ASToN

DIGITAL TRANSITION FOR SUSTAINABLE AND INCLUSIVE CITIES

CASE STUDY
MOBILITY

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MOBILITY

How can African cities find the right digital solutions to improve mobility and inclusion ?

CASE STUDY

This case study is one of four thematic case studies demonstrating how digital solutions and technology can create sustainable transformation in African cities. These themes illustrate the different areas of urban digital transformation addressed by each city - citizen participation, mobility, e-taxation, and land management.

Acknowledgments

This case study is written by Saloni Sharma and Andra Stanciu with the contributions of Mathilde Bigot, Amy Labarriere, and Simina Lazar.

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We would also like to thank our Brink colleagues for their contributions to knowledge capturing and sharing of these unique experiences. We hope to share with the world and add to the urban themes the substantial work happening through this project.

Inspiration from ASToN projects in Kampala (Uganda), Lagos (Nigeria), and Niamey (Niger)

Africa's fast urbanisation has outpaced growth in urban transportation and mobility infrastructure. Bringing in new solutions to tackle the challenges of urban mobility requires local and higher-level authorities to work together on aspects as diverse as design, digitalisation, and policy. As partners in ASToN network, national and local governments came together with other relevant stakeholders in Niamey, Kampala, and Lagos to explore transport issues and their implications for citizens, and plan digital solutions that are inclusive and sustainable.

What elements and resources contribute to a successful digital mobility project? Why involve stakeholders, citizens, and diverse municipality staff in urban mobility planning? And what can municipalities do to experiment with digital mobility solutions in their own cities? Looking for answers, this case study explores three new digital mobility initiatives launched by the municipalities of Kampala, Lagos, and Niamey during their ASToN projects in 2019-2022.

ASToN represents a network of 11 cities in 11 African countries, all focusing on advancing their digital transition to become more inclusive and resilient. Convinced that digital tools can be a means to change, the cities embarked on a three-year learning journey to build sustainable solutions for their citizens.

Running from 2019 to 2022, the ASToN pilot programme gave local authorities in each of the 11 cities a framework to test and build a roadmap for digital transformation. This included an experimentation phase where each local team tried possible solutions, collecting data and insights to identify successful – and unsuccessful – approaches, and gain a better understanding of how to scale up their ideas and improve their work. In this way, ASToN acted as a catalyst for lasting change, providing a foundation for cities to continue learning and improving their own digital solutions.

Kampala, Uganda

Niamey, Niger

What is urban mobility, and what key challenges are involved for African cities?

Defining mobility in urban areas means defining the ease and type of access people have to the space in which they breathe, move, live, and work. Mobility is also a driver of economic activities as it enables the movement of goods, services, and consumers in and between cities.

Successful urban transportation systems enable citizens and goods to travel smoothly, and motorised vehicles such as private cars, taxis, and motorcycles can play a key role, especially in growing and large cities. But cities can also encourage more sustainable alternatives that are better for the environment, and for the physical and mental health of the population.

African cities face an array of mobility and transportation challenges. A lack of reliable, affordable, and safe transportation options correlates with congestion, pollution, accidents, noise, rising expenses for the city and its citizens - and protracted delays for both transport users and pedestrians (World Bank, 2022). Expanding urban populations and a rise in the use of motorised vehicles put significant strain on city infrastructure and resources.

When transport authorities are unable to manage accessible public transportation for citizens, informal transportation services multiply. For example, in ASToN partner city Niamey, 80% of individuals who use transport services travel in privately-run motor vehicles such as taxis (Bourgeois & Piozin, 2017). Although flexible and cheap, this mode of transport is often not managed, engaged with, or acknowledged in cities' transport plans. Hence, transport run by private actors is often underdeveloped, unregulated, and unsafe.

In addition, a lack of reliable data makes it difficult for many cities to analyse their mobility challenges and base their actions on informed choices. In response, as shown below, ASToN project teams in Kampala, Lagos, and Niamey decided to experiment and learn from the data they were able to collect, then sharpen local action plans for enhancing mobility conditions in their cities.

Lagos, Nigeria

CASE STUDY

Knowledge and action: Three cities explore their local mobility challenges

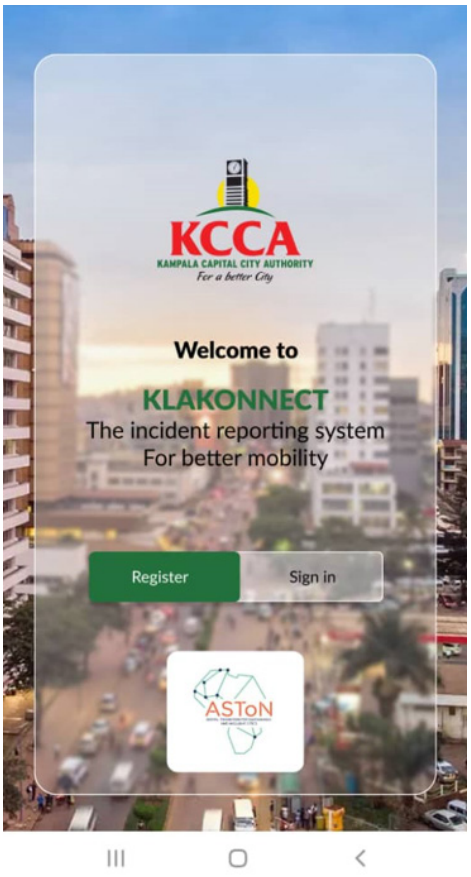
Kampala, Lagos, and Niamey joined the ASToN network to focus on improving mobility in their cities using digital tools.

> *Traffic congestion is a transport problem as well as an economic problem because we spend a lot of time in traffic which reduces our productivity. Also, economically it has a big impact on our financial status because we spend over 1.5 million euros wastage in fuel on traffic jams alone,"* according to Agnes Kahwa, local leader, Kampala.

Kampala: New app to help citizens report traffic incidents faster

Kampala's main challenge when they launched their ASToN project was the city's traffic congestion – an issue also reflected in the Kampala Capital City Authority (KCCA) Strategic Plan (2020/21-2024/25). The city's local ASToN group identified traffic congestion as their primary focus based on a study conducted by the KCCA, and preliminary research for the ASToN project. Their research, which included a survey of city taxis in 2018, revealed that over 24 000 hours of labour are lost every year from traffic jams alone in Kampala. Traffic problems were causing huge revenue losses for the city administration, and damaging citizens' quality of life due to time lost in travel delays.

Kampala's ASToN project team, led by KCCA officials, chose to design a traffic congestion solution that would allow them to collect and communicate mobility infrastructure data to citizens. They looked into issues that hinder traffic movement and lead to congestion and queues - accidents, construction work, and vehicle breakdowns, among others. They also wanted to involve concerned citizens in reporting such incidents and use them as sources of information in different parts of the city. Overall, the goal was to ease traffic congestion by including people in a system allowing municipal management to respond more quickly when an issue arose. This resulted in the creation of the KlaKonnect Incident Reporting System-Digital platform.



Kampala Mobility Project, KlaKonnect

> *We came up with a digital platform with ASToN where we will be able to input incidents, and this project is backed by the different infrastructure projects that we are going to have in the city,"* *Agnes Kahwa, local leader, Kampala*

The ASToN initiative in Kampala will allow residents to view and submit real-time traffic information and tips on how to effectively navigate the city. The team developed this solution with a local partner, and the platform is hosted internally at the KCCA data centre. Citizens who notice an incident in the mobility area, like an accident, traffic jam, or illegal activity, can report it via this app – and add photos. When such an issue is reported a ticket is raised, which is forwarded to the concerned department within the city authority.

Niamey: App for taxi drivers to pay their charges online

Despite being very small in comparison to Lagos and Kampala, Niamey, covering an area of 670 km^2, faces similar mobility issues in its transportation sector. Like many other rapidly urbanising cities in the world, Niamey faces the challenge of high traffic congestion and unsafe roads. In alignment with their National Transport Strategy (2017-2025), Niamey's local ASToN group identified safe public transport as a crucial area of intervention in the city. According to their preliminary study, Niamey recorded 34 296 accidents in 2015-2019. These problems are caused by a number of factors, such as unregulated public transport, under-resourced traffic police, and inadequate road infrastructure. For example, privately-run transport services, including taxis and faba-faba (or minibuses), are frequently unregistered and unsafe.

During the preliminary research, the core team in Niamey was able to assess their urban mobility issues. They identified that there are several axes on which they might focus their interventions through the ASToN initiative.

Fafa-Faba (mini-buses), Niamey

Moto bikes collected by the National Police for not respecting the security regulations, Niamey

Taxi cars in Nimaey

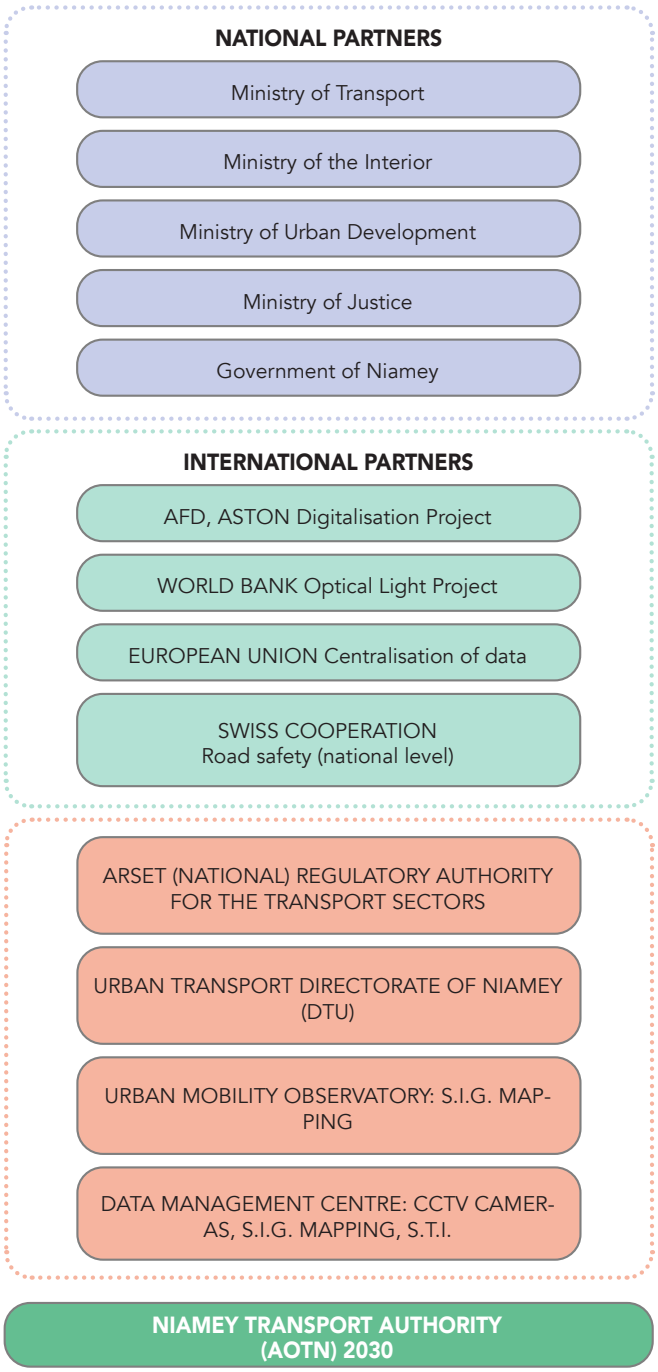
Following extensive engagement with its many stakeholders, the core team agreed to build a system to improve the monitoring and safety of small-scale transport providers, including taxis and faba-faba minibuses. The team decided to use digital technology to strengthen local transport governance.

Niamey proposed to improve the process of issuing and withdrawing administrative documents for licensing small transport vehicles, mainly taxis and minibuses, or "retire the typewriter for good". The city's ASToN project prepared the launch of a new system digitising the taxation of taxi drivers. Rather than travelling to the administration to pay their monthly tax, in 2023, more than 10 000 local drivers will benefit from a new e-wallet recharge system.

> *The team is working on the payment of the tax paid by cabs and small buses. Before, the work for these payments was done manually and often there were problems of corruption, fraud, and security. The city wants to avoid all these problems,"*
> *said Ousmane Mamane, local leader, Niamey.*

Citizens lined up in the town hall to complete licensing administrative formalities in Niamey

The launch of this solution follows an experimentation phase that began in August 2022, testing mobile payment of the monthly taxi and minibus tax, and collecting data from over 120 drivers in the city - a big opportunity to promote the idea of digital payments. According to their analysis, 60% of the 120 taxis and minibuses in their study use mobile payments.



Institutional Partners & Governance, Niamey ASToN project

Lagos: A people-centric solution for reporting traffic dangers to relevant authorities

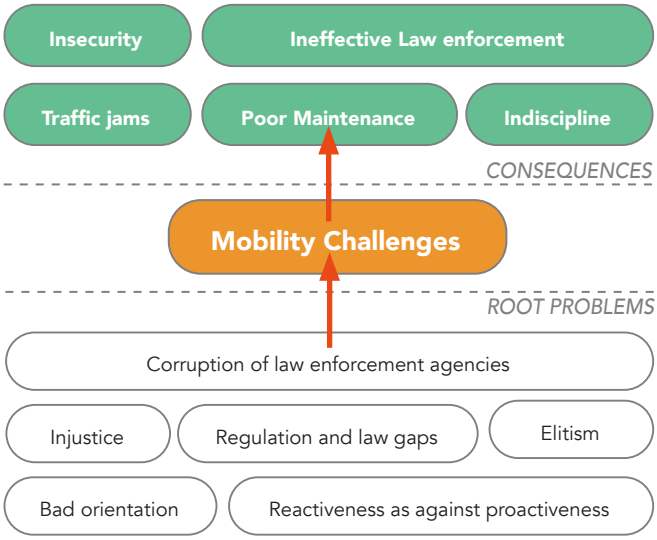
Lagos State is the economic and commercial capital of Nigeria, covering a massive area of 3,577 km2. Each day 17 million trips are made within the city, of which 97% are by road. Preliminary research by Lagos' local ASToN team identified long, unpredictable journey times as an obstacle to production, slowing down freight transport and disrupting education.

"Traffic problems are quite endemic in Lagos. It is very fast-paced and everyone is in a hurry. And therefore it is not just not uncommon for you to see someone riding against traffic, someone driving a vehicle that is not roadworthy, someone beating the traffic light," said Alani Lateef Adebayo, local leader, Lagos.

The Lagos ASToN team focused their preliminary study on the expansion of Lagos State's Strategic Transport Master Plan, which would be implemented through 2032, to improve intermodal, trans-city, and national mobility in the State. During their online roundtable engagement with residents, they also discovered that consumers regarded mobility in the state to be unsafe and inadequate. This preliminary research showed that insufficient road infrastructure, driving misdemeanours, vandalism of transport infrastructure, robberies, and carjacking are the primary, high-cost transport challenges in the city of Lagos.

With new insights into these challenges, Lagos launched an ASToN project to develop a people-centric solution that would create awareness among the residents of Lagos in order to make mobility and public spaces safer and more efficient for citizens.

After multiple changes of plans, a pandemic, and internal political issues in the city, Lagos successfully launched the development of an incident reporting app with local partners Messrs, Davtonlearn Consults, an IT company that met the core team's set criteria in developing the solution on behalf of the state.



Root causes identified during preliminary research in Lagos

> *"If you see a vehicle or a person that is having some kind of misdemeanour or against the regulations of that space, you use your phone. Because we know that you might also be driving, we want to be sure so the solution will test first to ensure that you are safe where you are trying to capture that scenario," says Alani.*

ASToN mobility expert Alexandre Ariaux said that the focus of Lagos' ASToN project evolved from traffic management to traffic enforcement, to citizen engagement via an application. A simple version of the app was created, however, it hasn't been tested yet because the project did not reach the experimental phase within ASToN.

Resources and challenges: human, financial, and political

Kampala: City actions coherent with the national strategy to digitise mobility solutions

Before the ASToN project, numerous efforts had already been made to alleviate traffic congestion in Kampala. Mobility is a part of their bigger regional and national strategy. From Bus Rapid Transport (BRT) and taxation efforts to developing a data centre for smart parking, Kampala is already developing digital tools to become a smart and resilient city.

"We've got African Development Bank funding for 260 kilometres of roadworks in the city. We've got drainage works ongoing, and we've got junctions that are being rehabilitated and reconstructed, and signalised. With so many infrastructure projects coming up in the city and many already going on, we already anticipate [additional] traffic congestion in the city," says Agnes Kahwa, local leader, Kampala.

Kampala's local ASToN group decided to build the KlaKonnect Incident Reporting System - a digital platform that allows citizens to observe and share real-time traffic information and the best ways to navigate the city. The project has attracted significant political support and is coherent with the national agenda.

The fact that Kampala's ASToN initiative is part of a bigger national strategy to digitalise mobility solutions means the city already had an extensively skilled project team with relevant experience, as well as the support of elected officials.

> *"There are lives of people impacted just because in Kampala traffic situation is very risky. So we want to ensure all those risks are reduced by managing the traffic situation in Kampala. That's why the focus is very much there on the policy level," mentions Agnes.*

ASToN network local group, Kampala, during an ICT meeting with other KCCA staff, discussing challenges and implementation of their project

Drawing on its own political, human, and technical resources, the Kampala core team did not require extra finances to hire additional technical support for its ASToN initiative. *"As far as Kampala is concerned, there is total political support for this project. Kampala is the economic centre of Uganda so a project for Kampala is a project for the whole country,"* says Agnes.

Recognising the need for skilled professionals to support such projects is critical, digital training was already part of Kampala's policy and planning.

> *"We want to be smart in terms of digitisation of the studies of software engineers. They are an asset and they (the technical team) are doing a great job,"* adds Agnes.

The experienced and enthusiastic local ASToN team invited their own staff members to collect information, reporting their findings about accidents, roadblocks, construction works, misdemeanours, and other incidents as they moved around the city's roads. This data is fed into the incident reporting solution being developed with partners.

Kampala's core team testing the app

Niamey: Integrating digital actions to improve mobility into the city planning tool

Niamey has been working on addressing urban mobility and traffic congestion issues for quite some time. According to the core team, the city had concrete plans to tackle its transportation, traffic congestion, and road infrastructure issues.

"We thought that by setting up a computerised system and contracting with a local transport agency that offers us two possibilities: payment at the counter or through an application that it had made available to us, we could ease access to these services. At the same time, it allows the services concerned to take charge of the matter by putting it in a computer database," says Ousmane Mamane, local leader, Niamey.

ASToN is a flagship project in Niamey. Despite certain delays owing to changes in city authorities and project staff, including a new mayor, a new transportation directorate, and new local technical partners, the project made progress thanks to the good align-

Ousmane Mamane, ASToN local leader, Niamey

ment with national transportation and digitisation goals. Coherence with the national agenda of optimising mobility made the city leaders pioneers in attempting solutions using digital tools.

Niamey's ASToN project team needed human and financial resources to progress smoothly with their proposed digital solution. When they presented their project to the Mayor of the city in 2021, it was immediately appreciated and support was provided. This political attention brought more skilled human resources to lead the project, as the team of the ASToN digital transition project changed in July 2021. Thematic expert Alexandre Ariaux said the project benefited immensely from the change in management and gave an additional asset to the team - a new manager, who is an expert and *"terrific at their job."*

Ousmane added: *"The political will is there because at the second session of our city council, the president signed the convention and the council gave him the mandate to sign this convention with ASToN, on the basis of deliberation. This allowed this project to move forward. The actions planned in the ASToN action plan are already integrated with the planning tool of the city of Niamey."*

Despite relatively low digital intervention experience in the past, locally as well as nationally, the city successfully gathered data for the experimentation phase, and ASToN project stakeholders reacted positively.

Team Niamey during ASToN all-partner meeting, Kumasi

> *"We are proud of the way the beneficiaries are appreciating the idea of scaling up this project into different locations,"* Ousmane says.

In terms of technical expertise, ASToN mobility expert Alexandre believes that successful projects require:

> *1. a balance between programme management and project-specific technical skills*
> *2. the will to show up for a project, and*
> *3. the political support that can act as a catalyst in project development.*

All three points are true in the case of Niamey.

"In terms of technical skills, we were able to mobilise all the skills that exist in the field, because the constitution of the local group reflects the representation of all the institutions that have proven competence in the field. In addition, the community has planned, in its training plan, to train a certain number of executives to ensure the management of the system that will be put in place," says Ousmane.

Strong political support was a catalyst for Niamey to gain skilled human resources which subsequently led to a well-developed system of data collection and evidence-based project planning.

Lagos: A supportive ecosystem of contacts in government and tech

Lagos, one of the largest cities in Africa, is actively contributing to national digitalisation and turning into a global centre for tech investment. The fact that their initiatives were in line with national and local objectives was a crucial component in Lagos' three-year ASToN journey.

"Locally for us in Lagos, this programme has opened a vista to also work with different ministries in the government of Lagos. For example, I'm from the Ministry of Science and Technology and I'm working closely with the Ministry of Transportation, the Ministry of Works, the Ministry of the Environment and the public, the press, the transport workers, and the market people so that they can come and work with us as government to understand the problems affecting us the most," says Hakeem Popoola Fahm, The Honourable Commissioner, Lagos State Ministry of Science and Technology.

Together with political support, this helped the local ASToN team work closely with relevant stakeholders on improving the city's approach to mobility. According to ASToN mobility expert Alexandre Ariaux, Lagos benefited immensely from these connections. Compared with previous systems, this incident reporting app has been developed using input from relevant groups to become more convenient, well-connected with the concerned stakeholders, and involve fewer steps to address a reported incident.

"What makes it more interesting in Lagos, of course besides its size is that they managed to involve at least four big agencies in the project: the agency of waste management, traffic management, BRT bus, and the police. They are very involved in the project. They co-designed the app and the project," says Alexandre.

Alani Lateef Adebayo, local leader in Lagos, described the new incident reporting app, as *"elegant and well-designed."*

> *With this ASToN solution, we're trying to provide a hub and we are testing that in the upcoming experimental stage. We want to see if citizens can be in charge of monitoring the mobility space by themselves. The key word is: see Something - say Something,"* says Alani.

Team Lagos, ASToN kickoff event in Kampala, 2019

Team Lagos and Kampala working together during the "Finance your project" workshop in Kumasi, 2022

"We have a large enterprise for the GIS projects in Lagos, which is nearly complete. So we can say it is open for people to come on board with us for more such projects. People around the world are seeing that we can get things done," says Alani.

Subsequently, because of the national coherence, excellent connections, cross-departmental core team, and relatively strong experience in digitalisation, Lagos had no difficulty finding partners, funding, and expertise for their ASToN project.

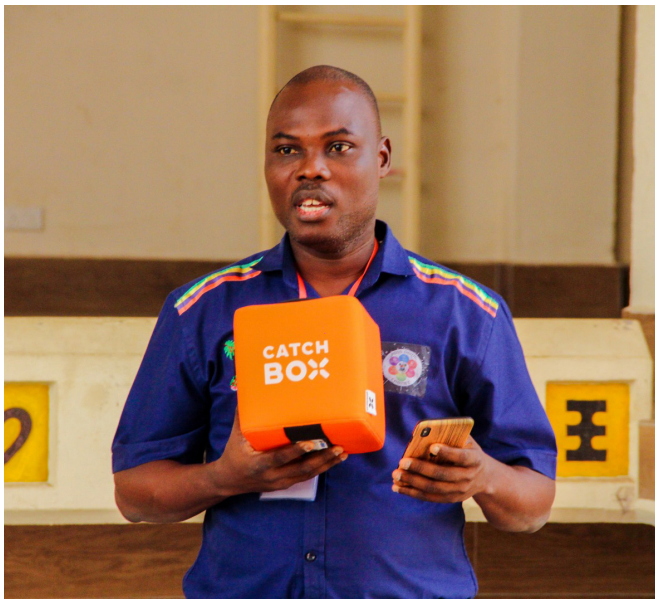
Known as the Silicon Valley of Africa, Lagos has a thriving tech start-up ecosystem, which has been a positive force enabling Lagos' ASToN project to bounce back despite multiple setbacks.

"Apart from the citizens, [digitalisation] is also a desire from politicians, because since our present [national] government came into power, they have an agenda, which represents THEMES: Transportation, Health, Education & Technology, Making cars for the 21st-century economy, Entertainment, Security. So there is a larger vision that we are trying to integrate this project into," says Alani.

This digital intervention in the mobility space also connects well with other smart city projects the city has already launched. The ASToN project to tackle traffic congestion via citizen engagement is part of the city's more extensive development strategy, along with actions on internet connections in schools, last-mile connectivity projects, metro network expansion works, and cameras in multiple locations across the city.

In December 2021, the thematic experts together with the secretariat noticed a decline in political support and hence the project activities. The ASToN project in Lagos was slowed by COVID-19, but they did their utmost to maintain their initial speed. Despite their efforts, toward the conclusion of the ASToN project, it was noted that the team was having problems engaging important stakeholders and technical partners and that the project was being handled by a small group of individuals.

Team Lagos during the ASToN all-partner meeting, Kigali, 2021



Alani during Kumasi all-partner meeting, November 2022

City insights from experimenting with digital solutions to urban mobility challenges

After developing local action plans based on preliminary research and stakeholder consultation, each local ASToN team launched an experimentation phase. The idea was to test certain assumptions and solutions on a small scale and use the learnings to define realistic action plans.

In Kampala and Niamey, local ASToN teams tested theories on the ground and presented their initiatives to local partners and residents. Gathering data throughout these experiments enables cities to discover what works or doesn't, obtain user input, and figure out how to scale up their solution. Even if they were not able to launch an experimentation phase like the other cities within the ASToN timeline, Lagos developed the app prototype in the second half of 2022 using local funds.

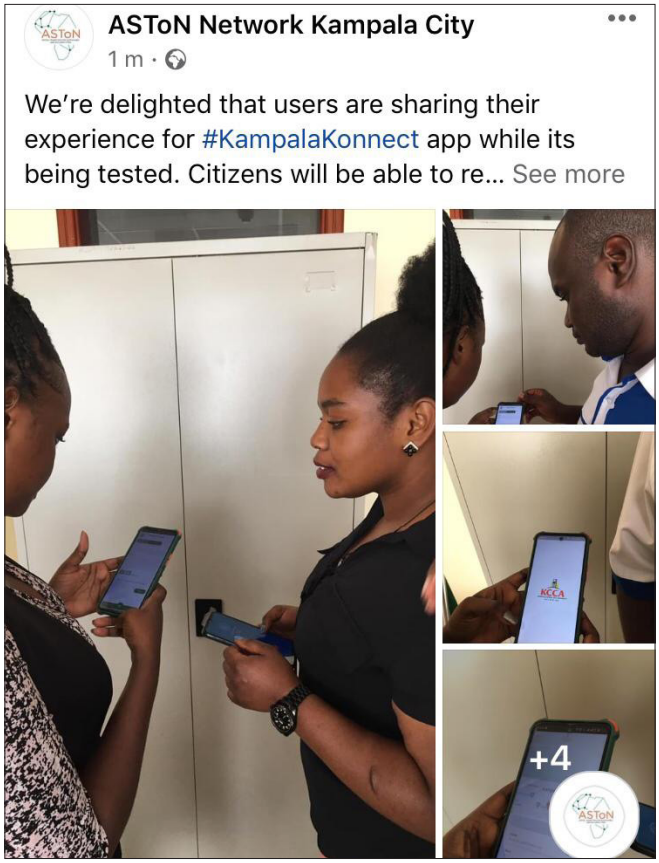
> *So what happens is a city administrator or a city official would input a city report, like publish information about traffic movement on a certain road, it would get out to the citizens in the form of notifications on a mobile app, people would view it and maybe plan their journeys ahead or get information,"* says Agnes.

Kampala

Team Kampala tested its app on 70 users in its local ASToN group, before scheduling a broader launch of the pilot to citizens.

"Experimentation was very interesting. First of all, it was the first of our kind in Kampala to have a solution and then learn from it. So we developed this app with limited functionality using one of the start-up companies in Uganda. We're able to use it on a small number of people, approximately 70 staff used it. It was a simulation of what would happen when we roll out a solution," explains Agnes.

ICT Centre, Kampala



KCCA staff during experimentation of KlaKonnect

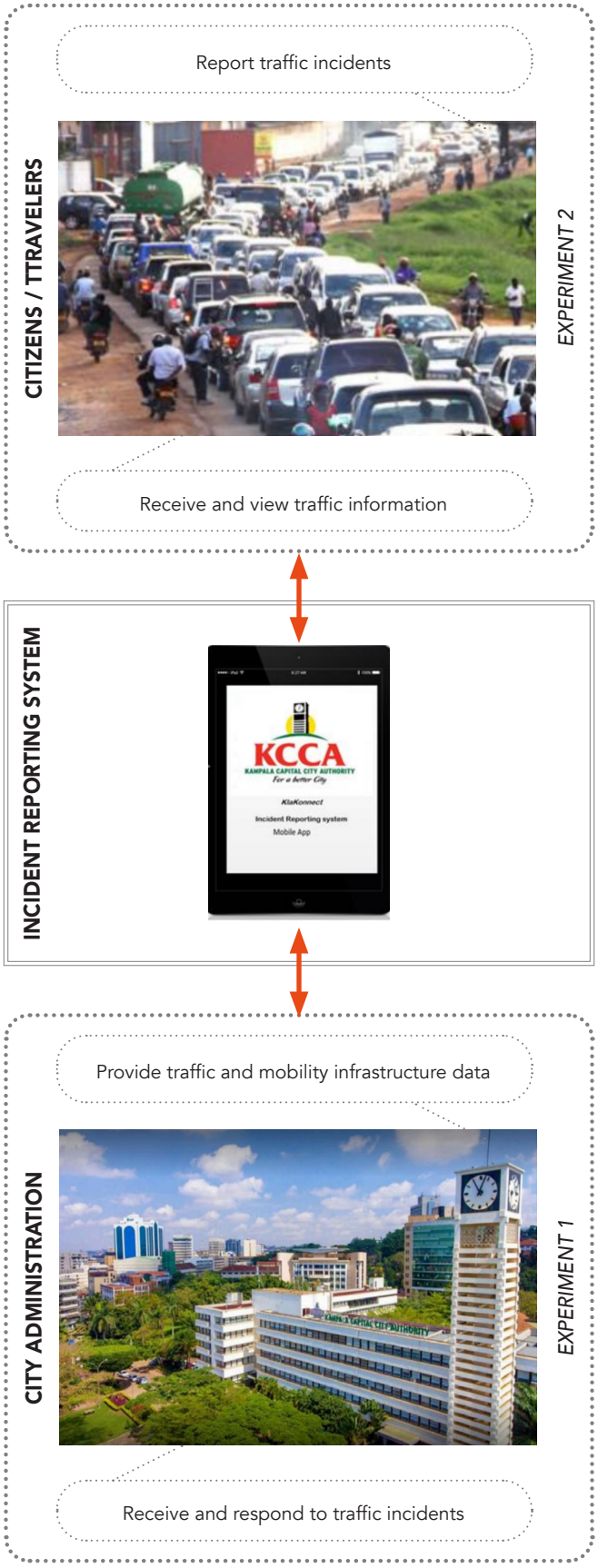


Illustration of Experimentation, Kampala

Expectations vs reality: lessons from experimentation in Kampala

Expectations

- the solution would provide authentic public infrastructure data from the city administrators in order to improve the mobility experience of travellers
- the interface would be easy to use, and travellers would report the type of incidents. We believed that this information would be used by city administrators to make decisions

Lessons learnt

- For the city administrators' data to be helpful to the citizens and improve their mobility experience, it should be displayed according to the proximity of the traveller. Travellers will only see data reported near their location so that they plan ahead of their journeys
- Testing an application with a wide variety of stakeholders is very helpful as good feedback for improving the application is obtained
- A good user interface is important for user buy-in and satisfaction
- Other than mobility, citizens want to report a broad range of incidents to improve their stay in the city
- There is a risk of not responding to all incidents given that there are only two engineers per division. Given their current workload, there is likely to be a delay in resolving incidents

Inclusive and participatory

ASToN projects were managed in each partner city by a core team, usually made up of three to five people from relevant municipal services. Each of these teams started with a preliminary research phase to gain a clear understanding of the topic. They identified diverse relevant stakeholders who they invited to form local ASToN groups – thanks to discussions, surveys and other data collection, brainstorming sessions, political gatherings, and tools proposed by ASToN such as the 'problem tree analysis'. In this way, local politicians, start-ups, incubators, NGOs, universities, well-established companies and other groups became directly involved in building their city's local action plans for digital transition.

For more on ASToN tools and methods for forming local groups: ASToN Blueprint and ASToN City Handbook.

During experimentation, the team was able to improve their software by leveraging Google Maps and the recommendations and comments provided by the experiment's participants. Road names weren't always known, and sometimes the claimed location was impossible to find or unreliable.

> *"We noticed that different platforms had to come together. We had to input the Google Maps application so that you can locate the exact place of the incident. The experimentation phase allowed us to assess our platform,"*
> *recalls Agnes.*

The team wants to further develop a robust digital mobility platform that will incorporate all modern technologies, such as artificial intelligence, and machine learning. Although further integration of multiple apps and platforms is challenging both financially and technically, the core team believes that they can overcome it with extra effort and strategic planning. Kampala's core team was a critical asset in the successful carrying out of their ASToN project.

Core team, Kampala

Extended core team, Kampala

While providing support to the team, ASToN mobility expert Alexandre Ariaux noted that the project partner (City of Kampala, KCCA) was well organised with strong leadership. He observed that the local team was well represented at meetings and composed of technical profiles - project manager, communication personnel, etc. who were able to present and defend their project to the Mayor of Kampala directly. Another factor that contributed to the project's success was the existence of technical talents within the project partner organisation, KCCA.

Project managers compensated for their limited financial resources by engaging users to report traffic issues and leveraging their input to enhance the app.The experimentation phase has shown that this was a smart and strategic move, and inclusivity positively impacted the ASToN project of Kampala.

"We presented the project at the political level and it was 100% approved - this digital innovation was the first of a kind and everyone is eager to have it and if possible we would start tomorrow," added Agnes.

Kampala Local Action group presented its Local Action Plan to the top city management called the Technical Planning Committee (TPC). Their plan was approved and the TPC pledged its full support for the next phase

Niamey

Team Niamey is in the early stages of digital transition, even nationally. Despite limited resources and multiple changes in the project, the team reached the experimentation phase and collected data to improve its action plan. With the technical expertise of a money transfer organisation named AL IZZA, Niamey experimented with digitalising the payment of monthly tax for issuing licences to taxis and minibuses in order to manage small-scale transport more efficiently in Niamey. Taxi drivers' associations and city administration found the project helpful and inspiring.

> *"We have tested this solution on the basis of 100 cabs and 20 minibuses, and all the unions in charge of the transport issue have asked to scale up this solution,"* says Ousmane Mamane, local leader, Niamey.

Mamane, sharing the team's work at all-partner meeting, Bizerte May 2022

Team Niamey during mobility thematic meeting in Niamey, July 2021

Expectations vs reality: lessons from experimentation in Niamey

Expectations

- Zamani Telecom and Fameye Holding will be the city's mobile payment partners
- Car owners will be willing and able to make monthly tax payments electronically
- Car owners will have an account and familiarity with the mobile payment system, specifically with Zamani Telecom
- The city will be able to receive and manage tax payments through mobile payment

Lessons learnt

- Signature of an agreement between the city and Zamani Telecom
- 60% of car owners pay their taxes with mobile money
- 50% of car park owners have a Zamani Telecom mobile payment account
- 90% of the payments made by car park owners are received and managed by the city

The experimentation phase was intended to evaluate solutions so that stakeholders could understand possible advantages and downsides, and make informed decisions about how to go forward. Team Niamey intends to expand the solution to the city level. However, they recognize that they will confront some difficulties because the scale will be considerably bigger than the experimentation sample size.

"The major difficulties concern the delivery of the solution. The technical services of the administration had to be able to do the work themselves by mastering the solution," said Ousmane Mamane, local leader, Niamey.

The availability of internet connections, which is less established in Niger, is the second challenge observed during experimentation. Ousamne says: *"Not everyone has access to a telephone to make payments by mobile means. So from this point of view, people tend to keep the same habits."*

Despite these challenges, the experimentation also revealed that 60% of car owners paid their taxes with mobile money. They identified a need to strengthen the community's digital capability in order to further disseminate the usage of digital technologies, which they want to address in the future.

The transition to a digital economy can bring many benefits, but it can also create challenges for those who lack the skills and education needed to participate in the new economy. By completing the experimentation, team Niamey was also able to foresee the biggest challenge of scaling up their solution: loss of jobs.

According to ASToN mobility expert Alexandre, Niamey would have to make extra efforts to avoid job losses during the digital transition.

"They [Lagos and Kampala] do not face difficulties like job loss during the transition, this is something they can deal with on their own by reemploying or reskilling people. Niamey, on the other hand, does not have that handle on the situation yet. There is a big chance that people will lose jobs in the city transition to digitalisation," says Alexandre.

Having recognised the risk of job losses, Niamey's timely intervention gave them a chance to ensure jobs are retained when their solution is scaled up. By deciding to invest in education and training programmes to help workers acquire the skills they need to succeed in the digital economy, team Niamey found a way to build a more inclusive digital transition path in their city.

Team Niamey during launch of experimentation

Citizens participating at the launch of experimentation event, Niamey

"With regard to capacity building of other actors, there is the national information agency which also accepts the principle of hosting all the data, not only in the case of this project but also to provide training in the framework of digital technology," says Ousmane.

> *We have planned to train the staff by finding a way to orient them to the new function. Let me give you an example. Those who are called to work manually, but through the national information agency, it is planned that the training phase in the field of computer science gives them the ability to use the computer tool," added Ousmane.*

Due to successful and smooth payment collection methods and a reduction in the time needed to carry out these formalities, the solution saw great acceptance from users and citizens.

"At the end of the experimentation phase, we conducted a survey to get an idea of the users' level of satisfaction. The users told us their satisfaction was total because they noticed a reduction in the time needed to do these formalities. So we can think that the satisfaction went beyond the 80 percent decided before the experimentation," says Ousmane.

Ousmane Mamane at WUF in Poland, June 2022

Ousmane with other ASToN city leaders , during Bizerte all-partner meeting, May 2022

What's next for the three ASToN projects?

Government officers and other stakeholders in Kampala, Niamey, and Lagos hope to build on their ASToN projects and scale up the solutions to benefit more citizens.

As for the next steps, having secured political support for their traffic platform, and positive engagement at the top executive level, Kampala is now applying for funding to develop the platform further, and link it with external data sources such as the Uganda Police, the traffic control centre, or Google. ASToN sparked the city to look beyond traditional road infrastructure interventions to improve urban mobility and explore data and IT solutions.

In Niamey, the new taxi and minibus digital taxing service is set to open to the public in February 2023. The scheme is funded by the city hall's 2023 budget and supported by the transport agency. The National Information Agency of Niger has also agreed to train other actors in the digital technology framework, and host all data generated by the ASToN solution. Longer-term actions planned during the ASToN project are being integrated into the city's planning tool for 2022- 2026.

Despite delays, and the end of the ASToN project, Lagos' plans are still going ahead. Continuing to use the ASToN methodology, they aim to experiment with their incident reporting app on certain traffic 'flashpoints' in 2023, then revise their action plan based on the findings. They plan to continue developping the solution and test it with funding from the Lagos State Government.

A legacy of sustainable, inclusive urban solutions

For all three cities, ASToN has provided links to other advancing cities in Africa. But above all, ASToN's legacy lies in its participatory approach to urban challenges. Kampala adopted new ways to engage diverse stakeholders and co-design a mobility solution, the broad ownership of the project boosting its success. The city hopes to continue using this methodology for future urban development projects. Niamey's town hall also capitalised on the co-construction method, reinforcing their use of participatory democracy methods in municipal governance. For Lagos ASToN has shown how integration, participatory, and action learning methods can help find solutions to urban problems, increasing the chances of success and sustainability.

ASToN city leaders during Bizerte all-partner meeting, May 2022

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