriented Development, see section below.

[12] NMT: Non-motorised transport, including importantly pedestrians and bicycle users.

The current situation: successes but missed opportunities

Current integration levels in land-use and mobility planning

Effective land-use and mobility planning integration has seldom proven true in previous planning processes. While some cities have sought a robust dialogue between land use and mobility and have successfully achieved integration, most municipalities have been less successful. Due to outdated information or missing context, mobility plans fail to produce sustainable links to land use visions and models. In the African context, for instance, many planning documents on land usage are not made available or considered when producing Mobility Plans.

One of the causes of one such problem is the lack of institutional dialogue between authorities in charge of urban planning and those responsible for mobility or transport planning. This results in Strategic Plans that diverge, as opposed to converging, and mobility programmes or initiatives that fail at supporting mobility in new urban zones or renewed areas in the build-up city. Since land-use plans seek changes on existing urban structures without dialogue, Mobility Plans often reinforce existing systems, primarily considering current trends and overlooking changes evoked in strategic land-use planning documents.

Another probable cause explaining lower integration levels is the time lag between the production of land-use planning and mobility planning documents. In all, Strategic Land-Use Plans require more time to develop than some of the main components of a Mobility Plan. Comparatively less defined for Zonal or Local Scales, timeframes can be widely dissimilar for the Metropolitan Scale. For the latter, mobility solutions involving the implementation of higher-capacity public transport alternatives or heavy infrastructure are more likely to align adequately with long-term land-use planning. However, municipalities can quickly implement other projects, such as providing walking and cycling facilities or programmes seeking changes in traffic plans, achieving results within a shorter timeframe. Transport planners might overlook long-term land-use planning initiatives and often consider them isolated efforts.

Finally, a third element to consider is conceptualising land-use/mobility planning as a rigid relation. Cities are not closed systems; neither are mobility systems. Many variables at play shape or modify urban structures and systems. Exogenous causes can, when significantly severe, impact the development path of a city. Moreover, regarding endogenous elements, choices made in mobility plans can impact land-use practices in unforeseen manners and vice versa. Having excessively rigid plans hampers the integration prospects of the land-use/mobility planning relation. Failing to adapt to changes or inflexions in land-usage trends can make mobility plans or programmes outdated and inconsistent with new demand patterns. This situation likely reduces integration, even if the land–use/mobility relation was once adequate at the onset.

Although rare, some successful examples of land-use/mobility planning integration exist. Different cities have created sustainable links to varying scales by introducing planning tools or basing mobility programmes on sound land-use strategic planning. The development of tactical urbanism has also strengthened the urbanism–mobility link.

The sections below present summaries of selected cases focusing on how land use and mobility integrate at different scales. It demonstrates that various levels of integration are occurring, i.e., that integration is not a strictly binary variable. One might also notice that, in some cases, authorities overlook long-term planning processes.

Case 2 | The Addis Ababa City Development Plan (2000-2003)

Between 2000 and 2002, this process aimed at revising the former 1986 Master Plan by correcting its weaknesses and building on its strengths. This Master Plan revision placed mobility at the heart of the analysis and production process. As an outcome, the 2002 City Development Plan provided a long-term vision of the city's future growth based on a mass transit backbone. The city government officially endorsed the City Development Plan in 2003. This vision was then, in 2006, followed by the preparation of a Transportation Master Plan that reinforced the focus on this corridor-based backbone.

Figure 8. Vision of the 2002 Addis Ababa City Development Plan

Figure 9. Proposed public transport network - Addis Ababa 2006 Transport Plan

The preparatory phase of the study dedicated to the co-construction of a vision for the future of Addis Ababa materialised through a robust participatory process that included institutions, universities, and private companies and benefitted from strong support from international technical and financial partners. This co-construction process led to defining ten (10) guiding concepts that would shape the City Development Plan (CDP). Notably, the first six (6) concepts of the CDP were related to mobility and its link with land use:

1. Create a solid corridor-based backbone for the present and future development of the city that would link it with a mass transit system;
2. Create mass transit corridors along the backbone connecting the central business district (CBD) and the main centre to the sub-centres;
3. Transform the city into a polycentric metropolis to reduce congestion in the city centre and Mercato;
4. Prioritise strategic development sites along the corridor-based backbone and through Public Private Partnerships (PPP) for boosting investments;
5. Adopt "mixed-use" land use, especially along the main corridors;
6. Develop urban design along the avenues, in open public spaces and the districts for a better quality of life and improved image to attract investors.

In 2010, the Lyon Town Planning Agency (LTPA) and Mathewos Consult conducted the first evaluation of the Master Plan. It concluded that the 2002 Revised City Development Plan of Addis Ababa had significantly contributed by introducing a new paradigm shift, providing shared, clear guidelines for Addis Ababa and influencing, by extension, the planning processes of many Ethiopian urban centres.

Tools for integration

There are various tools to achieve land-use/mobility integration. These can be grouped into those that propose citywide approaches with several elements interacting among them (i.e., they utilise various features or tools) and those that focus on one single strategy. This document starts with the latter group, which includes but is not limited to (1) the development of multipolarity in cities; (2) encouragement of targeted densification; (3) improvement of higher capacity public transport options; and (4) improvement of active mobility conditions in targeted sectors. The second part of this section focuses on wider-scope strategies, notably (1) the TOD concept, (2) the 15-minute city, and (3) the 20-minute neighbourhood.

Multipolarity in cities

In many cities of the Global South, urban structures remain highly monocentric, with the historical core grouping most metropolitan-level amenities and commercial activities. Further, this core is also home to most formal jobs in many African cities. As cities spatially grow, they do not always do so by replicating urban fabrics and historical patterns. Nowadays, cities are more likely to extend their limits with primarily low-density residential areas (sprawl) or mostly residential unplanned zones. Both options independently meet mobility needs albeit with substantial obstacles, most notably, the wide distribution of demand and road networks lacking hierarchy or easily identifiable main corridors. When extending the analysis to the Metropolitan Scale, these growth patterns increase mean trip lengths, time spent for home-work trips (commuting) and, significantly, fail at inverting the trend of excessive convergence towards a city centre.

Some cities present further complexities. For instance, Dakar's historical central area is at the peninsula's southernmost point, forcing many daily trips to converge towards a progressively narrower territory. Another example is Abidjan, where, similar to Lagos, the lagoon surrounds the historical central core, and few axes exist to reach it; however, daily trips towards this centre remain, in quantitative terms, the most important for the city.

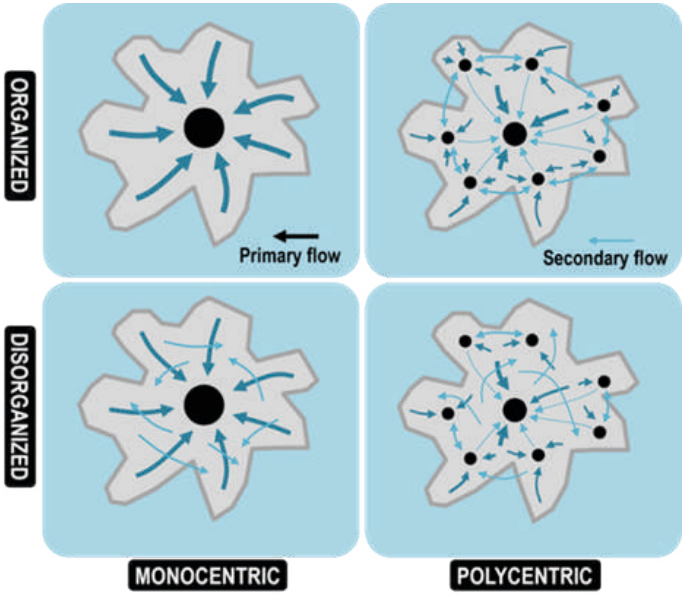

Figure 10. Conceptualisation of monocentric and polycentric urban structures

(Source: Bertaud 2001 in Rodrigue 2020)

The introduction of multipolarity in cities seeks the development of new cores or poles that can counterbalance the pull of the central one. New poles can be of comparable weight or placed at the secondary level on a theoretical scale, leaving the initial historic area as the main activity centre of the city. The overall objective is to modify urban structures and, as a result, change trip distributions in the city. Indeed, this polycentric or multipolar urban structure promises to reduce trip lengths (time spent travelling in the town). Ideally, new poles will have sufficient activities, amenities and jobs to reduce convergence levels towards the historical city centre.

Moving from a monocentric to a polycentric structure must be one of the objectives included in the strategic land-use document. Developing new nodes or hubs in any city is a lengthy and complex process, mainly when this occurs in an already built-up area (as opposed to Brownfield[13] and Greenfield [14]Developments). Implementing new hubs requires substantial investment from public and private stakeholders. Successfully developing a new hub requires the construction or transfer of metropolitan-scale services that often also need changes in the urban fabric. Be it a new administrative building or a new hospital, for instance, a particular activity is often necessary to be a catalyst for transformation. Public stakeholders are thus required to invest in the hub; subsequently, the private sector should follow when it has proven its relevance.

In Brownfield Developments, dynamics are similar, yet they will likely require more institutional investment. Creating new hubs in areas formerly occupied by industrial activities entails building around the hub and making it attractive enough for private investors.

Finally, in Greenfield Developments, strategic land-use planning will likely play a significant role. Areas targeted for development allow for some manoeuvring when implementing primary or secondary hubs. Public and private investment can co-occur, with each side feeding the other. Regardless of the planning scale (neighbourhood, district or local), the process faces fewer obstacles than the two previous cases (built-up areas and brownfield zones).

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[13] Brownfield Development: A land that is abandoned or underutilized due to pollution from previous industrial or commercial purposes, and thus requires further development before reuse.

[14] Greenfield Development: Undeveloped land in an urban or rural area that land developers typically desire for new development.

