Supporting Cities through the Pandemic

COVID-19 lessons learnt from the Future Cities South Africa Programme

FUTURE CITIES SA

UK Government

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CITY OF CAPE TOWN
ISIXEKO SASEKAPA
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Executive summary

2020 was the first year of the three-year Global Future Cities Programme in South Africa. It was also the year that the COVID-19 pandemic swept through the world, impacting significantly on the three cities in which the programme was implemented locally. Many lessons were learnt, about how the core programme of work might require adaption and also how to scope and deliver augmented support during a crisis producing significant uncertainty.

The intention of this document is to distill the lessons of COVID-19 support provided to three cities in South Africa, sharing lessons from our experience with other cities, donors, stakeholders and delivery partners so that it might shape their responses in the face of a crisis. It is particularly relevant for development programmes in how they might utilise agile and adaptive responses.

The programme focuses on three cities: Johannesburg, eThekwini/Durban and Cape Town and the emergency technical support provided by the funding partner, the UK Government's Foreign, Commonwealth and Development Office (FCDO). Depending on the specific city needs, the core programme activities were pivoted, adapted or augmented towards supporting the city administrations of Johannesburg, eThekwini and Cape Town with some of the urgent COVID-19 challenges they faced.

Adaptive programming, learning and partnering are all critical parts of this programme. As the programme partners continue to deliver in a fast-changing context, it is critical that the learnings are reflected upon and evaluated, in order to effectively adapt programme delivery and support for cities by funding agencies and partners in this programme and others.

In reflecting on the lessons learnt for funding agencies and programme owners, delivery partners, programme teams, and city-beneficiaries, the following has become apparent.

Emergency interventions such as the Global Future Cities Programme's COVID-19 package in South Africa, are likely to have better results when:

- they are closely integrated with and support existing work projects and themes at that particular municipality (whose current projects can be adapted to support a crisis response);
- the donor and the delivery partner are prepared to be agile and responsive to changing conditions and emerging insights;
- city officials are not overburdened by additional effort, arrangements, data or information; and
- the opportunity is used to innovate or otherwise improve the main projects and themes.

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City governments with the following characteristics are likely to derive greater benefit from emergency assistance such as this programme's COVID-19 support when:

- they have a transversal coordination structure at a strategic level that is also able to direct and prioritise how assistance is used;
- they can collaboratively manage the relationships with both the donor and delivery partner, building a shared understanding of the desired impact for the City, as well as what the expected return is for the donor;
- they have a robust pre-existing infrastructure of systems & data;
- they have learned from their responses to recent previous crises.

1 Introduction

Future Cities South Africa (FCSA) is the delivery partner for the South African component of the Global Future Cities Programme, funded by the UK Government's Foreign, Commonwealth and Development Office (FCDO).

This programme is designed to contribute to inclusive and sustainable economic growth, poverty reduction and mitigation of gender, social and economic inequalities through targeted projects on transportation and mobility, urban planning, resilience and the innovative use of data.

South African cities face rapid urbanisation within the inherited and perpetuated spatial constraints of the apartheid city. This is most notably characterised by spatial inefficiency and a mismatch between where poor people live and where economic opportunities lie. Previous attempts at stimulating inclusive economic growth through urban spatial transformation have been limited by several factors. These include the capacity for innovative socially rooted urban planning, financing and evidence-based decision-making that can accelerate urban development and mobility investment across society, in spatially targeted areas, townships and informal settlements. The Global Future Cities Programme aims to strengthen these essential city capabilities.

Future Cities South Africa (FCSA) is a unique alliance of organisations and independent specialists. The programme is anchored by PwC (UK & SA) and includes Open Cities Lab (OCL), Zutari, Palmer Development Group (PDG), Violence Prevention through Urban Upgrading (VPUU), the Isandla Institute and others. This alliance strives to offer the three targeted South African city governments' global expertise, local insight and trusted relationships for transformative, inclusive and enduring impact.

The programme focuses on three cities: Johannesburg, eThekwini/Durban and Cape Town. The five core projects being implemented over a 2-3 year period, each have exceptional potential for creating more connected and inclusive spaces and being sustainable and replicable amongst the targeted cities and others. In doing so they have the potential to inform national practice and policy. The programme is aligned to the UN's Sustainable Development Goals Agenda 2030, the National Development Plan and the Integrated Urban Development Framework.

Within the core programme, collaboration and partnering were already becoming features of how the FCDO and FCSA were working with the partner cities. In addition, continual change was also seen as a natural part of the three-year programme, leading FCSA to focus intensely on adaptive capacity within programme management system design. This would enable the programme and projects to evolve with new learning. Both design features became even more important in April 2020, when the cities requested that the FCDO expand the programme's technical support to contribute to their COVID-19 response and recovery. This programme extension in response to COVID-19 is the focus of this document.

Clodagh Da Paixao

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Adapting and Responding to COVID-19

2020 was the first year of the three-year Global Future Cities Programme in South Africa. It was also the year that the global COVID-19 pandemic impacted significantly on the three cities in which the programme was implemented locally. South Africa diagnosed its first case of COVID-19 on 6 March 2020.

Ten days later President Cyril Ramaphosa declared a State of National Disaster, invoking disaster management regulations. A further ten days later on 26 March SA went into a hard lockdown, which stopped all non-essential activity for 35 days. These restrictions basically curtailed movement except for essential goods and services.

On 27 March 2020, South Africa had 1,170 confirmed cases with an increase of 243 new cases from the previous day and these cases were expected to soar.[1] Like everyone else, this meant that the programme partners had to quickly adapt to new ways of working and establish new communication channels for meetings and community engagement.

By the time the hard lockdown arrived the FCSA team were already working remotely. As a nationally and internationally dispersed team, the team were fortunately already equipped to work remotely and online. There were, however, numerous digital access challenges the team did encounter, both as the cities ramped up to become 'remote working ready,' and in terms of accessing and engaging with communities and stakeholder groups.

[1] Tweet from Health ZA

Rodger Bosch

By the time the hard lockdown arrived the FCSA team were already working remotely. As a nationally and internationally dispersed team, the team were fortunately already equipped to work remotely and online.

Some of the initial challenges included connectivity issues on virtual platforms, which required FCSA to ensure that these platforms worked for all stakeholders. It was also essential to develop shared working platforms, where all parties could co-create the deliverables. Regular and consistent communication between FCSA and city partners was a key part in overcoming these challenges and ensuring delivery.

The FCSA team communicated with each of the city project teams to establish the best virtual platforms for engagement. WhatsApp messages and codes were sometimes utilised when connectivity was a challenge.

The greater difficulty was in communicating with communities and some of the stakeholders. This required more thought and foresight given that many team members were engaging with residents in more impoverished areas and were unlikely to have the necessary technology or data.

As the three cities ramped up their efforts to become remote-ready across departments and service delivery units in response to the emergency legislation, the FCSA team was able to deliver input and support, based on the challenges and learnings from its own digital coordination effort across the programme (see project sections on the following page).

Providing COVID-19 Support

In response to the specific and broader requests submitted by the three cities, the FCDO secured a funding uplift to the core programme which allowed FCSA to expand their technical support. Depending on the specific city needs, core programme activities were pivoted, adapted or augmented to support the city administrations of Johannesburg, eThekwini and Cape Town with some of their urgent COVID-19 challenges. Through these projects, FCSA was able to support the cities in improving effective decision-making, managing their COVID-19 response and mitigating risks in a short space of time.

In April 2020, the FCSA team worked simultaneously with the FCDO and city administrations of Johannesburg, eThekwini and Cape Town to scope out the vital support required immediately and over the coming months. FCSA and city partners collectively scoped and delivered ten projects and 20 deliverables in response to COVID-19. These included:

- Logistical support for city public health systems
- WhatsApp/data portals to ensure informal settlement residents were receiving basic services, and
- Tools to assess the environmental, economic and financial impact of COVID-19 recovery plans.

Embedding adaptive programming, learning and partnering is a critical part of this programme. As the programme continues to deliver in a fast-changing context, FCSA will need to ensure that the learnings gathered from responding to and supporting cities are deliberately reflected upon and evaluated. This will enable FCSA and the FCDO to continue adapting programme delivery and how they support cities through this programme and others.

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2 CAPE TOWN: Introduction to the COVID-19 projects in the City

City of Cape Town (CCT) COVID-19 Recovery Projects: Overview

The City of Cape Town recently experienced its worst drought in recorded history, with the economy still recovering from some of the related adverse impacts. The drought highlighted the challenges of rapid population growth, unequal consumption, and unequal access to services. For Cape Town, COVID-19 is the second major system-wide shock in consecutive years.

At the start of the pandemic, this core project was supplemented with several shorter-term projects to assist with the immediate needs of the crisis. The FCSA team provided support to the COVID-19 Crisis Coordinating Committee, chaired by the Executive Director for Corporate Services at the City of Cape Town. This Committee took a data-driven approach to balancing stress across different internal and external systems.

The City of Cape Town was recently awarded an Apolitical award for COVID-19 Rapid Responders for this response. The award citation commends the City for its "impressive data products, world class project management capabilities, and innovative risk and resilience tools".

The past year has produced many valuable lessons regarding the value of data tools and skills in a time of crisis, which has further accelerated the City's data maturity journey and the role of data capabilities in its broader resilience strategy.

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Projects in Cape Town – a Summary

The FCSA has implemented the following COVID-19 response projects in Cape Town.

- Impact & Recovery Support
- CKAN: Data Portal, Application and API
- Logistics & Recovery Support
- Informal Settlement Data Pilot
- Financial Management & Scenario Modelling

CKAN: Comprehensive Knowledge Archive Network
API: Application Programme Interface

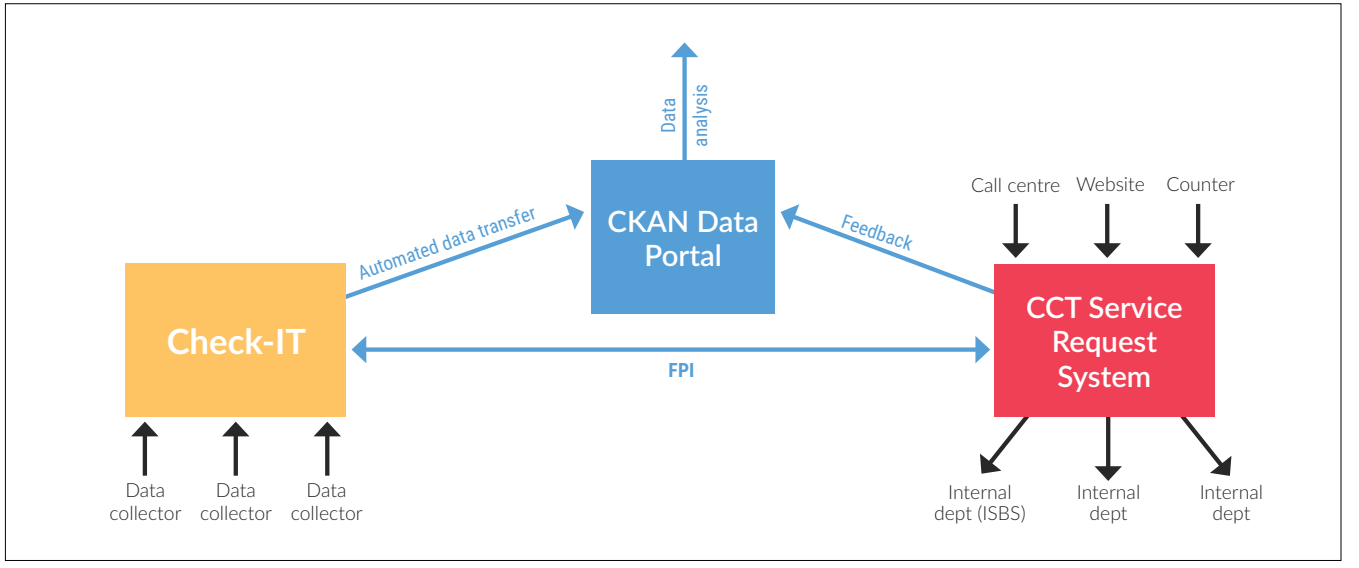
Summary information on each of the projects can be found in this section with further information in the annexure.

CCT Rapid Open Data (CKAN) and Data Support

The main aim of this project was to set up and administer a data portal that:

- delivered secure data sharing and an access platform.
- supported the City in the use, maintenance, extension, and capacity building of the platform and its users.

To this end, the data portal enabled the access and sharing of relevant data to and from other City COVID-19 work streams and Provincial departments (case data for logistics modelling), and to other researchers across the academic, public and private collaborative platform on the COVID-19 response.



CCT Impact and Recovery

This workstream focused on supporting the understanding of the local and global economic impact and recovery scenarios, and how they interacted. Working closely with the City's internal economists, the FCSA team built a model to simulate potential impacts on the economy, and ran various scenarios based on economic and health policy.

CCT Financial Recovery

This project helped the City of Cape Town to improve its understanding of its financial sustainability to better serve its citizens with the limited resources available.

FCSA provided modelling support, building:

- **a revenue scenarios model**, using economic and consumption scenarios as inputs to present a view on revenue collection.
- **a costing model**, quantifying the costs associated with the broad ranging COVID-19 response in a single space
- **a decision support tool**, that integrated various risk and decision models in one place
- **a risk model** tailored to the specific system risks associated with the COVID-19 response.

CCT Strategic Support to Informal Settlements

This work stream supported the City's Water and Sanitation Department with their work in informal settlements to address the needs of particularly vulnerable communities during the pandemic. The work piloted a data collection system in 23 of the most vulnerable informal settlements (identified based on a vulnerability mapper and inputs from NGO partners), to collect live data on their access to water and sanitation services, and the performance of these services within the community.

CCT Logistics (Health, Mortality, Water & Sanitation)

The logistics workstream provided modelling support to review the current healthcare supply chain network and distribution model and make recommendations to improve functionality given the COVID-19 crisis.

Modelling around fatalities helped inform and support the City's work on expanding crematorium facilities. At the start of the pandemic there was one functional cremator, which was increased to four cremators in eight weeks. Two had been non-compliant due to not meeting air emissions standards and one was idle and not maintained. The City also worked closely with the Western Cape Province to identify a contingency site at Ndabeni and share resources. In three weeks, they had plans for staff, water and electricity so that if they ran out of space there would be a place to store and identify bodies. Additional graves were prepared at cemeteries and burial cases and body bags procured in record time.

This work stream supported the City's Water and Sanitation Department with their work in informal settlements to address the needs of particularly vulnerable communities during the pandemic.

Overall Lessons Learnt at the City of Cape Town

The City of Cape Town was able to leverage available support from the Future Cities programme in an extremely effective way for several reasons.

Firstly, the core programme was being managed at a strategic transversal level within the City, which was the same level that mobilised to manage the crisis. This meant an early recognition of the opportunity to connect the Future Cities programme to the crisis response.

With the City having already been through a recent system-wide shock in the form of the drought, the City of Cape Town was also equipped to quickly mobilise both strategic and operational crisis structures. These structures and their workstreams were able to identify focus areas, priorities and gaps which were then used to direct the available support.

The City's strategic and programme management capacity to engage transversally, and on a range of problems, was key to creating categories of support, and scoping focus areas for FCSA.

In some instances, the scope was clear up front, while in other instances there was a clear focus area, but the deliverables or output required was uncertain. In the workstreams where the latter was true, a part of the FCSA team's work was to support the City in diagnosing the core area of need. This was true of the informal settlements project, where initially there was a fair amount of "noise" about what the most significant risks might be. However, in the end a very focused and impactful area of support was delivered.

Similarly, the support delivered under "recovery" was not clearly scoped upfront. At the point of crisis mobilisation, all that was certain was that a recovery planning stage would be reached at some point, and resources for support would then be needed. A key learning from this is that for all partners – the City, the donor funder and the delivery partner – a degree of foresight, trust and willingness to start somewhere was needed.

To provide balanced programmatic support during this period of uncertainty, there were established principles that our support would be split across:

- Crisis support (logistics modelling and informal settlements)
- Analysis and foresight to stabilise (economics and finance workstreams)
- Recovery planning (economic, institutional and financial recovery, and learning).

Regular (weekly, and at some stages daily) reporting and decision-making channels were established to ensure three-way decision-making with the City, delivery-partner and FCDO on any major scope changes. This process was, of course, intensive on programme management.

The City maintained a bilateral line of communication with the FCDO which helped in building trust and made giving feedback and making decisions easier.

The focus on COVID-19 naturally impacted on the workload of the core FCSA programme management team (and some project leads), as they switched between the impact of COVID-19 on the core projects and the new COVID-19 focused projects. While the core work was able to progress mostly according to its original schedule, certain elements did suffer from less attention or lower levels of participation from stakeholders who were more heavily involved in the COVID-19 response. This was a known trade-off; the City, FCDO and delivery partner were engaged in assessing these risks routinely to keep the core work on track despite this.

The augmentation of the work to include the COVID-19 support aligned with the focus of the core work, in that it involved support to the data and economics teams in their involvement in the City's overall COVID-19 response. This held many positives in terms of impact and learnings – accelerating many aspects of the Data Strategy by showcasing the value of data-driven approaches, and accelerated learning. These lessons are actively being incorporated in the core work by both the FCSA and City teams who have been involved in the delivery of the COVID-19 response.

Overall, at a programme management level, trust has been built. There is an ability to work robustly, adaptively and responsively to keep the programme swiftly, while guided by City priorities.

3 JOHANNESBURG: Introduction to the COVID-19 projects in the City

City of Johannesburg (CoJ) COVID-19 Recovery Projects: Overview

With the addition of the programme uplift during 2020, five projects were underway with the City of Johannesburg (CoJ). Two of these were the core two-year projects, namely 4th Industrial Revolution & Mobility, working with the CoJ Department of Transport; and Soweto Strategic Area Framework, working with the CoJ Department of Development Planning.

The other three were six-month COVID-19 projects, funded by FCDO's uplift to the core programme:

1. **CoJ Urban Mobility & Reopening:** Data modelling and analysis to assist CoJ in better understanding and responding to the pandemic effects on mobility planning and bus services contracting in its municipal area, and to generate lessons about more adaptable governance systems for the future.

2. **CoJ Soweto Pandemic Impact Study:** Using electronic movement data and data from electronic surveys of households and businesses in the study area to better understand the impact of (and reactions to) the pandemic and its associated restrictions.

3. **CoJ Financial Recovery:** Assistance to the City to recover from the negative financial effects of COVID-19-related restrictions via a scenario model, facilitating long-term financial planning taking COVID-19 impacts into account; and analysing commercial losses relating to the pandemic.

CoJ Urban Mobility and Reopening

This project was initially conceived as assistance to help the City of Johannesburg better understand and respond to the effects of the pandemic on mobility planning and bus services contracting in its municipal area (which lie at the heart of its mandate), and to learn lessons about more adaptable governance systems for the future.

The work generated the following important conclusions:

- **Data management is a key enabler / disabler of responses to emergencies, including pandemics**: urgent steps should be taken to use current data resources (primarily through ticketing), to redesign and moderate services continuously.
- **Rea Vaya is seen as a safer and more reliable means of transport**, particularly by the more vulnerable. Although the pandemic brought about a 49% decline in Rea Vaya ridership (between equivalent periods) in 2019 and 2020, sampled respondents, especially women, were less likely to shift from Rea Vaya to other alternatives.

CoJ Soweto Pandemic Impact Study

A centerpiece (and significant differentiator) of the main Soweto Strategic Area Framework (SSAF) project plan had been an intensive survey of community and business activity in the local study area. However, just as the project was getting underway, COVID-19-related restrictions made the survey impossible.

As a result of this challenge, the 'Soweto Pandemic Impact Study' was developed by the FCSA project team and the CoJ's Development Planning department as a way of overcoming the setback. Since the pandemic was clearly an entirely new and profoundly important influence on development trends in Soweto, it was critical for the main SSAF project that these implications be properly understood.

The results of the Soweto Pandemic Impact Study will be thoroughly incorporated into the main SSAF project. The project also generated lessons from the use of Story Maps to present the information and make it more accessible. The Story Map that was ultimately delivered was a trial run for the use of the same platform for the full SSAF Status Quo report, which incorporates the COVID-19 project output under a specific tab.

CoJ Soweto Pandemic Study: the project also generated lessons from the use of Story Maps to present the information and make it more accessible.

CoJ Financial Recovery Project

This project was intended to assist the City to recover from the negative financial effects of COVID-19-related restrictions, by working with City officials to develop:

- a scenario model, intended to facilitate long-term financial planning taking COVID-19 impacts into account; and
- an analysis of commercial losses relating to the pandemic.

The scenario model projects the impact of COVID-19 and local economic conditions on municipal revenue and cash flow for the following financial year. This should form the starting point for any long-term financial model. This model can also test the financial impact of different economic interventions to inform an evidence-based recovery strategy. The results will form a key input to the CoJ's strategy and will be included in the document and discussions.

The COVID-19 Finance products offered (a) a COVID-19-aware evidence-base to inform the city budget strategy, and (b) a strategic approach to pandemic-related credit-control operations.

The project highlighted the need to substantially strengthen basic data and other systems necessary for city resilience. To enhance this for the future, a way forward would be for the CoJ Finance team to build an accessible data platform to leverage for deeper insights into their customers and revenue. This should be incorporated within an overall city data strategy.

Overall Lessons Learnt in the CoJ

The most successful CoJ COVID-19 project out of the three was the Soweto Pandemic Impact study. There were several primary reasons for its success, differentiating it from the other two projects:

- The concept emerged from within the main SSAF project, as a direct result of having to confront the short- and long-term implications of COVID-19-related disruptions of the original project plan.
- The project supported the main SSAF project, which would otherwise have been significantly hindered by COVID-19-related restrictions.
- No additional pressure was placed on CoJ to provide data or information. Instead a new and very useful component was essentially added to the original project plan.
- The COVID-19 project enabled important innovations in the main SSAF project, including respect for improved consideration for Gender and Social Inclusion (G&SI) attributes, and also in how to present project results in a more accessible format (the online Story Map).
- A baseline data assessment is essential as a precursor to the design and delivery of any project that focuses on data-driven decision-making. As such, in municipal environments where there are significant gaps in data repositories, a crisis response can be hampered and result in inadequate outcomes.

The other two CoJ COVID-19 projects were not closely integrated into the core CoJ projects; and both relied upon the delivery by the CoJ of substantial and specific data. Ultimately the delivery of this data proved difficult to achieve and was delayed, reducing the projects' scope and effect.

4 ETHEKWINI MUNICIPALITY: Introduction to the COVID-19 projects in the City

eThekwini Municipality (eTH) COVID-19 Recovery Projects: Overview

The programme uplift provided by the FCDO in response to COVID-19 enabled the delivery of technical assistance to eThekwini Municipality in line with priority needs that emerged in relation to the crisis.

Based on the request submitted by eThekwini Municipality and with FCSA's input, two areas of support were identified, focusing on Informal settlements and economic recovery. The first area was to augment and pilot lessons for the ongoing core project focused on the development of an Informal Settlement Information Management Solution. The other was to support the Municipality with an economic model to assess the impacts of proposed economic policy interventions to cushion the local economy against shocks induced by the COVID-19 pandemic.

In brief, the COVID-19 technical support provided to eThekwini Municipality included:

- **Additional technical support on data in informal settlements.** This was a project designed to augment and test assumptions for the central core project which aims to develop an Informal Settlements Information Management Solution (ISIMS). The data support intervention was provided to test and explore data systems, data collection and verification processes, along with data analysis for informal settlements to better understand how to sustainably scale up and integrate the pilot into the existing ISIMS. The pilot project's specific focus was to

The economic recovery support intervention was intended to equip the eThekwini Municipality with a quantitative economic model to simulate the City's economy to allow for testing of general economic policy interventions to address the COVID-19 induced recession.

facilitate informed and efficient service delivery (water, sanitation and waste removal) in response to the COVID-19 pandemic.

- **Economic recovery support intervention.** This was intended to equip the eThekwini Municipality with a quantitative economic model which was intended to simulate the city's economy to allow for testing of general economic policy interventions addressing the COVID-19 induced recession. The model was enhanced through the development of a front-end 'Sustainability Filter.' This aimed to provide a holistic assessment of the potential implications of policy interventions on broader sustainability considerations and encourage a 'green and equitable recovery' from COVID-19.

eTH Data Pilot Project – Specific focus on informal settlement data collection and analysis for the eThekwini Water and Sanitation Unit

The Informal Settlement Information Management Solution (ISIMS) project focuses on improved data integration, management and analysis in the space of informal settlements. The assistance offered through the COVID-19 response workstream to eThekwini Municipality (EM) took the form of additional/adapted technical support to the current and existing project to support the Human Settlements Unit (HSU), eThekwini Water and Sanitation (EWS), and the Cleansing and Solid Waste (CSW).

The Informal Settlement Information Management Solution (ISIMS) project focuses on improved data integration, management and analysis in the space of informal settlements.

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The eThekwini Economic Impact project

The eThekwini Economic Impact project aimed to equip eThekwini Municipality with a numerical model to allow for testing of general economic policy interventions addressing the COVID-19 induced recession. It also aimed to equip the Municipality with a simulation model and system which would guide policy responses to all shocks to the economy with relevance beyond the COVID-19 pandemic. The development of a Sustainability Filter to accompany the model, was aimed at evaluating how well economic projects align with broader Municipal sustainability priorities, thereby considering the socio-economic and ecological factors related to economic interventions, thereby helping to direct the Municipality towards a 'green recovery'.

Overall Lessons learnt at the eThekwini Municipality

The technical support was a short-term intervention to assist the Municipality in engaging with the changes and shocks induced by the COVID-19 pandemic. The outcome revealed the levels of resilience and agility of the teams that worked together and pulled towards common goals in a time of crisis. While it is still too early to determine the overall impact of the pilot projects, the outcomes allow for the Municipality to engage further to determine how these can be integrated into existing municipal processes and ultimately institutionalised. Some overall lessons include:

- Time spent in strengthening the scope of the economic model to include sustainability considerations helped strengthen partnerships between key built environment departments.
- More time could have been spent on ensuring the project scope matched the City's resource availability

The 'Sustainability Filter' aimed to provide a holistic assessment of the potential implications of policy interventions on broader sustainability considerations and encourage a 'green and equitable recovery' from COVID-19.

DATA PILOT PROJECT: LESSONS LEARNT

Although much groundwork was laid to enable some departments to work together and cross-reference data in ways that had not happened before, many lessons have been learnt as part of this pilot project. Notably:

- **Data sharing was complex.** It wasn't anticipated that a Non-Disclosure Agreement (NDA) would take so long to be drafted and approved. This affected the process of data sharing which in fact slowed progress. Factors like these must be planned and set up upfront as part of any projects' readiness.

- **The Municipality is strong on data collection.** However, there was a limited understanding of each department's data processes which often resulted in a duplication of effort. Silo operation continues to be an institutional feature regarding data, making integration across departments and their systems difficult.

- **The pilot project allowed for greater cross departmental cooperation and integration.** The pilot project helped the Municipal officials to confirm numerous issues around data and governance practices. It also highlighted the need to align better by sharing their data to avoid duplications of efforts. The pilot project became a microcosm of a much broader process helping to determine what approaches could be employed on the ISIMS in future phases.

- **Heightened recognition of the need to set norms and standards for each department when working with informal settlements.** This pilot project and its processes allowed the Municipal teams to interrogate existing systems around informal settlements e.g. to look at fault maps and consider the needs of informal settlement communities who may not have used the fault map system before. As a result, a review of the systems' ability to serve varied needs was taken forward.

- **Scalability: the pilot project elements can be scaled;** it will however require an investment of human and financial resources from the Municipality to accelerate and sustain these elements of work, given that the FCSA support was constrained. Depending on requisite capacity at city level, this can be replicable with an understanding that it will require necessary leadership capacity and resources.

- **Things can move quickly when there is trust and common goal and objective.** This was apparent in both the training process for data gathering and the human interface. A firm scope of work would have enabled even better results and ensured the key focus areas could be delivered. For example, the specific needs of the Human Settlements Unit (HSU) were not met given some of the data challenges that were experienced as part of the pilot project.

Lessons from this pilot will be considered and accommodated in the development of ISIMS core project.

> Things can move quickly when there is trust and common goal and objective. This was apparent in both the training process for data gathering and the human interface.

ECONOMIC IMPACT PROJECT: LESSONS LEARNT

- **Additional scoping space benefited the outcomes of the pilot project.** Although the Sustainability tool/filter was not originally envisaged as part of the Terms of Reference, the Municipality saw an opportunity to strengthen the scope to enable a model build that would enable considerations of inclusivity, the informal economy and sustainability. For example, the Sustainability filter was intended to test the extent to which specific disadvantaged groups within local communities would be impacted by projects implemented as part of economic recovery. It also prompted questions about the impact of the same projects in advancing the green and circular economy and a 'just transition' towards more sustainable development pathways.

- **External interventions can often help to mediate between competing internal objectives and interests.** The support intervention on economic recovery created space for cooperation and integration across departments. Specifically the Sustainability and Economic Development portfolios worked together and united behind a common purpose for building back better. The Sustainability filter provided an important starting point to raise critical considerations around development decision-making in the future. However, further engagement and consultation are still needed to understand its potential usefulness and application opportunities better, and how it might be integrated into municipal processes.

- **It is hard to impact upon long-term institutional shifts and changes when operating within a crisis as there is a limited window of opportunity:** The major institutional shifts required will take much longer than the duration of these pilot projects. Therefore, the expectations of a pilot should be to initiate a longer-term change process without anticipating that such change will result directly or immediately.

- **Project championing is critical to bring about desired change:** Mutual cooperation and flexibility made it possible for the project team leaders to accommodate an unusual mix between economic modelling and sustainability which are sometimes perceived as pursuing competing ends. Similar champions will be needed to ensure the continuation of the work initiated through the pilot projects.

- **Skills transfer is central:** The most significant value added to the Municipality has been skills transfer, which has enabled the benefits of receiving the model to be sustainable. Since the development of the initial economic model, internal changes, edits and improvements have been made. This would not have been possible without the training and skills transfer elements attached to the project.

> The Sustainability filter was intended to test the extent to which specific disadvantaged groups within local communities would be impacted by projects implemented as part of economic recovery.

- **Engage, identify, support, maximise:** The success of the pilot project and its ability to strengthen the ground for the core projects can be attributed to the teams' readiness to engage with the scope, identify technical support needs and then maximise the value - whilst remaining agile and flexible.

5 Programme-wide Lessons

For convenience the lessons of this programme have been grouped into those most relevant for funding partner/programme custodians, for implementing partners, and for city government beneficiaries. There is some overlap for the first two since they are both on the programme's "supply side".

Lessons for Global Donors in a Crisis

1. Recognise the need to respond.

Recognise your place to respond: A series of conversations within the FCDO and between the FCDO, delivery partner and Cities very rapidly created a shared understanding that the crisis was a common threat to all three Cities in the programme. Furthermore, a delivery partner consortium was up and running, with multi-disciplinary teams, that were able to offer alternative forms of support under emergency conditions. Coupled with the fact that the Cities already have Memorandums of Agreements with the FCDO, this enabled smoother official EXCO/Council approval for the additional support that enabled the work to flow quickly. This essentially recognised that this FCDO programme was uniquely positioned to leverage extensive shared experience to support the Cities in their COVID-19 responses.

The programme's inherent emphasis on a theory of change built around the three pillars of urban planning, transport and resilience further enabled the FCDO to clearly frame the cities' needs and challenges within its offering. Recognising the programme's positive faculties, and the most effective approach to leverage them, was key to enabling everything that followed.

A series of conversations within the FCDO and between the FCDO, delivery partner and Cities very rapidly created a shared understanding that the crisis was a common threat to all three Cities in the programme.

2. Flexible Programming:
The demand-led approach of the FCDO combined with the recognition of the unprecedented nature of the COVID-19 crisis, and the role of the Cities in responding to it, fostered a flexible environment to augment the technical assistance within a short period.

3. Flexibility of the supply:
While Cities may have had the foresight to know that support would be needed in planning recovery, in the heat of the crisis this support could not be scoped in detail. For example, the scopes of work for very particular work up front were clear but were less clear for later recovery work. This was supported by a degree of "broadness" in the terms of reference process allowing for adaptation. This approach allowed space for unfolding insights on the crisis as well as the institutional process of refining the requirements. In the absence of funding flexibility, the programme teams and partners must account for a higher degree of risk of an unproductive and/or misdirected delivery.

4. In developing emergency assistance, ensure the strategic intent of the programme is maintained and relevant systems are adhered to:
The core programme is clearly framed by a set of desired outcomes and impact articulated in a theory of change, which includes a clearly defined imperative for Gender and Social Inclusion (G&SI). While the theory of change was adapted to frame COVID-19 projects appropriately, G&SI considerations were not prioritised upfront in COVID-19 project TORs submitted by the cities, which also meant that inadequate provision was made for the G&SI Lead to engage in project scoping, implementation and revision. As COVID-19 projects produced deliverables, programme management sought to rectify this by ensuring G&SI review of draft deliverables. While an important attempt at 'course correction', at this stage feedback aimed at enhancing inclusion and gender equality could often only be partially addressed. A similar point can be made about sustainability. However, this was a specific focus in one of the projects and was incorporated up front.

5. Enabling a critical diagnostic mode upfront:
In crises, the immediate visible need is upfront, and the more transformative strategic agenda is not always considered in as detailed a way as possible. While appreciating the need for expediency, a critical diagnostic orientation in the face of expressed city needs is needed and can be rapid. Funding agencies may need to explore ensuring a fast-tracked but critical diagnostic engagement with City needs. A transformative strategic agenda could be furthered through their support in the context of a crisis.

Ashraf Hendricks – GroundUp (CC BY-ND 4.0)

> Funding agencies may need to explore ensuring a fast-tracked but critical diagnostic engagement with City needs in the context of a crisis.

6. **Incentivise and enable change over familiarity.**
   City institutions like others, will often embrace ways of working that they are culturally familiar with and be reticent on ways of working that are uncomfortable. This can become even more apparent in a crisis. Both crises and programmes such as this one have immense potential to recognise where city governments stand culturally, whilst also creating incentives and enablers for city governments to transcend their comfort zones and do things differently. Open collaboration with civil society is an example of this.

Lesson for Delivery Partners

1. **FCSA proved capable of quickly developing a suite of ten viable emergency projects.**
   FCSA, the FCDO and the three cities discussed and agreed the ten projects swiftly and then implemented these over the next seven to nine months..

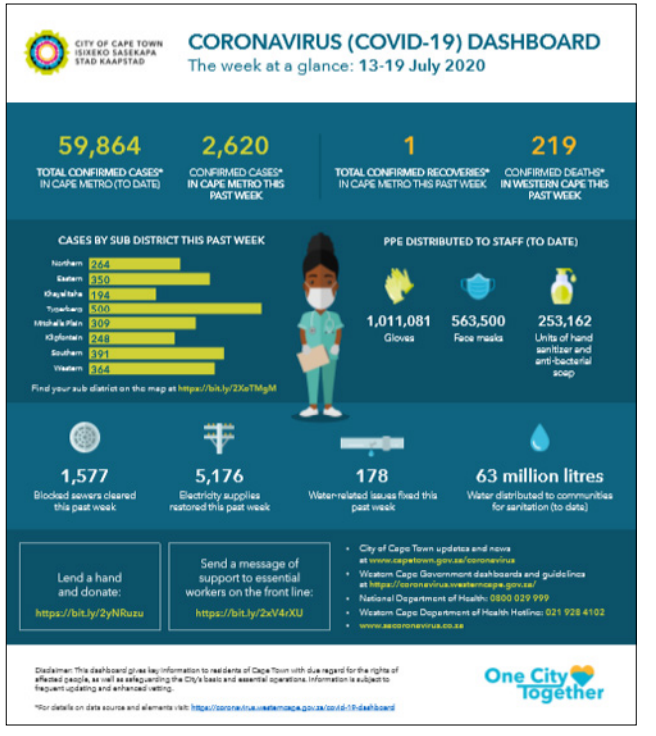
2. **Employment of agile multi-disciplinary teams capable of flexibly adapting to new requirements.**
   The programme teams were capable of flexibly adapting to new requirements which emerged as the projects proceeded. This applied across all three cities, and adaptive programming was a key facilitator. Such flexibility would seem to be an essential requirement for emergency support programmes of this nature.

3. **The COVID-19 emergency programme abruptly required substantial additional work.**
   This impacted the FCSA programme management team and also took away some time from the main projects. Delivery partners must have the foresight to manage their adaptability against the resources needed to deliver such projects effectively. As this programme is demand-led, the agility must not be taken for granted, either on the Delivery Partners side, or by the Funding partner. Therefore, the critical diagnosis is essential for the Delivery partners to:
   a) Counter poor management of expectations of the city partners.
   b) Thoroughly verify the capability and extent that emergency support can have in different cities. Clear cross-partner communication during such crises is vital.

4. **Working across different Cities requires different approaches.**
   Not all Cities needed or had an interest in the same solutions or ways of working, and not all lessons apply equally to all Cities.

5. **The most successful COVID-19 projects were those which were most closely linked to the existing FCSA programme.**
   This applied at thematic and project level across all three cities. This can be attributed to the detailed insights of the project teams, and the existing (albeit new) working relationships with their city counterparts, which enabled them to quickly identify gaps and (at least informally) scope the emergency support required.

6. **Even emergency assistance requires project scoping.**
   Time and work effort should be allowed to achieve that. Pressure to develop and execute emergency projects over a short period reduces the time available, potentially the project scoping effectiveness. This is especially relevant when the emergency assistance is not closely linked to the main projects, which will have already had time and consideration given to their scoping and context. To mitigate this, the scoping alignment with the Theory of Change must be considered in such a way that the Delivery Partner's familiarity with the technical scope can be leveraged positively to inform the funding partners. The programme is run on the principle of turning the Cities into intelligent customers and turning the 'funder' into an intelligent supplier. in this relationship. Delivery Partners play a crucial role in mediating these two sides. The delivery partner should seek to respond in an agile way to emerging insights about the crisis or the institution, rather than taking the initial scope as final. At the same time, the scope should not be managed so flexibly that it ends up being unfocused and not addressing the important original objectives. This requires skilled project management.



7. **Emergency assistance should be adequately institutionalised.**
   If the intense pressure to produce high-quality technical outputs is not matched by equal pressure to establish that project outputs are both appropriate and can be turned into routine administrative practice, the project may not achieve what is intended. The balance required should be assessed as part of the scoping exercise and should not be overlooked even under pressure to get going. The Delivery Partner can also contribute to informing this.

8. **It is ideal for the project to have strong City leadership and active engagement with the project.**
   However, this is not always guaranteed and may even shift during the course of the project. It is crucial for the delivery partner to adjust their level of assertiveness in response, in order to make the project a success. A delivery partner described this as "knowing when to lead from the front and when to lead from the back". Delivery partners, as neutral outsiders, can also sometimes help to mediate tensions, unblock institutional processes and facilitate communication.

Lessons for City Government Beneficiaries

1. **When participating in global donor programmes, it is vital that Cities know their own strategies and how they intend to use the available support to advance their strategic focus areas further.**
   The same is true for support in the context of a crisis. If the support cannot be channelled into established priority areas, Cities may be left with something that was more effort to manage than it was worth to them. This requires that the appropriate level of crisis support is made available to the crisis coordination effort, prioritising where support is most needed - ideally at the most strategic level.

2. **City governments with strong internal coordination are likely to manage any crisis more effectively.**
   Regular and focused internal coordination meetings at the senior/executive level will not only enable their crisis response to be more effective, but they should also be better able to respond more effectively to external offers of emergency assistance. Strong internal coordination allows the city to synthesise multiple inputs on what is needed, and then manage or negotiate the emergency assistance with a clear sense of city priorities and capacity

3. **Emergency assistance projects are more successful if there is greater engagement by senior officials:**
   In general, COVID-project experience suggests that this can be attributed to the ability that senior officials have to coordinate, as well as their authority to make decisions, to ensure outputs are adopted at all required levels, and to direct the necessary city capacity to collaborate with the delivery partners to achieve the desired goals.

4. **City resilience and responsiveness requires pre-existing systems to provide essential data:**
   The experience of the COVID-19 projects highlighted that this is especially relevant regarding excluded groups, and in many cases on a consolidated / integrated basis. This is essential for the provision of relevant and timely information to decision-making processes. Under crisis circumstances, managers are often thrust into new roles (in coordinating committees and`war rooms') and may often find that they need new data and information. If those datasets are not readily available the crisis response will be retarded and/or misdirected. Emergency initiatives can only address specific types of data gaps and data infrastructure needs. The stronger the pre-existing data infrastructure, the more effectively the city government can respond to crises.

5. **City governments with more robust systems that provide essential data extract more benefit from emergency assistance offered in programmes.**
   More specific and directed assistance can be offered in this situation. Where these systems & data sets are weaker, the emergency assistance risks either (i) spending precious time and resources trying to collect the data or put fundamentals in place on an emergency basis, or (ii) delivering inappropriate products. City governments should invest in such systems and data to be ready for emergencies.

6. **City governments with recent prior experience in responding to crises are likely to respond more effectively to the next crisis:**
   This is especially if they ensure that the lessons learned are not just forgotten but thoroughly institutionalised.

7. **Disaster management structures are essential but not sufficient.**
   The nature of the COVID-19 crisis, like others, is significantly multi-dimensional. Indications are that our local and intergovernmental structures are important coordination vehicles, but insufficient to provide the leadership and level of coordination needed.

8. **City governments participating in global donor funded programmes need to have a clear strategy for maximising that opportunity.**
   They not only need to be adapting internally to create structures to utilise the support, but also influencing the donor environment to support their strategic objectives and the vision and direction they have established for and with their citizens. This is particularly true during a crisis. Strong engagements between the City and the donor on the purpose of the support, and the development of a shared vision for the impact of the support during the crisis is key to ensuring that the required support is available, that the terms and desired impact are understood by all, and that there can be no later confusion regarding intent.

In Conclusion

1. **Emergency interventions such as the Global Future Cities Programme's COVID-19 package in South Africa, are likely to have better results when:**

   - the interventions are closely integrated with and support existing work projects at that particular municipality (and the existing projects can be adapted to support that crisis response).
   - the donor and the delivery partner are both equipped to be agile and responsive to changing conditions and emerging insights.
   - City officials are not overburdened by additional effort, arrangements, data or information.
   - the opportunity is used to innovate or otherwise improve the main projects.

2. **City governments with the following characteristics are likely to derive greater benefit from emergency assistance such as this programme's COVID-19 projects:**

   - They have a transversal coordination structure at a strategic level that is also able to direct and prioritise how the support is used.
   - They can manage the relationships with donor organisations and delivery partners in a collaborative manner, building a common understanding of the desired impact for the City, as well as what the desired return is for the donor.
   - They have a strong pre-existing infrastructure of systems & data.
   - They have learned from their responses to recent previous crises.

> Emergency interventions are likely to have the best results when the interventions are closely integrated with and support existing work projects at that particular municipality

Annexure: Detail on each of the COVID-19 projects in the Cities

City of Cape Town

CCT Rapid Open Data (CKAN) and data support

The main aim of this project was to set up and administer a data portal that:

- delivered secure data sharing and an access platform; and
- supports the City in the use, maintenance, extension, and capacity building of the platform and its users.

To this end, the data portal enabled the access and sharing of relevant data to and from other City COVID-19 workstreams, from Provincial departments (case data for logistics modelling), and to other researchers across the academic, public and private collaborative platform on the COVID-19 response.

This platform has a plethora of uses. These include sharing epidemiological data, vulnerability mapping, geotagging case data, and sharing large data files for the financial and logistics models. This platform also has ongoing use in the core programme support to the City's data strategy.

CCT Impact and Recovery

This workstream focused on supporting the understanding of the local and global economic impact and recovery scenarios and how they interacted. Working closely with the City's internal economists, the FCSA team built a model to simulate potential impacts on the economy and ran various scenarios based on economic and health policy.

This model was used as a direct input into the financial scenarios model (see the Financial Recovery section below). It was also used for adjusting contextual informants for various City strategies and plans and informed the internal City 3-year recovery scenarios. The team further produced leading indicators to monitor the real recovery of the economy to support the economics team in monitoring the efficacy of the scenarios against the actual performance of the economy while waiting for GDP releases.

This workstream also worked together with the City's Recover workstream. Further work was conducted for input into the City's revisions of its Annual strategy brief, Inclusive Economic Growth Strategy, draft Human Settlements Strategy, and its Strategic Infrastructure Strategy for recovery. A substantive thought leadership document was produced on multiple Intergovernmental Functions that may be impacted by changes in resources due to the impact of COVID-19. Together with the City's human resources and information systems and technology teams, FCSA researched and workshopped a "Future of Work" paper as an input into the City's institutional recovery planning workstream. Finally, FCSA worked with the City's Resilience team to document learnings from COVID-19 for future city-wide shocks in a series of Disaster Risk Management lessons and recommendations reports.

These pieces of work all contributed to the City's Strategic Management Framework annual strategy brief (to inform planning and budgeting).

CCT Financial Recovery

This project helped the City of Cape Town to improve its understanding of its own financial sustainability to better serve its citizens with the limited resources available.

FCSA provided modelling support, building:

- **A revenue scenarios model,** using economic and consumption scenarios as inputs to present a view on revenue collection. This was used to understand immediate cash flow risks, medium-term financial scenarios, and opportunities for revenue enhancement. In addition, it also identified opportunities for further sophisticated modelling, using the power of the City's extensive consumption and billing data. This modelling includes economic scenarios and built-on inputs from theoretical models such as those developed through the consumption and tariffs workstream, which could be used to create learning models that produce powerful insights for City fiscal policy.

- **A costing model** quantifying the costs associated with the broad -ranging COVID-19 response which will enable the City to clearly articulate and trace its investment in COVID-19 response

- **A decision support tool** that integrated various risk and decision models in one place, allowing the COVID-19 Coordinating Committee to compare and record strategic choices at given moments in time

- **A risk model tailored** to the specific system risks associated with the COVID-19 response. The City has since taken this work further, with light input from the FCSA team, to apply it to other strategic areas - including its New Water Programme.

CCT Strategic Support to Informal Settlements

This workstream supported the City's Water and Sanitation Department with their work in informal settlements to address the needs of particularly vulnerable communities during the pandemic. The work piloted a data collection system in 23 of the most vulnerable informal settlements (identified based on a vulnerability mapper and inputs from NGO partners), to collect live data on the performance of and access to water and sanitation services.

By the time the pilot ended in November 2020, 4,772 unique data records were captured, covering 1,160 taps and 166 broken toilets. The 1,160 taps recorded represent a 16% sample of the 7,350 communal taps in the city. A total of 736 water and sanitation service requests were sent to the CCT. A GIS file of all taps in the settlements surveyed was provided to the CCT to update the asset register. The project gained a comprehensive view of the installed water service levels in each settlement and how these changed over time in response to maintenance activities. The automatic uploading of the data records onto the CKAN data portal allowed for analysis of this data for more significant insights into informal settlement dynamics.

This short-run project supported immediate service provision during the first peak, and provided valuable data and operational insights, which will inform a longer-term informal settlements' use case project. Many lessons were learned though this project about water and sanitation infrastructure and fault reporting in informal settlements. These insights are valuable, both for longer-term infrastructure and service planning and also day to day operational efficiency and service enhancement. These lessons were captured in a comprehensive document, which has been shared and presented at appropriate planning and operational structures within the City. The Water and Sanitation Department and Urban Management Department are taking the data collection and lessons forward.

CCT Logistics (Health, Mortality, Water & Sanitation)

The logistics workstream provided modelling support to review the current healthcare supply chain network and distribution model and make recommendations to improve functionality given the COVID-19 crisis.

This project took place when the City was working at pace to expand and improve clinic facilities. During the initial stages of the pandemic, the City upgraded 38 facilities that were repurposed as overflow clinics and COVID-19 sites. These clinics required additional nurses and health care workers, including permanent, contract and some volunteers, which posed significant challenges. Initial models were built and updated multiple times a week, and later on a weekly basis to assist the City in ascertaining which clinics across the entire system needed PPE, staff and other resources. These models were used by project managers tasked with procurement and resource strategies and the establishment of temporary overflow facilities.

This work also involved simulating the fatalities chain and identifying where bottlenecks might occur in terms of transport, storage, burials or cremations, and informing appropriate investments in additional transport, storage and crematorium capacities. Part of this work was a costing model to understand at what point the City might need to pay for burials to increase the speed of burials and alleviate potential backlogs in the system. The intention behind this work was to ensure that the City was prepared for worst-case scenarios but triggered to spend resources only at the right point in time to prevent those scenarios from becoming a traumatic reality for society.

The fatality modelling helped inform and support the City's work on expanding crematorium facilities. At the start of the pandemic, there was one functional cremator, which was increased to four cremators in 8 weeks. Two had been non-compliant due to not meeting air emissions standards, and one was idle and not maintained. The City also worked closely with the Western Cape Province to identify a contingency site at Ndabeni and share resources. In 3 weeks, they had plans for staff, water and electricity to ensure that, if they ran out of space, there would be a place to store and identify bodies. Additional graves were prepared at cemeteries and burial cases and body bags procured in record time.

SUMMARY LEARNINGS

- **A strong partnership with the FCDO, CCT and FCSA was vital.** Regular engagements with the local FCDO representative for Cape Town provided the necessary oversight, support and confidence that there were shared objectives between the City and the FCDO, and that FCSA were properly mandated to work in the adaptive and agile manner necessary to provide crisis support.

- **The importance of governance.** The team produced daily and weekly written updates for traceability of decisions, and model documentation & lessons for long-term use of some of the modeling capabilities or elements. Long term crises (such as the pandemic) need sustained management and systems that can support this.

- **In crises, managers need new types of information and data.** Many officials adopted new roles in the crisis, separate to their pre-existing roles. Consequently, they needed access to new insights, information and data sets in support of these new roles. These were often not available. Systems need to be built with both regular and crisis roles in mind, so that this pivot can happen quickly.

- **The need for solid ongoing coordination.** