Planning urban mobility in developing countries for more energy-efficient cities: the required alliance between global objectives and local needs.

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Most of cities in developing countries (called for simplification “Southern cities” in the rest of the article) face the dual challenge of an extremely rapid urban transition and the energy transition. In this context of a potential explosion of Greenhouse Gas (GHG) emissions related to the increase in the demand for urban mobility, SUMP (Sustainable Urban Mobility Plan), or PDU in their French meaning (Plan de Déplacement Urbain), are becoming increasingly important. Southern cities are unique in many ways: in addition to their high population growth rate and weak local capacity, potentially major investments in the near future require specific and innovative solutions to face urban mobility challenges. This paper will discuss the major issues involved in adapting SUMP in southern cities, particularly the link between urban planning and transport, the social dimension of mobility, the overcoming of the North's mistakes, the governance and the financing of sustainable mobility improvement. It will rely on concrete illustrations in southern cities from the experience of the authors.

I. The new dynamism of urban mobility planning in the South for energy and congestion reasons

The multi-stakeholder initiative "Mobilize Your City", a result of the COP 21, started its implementation in 2017 and aims to help a hundred developing cities to get an efficient urban mobility planning, qualified as sustainable. The main motivation for this new program stems from the observation that a considerable leverage to reduce greenhouse gas emissions was in the mobility of future urban dwellers in southern cities. The argument used is that the mobility of people and goods is already responsible for more than a quarter of global CO2 emissions from
fossil fuels. However, these emissions, which are expected to increase by 70% by 2050, are the fastest growing sources of all emissions, particularly because of the growth in urban mobility in cities in developing countries, which is also increasing the problems of congestion. This urban transition, now well documented, will bring 70% of the world's population to live in the city by 2050 according to UN data. Cities which are joining the initiative commit to "reducing greenhouse gas emissions from urban transportation in our city by 25% in 2030 and by at least 50% in 2050, compared to a business as usual scenario. (Statement mentioned above)

In its message on "the accessibility we need" at the Habitat III international conference, the CODATU association argued that it is important to "develop Sustainable Urban Mobility Plans (SUMP) to organize spatial planning and transport, and build consensus around a shared vision for the city's development. Managers and policy-makers in developing countries, often overwhelmed by the day-to-day management of transport networks, are addressing sectorial issues in the very short term without adopting an interdisciplinary and longer-term approach. The SUMP is a strategic planning tool which aims to define a common perspective for the development of a sustainable multimodal mobility system. A shared vision also contributes to better planning and implementation of short-term projects. » (CODATU 2016, p 4)

Nowadays, SUMP can be articulated with NAMA, which are, in summary, tools from the UN climate change negotiations, as voluntary GHG reduction measures taken by developing countries. The implementation of a NAMA requires an impact monitoring method of the implemented efforts, called MRV (Measure, Report and Verify) system which guarantees a greater strength of the measurement system of potential and actual emissions reductions. NAMA implemented in transport sector are called Transport NAMA, or T-Nama. The methodological context which governs the implementation of T-NAMA is the A.S.I. approach (Avoid, Shift, Improve):

- Avoid: Limit mobility by motorized personal vehicles;

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1 MobilizeYourCity declaration, signed by the cities which are joining the initiative (08/2017 version of the document)
• Shift: Increase the modal share of trips made through sustainable modes (public transport, active modes such as walking or biking);
• Improve: Improve the energy efficiency of the trips that can not be avoided.

An Enable component is being added by some actors, including CODATU, to designate actions taken to improve transport planning through strengthening its institutions, both legislatively and in terms of human resources, at both local and national levels.

A database lists T-NAMA around the world is available: http://www.transport-namadatabase.org

This evolution follows the movement initiated in Europe (notably by the European Commission) until a decade ago to develop SUMP in the member states cities (A. May, 2015). Methodological guides have been published for this new generation of planning documents, which are expected to be more strategic, integrated and collaborative than the old transport schemes (Tomasoni, 2016).

Few studies focuses on these evolutions impacts, whether in the North (ELTISplus, 2014, A MAY, 2015), as in the South (ADB, 2009).

The main principles which emerge almost systematically from these guides, and which show an evolution compared to older planning practices, are particularly about the notion of sustainability, participatory processes, strategic and visionary conception of the method, integrated approach between sectors and actors, diagnosis and quantification of evolution when possible, specific nature of the produced document and its complementarities with existing planning documents.

In guides and manuals, these new principles have gradually emerged as necessary (but not sufficient) for mobility planning success. The transport concept is replaced by the mobility concept, which is more global, linked to the characteristics of individuals, and including active modes. But how can this approach be translated into the context of developing countries, subject to a double obligation of having to manage an historic urban transition, as well as an energy transition?
II. The features of developing cities and the challenges for planning mobility

The most obvious feature of southern cities is the fast growth of their population. The graph below shows this growth through the evolution of the urban population in selected African countries.

Illustration 1: Urban population growth in selected African countries - Graph: JJ Helluin with Gapminder software 08/2017, United Nations data.
The consequences for these cities of such a rate of demographic growth must be explained: with for example 7% of growth per year, which is a relatively high case but not exceptional, the population of a city will multiply by 4 in 20 years (according to a demographers well known formula) and its built area could then be multiplied by 9, according to a study initiated by the World Bank on 120 agglomerations and which demonstrates that, generally, the built area triples when the population doubles. (Angel S., 2012).

Under these conditions, it becomes difficult but even more essential to plan land use, urban services, and to imagine the future demand for transport, since the reality on the ground is often ahead of the planning process. The anticipation of the city extension, the corridors and the primary networks creation becomes essential, even if it is done in a very rough way.

If, in the North, long-term strategies are conceived based on fine analyzes, and therefore costly in time and money, planning is a process of another nature in southern cities, which must also produce long-terms visions, but also quickly set up the conditions for the implementation of these visions. In order to mobilize concerned actors and meet population support, it must lead as quickly as possible to significant improvements in population living conditions. These include congestion, pollution and health, comfort and safety of pedestrians, service provided by informal transport and street vending problems.

The second obvious feature is the weakness of human and financial resources available to local and national authorities to manage urban mobility. In Antananarivo, for example, an urban municipality of 2 million inhabitants in charge of urban transportation in its area, the municipal budget is about 8 million euros per year, which barely covers the salary of the 3 500 municipal agents, and which does not have a mobility study department or even one specialist on this. How, then, could be implemented a planning and local urban mobility policy? Not all southern cities are in such dramatic situations and they must be distinguished according to their capacity level to plan and implement local policies. A quote illustrates this:

"In Hanoi, we participated in the first articulated bus inauguration. Although old equipment, it carries 140 passengers for a consumption of 25 liters / 100 km. In Antananarivo, each one of the 125 Mazda minibuses of the 119 line carry 14 passengers (19 not respecting the standards), for a consumption of 15 liters / 100 km. Apart from this ecological tragedy that does not disturb the
climate change mundanities, it is above all a tragedy for competitiveness of Antananarivo" (Helluin, 2010, p7).

Kuznet's theory of environmental curves (Illustration 2), applied to urban development, provides a framework for thinking about these different capacity levels of cities to deal with a range of problems. Drawing on economist Mathew Khan's book (2006) on green cities, we propose a scheme which summarizes a set of empirical observations:

- With economic development, in a first phase, cities meet problems that they can not handle: for example solid wastes, floods, road safety, air pollution, socio-spatial inequalities and insecurity.
- Arrived in some threshold of development which depends on the problem category, some processes begin to be effectively implemented to mitigate the problem (local policies, civil society actions, new informal services, population awareness, etc.). Thus, urban air pollution becomes a concern from the moment when the most urgent problems have been resolved, such as food, hygiene or solid waste management. Gradually, more complex local problems are fixed, and then it is possible to deal with problems whose consequences do not directly affect the population of the city, such as GHG emissions.
- This implies that some cities are not able to solve some issues unless they receive effective and sustainable assistance.
- The development thresholds that allow trends to change are not precisely known and certainly differ according to the context. But it is possible to have rough estimates. It seems that below € 8K of GDP per capita, a city can’t even deal with the urgent problems it faces, such as waste management. Below 20K € of GDP per capita, GHG emissions are certainly not in the priorities for local actors.

Of course, this scheme is simplistic. It can be criticized for not being relevant when pollution has irreversible effects, for not relying on extensive historical research on all cities in the world (they do not exist), or for not considering possible variations, at the same development level, depending, for example, on the quality of local governance. There is an immense field of research to improve the knowledge we have of the historical trajectories of cities according to their
development level and the long term impact of the local public policies. In the meantime, this first curves matches with the trends observed in a group of southern and northern cities:

![Diagram showing Kuznet curves for different types of urban problems.](image)

**Illustration 2: Approximate Kuznet curves for three types of urban problems. Conceived by JJ Helluin, reference: Kahn, 2006.**

A third feature of the southern cities is that they will know, for some, massive investments in the coming decades, whether it is about settlement investments or to catch up the accumulated previous under investment. T. Paulais (2012, p. 124) estimates these investment needs for basic infrastructure in urban areas for sub-Saharan Africa, by various methods, around $25 billion/year. This amount relates to basic infrastructure and does not include mass transport, which will also have to go with all investments and will structure the urban form for upcoming decades and perhaps centuries. From then on, two scenarios stand out:

- Either this minimum amount is not realized in some cities, and the difference, in current contexts of very limited access to land for the poorest, will automatically result in the creation of slums or informal settlements, which will have to assume future greater costs and investments.
Either these amounts are reached and they involve considerable challenges of integration and coordination between programs and actors. This coordination can be more difficult in contexts of great weakness of local authorities, lack of local specialists in urban development, fragmentation of international assistance, in countries where the states have often practiced long-standing anti-urban bias (Prud'homme 2007, Helluin 2009).

These three main features of southern cities imply specific difficulties for planning urban mobility, which could thwart any attempt to copy and paste the SUMP approach as initially designed for European cities. It is proposed here to analyze in particular four essential questions that must be addressed so that the SUMP could ambition to have a positive impact: land use - transport articulation; social question policies; overcoming North errors or limitations, and sustainable financing.

III. The challenge of linking urban planning and transport
Since at least the beginning of the 2000s, practionners of urban planning and urban mobility, in Europe and in America, have agreed to emphasize the importance of successfully linking urban planning and transport and systemic relations between these practices, which have often been ignored in the past\(^2\). An illustration produced by the Urban Planning Agency of Lyon Metropolitan Area illustrates the approach, which should inspire the large southern cities:

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\(^2\) See, for example, the CERTU IUD (Interface Urbanisme Déplacement) program in France, in the early 2000s following the Solidarity and Urban Development law, and the emergence of strategic urban planning in France with SCOTs and new PDUs (Sustainable Urban Mobility Plans).
But today, in southern cities, there is an alarming bitter assessment on this link which already poses dilemma in the North:

"Land use planning (in Antananarivo) has so far been dissociated from urban transport planning" (Delville F., 2008: 253).

"The technical and financial partners who support most of the major road infrastructures adopt the same disjointed approach (between transport planning and land use planning)" (Ranaivoarimanana N., 2017, p. 49)

It is interesting to notice some approaches resulting from the decentralized cooperation between cities and which try to encourage these processes, as evidenced by two projects carried out in Ouagadougou and Antananarivo:
Illustration 4: Simplified reflection on the issue of secondary centers and mobility in Ouagadougou. Document produced with the support of the Urban Planning Agency of Lyon Metropolitan Area. Three of the seven secondary centers identified in the Ouagadougou Land Use Plan are currently subject to heavy investments (€ 80 million) to strengthen their equipment and services level.

Illustration 5: diagram of the desired development of the city of Antananarivo, expressed by a group of actors after a one-day workshop, highlighting 5 axes of strong mobility and 5 secondary poles.

3 Urban Commune of Antananarivo, Institut des Métiers de la Ville (Ile-de-France Region), April 2013, 16. Synthesis of the consultation day "Urban Initiatives": what density for the agglomeration of Antananarivo? Participants: Managers of the Antananarivo Urban Commune, urban service management agencies, order of the architects of Madagascar, specialists of the Institute of City Trades, concerned Ministries, AFD, Master students.
Following a one-day debate on the notion of density and compact city, the point of view of a large majority expressed in Antananarivo between institutional actors of the city development, was the one presented as "the mixed city", in the sense of compact in its center, while being polynuclear with strong axes of transport between the secondary centers and the main center, and between neighboring secondary centers.

Other examples go further. This map, extracted from the 2006 Addis Ababa SUMP, illustrates the choice to build secondary centers to limit travel demand:

This representation of the secondary center project of Kaliti, 14 km south-east of the center of Addis Ababa, assumes a population clustered here of about 2 million inhabitants in a radius of 7 to 10 km from the center of the secondary pole.


These two types of approaches break with an illusory too precise urban planning, often ignoring public transport projects, which is too usually the norm in southern cities. They suppose the collaboration between the often segregated worlds of the transport organization, and the local urban planning authorities and practitioners, an issue which will be developed further.

**IV. The challenge of the social dimension of mobility**

The lack of a pro-poor approach to some urban mobility planning in northern cities is identified in some research work (Caubel 2006, Reigner 2017). In the South, some studies identify biases in the improvement of mobility, which would always benefit, above all, the urban elites:

"Transport policy on the territory of the urban agglomeration has mainly consisted of an improvement of the car traffic by infrastructural arrangements which also benefit the taxibe (minibus). The few cases granted to the mobility of the urban poor are manifested by the few adjustments made to secure walking and improve its comfort. "..." Walking that accounts for more than 90% of poor’s mobility must be recognized by the public authorities as a means of transport at least equivalent to the others. (Delville F., 2008)"
Thus, walking, which is often the ultra-majority mode of transport for the poorest, is much less considered, as it has been for a long time the situation in northern cities. It is significant that in France, a country highly relying on planning, only recently has a city adopted a pedestrian mobility plan, after having realized that nearly one out of every two trips were done by foot in the perimeter of the center, and one in three in the agglomeration, and that the pedestrians were "in the blind spot of mobility". (Document: Le plan piétons de la Ville de Strasbourg. Colloquium « le piéton au cœur de la ville, Strasbourg, October 2013, 17.)

Some data can illustrate the variety of situations of the cities with regard to the modal share of the pedestrians:

<table>
<thead>
<tr>
<th>City</th>
<th>Country</th>
<th>Modal share of walking (/ all modes)</th>
<th>Year</th>
<th>Data source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dakar</td>
<td>Sénégal</td>
<td>74%</td>
<td>2000</td>
<td>Diaz Olvera, Plat &amp; Pochet 2008</td>
</tr>
<tr>
<td>Antananarivo</td>
<td>Madagascar</td>
<td>65%</td>
<td>2004</td>
<td>Etude PDU louis Berger</td>
</tr>
<tr>
<td>Bruxelles</td>
<td>Belgique</td>
<td>3%</td>
<td>2008</td>
<td>EPPOM, visité en 2016</td>
</tr>
<tr>
<td>Toronto</td>
<td>Canada</td>
<td>5%</td>
<td>2006</td>
<td>EPPOM, visité en 2017</td>
</tr>
<tr>
<td>New York</td>
<td>Etats Unis</td>
<td>39%</td>
<td>2009</td>
<td>New York City 2009</td>
</tr>
<tr>
<td>Bangalore</td>
<td>Inde</td>
<td>26%</td>
<td>2008</td>
<td>Ministry of Urban Development 2008</td>
</tr>
<tr>
<td>Barcelone</td>
<td>Espagne</td>
<td>46%</td>
<td>2006</td>
<td>EPPOM, visité en 2016</td>
</tr>
<tr>
<td>Paris</td>
<td>France</td>
<td>47%</td>
<td>2008</td>
<td>EPPOM, visité en 2016</td>
</tr>
</tbody>
</table>

*Illustration 8: pedestrian’s modal share in different cities*

Thus pedestrian mobility is often very much the main mode in southern cities, sometimes even over long distances. It represents an opportunity to limit the modal shift to the car and a SUMP should therefore include a strong pedestrian mobility planning component, staying ahead of northern cities. Yet the point is still in a blind spot of mobility:

"Finalized in 2003, Madagascar DSRP (Documents de Stratégie pour la Réduction de la Pauvreté - Strategy Papers for the Reduction of Poverty) highlights, in the field of transport, a policy of improving the road supply, focused on the rural environment and totally ignoring the urban dwellers mobility needs, poor or non-poor. Urban transport policies are mainly reflected in the rehabilitation of the urban road network and their extension for fluidity of flows, as recommended by the Urban Transport Plan, which deals little with urban mobility. These different economic or urban policy documents give the primacy to operational issues over social..."
issues, in terms of transport and mobility, through the choice of infrastructural policies. They do not really deal with the issue of poverty which is quickly removed from projects.” (DELVILLE F., 2008, p.234).

In this country, an exceptional study on the elite (ELIMAD 2012-2013 and CITMAD 2013, IRD-DIAL, Coef-Resources) allowed to highlight the differences of appreciation on the public policies priorities, between the elite 1000 members as defined in this study, and the ordinary citizen. The table below can help to understand why pedestrian mobility, which is extremely used and difficult in Antananarivo, is so poorly treated.

**The main priority for Madagascar according to the elites and the ordinary population**

<table>
<thead>
<tr>
<th>In %</th>
<th>Elites of the political sphere</th>
<th>Elites of the economic sphere</th>
<th>Elites of the public institutions</th>
<th>Other elites</th>
<th>Total elites</th>
<th>Ordinary citizen</th>
</tr>
</thead>
<tbody>
<tr>
<td>«Maintain order»</td>
<td>37.7</td>
<td>38.9</td>
<td>43.9</td>
<td>25.6</td>
<td>37.3</td>
<td>27.9</td>
</tr>
<tr>
<td>«Improving conditions of the poor»</td>
<td>25.7</td>
<td>32.6</td>
<td>23.6</td>
<td>33.5</td>
<td>28.4</td>
<td>51.9</td>
</tr>
</tbody>
</table>

*Sources: ELIMAD 2012-2013 and CITMAD 2013 surveys, Coef-Ressources and IRD-DIAL*

From this point of view, the pedestrian mode is often quite similar to paratransit, often by minibus or mototaxi. In many countries, they are simply not considered or even blacklisted by the public authorities, while in fact they provide a considerable service, even if it falls short of basic standards of comfort and safety. In Antananarivo, for example, the entirely private and artisanal Taxi-Be system (urban minibuses) transports more than one million people a day, at a price of 10 eurocents, without any public subsidy. Most experts agree that the challenge in the short or middle term is to improve these systems, rather than dreaming of replacing them with formal systems. Some projects to improve these artisanal systems are under way in Africa, and they usually start with a map of the lines, which often does not even exist.
Attempts to improve these artisanal systems are, for the moment, rarely effective. Too often, they focus on the ad hoc replacement of informal systems by a formal system, including the change of rolling stock, but without resolving the issues of proper bus operation, driver training, maintenance, management of licenses or absence of a true local Transport Organizing Authority. Attempts to formalize often ignore the complexity of the actors relationships and their long
history, and the social impacts on the population living from informal transport, directly or indirectly. In 2012, the attempt to ban mototaxis in downtown Douala, Cameroon, resulted in violent riots, forcing the municipality to partially return back. In addition, a recent study shows the failure of many bus change operations in sub-Saharan Africa (CODATU, 2017).

Finally, some examples demonstrates that it is possible however to accompany large-scale financing of public transport projects with inclusive urban social projects, of a scale such as the improvements made during the construction of the Métrocable of Medellin (Colombia) or the "streets of citizenship" in Curitiba (Brazil).

The lack of pro-poor policies in urban mobility is sometimes associated with the existence of anti-poor policies. It is the case with the emergence of large scale gated communities that are institutionally justified by security arguments, or when urban development ultimately lead to relegation to the remote peripheries of populations that can no longer stay close to the center, and without efficient and low cost transport systems in these peripheries. On these issues, it would be useful to return to the lessons of northern cities, which are not always taken into consideration by the most concerned officials.

V. The challenges of overcoming the mistakes of the North

If southern cities have much to learn from northern cities, it is also through their mistakes or at least what appears as questionable choices after several decades of hindsight. It is still a huge field of study and research to initiate. Here are some of the main directions for this future work.

First, there is the social impact of mobility policies. For some authors, the current slogan of northern cities of "urban quality" (with its constellation of density, sustainability, alternative to the automobile, etc ...) would participate in a "selective insular model of space production, which legitimizes the urban policies that fuel the operations of spatial and social segregation in the "post-Fordist" city (Reigner & Co, 2013, p.22). The anti urban sprawl policies would even sometimes be considered as a social class policy "carried out by an urban elite with the resources to access "amenities" and urban heritage, and to become green and which would
confine vulgum pecus in denser and less space consuming suburban areas” (Reigner & Co, page 51). For some authors, this historical bias of public policies toward the large perimeter of the city should be corrected: "the challenge today is to prioritize investments (and more generally new financial efforts) in the suburbs and peripheries” (Mignot D 2008). David Caubel's PHd dissertation on Lyon, defended in 2006, illustrates the complexity of the relationships between social geography and accessibility and shows that a strong improvement in the public transport supply can have limited impacts that do not necessarily compensate for the losses due to changes in the location of activities. Thus, there is a need for joint transport policies with other land use planning policies.

There are also many contradictions or hesitations between different public policies, not often resolved. The place of the car in the city is obviously at the forefront of these hesitations, after the period of “everything for the car” that should be obviously avoided at all costs in southern cities. For example in recent years, the incentive parking systems highlighted in many SUMPs are sometimes challenged: "Is it not about providing extra capacity for car traffic and parking for consumers and tourists in central trading areas by imposing a virtuous modal shift on public transport to other users such as commuters ?” (Reigner and Co, 2013, page81). Another example is the ban on very old vehicles in some priority areas for air quality in France, which is very socially selective and may complicate access to employment for the poor. In the South, the public transport supply will be very insufficient in the urban peripheries for a very long time (as is often the case in the North), and the car will be an almost inevitable. So these hesitations of public policies, in terms of density, multipolarity, socio-spatial segregation, major spatial cuts, lack of investment in working class neighborhoods, perimeters of the action, have had many adverse consequences in the North, and are starting to have some in the South.

Much of the urban landscape of northern cities is the result of a all car policy between 1950 and 1980. Near these "highways in town", noise, pollution and urban cuts further degrade the living conditions of millions of city dwellers. While northern cities are everywhere embarking on repairing projects which are very expensive (going under ground, above the street urban planning, redevelopment, protection against noise ...), the southern cities too often reproduce this scheme. Urban infrastructure projects (as well as heavy public transit projects) focus on capacity objectives with insufficient consideration of the context and urban life: forced expropriation, trees removal, unplanned and dangerous pedestrian crossings, impossible or dangerous roadside shops
and equipment access. It is rather a reflection associating land use planning and transport which must be immediately favored in fast evolving cities, and this at two scales. At the scale of the agglomeration, it is the formalization of a strategic and territorialized vision that can address these questions. The principle is then to rely on both secondary centers discouraging long-distance travel and on bypass itineraries to avoid centers and neighborhoods with high density of use. And at the neighborhood level, the association of urban planners and local actors must allow, during the design phases, to ensure the integration of the infrastructures (positioning of crossings, stations, choice of profiles, etc.) and thus limit their impact on neighborhoods and their population. This is now well documented in the North, and even more important in the South where urban life is mainly on the street: if pre-existing uses and contexts are not sufficiently considered at the time of conception, the malfunction risks are numerous.

*Illustration 11: Urban cutting in Addis Ababa, by the LRT line which cuts in two the urban boulevard, complicates the circulation of cars and pedestrians who can cross the avenue only every 800 m with the stations. Source: Urban Planning Agency of Lyon Metropolitan Area.*

There are also policies that do not work, or in challenged ways. Regarding urban congestion, in terms of CO2 emissions reduction, the results of urban tolls seem to be very low in the three historical cases of Singapore, Stockholm and London (Raux C., 2007, p 82). The numerous cases of lack of reflection on the long term effects of infrastructures must also be mentioned. The requalification of the High Line in New York is an emblematic example of a railway that was diverted from its initial use to a tourist site that generated land value gains of $5 billion in a place which was depreciated and absent for a long time in urban thinking.
But the issue of the urban mobility governance is undoubtedly where southern cities can save a lot of time compared to northern cities if they manage to identify and operate the levers of action adapted to their situation. In France, for example, several studies show how the fragmentation and collective hesitations of the urban intermunicipal governance have slowed down and sometimes blocked the urban policies development at the level of functional territories (Hulbert & Co, 2006; Helluin 2006). At the opposite, in the recent period, some cities demonstrate that they get results by the political will, as Paris about the place of the car in the public space, Lyon on the use of public transport or Grenoble on the return of cycling in the city and accompanying the city of Sfax in Tunisia to conduct a similar policy.

VI. The challenge of urban mobility governance

To avoid the hesitation of northern cities in the governance of urban mobility, the question of creating real authorities organizing urban mobility seems unavoidable. These political structures should then clearly assume some choices that could be: pro-density (in a well-reasoned manner), pro mass public transit and therefore pro secondary hubs in the large cities; pro management of mobility at the scale of the large urban area; pro poor by promoting the accessibility of urban amenities to everyone.

Without such decision-making power, all southern cities are likely to know the evolutions observed in the cities where CODATU and the Urban Planning Agency of Lyon Metropolitan area have cooperations: strong development of individual modes, weak coordination of urban planning and transport, socio-spatial segregations which are not new but are developing at new scales and becoming more rigid, and major road investments without coordination with new public transport projects.

Cooperation in several southern cities (Antananarivo, Dakar, Douala, Rabat, Sfax, Addis Ababa, Ouagadougou) shows that effective urban mobility governance must begin with removing some ambiguities about the concept of the SUMP. Modern SUMP "à la française" “French” (PDU) is above all a collective approach, a partnership and concertation, and must be distinguished from many non-partnership based approaches or simple technical studies, all called SUMP, conducted in developing countries. In France, based on a multi-thematic diagnosis, the objective is to
identify the strategic stakes about mobility and urban coherence, and to define general but quantified objectives, as well as an action and a financing plan to achieve these goals. The action plan is of a strategic level. Depending on the theme, it gives principles of action and assigns responsibilities to the different actors, leaving everyone prioritize actions and implement them. This type of SUMP does not immediately lead to a reorganization of the bus network and traffic management plans. These are made in different deadlines, whereas this is a quick result often expected in developing countries. For example, in the preparations for the Rabat PDU in 2017, within 6 months, the consulting firm should:

- describe the transport actor’s system.
- carry out a critical analysis of the urban projects contained in the master plan and other documents, compared to real achievements.
- organize and analyze a household survey of 15,000 people, perform a transport survey
- make a road network inventory.
- build an urban mobility modeling tool.

Then within an additional 4 months:

- build the strategic scenarios and their evaluation
- write the PDU document and its implementation into an action plan.

This last phase, clearly the most important for the debate and the appropriation by the actors, is therefore often very little developed, in favor of very technical upstream studies. A restructuring of the bus network and a traffic plan is also expected, while at this stage it seems already essential to agree on principles that will be implemented operationally, after the SUMP, and will remain valid in time. For example, in the case of Rabat, the fact of insisting on the principles of complementarity with the existing and planned bus network (Tramway).

To remove these ambiguities, it is necessary to have an authority in charge that can answer the following questions: what is the level of political ambition, what is the true status of the SUMP approach? In addition to the regulatory dimension, is the SUMP a technical study that should lead

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to a new traffic plan and a new design of intersections? Or is the SUMP a partnership and a concerted approach that must engage the actors of mobility in the agglomeration on shared principles, actions to be carried out in the short, medium and long term, and a financing plan? In the absence of a clear answer, the SUMP is likely to be a technically complex document, never really validated or exploited, like those of Rabat in 2008 or Antananarivo in 2004.

It also appears important that this authority should be clear in its expectations especially in terms of SUMP development studies. There are many examples of SUMP qualified as "black box" where the possible scenarios tested on the computer mobility model become the results of the all process whereas they should only be intermediate tools for reflections and pedagogy. Should we not instead favor simple and inexpensive transport surveys, simple models, and insist on dialogue with elected officials and technicians, and then the inhabitants and the grassroots actors, to ultimately produce a more strategic than technical PDU, custom made and not an international ready to wear method? All this supposes a method renewal of the international consulting firms.

An example of pedagogical work is the mobility observatory implemented by the Ouagadougou Municipality. Based on a first study conducted by Transitec in 2011, the municipality has implemented a bi-annual survey campaign. It analyzes the evolution of mobility in a pragmatic and sustainable way over time. This type of observatory makes it possible to capitalize the collected data, to make pedagogy, to provoke future debates and exchanges with the other actors like the State or the donors.

Illustration 12: Traffic flow counting system in the city of Ouagadougou
Illustration 13: Observatory of urban displacements in Ouagadougou and example of how Ouagadougou commune itself can progressively position road counting points according to cords and highlight the lessons in its observatory.

Ideally, the SUMPs should be integrated into the development process of the master plans, in order to reduce the high risk of poor coordination. This presupposes a definition of the structure of the city’s operation and mobility, the definition of urban density corridors with mass transit and exchange hubs that will become secondary centers. This can only be done with institutions in charge of urban planning and transport that interact effectively with each other, which is very rarely the case when they exist. It also requires a strong collaboration at least between the transport engineers, the urban planners, and the landscapers who work on these projects. Northern cities continue to experience these difficulties, and sometimes find solutions in the form of Urban Agencies that bring together multidisciplinary teams for studies, observation and urban planning. However, this requires a profound change of mindset that is too rarely engaged nowadays, in the North as in the South: it is necessary to review or invent the training curriculum for future actors in mobility and urban planning in order to foster this interdisciplinary approach, which will be essential once the students are in the various institutions. The Master II "Transport
and Sustainable Mobility in African Cities”, jointly proposed by Senghor University, CODATU and CNAM and hosted and coordinated by the African School of Architecture and Urban Planning (EAMAU - École Africaine des Métiers de l’Architecture et de l’Urbanisme) in Lome (Togo) is trying to answer this problem, but this example is still the only one on the African continent. So we see the problem today for instance in the new cities of Morocco which are designed without public transport services, in master plans led by the Ministry of Urban Planning and very quickly obsolete, in the absence of obligation of legal compatibility between different types of planning documents. It is therefore not surprising to find this type of witnessing: "Our plight, it is the transport, they built a dormitory without access, all the rest is outside" or "For those who do not have car, Tamesna is a prison, an island without a boat "(Le Monde, 30/08/2017, Tamesna, une ville « pas smart du tout » aux portes de Rabat).

In Rabat, the circular metro (modeled on the Grand Paris), a long term proposal, is only supported locally by the local urban planning agency, the other Moroccan actors having great difficulty in projecting themselves into such a distant future. Examples of this type can be reported in Addis Abeba with the proliferation of planning documents, or in some cities of India, with metros made with few land use planning coordination. The counter-example of Curitiba is well known, which shows that it is not inevitable for southern cities. The French Development Agency is promoting this integrated urban project approach to local authorities in some projects in India for example (Kochi Metro).
Illustration 14: Example of B scenario proposed by the Parisian Urban Planning Agency, in the Unified Development Plan of the City of Salé, in November 2009. Scenario said that "development loop around the Bou Regreg valley, with creation of a subway line loop and serving the new urbanizations of Al Boustane and the extension of Souissi, new district of Akrach, new urbanization on Ouled Yahia ".

VII. The challenge of financing SUMP\textsuperscript{a}s action plans.

In order for SUMP-type initiatives to be able to rally all necessary actors for their success, specific funding for their short-term action plans must be identified. Mobilizing a set of sometimes innovative practices in southern cities can help to move in this direction:

- some actions can often be inexpensive and very useful, such as the renovation of sidewalks, the marking of the parking lots, paving the future ways, the traffic lights and its regulation at the scale of an axis or at the agglomeration, the information to users or a traffic plan modification with the assumption to use only the ground marking and the sidewalk borders. These levers are still largely underused in southern cities to implement traffic plans.

- when major transport projects are planned with international support, public captation of land use increases must be sought, even if it is complex. Infrastructure which costs 100 units can commonly produce more than 200 units on land value (N. Ranaivoarimanana, 2017), a paradox well known by developers.
VIII. The necessary alliance between global and local, and between the northern cities and the southern cities

The funding strategies mentioned will certainly be largely insufficient to face the challenges of sustainable mobility in southern cities. An international mobilization should, therefore, assist these cities very quickly and efficiently if the objective is really to avoid an explosion of GHG emissions from urban mobility in southern cities. To succeed, the MobilizeYourCity approach must be developed with a new alliance addressing the global climate problem in the same time with very local problems of urban management in everyday life: waste, mobility, air pollution, basic infrastructures ... Without this alliance, southern cities will not be able to get out of the Kuznet curves' determinism, with associated GHG emissions.

But the funding that such an alliance could generate may not be effective because very often the local capacities are too weak to be responsible and to make local and national officials the central actors of the development and infrastructure programs. Supporting southern cities by northern cities (decentralized cooperation) to improve the daily lives of urban dwellers in an energy efficient manner could be the most effective tool for that. Today, very few decentralized cooperation between cities are working on the issue of urban energy transition. Yet northern cities, many of whom want to contribute to the fight against climate change that they have largely contributed to increase, could consider entering a partnership with a southern city as a powerful and motivating way to do so. Policy-makers in northern cities should immediately be aware of this urgency, which should also be supported by international institutions that are most of the time ignoring such partnerships between cities. The states resistance to confer some prerogatives on cities and the under-representation of infra-state actors in international bodies, especially in climate negotiations, largely explain the timidity of the initiatives taken to promote the emergence of an effective large scale cooperation system between cities endowed with substantial financial resources. The actors’ games are evolving, as evidenced by the editions of the World Climate Chance Summit, which brings together the infra-state actors mobilized against climate change (Agadir in September 2017, Abidjan in June 2018) and of course the San Francisco global climate action summit. But this enormous task remains to be launched, both in
the cities themselves and in urban research to study under what conditions these partnerships between cities can produce results for the actors involved.
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Studies and documents:


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