Irrespective of the type of location, it is essential to consider that hub implementation will take a long time and that the tools are helpful in medium- and long-term phases, presenting private stakeholders and investors more time to buy into the proposed process.

Case 3 | Ouagadougou's secondary poles, a work-in-progress

Before realising a strategic urban vision, Ouagadougou was a highly monocentric city. Not only were most of the main historical metropolitan activities, including markets and health infrastructure, located in the central area; the road system's structure further exacerbated the need to converge towards that central area. At the Metropolitan Scale, monocentric urban structures hamper the promise of land-use and mobility integration. Hence, the objective of altering such a monocentric structure to a more polycentric urban form aligns better with the goal of improved land-use/mobility integration.

Star-shaped radial national-level roads are often the only infrastructure with sufficient freight and public transport supply capacity. Indeed, inhabitants largely depend on motorcycles in the city for their mobility needs. This dependency is because other vehicles would struggle under such conditions (i.e., sparse public transport demand due to generalised low densities and path dependencies related to individual modes of usage).

Figure 11. Synthesis of the strategic vision for Ouagadougou

(Source: Ville de Ouagadougou & UrbaLyon, 2019)

City authorities, together with the assistance of international experts, sought to unclog the city centre by developing seven secondary centres organised in a circular shape in the closest belt, around the initial central area. Most of these poles are located on main road infrastructures, seeking improved

accessibility. In general, new centralities would host amenities and metropolitan-level infrastructures (namely markets, administrative buildings, and, to a lesser extent, public transport ranks) that can counterbalance the role of the city centre. Several poles, still in development, have started to build infrastructures and attract inhabitants and traffic flows. Public transport services would link two secondary poles using high-capacity services. With political changes and uprisings, the project seems to halt.

Targeted densification

Higher population densities are best suited for implementing medium- to high-capacity public transport modes. Behind this is the principle that higher densities translate into higher public transport demands and general demands more concentrated in smaller areas. Similarly, public transport provision in sprawling contexts is challenging as operators tend to steer clear of supply levels that create unbalanced financial models, with relatively stable operational costs at best and reduced income from fareboxes as users locate further apart. Territorial coverage is also an issue.

BOX 2 The importance of urban densification on modal shift

Urban densification is associated with more use of public transport, less distances to cover and a reduction in the carbon footprint. Densification brings buildings (residence, offices, shopping) closer to each other, which encourage people to use softer modes of transport such as walking, cycling, etc. and to avoid using cars. People tend to use public transportation because they are more efficient in dense environment. Moving towards sustainable mode (trains, buses, walking) of transport reduces transport energy consumption and proves to be cost-effective.

Source: Teller, 2021

Cities have local population densities that fluctuate depending on the context: an urban territory will never have the same demographic density throughout its area or the same activity density. Historical central regions tend to be denser than most recent residential areas. In this context, an envisioned approach to integrate land use and mobility is to target specific areas for densification, considering a more condensed public transport demand in such areas. Often, targeted densification is likely to occur along main transport corridors. Densification in areas without public transport is possible, but its impact is expected to be insignificant when analysing the land-use/mobility relationships.

Higher population densities promise a reduction in mean trip lengths and, considering that trips are shorter, they can also reduce the need to extend networks while increasing territorial coverage excessively. There is also the observation that higher population densities go together with reduced car usage and, as a result, reduced energy consumption (Meurs, 2003).

Targeted densification can take various forms. The most common type of densification pertains to increased building heights to boost populations living close to or on the corridor. This targeted densification often entails allowing building heights' transfers from other areas to the road (like Curitiba's

strategy, for instance) or introducing regulatory land-use rules that encourage higher buildings to increase residential spaces. A similar approach is suitable in and around activity hubs, aiming not to increase densities throughout the corridor but rather to increase it at specific points in the network. In both cases, population density increases are directly linked to more build-up floor space.

A second type of approach is to impact buildings' or dwellings' internal distribution. The objective is to reduce mean dwelling sizes without impacting building sizes; this can entail dividing existing dwellings or introducing building regulations to encourage smaller spaces. This approach often goes together with the objectives of the social and socioeconomic mixture.

In any case, densification is twofold: new regulations on new and old buildings encourage it, and densification occurs based on (individual) private sector initiatives, without particular impact from new rules.

Higher-capacity public transport alternatives

Implementing high-capacity public transport alternatives has recently helped improve the relationship between land use and mobility. Closely linked to densification along public transport corridors and mixed land uses, these modes' implementation relies on sufficient demand levels to justify capital investments. Often, higher capacity modes take the form of tramways, BRTs or BHLSs and, to a lesser extent, underground or elevated metro networks.

Two elements improve land-use/mobility integration when dealing with the implementation of high-capacity public transport services. First, the land-use/mobility link exists along the transport corridor where it is pertinent to have mixed residential and commercial uses, taking advantage of higher demand densities, and second, the connection created at specific moments in the public transport network, where main stations or terminal stations/ranks become areas of opportunity to develop high activity commercial zones or metropolitan level amenities.

High-quality public transport modes, introducing higher capacity, are also meant to produce a transparent hierarchy network around these high-demand corridors. Other modes are then (re)structured around the newly formed backbone of the public transport network, awarding each mode a clear role in the system. In a hierarchical network, (i) medium capacity modes will serve as either feeder services to higher demand modes or as services serving secondary origin-destination couples, and (ii) lower capacity modes used in last-mile (or last-kilometre) connectivity or for local-scale trips.

A second expectation is that improved quality of the public transport supply can help reduce or invert the growth patterns of motorisation. In theory, sprawling can be curved with less individual vehicle usage, thus supporting the idea that more compact and mixed-used cities are best suited for public transport provision.

Case 4 | Proposing a hierarchy in Abidjan's public transport network

Note: This case was not the direct result of a SUMP process.

In 2022, Abidjan started a large-scale reform of its public transport system to adapt it to two main forthcoming projects that will transform and shape the city: a north-south Metro system and a west-east BRT corridor. These two projects will act as the high-capacity backbone of the public transport system for years to come. Hence the newly created transport authority (AMUGA[15]) sought to reorganise the entire public transport system, including paratransit modes, best to adapt it to growth patterns and anticipated changes attributed to the implementation of high-capacity modes.

Abidjan's authorities proposed a hierarchy of modes based on four levels. The first level pertains to high-capacity modes (i.e. Metro and BRT systems) that should be reliable alternatives for metropolitan-scale public transport demand.

A second level, the intercommunal level, was composed of standard buses, some incumbent paratransit midi-buses and lagoon-based services. This second level guarantees urban-scale trips linking the various 'communes' of the city.

[15] AMUGA: Autorité de la Mobilité Urbain du Grand Abidjan.

The third level, the communal level, comprises paratransit midi-bus services and other shared taxi services. This level includes all public transport travel between local hubs.

And finally, the fourth level, the local network, includes modes used in last-kilometre trips and capillary-based internal trips. The fourth level comprises paratransit shared taxis and low-capacity lagoon-based services called 'pinasses'.

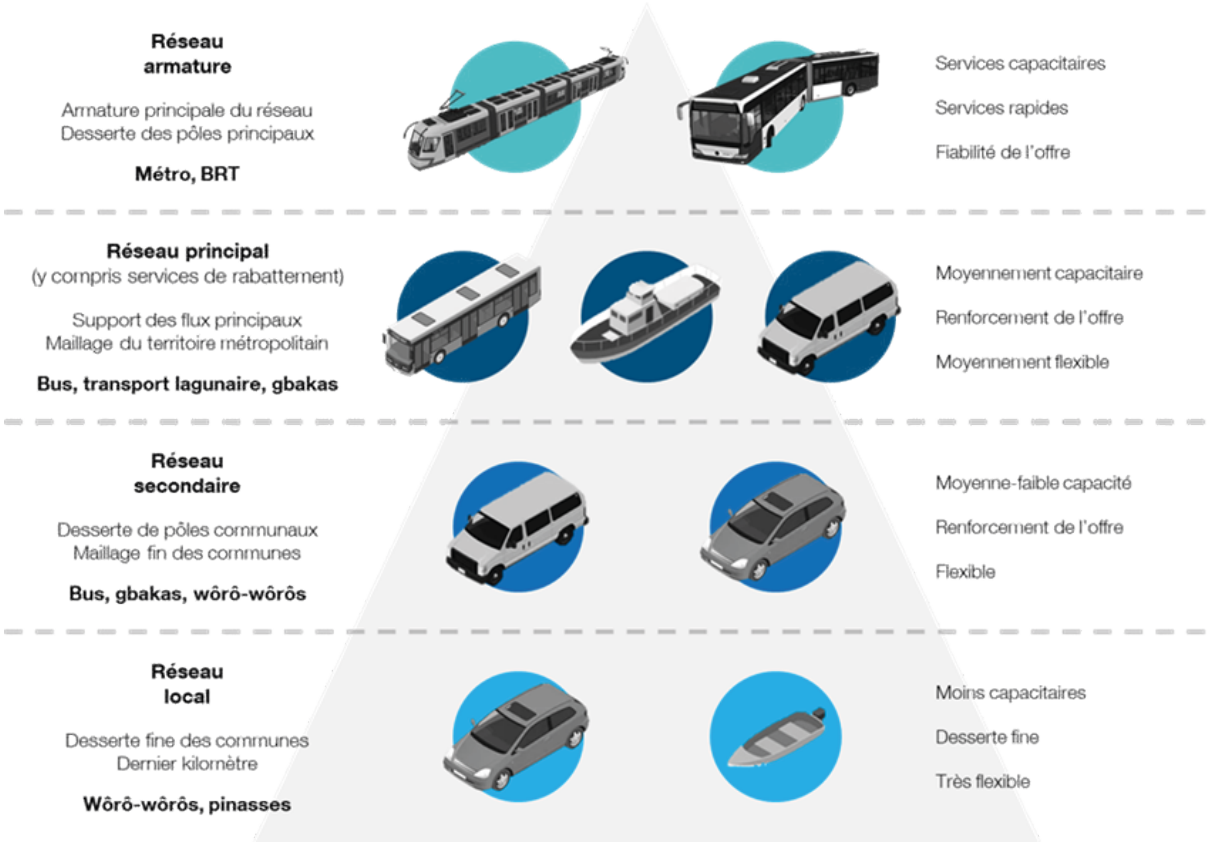

Figure 12. Proposed public transport hierarchy in Abidjan

Improvement in walking and cycling

Creating an adequate environment for walking and cycling, when aligning it to public transport infrastructure provision or encouraging their usage for short- and medium-distance trips is one component of local scale land-use/mobility planning integration. Even though active modes are suitable for shorter-distance trips, their scope is limited when compared to what, for instance, public transport supply can accomplish. Nevertheless, their place in creating stronger links between land use and mobility is also essential.

Walking and cycling align with 'slower' urban areas, where local-level mixed uses are encouraged. By providing infrastructure for pedestrians and bicycle users – preferring them over car users –it is theoretically possible to enact changes to formerly highly residential areas or urban-scale commercial-only areas. When provided with adequate conditions in local neighbourhoods' centres or poles, active mobility users can support mixed uses in small-scale retail, education facilities and medium- to high-density residential options.

Improving accessibility by providing active mobility options is also relevant around public transport stations. Besides the possibility of creating functional mobility – public transport multimodality when introducing adequate infrastructure (likely in the form of bicycle parking facilities and preferential access to high-capacity corridors' stations), walking and cycling can also irrigate zones around transport stations and ensure last-mile connectivity.

Case 5 | Yaoundé's efforts to improve active mobility conditions in its central area

Recently, Yaoundé launched a project that follow-up the primary directives set out in the SUMP produced in 2019. One of the critical elements of the SUMP was to improve accessibility and general mobility conditions in the city's central area, where most metropolitan-level facilities and services are.

One of these efforts was the programme that sought a redefinition of the area closest to the Place du 20 Mai, one of Yaoundé's most active areas, often characterised by heavy motorised traffic within a highly commercial zone. Indeed, heavy motorised traffic met the need to access the city's market and often resulted in sidewalks occupied by parking or logistical uses.

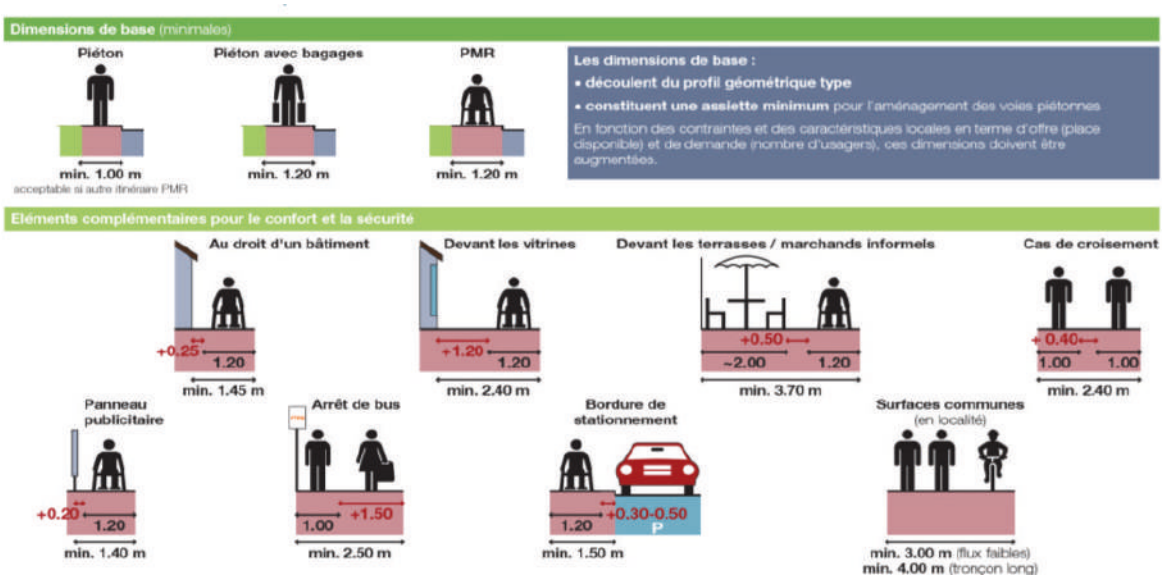

Figure 13. Yaoundé's toolkit defining sidewalks depending on the nearest land use

The programme produced two primary outcomes regarding pedestrian environment improvement. First, it led to the implementation a week-long demonstrative action that made one of the main streets a pedestrian street (Avenue du Président Ahidjo). The second was a toolkit defining minimal characteristics of what sidewalks need to be, considering contextual elements, most notably the type of land use around infrastructure, how to approach each class, and the need to improve the current situation. Other programmes for the city could later use the toolkit.

Transport Oriented Development (TOD)

Calthorpe introduced the concept of TOD in 1993, but many cities had applied the idea earlier than that (for instance, Curitiba in 1972 or Copenhagen in 1947). The TOD concept combines various tools to seek robust land-use/mobility integration in all cases. Most notably, developing higher-capacity public transport modes will structure a network of hubs that improve accessibility. According to ITDP (2017), there are eight principles in the construction of a TOD:

BOX 3 The 8 TOD principles

1. ***Walk:*** High quality, unobstructed pedestrian footpaths provide basic mobility for all. Furniture, landscaping elements, and active building edges transform walkways into vibrant public spaces.
2. ***Cycle:*** Street design ensures safety for cyclist by reducing carriageway speeds or creating separate cycle tracks. A complete network, adequate shading elements, smooth surfaces, and secure cycle parking are essential.
3. ***Connect:*** A dense network of walking and cycling routes results in short, varied, and direct connections that improve access to goods, services, and public transport.
4. ***Public transport:*** Frequent, fast, and reliable high-capacity rapid transit reduces dependence on personal motor vehicles.
5. ***Shift:*** Adequate parking fees and a reduction in the overall supply of parking create incentives for the use of public transport, walking, and cycling.
6. ***Densify:*** Intensification of residential and commercial uses around high-capacity rapid transit stations helps ensure that all residents and workers have access to high-quality public transport.
7. ***Mix:*** A diverse mix of residential and non-residential land uses reduces the need to travel and ensures activation of public spaces at all hours.
8. ***Compact:*** Redevelopment of existing urban fabric helps ensure that residents can live close to jobs, schools, services and other destinations, resulting in reduced travel times and emissions.

The TOD concept creates hubs along high-capacity public transport corridors at different scales and following a clear hierarchy. The concept imagines these hubs as « urban villages » with intense accessibility levels and a preference for active mobility.

BOX 4 Advocating for a restructured public policy and development practices

We advocate the restructuring of public policy and development practices to support the following principles: neighbourhoods should be diverse in use and population; communities should be designed for the pedestrian and transit as well as the car; cities and towns should be shaped by physically defined and universally accessible public spaces and community institutions; urban places should be framed by architecture and landscape design that celebrate local history, climate, ecology and building practice

Source: CNU, 1996

In Calthorpe's approach, hubs' organisation happens around public transport infrastructure. One side of a commercial and employment zone appears while residential activities and open spaces emerge on the other. Each hub plays a predefined role in the metropolitan grid formed by the public transport high-capacity network.

TOD produces positive outcomes for users, operators, and local governments. First, about the advantages users can have, the TOD concept can (1) open the network to more destinations by increasing commercial speeds in the public transport supply, (2) globally improve walking and cycling conditions – this being one of the pillars of the concept – and (3) improve safety conditions around public transport stations.

For transport operators, there exist three advantages: (1) an increased demand – and convergence of demand – in the central transport axis, (2) reduced operational costs as a result of increased commercial speeds, and (3) an improved image of the public transport supply as a result of introducing more high-quality services, in terms of comfort and frequencies, most notably. Local governments, in turn, should find that the TOD approach can reduce travel needs and increase the commercial appeal of the city.

Implementing a TOD in a built-up zone and, to a lesser extent, in a vacant area is not necessarily easy. Few cities have fully developed the prospects of a wholesome TOD; those that have managed to do this have done so through a long process (for instance, Curitiba, which started in the 1970s or Copenhagen, which implemented its Finger Plan first in 1947). In most cases, TOD implementation requires a substantial initial investment, and it needs to be accompanied by 'softer' measures that will help in effectively enacting behaviours that align themselves with the objectives of the TOD programme.

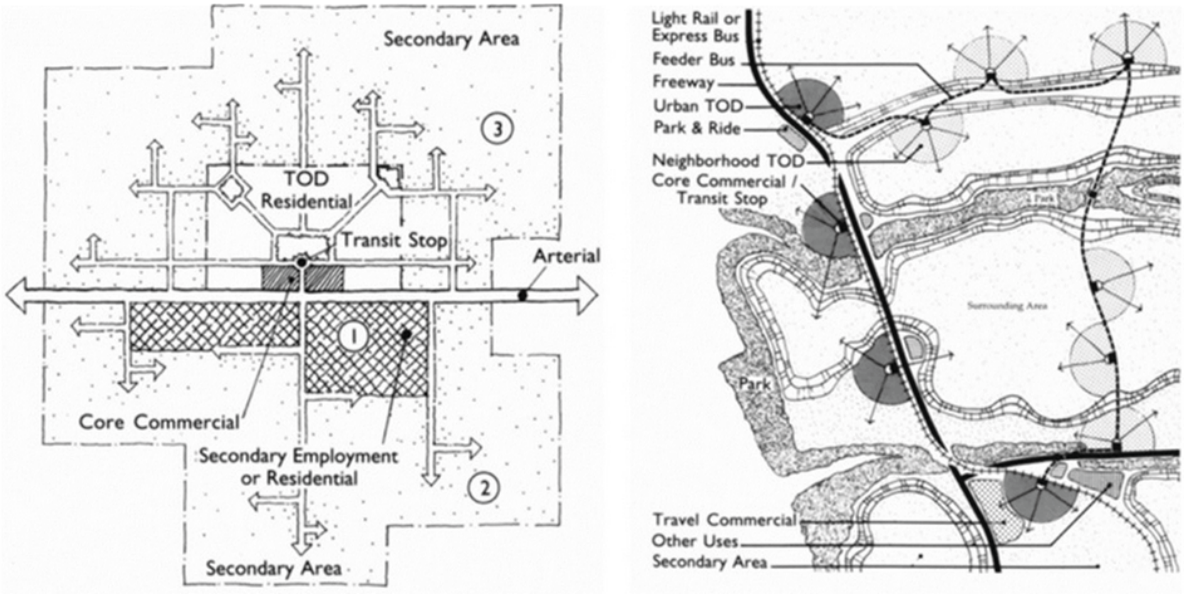

Figure 14. Calthorpe's TOD concept – Left: General hub structure – Right: hierarchy and location on the network (Source: Calthorpe, 1993 in Mangukiya, 2022)

The 15-minute city

The main principle of the 15-minute city is that the entire city is accessible, for any user, within the distance that either a bicycle or walking trip can take them (some definitions focus mainly on the latter option, thus giving pedestrian trips the primary role in the description). The concept seeks to reduce travel needs, primarily the part of private motorised vehicles in the city. To do so, inhabitants must reside within a catchment area small enough to be travelled by walking or cycling. This condition entails that a network of neighbourhoods providing all necessary amenities must shape cities' structures, mixed in usages and adequate walking and cycling infrastructure.

These neighbourhoods are often called 'complete neighbourhoods', where inhabitants can find everything they need in relative proximity. These neighbourhoods rely heavily on higher population densities throughout the territory. Buildings must contain several land uses, combining residential activities with commercial and service uses on lower floors. Spaces could have new purposes; for instance, shared gardens could become small-scale urban agricultural land. Land-use planning and local programmes are essential elements in this regard.

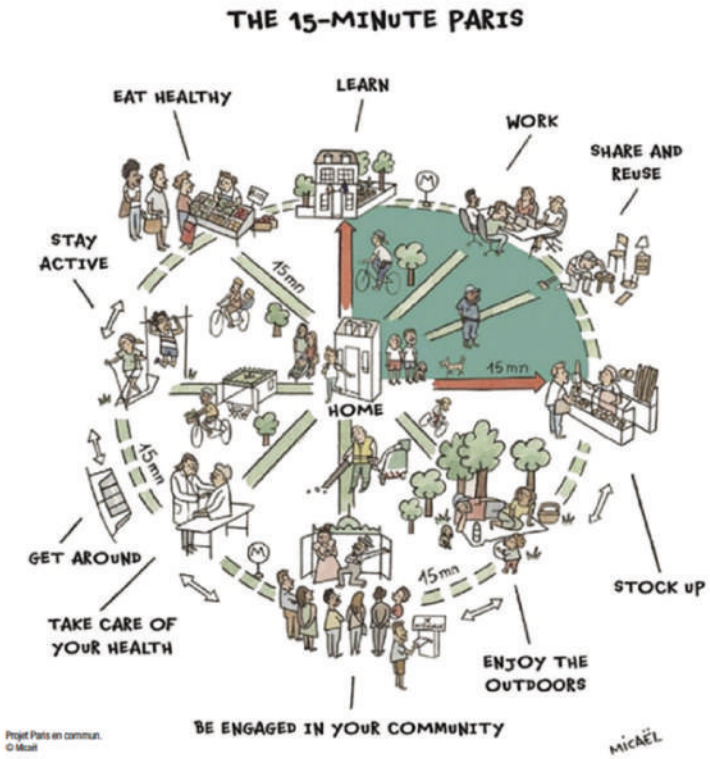

Figure 15. The 15-minute city applied to Paris

(Source: Projet Paris en commun in Soizic 2021)

The 20-minute neighbourhood

The concept resulting from improved zonal or neighbourhood units comes from other contexts. During the 2000s, the idea of the 20-minute neighbourhood was, for instance, studied in north-western cities of the United States (namely Portland) and later exported to other cities worldwide, such as Melbourne in Australia. With comparatively less stress put on city densification, the concept aims at providing inhabitants with (i) health facilities, (ii) schools, and (iii) markets within 800 metres of their place of residence. The 800-metre mark equals the average distance travelled within 20 minutes of walking.

In this concept, more extensive public transport options are also accessible by walking within 20 minutes. Public transport should provide access to larger-scale services and amenities a neighbourhood cannot develop.

Some cities have also played on the time element to suggest that 20 minutes is needed to make a round trip (two trips) instead of just one trip.

The previous three concepts are not exclusive; they can be combined or complementary, as they can all utilise the same tools to produce land-use/mobility integration.

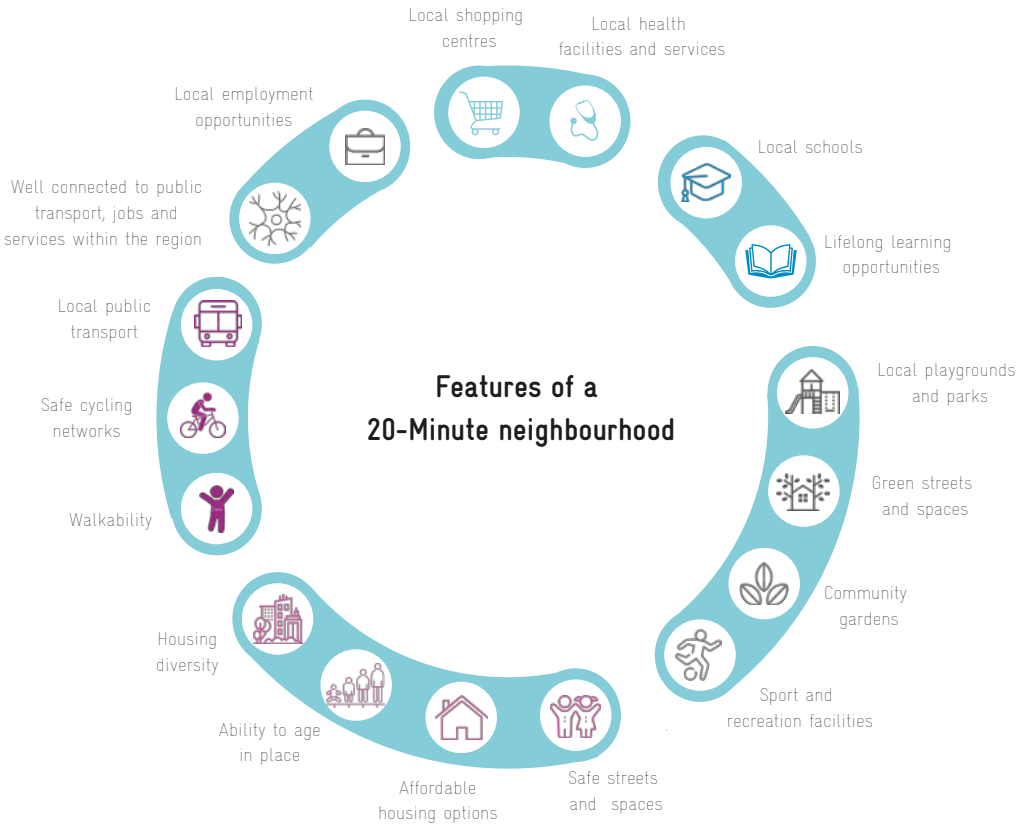

Figure 16. Victoria (Australia) interpretation of the 15-minute city, based on a 20-minute neighbourhood (Source: C40 Cities Climate Leadership Group 2020)

Linking land-use and mobility planning for a SUMP

The exponential urban growth experienced over the last 30 years in the Global South has highlighted the intimate link between urban planning and urban mobility planning. The lack of a bridge in planning between these two approaches, or even the absence of a mobility approach in some cases, has resulted in preparing documents that are quickly outdated and, therefore, relatively ineffective.

When a strategic urban planning document is being prepared or implemented, while the strategic mobility document – in this case, a SUMP – is being developed, planners should immediately establish a link between the two documents. This linkage must be carefully planned at all stages of the planning process to go beyond a mere wish. This chapter aims to identify the various actions to ensure the link between urban planning and mobility planning while producing a SUMP.

Focus on the SUMP planning process

The European Commission defined SUMP central vision and objectives, which have since been adopted and adapted to suit, for instance, cities in the Global South. About the latter, MobiliseYourCity SUMPs seek improvement of urban accessibility and better quality of life through the provision and promotion of sustainable mobility and take into account common characteristics of many Global South contexts: (i) lack or insufficient technical capacities that constrain decision-makers choices; (ii) lags in governance and institutional frameworks; (iii) lower motorisation levels and, hence, a rapid future growth in this regard; (iv) existence of paratransit services and their place as a critical element in the public transport system; (v) lack of updated or missing qualitative and quantitative data; and (vi) scarce financial resources to fund urban mobility.

SUMPs express, through a detailed document and subsequent action plan, a long-term vision adapted to address mobility issues.

Figure 17. The SUMP Cycle

The sections below present a simplified and summarised description of the planning process, highlighting the link between land-use planning and mobility. They highlight opportunities for land-use/mobility planning integration and point to certain likely obstacles in the quest for this integration. For a more detailed presentation of the SUMP planning process, several MobiliseYourCity documents are available, most notably the SUMP guidelines[16].

Phase 1: Preparation and analysis

It is necessary to draw a picture of what is currently happening in the mobility system and what trends are arising to start the planning process of a SUMP. The diagnosis element (Step 3, Figure 17) is vital in the entire process: it sets the base of the cycle. It consolidates initial data and information to compare or measure to concretely quantify evolutions in the system resulting from a SUMP implementation. This type of approach closely aligns with the MRVapproach, which depends on continuously monitoring how the situation evolves during and after the planning process.

[16] Developing Sustainable Urban Mobility Plans – Guidelines for MobiliseYourCity Geographies

BOX 5 Considerations on land use issues when preparing a metropolitan SUMP

A metropolitan SUMP should build on a thorough assessment of the current and future performance of the transport system and land use patterns in the whole metropolitan region. A comprehensive review of the current situation of the urban core and its commuter belt is fundamental to drawing the baseline against which results can be measured.

Source: Chinellato & Morfoulaki, 2019

One first step is fully grasping the planning environment and primary stakeholders. Understanding this planning framework is critical. More precisely, when seeking land-use planning and mobility planning integration, the essential part is identifying who is responsible for land-use planning and who conducts mobility planning. Often, two different institutions hold these roles. In most cases, efforts to improve or optimise integration are needed.

Identifying the existence or not of planning documents is essential too. A land-use plan at the metropolitan level is a robust foundation for subsequent mobility planning efforts.

The diagnosis of the situation ought to include an assessment of how the current mobility system is answering to urban growth (demographic and territorial) and how it adapts to the vision for the metropolitan area defined in the land-use plan. This assessment must identify the opportunities to improve land-use/mobility planning.

Phase 2: Vision, goal setting, and scenario building

The second phase of the SUMP planning process is more prospective than the earlier one. The effort of defining multiple scenarios – and assessing them – (Step 4, Figure 17) should highlight manners of improving land-use efficiency. Based on the strategic urban vision, this process implies setting up scenarios that efficiently answer demand evolutions and trends and propose a system that supports the land-use structure for short-, medium- and long-terms.

Subsequent analyses should focus on the proposed alternatives the mobility scenarios might have. In general, SUMP planning processes use three scenarios under two different approaches. First, the most common approach to building scenarios is to have the BAU[17] scenario and two other scenarios that are sufficiently contrasted against each other and with varying levels of ambition. This approach often results in the latter two scenarios being one ambitious scenario and the other mildly ambitious. The second approach to defining scenarios compares the BAU scenario to two similarly ambitious scenarios.

[17] BAU: Business as usual scenario. This scenario proposes a vision of the future mobility system basing it strictly on what trends exist and what projects that have already been validated and that will be implemented existed before the beginning of the SUMP planning process.

Figure 18. Types of scenarios when preparing a SUMP

The appraisal to select one SUMP scenario from the initial three options comes from a multivariable analysis that must include variables on the link between the land-use vision and how, from the mobility scenarios, each responds to it (Step 6, Figure 17).

Phase 3: Measure planning

The objective of Phase 3 is to concretise the proposed link between land use and mobility planning. Within Phase 3, Step 7 (Figure 17) intends to produce measures or actions that support the vision and improves land-use efficiency; Step 8 (Figure 17) seeks to set a clear timeline and priorities for standards, and; Step 9 (Figure 17) aims to define quantitative and qualitative indicators associated to proposed measures that will help in monitoring the implementation of the SUMP. Clear indications of what funding sources will be available and what institution oversees implementation should accompany these elements.

A few mobility improvement measures are decided while developing planning documents, which can influence urban regulations and land uses by extension. These measures can be taken at two scales of regulatory urban planning documents, planning documents (Master Plans at scales larger than 1:2000 or Detailed Urban Plans between scales of 1:500 and 1:2000). Three mobility-related actions can, in particular, influence urban regulation and land use:

- Widening of existing roads through their requalification: In this case, with a view of specific developments to implement public transport in dedicated lanes or walking and cycling mobility developments, primary, secondary, or tertiary roads can be widened. An urbanisation freeze can

therefore be introduced within a perimeter on either side of these roads. It will allow a widening (which may be progressive) of the roads by pushing back building rights. The space gained can then allow for the widening or multiplication of mobility infrastructures.

- Creation of secondary and tertiary poles: Urban planning documents can facilitate the emergence of secondary and tertiary urban centralities or hubs at the crossroads of major transport routes. Such emergence will promote urban density and compactness. New poles or hubs will concentrate on socio-community facilities and local services for the population. The emergence of these secondary poles requires action on existing land reserves or their creation by public authorities so that they can mix with local service functions assigned to them. Indeed, the challenge is to limit the effects of the displacement of populations from the peripheral districts towards the facilities and services generally located in the city centres. These secondary centres must accommodate local facilities that can be reached on foot within population catchment areas of around 20,000 inhabitants.
- Verticalisation, density and functional mixture along the main transport axes: These corridors must be subject to specific regulatory provisions superimposed along the primary and secondary roads, regardless of the use of the area concerned. This provision aims to encourage development or urban densification along the city's major highways to give them the character of an "urban boulevard". The purpose of these memorable authorisation lines is to encourage, based on urban regulations, the establishment of commercial activities on the ground floor. In contrast, the upper floors of the buildings contain residential or tertiary functions. This provision proposes a mix of uses along the main roads and theoretically increases land value. These provisions also aim to allow potential investors to build higher on determined portions of the territory to create a homogeneous and structured landscape in a logic of accompanying densification. The occupancy rate will be at least 60% of the plot and 80% of the plot surface. In addition, to promote the densification of these primary and secondary axes, there are no restrictions on the height of buildings or their external appearance.

Phase 4: Implementation and monitoring

Implementation and monitoring efforts comprise the SUMP cycle's fourth and last phases. The most important steps here consist of (1) designing an implementation plan (Step 10, Figure 17) and (2) reviewing and assessing what successes or failures occurred during and after the implementation of the SUMP (Steps 11 and 12, Figure 17).

Land-use/mobility planning integration should occur according to SUMP choices. In this phase, it will be necessary to monitor if integration is happening and to develop strategies to improve integration if it is deemed insufficient.

Understanding the link from the onset and setting up the process

(SUMP Phase 1 – Preparation and analysis)

There are four prerequisites during the diagnostic stage for identifying the existing links between land-use planning and mobility planning and for fulfilling the opportunity to establish or strengthen ties in developing a SUMP. Sections below depict these pre-requisites:

Making sure all stakeholders are accounted for

The first step is to identify the strategic and operational stakeholders involved in planning processes, whether at the national, regional/departmental, or local level (Step 1, Figure 17). A successful planning process involves all the relevant stakeholders to reach a political consensus and a shared vision. Stakeholders might be: (i) planning authorities (decision-makers in charge of leading the SUMP), (ii) institutional stakeholders, including institutions that mobilised in the preparation of a SUMP, (iii) other vital stakeholders: individuals, groups or organisations impacted by the SUMP, and (iv) citizens.

From this standpoint, all institutional stakeholders involved in planning, production or urban management must be at least identified. This entails analysing the responsibilities, vision and actions of these institutions, as well as their collaboration practices, to evaluate the transversality and inclusiveness of past planning processes. This analysis should take place relatively quickly by reviewing each stakeholder's responsibilities, interviewing the institutions concerned and analysing available minutes of past meetings. Certain institutions responsible for urban planning or mobility processes may sometimes have internal departments and sectoral competencies. These can sometimes be misused; institutions must immediately identify this eventual weakness.

The initiator of the process must identify all the other stakeholders involved in the consultation launched when the SUMP process begins. MobiliseYourCity's topic guide on Participatory processes in Urban Mobility Planning[18] introduces several tools and recommendations that delve into detailed approaches. The sections below use the guide's definitions to focus solely on land-use/mobility integration efforts and what planning authorities should do.

Objectives	◢ Identification of strategic institutional stakeholders and operational, institutional stakeholders ◢ Identification of other key stakeholders, which can notably include NGOs and user associations
Appropriate actions	◢ Analysis of institutions' remit and organisation ◢ Analysis of the action and the role to be played by each stakeholder
Possible tools	◢ Interviews ◢ Workshops

Table 1. Key elements to make sure all stakeholders are accounted for

[18] To download the topic guide: Topic guide - Participatory processes in urban mobility planning | MobiliseYourCity

Case 6 | The Path towards setting up a mobility Authority in Tangier

Currently developing a SUMP, the Moroccan city of Tangier is seeking to redistribute responsibilities on mobility planning to improve, amongst other objectives, land-use and mobility planning linkages. Urban planning responsibilities are well-defined and attributed to the current situation, but several institutions share mobility planning responsibilities.

On the one hand, the Agence Urbaine de Tangier is responsible for producing and enacting strategic urban planning documents and more operational documents. This agency guarantees coherence between land-use documents and other institutions' strategic documents.

On the other hand, three leading institutions hold strategic mobility planning responsibilities. First, at the national level, the DGCT[19] is responsible for defining national-level policies for urban mobility and public transport. These principles are then to be operationalised by the DMUT[20] by way of more precise and territorially defined programmes. And third, at the metropolitan level, the DRETLET[21] aims to implement the Government's policy on road transport, most notably by defining a regulatory framework for various transport systems. Therefore, there is an inherent complexity in identifying the preferred institution to seek land-use/mobility planning integration with many institutions involved.

Even before producing a SUMP, local stakeholders have prioritised mobility planning responsibilities under one institution. The SUMP process further supported this objective, partly to mitigate likely gaps in the land-use/mobility planning discussion. Efforts thus focus on setting up an entity that will take on strategic and tactical mobility planning tasks: this SDL[22] should provide a more straightforward path to integrating land-use planning and mobility planning by simplifying the discussion process.

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[19] DCGT; Direction Générale des Collectivités Territoriales, or General Office of Local Government if translated

[20] DMUT: Direction de la Mobilité Urbaine des Transports, or Urban Mobiliity and Transport office, if translated

[21] DRETLET: Direction Régionale de l'Equipement, du Transport et de la Logistique et de l'Eau de Tanger, or Regional Office for Transport Facilities and Logistics and Water Works in Tangiers

[22] SDL: Société de Développement Local or, translated, Local Development Office.

Using events to prepare stakeholders for the upcoming process

The initial phase of a SUMP should ideally start with a major workshop (MobiliseDays) to launch the process. This event brings together institutional stakeholders who will be most involved in SUMP development. The MobiliseDays should develop a co-construction logic and communicate the importance of the link between mobility and land-use planning (Step 2, Figure 17).

Unfortunately, many institutional stakeholders still do not make direct links between land use and mobility. Their sectoral vision and expertise, however good it may be, does not always lead them to anticipate and visualise what the beneficial effects of this linkage may be in the long term. Bringing together institutional stakeholders involved should therefore enable the institution carrying out the SUMP process to:

- Raising the awareness of strong and inseparable links between urban planning and mobility planning in the urban fabric, in particular by making the connexion between densification, public transport and active modes, by also presenting the significant concepts of TOD and the 15-minute city;
- Communicating on a larger scale and involving the media in the following stages of the SUMP process will lead to a consensual strategy.

Objectives	◢ Improved awareness of the co-construction process to come ◢ Definition of a targeted capacity-building process
Appropriate actions	◢ Organisation of a federative event gathering all relevant stakeholders ◢ Communication on the initial workshop ◢ Definition of a capacity building programme for institutional stakeholders
Possible tools	◢ Workshops ◢ Capacity building process

Table 2. Key elements to use events to prepare stakeholders

Understanding the place of binding documents and the structures of existing regulatory frameworks

The second stage consists of analysing all existing urban planning documents (strategic or regulatory), including recently published ones or those requiring an update. This stage is part of Step 3 (Figure 17). Analyses must include all relevant regulatory frameworks and legal documents, identification of urban dysfunctions and strategic documents guiding urban development and growth.

The analysis of existing legally binding texts is critical. It is necessary to identify and analyse legislation on spatial planning and mobility/transport planning, significantly if the regulatory framework constrains institutional stakeholders, particularly within the framework of producing planning documents. As part of identifying institutional stakeholders', a cross-cutting approach to urban planning and mobility planning can also be determined by analysing the respective responsibilities of institutions involved in the process.

Suppose a SUMP is in the process of being prepared. In that case, analysing past and current planning documents should make it possible to understand whether there are precedents for linking mobility and land use planning. If so, identify how much this link should be strengthened or improved. In many planning documents, the connection between urbanism and mobility is present but, ultimately, relatively poorly thought out, with limited or no impact on pre-existing mobility dysfunctions. From this standpoint, a diagnosis of the area should also help identify what has not worked in the past and pre-identify the objectives to achieve in the link between urban planning and mobility. This way, the SUMP can influence all the strategic or regulatory urban planning documents to finance, produce or revise in the coming years.

Objectives	◢ Identification and analysis of all existing (and relevant) urban planning and mobility documents
Appropriate actions	◢ Analysis of the impact of binding documents on mobility choices
Possible tools	◢ Desk research ◢ Interviews ◢ Workshops ◢ Technical meetings ◢ Focus groups

Table 3. Key elements to understand the place of binding documents and the structure of existing regulatory frameworks

Assessing and territorialising available data

In parallel with identifying primary stakeholders, the SUMP process seeks, first and foremost, the definition of the long-term (approximately 20 years) mobility vision. Therefore, it is critical to project and grasp the territory in the coming years. There are four key elements to analyse, the detail degree varying depending on the quality of available data:

Demographic growth, ideally presented for short-, medium-, and long-term dates and identifying how the population will spread across the territory. Data should also allow for estimating population densities throughout the urban region.

Job quantity and location trends are ideally presented on a per-annum basis. A key element in the Global South is understanding the distinction between formal and informal jobs, which are often overlooked even if they represent most jobs in the city.

Localisation of main activity areas and amenities (metropolitan level facilities, major trip generators) and identifying where new locations will be. Ideally, there should be a typology of facilities and the definition of their influence scale.

Location and the expected delivery date of projected main infrastructure projects can impact the Metropolitan Scale. Often limited to road-based infrastructure, other elements might also be present if deemed pertinent in the analysis.

When data is not readily available, it is vital to either produce it by way of field surveys or to seek alternatives that can substitute missing information or mitigate the lack of data. The above list comprises data that all urban territories should have. Often presented in layers, it is helpful to territorialise available information. It can help identify gaps or lags and pinpoint areas of particular interest in planning.

All this data is often already contained in strategic planning documents and, namely, in land-use planning documents. In the SUMP process, except for when data lags are confirmed, it is preferable to use data contained in land-use planning documents and, eventually, adapt it to timeframes and the needed level of detail. Contrasts between the strategic land-use planning document and the SUMP should be avoided regarding quantitative data.

Objectives	◢ Collection of available data ◢ Assessment of data quality and update levels ◢ Identification of data ownership
Appropriate actions	◢ Analysis of available data and identification of data needs ◢ Definition of approaches to collect missing data or mitigation of its impact
Possible tools	◢ Databases ◢ Territorialisation of data ◢ Geographic Information Systems ◢ Data collection campaigns

Table 4. Key elements to assess and territorialise data

Defining the link between land-use and mobility programmes

(SUMP Phase 2 – Vision, goal setting, and scenario building)

The usefulness and relevance of a SUMP lies in its strategic dimension, i.e., the development of a clear roadmap to achieve the objectives set by public institutions in terms of mobility and urban planning.

The preparation of this strategy must emanate from a clear vision of mobility, specifically on an urban functioning, which optimises its mobility by coordinating as best as possible with land use. Nevertheless, as explained above, the city and transport planning institutions often cannot project themselves on differentiated operating models. This silo-based logic is evident when urban planners seek urban development only through urban sprawl and mobility improvement through new road sections and heavy public transport infrastructures.

Raising awareness and seeking paradigm shifts

In the institutional set-up, the complexity of the exercise lies in the likely need for a paradigm shift. Substituting well-established practices and habits with new ones is a significant challenge for many institutional stakeholders and decision-makers, while the objectives of urban densification or modal shift are not even imagined or perceived as simply impossible. Moving towards a renewed and modern vision of mobility, necessarily integrating a solid link with the issues of land use and urban densification, requires the person responsible for drawing up the document to prepare all the stakeholders for the necessity and the possibility of changing the paradigm.

Urban planners can carry out this exercise in the context of workshops focused on defining the vision and then the scenario, during which they present mobility dynamics and results to all relevant stakeholders. They should highlight the shortcomings of the current urban organisation and mobility system based on figures that value the congestion and pollution rates of the urban area. As far as possible, institutional stakeholders should identify these dysfunctions during these workshops to take ownership of the approach and make alternative proposals supported by mobility experts.

Very schematically, it is only when all the players in the process question the paradigm that they can collectively work on developing a new vision of the city's organisation and mobility. As the exercise is prospective, the workshop should help to explain the logic of projected scenarios and what changes or adaptations to propose.

Objectives	◢ Development of a clear vision that highlights linkages between land-use planning and mobility planning ◢ Efforts to raise awareness of mobility challenges ◢ Explanation and efforts to secure buy-in for the process
Appropriate actions	◢ Communicating changes needed ◢ Communicating to account for the levels of understanding of mobility topics of all stakeholders ◢ Advocacy for solid consideration of land use planning in the SUMP vision and possible scenarios
Possible tools	◢ Workshop

Table 5. Key elements to raise awareness and to seek paradigm shifts

Case 7 | Eastern-Europe city and the problematic paradigm shift on mobility

Within the framework of an urban project financed by a European donor, the Institute of Urban Planning of the capital of an Eastern European country (attached to the Ministry for Spatial Planning, Infrastructure and Construction) received support in the preparation of an Urban Plan, the superior regulatory urban planning document (scale 1:5,000). This support focuses specifically on the themes of urban mobility and green spaces.

The Institute of Urban Planning wanted to receive support on urban mobility during the project, even though the process of drawing up the document had already been underway. When work started, the institution had already worked on an Urban Plan Concept (followed by the regulatory stages of pre-draft and final draft), including a chapter and, therefore, a specific concept on mobility.

It is worth noting in this case that the Ministry of Transport carried out a SUMP. However, the Institute of Urban Planning had not fully appropriated that developed strategy in its mobility concept. In addition, it seems the project's owner may not have consulted the Ministry of Traffic on the mobility component of the Urban Plan concept, which demonstrated the disconnection that can often exist between the institutions responsible for urban planning and those accountable for mobility planning.

While the Urban Plan should define the land use and urban regulations for the next decades once adopted, the mobility dimension needs to be re-assessed. The Urban Plan Concept essentially oriented mobility aspects towards a car-dependent model and the creation of new road infrastructure. Even before starting a process of collectively drawing up the vision of mobility and reaching a political consensus (including the Ministry of Transport, municipalities, private stakeholders of the transport sector, and associations), it was necessary to convince the Institute of Urban Planning experts of the necessity and the possibility of changing the paradigm of mobility, to move towards modal shifts and multimodality. Consequently, the Ministry of Transport conducted a workshop with them to question the mobility concept of the Urban Plan and present alternative solutions.

Defining scenarios supporting land-use and mobility integration

Defining SUMP scenarios (Step 4, Figure 17) relies on comparing the "business-as-usual" scenario and two other ones that envision an improved mobility situation in the long term. Optimising the link between land-use regulations and mobility programmes and regulations is necessary when defining the latter. When transport models are available, they can help present the outcomes of proposed measures for comparative purposes. For further detail on this approach, the Topic Guide on Modelling for Urban Mobility Planning[23] can be used as the base tool.

The objective is to strengthen the operational link between land use and mobility programmes by using the three planning scales introduced earlier.

At the Metropolitan Scale, it is critical to:

- Identify the location, the type (e.g., employment area, commercial, industrial, etc.) and the expected intensity of central urban nodes or hubs as defined in the strategic urban planning document. Hubs can either be existing or planned for forthcoming implementation, so it is necessary to produce a map of which hubs will exist for short-, medium- and long-term timeframes. While the short-term map is relatively set, medium- and short-term versions require flexibility to adapt scenarios to what is effectively programmed and implemented.
- Analyse possibilities for the morphology of the mobility network, with a particular interest in higher capacity

[23] To download the Topic Guide: Transport modelling for mobility planning | MobiliseYourCity

public transport modes. When high-capacity modes already exist, the objective is to build from the current network to link main activity hubs within the city. When no high-capacity options exist, it is necessary to delve into a morphological analysis of the network to select the best-suited form for the proposed public transport network. For short-, medium- and long-term, the submitted public transport network form must align with the locations of main activity hubs. Several morphological options exist (non-exhaustive list below):

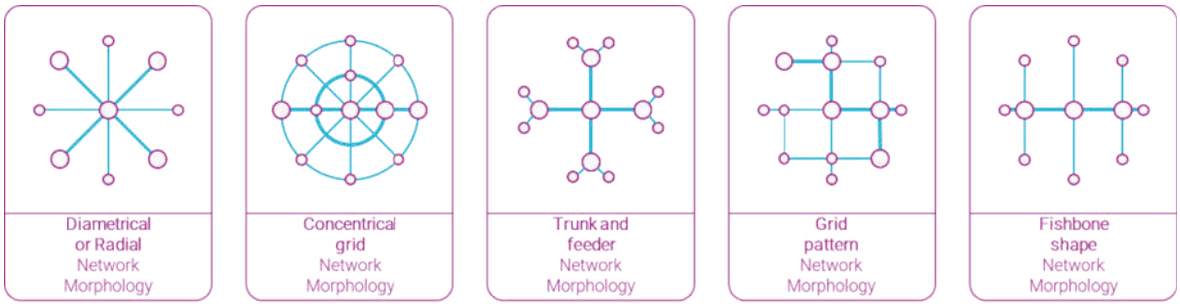


Figure 19. Schematic representation of selected network morphologies

- Propose scenarios for which metropolitan-scale public transport options are linked to major urban hubs or hubs expected to become significant hubs in the long term. Proposed scenarios can aim for TOD-based options or alternatives that suit the urban context.

At the Corridor Scale, the SUMP has a twofold objective to improve land use and mobility integration. First, it should focus on structuring higher-capacity public transport corridors, prioritising public transport over individual motorised modes to encourage users to rely on efficient public transport supply to reach the main activity areas of the city. Public transit prioritisation will improve the attractiveness of selected hubs while ensuring accessibility is adequate. Second, scenarios must include alternatives to channel and manage parking options for individual motorised modes and freight-related trips. This approach will help improve public road usage, a key element when seeking robust links between mobility and land use.

About the Zonal Scale, when preparing SUMP scenarios, it is necessary to introduce mobility alternatives that allow for mixed land usage. Through traffic should ideally be transferred to main road infrastructures, thus away from internal zones. As defined in the strategic land-use planning document, secondary hubs should be accessible using medium and lower-capacity public transport options and individual motorised. The latter often requires alternatives by introducing more adapted regulations to manage them best. Finally, when the urban context allows for it at this scale, scenarios can introduce cycling networks around hubs and link them to mainly residential areas. Accessibility to health infrastructures, satellite administrative buildings, universities and secondary commercial spaces must be guaranteed.

Finally, at the Local or Neighbourhood scale, SUMP scenarios focus on improving local scale accessibility for specific modes. More concretely, this entails enhanced management of public spaces for mobility by way of:

- Proposing adequate walking and cycling conditions inside neighbourhoods, especially around schools and local-level commercial areas. This can include more shaded paths or sidewalks without private commercial activities occupying this space.

- Analysing the possibility of implementing pedestrian or traffic calming areas around local-level hubs.
- Introducing parking policies to reduce, when possible, motorised travel inside neighbourhoods.

SUMPs often require at least two scenarios other than the BAU scenario. Therefore, there can be substantial variation between proposed scenarios while maintaining a robust link between mobility and land use. Selecting one scenario must result from a multivariable analysis in which the connection between land use and mobility is one of the main variables.

Objectives	◢ Optimisation of the link between land-use regulations and mobility programmes ◢ Revision of scenario alternatives most convenient to encourage mixed land uses ◢ The connection between land use and mobility aspects in all scenarios
Appropriate actions	◢ Revision of scenarios, including land-use/mobility integration as a critical element of analysis ◢ Inclusion of active modes in planning processes ◢ Analysis of TOD options ◢ Analysis on whether the 15-minute city model, the 20-minute neighbourhood (or other similar model) is adapted
Possible tools	◢ Scenario presentations at different technical detail levels ◢ Organisation of presentation sessions for civil society ◢ Transport model, when available ◢ Workshop (decision-making process)

Table 6. Key elements to define scenarios supporting land-use and mobility integration

Defining concrete measures toward land-use/mobility integration

(SUMP Phase 3 – Measure planning)

The objective of this phase is to operationalise the vision (shared by all stakeholders), to translate it into a realistic scenario, and, more importantly, to define a concrete action plan (Step 7, Figure 17), which, when implemented, will materialise the vision. Initially, the chosen scenario is only a general orientation, which needs translation into more concrete spatial planning.

At this stage, analysis of the Action Plan (organisation, priorities, timeframes, linkages) takes place, and the core of the technical dialogue between the urban planners, mobility experts, and all the other numerous stakeholders involved in the process occurs. The desire for urban sustainability, a more compact city, a reduction in travel times and CO2 emissions, improved efficiency of transport systems and non-motorised mobility, and quality of life enhancements (see Phase 2 presentation) are core concerns which must guide decision-making. These concepts will result from previous analyses on demographic projections, the desired urban development (localised sprawl, densification, etc.), the location of major facilities, residential and business areas, mixed uses, significant natural areas and major transport infrastructures (mainly road-based and rail-based higher capacity modes).

Regarding land-use/mobility integration, the SUMP should at least define the following:

- Location of the primary and secondary multimodal road network infrastructure in the urban area (existing, to be created or to be upgraded).
- Location of the rail-based transport supply (existing, to be created or to be upgraded) and any other mass transit axis.
- Readability of major multimodal hubs as well as local multimodal hubs.
- Location of proposed pedestrian areas (exclusive or adaptable).

Although the SUMP is critical when establishing a mobility strategy and providing a legal basis (partly because it can be binding to all institutions), its subsequent implementation is not guaranteed. Although the Action Plan emanates from a multi-stakeholder consultation and a strong political consensus, robust policies must support its performance at the different stages of urban planning. Disconnections between urban planning and mobility approaches can occur, as several cases have proven (cf. Case 7, above).

A SUMP's strategy and significant spatial orientations can happen on the various scales of urban planning and development documents for effective implementation. Institutions must strongly support the Action Plan, from a financial point of view, to include it in the following:

- A city's Master Plan (strategic urban planning documents that can be binding to all institutions).
- A city's Local Urban Plan (a regulatory urban planning document that administrations and third parties can challenge).
- Detailed urban plans (regulatory urban planning documents at the district or neighbourhood level, binding to institutions and third parties).
- Urban design documents (regulatory urban design documents at the street level), binding to institutions and third parties.

In many cases, actions about mobility improvement in the Global South do not necessarily occur within a SUMP's framework. Still, they can also occur in programmes that result from different planning processes. At an area-based/corridor scale or a local scale, as seen for Ouagadougou above, there was the PDDO2 programme (AFD financed project), where the planning of a new structure of the city was done through the planning of secondary polarities, linked by public transport hubs. Likewise, in Sousse in Tunisia, within the framework of the PUDi (SECO-financed project), a specific study on the 15-minute city has been developed and included in a more comprehensive integrated urban development project.

The SUMP is a strategic document that defines the axes and areas that need special attention from a mobility standpoint. The SUMP reflects the political-institutional vision regarding mobility and establishes a roadmap for action. Applying urban planning documents at different scales will impact its implementation and, ultimately, the link between mobility and land use (Step 8, Figure 17).

At the larger scale of urban planning, SUMPs must feed the Master Plan document, a strategic urban planning document only binding to institutions (at 1/20,000 scale or more). The Master Plan sets directives and principles for lower planning documents. This document's objectives are defining the long-term main strategic orientations for the city (10 to 30 years). The SUMP can enrich a Master Plan via general recommendations and rough graphic elements.

At a lower scale of urban planning, the strategy of the SUMP included in the Master Plan will allow for influencing the content of the Local Urban Plan (also called land-use plan, from 1/2,000 to 1/5,000 scale) and the detailed land-use plans (1/500 to 1/1,000 scale), more focused on the District or Neighbourhood Scale. These documents are regulatory urban planning documents binding for institutions and third parties. They aim to regulate public and private land use. In those types of documents, the link made between land use and mobility is expressed via (i) defining urban rules in TOD areas, such as plot sizes, heights of buildings, functional mixing rules (residential and tertiary), density rules, façade seatbacks (for urban mobility) and parking rules; (ii) defining active mobility corridors and transport connections; and (iii) zooming on main hubs (multimodal interchanges, transport corridors and non-motorised transport axes).

Finally, the mobility strategy defined in the SUMP can also influence the lower scale of planning documents. Urban design plans are the most detailed plans. They describe very precisely the land use and

the development to implement. Urban design documents are also regulatory urban planning documents binding for institutions and third parties. This document is the most relevant to link land use and mobility in detail, particularly regarding implementing the TOD concept or any other concept fortifying the land-use/mobility planning link.

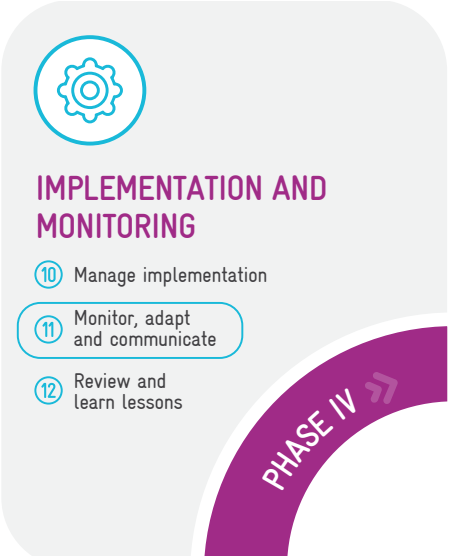
Objectives	◢ Introduction of specific measures on land-use/mobility integration ◢ Development of coherence and complementarity between strategic planning documents, using the strategic land-use document as the base for proposals ◢ Definition of elements from the SUMP to include in urban planning regulatory documents
Appropriate actions	◢ Introduction of an institutional dialogue arena for land-use/mobility integration regarding SUMP measures ◢ Active support for the opening of mobility measures in planning documents ◢ Definition of SUMP indicators to measure the coherence of land-use/mobility integration evolution
Possible tools	◢ Discussion and explanation with pertinent indicators with institutional stakeholders ◢ Introduction of periodic meetings between affected institutional stakeholders ◢ Joint analyses on best approaches to achieve integration ◢ Development of guidelines for institutional stakeholders to help sometimes navigate complex action plans ◢ In some cases, efforts to produce binding documents at the metropolitan scale

Table 7. Key elements to define concrete measures towards land-use/mobility integration

Implementing the envisioned land use and urban mobility link

(SUMP Phase 4 – Implementation and monitoring)

Setting the Action Plan in motion and continuously monitoring its implementation at this process stage requires effort. During the implementation phases of SUMP processes, the overarching directives have been set; different institutional stakeholders will be required to enact measures at different scales and begin producing concrete programmes about mobility, and in this case, the link between land use and mobility.



A SUMP plan that values the link between land use and mobility can follow broad directives and adapt to situations as they arise during implementation. To do so, indicators must help identify delays or hurdles to clear for adequate performance. Monitoring also entails, in some cases, adapting the initial plan: that is, maintaining the broad directives (no radical change to the Action Plan and the principles set by the SUMP) and allowing for some programmes at the urban and local scales to modify initial expectations (perimeters, timeframes, and locations) to suit the contextual situation best. Communication among institutional stakeholders and periodic meetings between the SUMP implementing agency and its main institutional partners are key if changes are required. Furthermore, all differences must be communicated and justified to other stakeholders. Hence, when seeking a fruitful land-use/mobility link, the dialogue between stakeholders should also allow for feedback between more Local and Zonal Scale Plans and the larger Action Plan, the latter being able to bring forward information to justify adaptations when warranted.

A clear example of this can be the decision to urbanise a particular area initially not targeted to be so; the causes of this situation are many, and it is often common in the Global South. Even if the SUMP could not foresee this change, the plan must be adaptable enough to propose solutions for this new area. The objective becomes two-fold: first, avoid, when possible, the need to rework the entire SUMP and maintain the primary directives of the plan, and second, develop a strategy for the new sector congruent with the general mobility vision.

Excessively rigid directives on how to enact land-use and mobility integration can often fail to consider urban dynamics that will reshape the city and its structure and, as a result, require more tailored solutions from a mobility standpoint.

Similarly, all implementation efforts and build projects resulting from the SUMP or from land-use strategic and detailed documents can produce insights and lessons on positive and negative unforeseen impacts. This information is valuable for a specific territory's existing and future SUMPs. Data might come from institutional stakeholders and other stakeholders, including citizen's associations, commercial or industry representatives or, for instance, NGOs. Channels should be available to allow implementing agencies to receive information, analyse it and use it to propose mitigating measures for negative consequences

or review outcomes of comparable projects and detailed plans. Assessment of plans, projects and programmes is a crucial feature of the SUMP process, and the link between land use and mobility should also be included in these efforts.

Objectives	◢ Monitoring and evaluation of land use and mobility integration ◢ Revision of adaptations when required, maintaining the general vision of the SUMP ◢ Feedback from all implementation efforts
Appropriate actions	◢ Adaptation of urban and local scale actions when required ◢ Inclusion of new dynamics and response to them ◢ Continuous monitoring of SUMP indicators about land-use/mobility integration
Possible tools	◢ Organisation of periodic meetings ◢ Implementation of channels to communicate on implementation efforts that include all stakeholders

Table 8. Key elements to implement and monitor

Conclusion

SUMPs are a right step for land-use/mobility planning integration

Urban planning defines land use and cannot be conducted without fully integrating a strategic mobility vision. The latter captures how people travel, thus embodying the issues of mobility within the city and, thus, its structure. Urban planning and mobility planning must be indissociable. The SUMP is an unavoidable tool to be employed when seeking land-use/mobility planning integration. It is also helpful for guiding decisions and measures affecting land-use processes. Although arguably not the only solution, SUMPs do promise to improve accessibility, travel conditions and, by extension, the quality of life of citizens. SUMPs, when implemented, reflect institutions' understanding of the need to integrate mobility planning as part of urban planning and design.

Over the last few decades, the urban mobility approach has become increasingly important, following a deeper understanding and awareness of the existing issues (e.g. urban sprawl, pollution, etc.). The increasingly frequent production of mobility planning documents aims at materialising visions and solutions as defined by institutions and city inhabitants. The existence of many SUMPs in recent years illustrates this and how integrating land use and mobility from the onset is critical to successful reform.

Nevertheless, recent improvements cannot hide the fact that most world cities, particularly those in the Global South, are still conducting planning processes (when these exist) that fail to consider urban mobility and its necessary integration into land-use plans. Notably, the completion of a mobility study or a transport plan does not automatically lead to adoption in the regulatory urban planning documents, which are the binding tools for the formal and controlled development of cities. Therefore, the coordination between mobility improvement guidelines and urban planning documents is not self-evident. It has to be organised (except for administrations systematically having an integrated approach to both aspects).

The improvement of urban mobility in all forms (active mobility, public transport, individual motorized vehicles) must be considered at varying scales, with different impacts. For each scale, from the macro to the micro, tools exist to design public space differently and regulate land use and urban density. In the end, the means for linking land use and urban mobility are well-known and do not require very complex engineering. Instead, they need adaptation to contexts characteristic of the Global South. Concretely, throughout the different planning stages, it is ultimately the process permitting co-construction and inter-actor dialogue (with a solid inter-institutional dimension) which will be the key to an integrated approach. This topic guide explains how to reconcile these two complementary and inseparable approaches, through a high level of consultation (public and private stakeholders and citizens) and collaborative efforts towards preparing planning documents for cities of the future, whether they already exist or are to be created.

What is the ideal moment to develop a SUMP?

Producing a SUMP is a complex task. Every city must consider strategic documents as a basis. Context is vital; institutional and regulatory contexts will likely determine the ideal moment for SUMP production. Broadly and schematically, four possibilities are likely to be encountered in developing a SUMP.

The most likely common situation is where urban strategic planning processes are not in place or abandoned. This situation denotes a context where, likely, the SUMP must be self-supported. Regarding land-use/mobility planning integration, the situation inherently impedes formal document integration as urban planning documentation is missing. Thus, the SUMP must define its vision and measures (or set of measures) to integrate land-use and mobility based on projects and programmes. The latter should include provisions that will impact urban forms and structures that the SUMP sees fit and can override the lack of urban strategic vision. This situation should not be an obstacle to the SUMP definition, as any SUMP includes short-, medium- and long-term actions that can help gradually implement measures to support urban and demographic growth and economic improvements.

Second, there is the possibility that a city may have recently produced or updated a Strategic Land-Use Plan, just about the time when the SUMP is expected to be defined. On the positive side, this allows the SUMP to take foundations in the strategic urban vision and develop the mobility vision accordingly. However, the demerit here is that an urban vision may be produced, which might not be pertinent or sufficiently realistic. In this case, the strategic urban vision will have defined growth patterns, expected urban structures and, in some cases, identified zones or corridors where mobility measures will support the land-use strategy. The SUMP can base its decisions and choices on expected urban form and urban structures. It should provide input into mobility patterns of the future urban territory while gradually introducing pertinent changes and more sustainable options for travel within the city. The SUMP will also provide sufficient measures to include in land-use regulatory documents to fulfil urban and mobility visions. This situation does not preclude the SUMP from questioning or challenging some choices in the strategic land-use plan or other existing documents. However, its effects are likely to be limited to the urban vision.

The third likely case is where Strategic Land-Use Plans are outdated or have been in place for a long time. Besides stating the mobility vision for the long-term, the critical issue for the SUMP definition is not to become obsolete when a new planning process for strategic land-use plans occurs. While it is not uncommon for a SUMP to be defined without the foundation of a strategic urban vision and strategy, decisions made can be challenged, overturned, or ignored when determining the strategic urban plan. It is likely that the SUMP will need to be updated and, consequently, should highlight areas where decision-makers for land-use planning and mobility planning can deliberate and discuss their visions, seeking to align them. In this case, SUMPs can serve as a basis for the inclusion of a mobility vision in future planning processes for land-use documents and can, in best cases, produce substantial insights that will shape the land-use vision.

The fourth and final case seldom occurs, although it is the ideal scenario when seeking integrated land-use and mobility visions. In this case, both documents are produced at the same time; therefore, strategic visions are defined simultaneously. Various rounds of discussion and stakeholder engagements are still required. In cases where outcomes are not ideal, this is often the result of incomplete processes. Both sides (land use or mobility) risk not being validated politically for various reasons. In such situations,

the general vision will be hampered as only one Action Plan is implemented, and only partially. Some key measures may be omitted when one of the strategic documents is not validated, thus weakening the impact the other document can have.

In any case, when preparing to undertake a SUMP process, it is necessary to assess current land-use/mobility integration levels and consider that time frames (i.e., for implementation, planning, etc.) may differ for strategic land-use documents and strategic mobility documents. However, both processes are necessarily intertwined and affect each other.

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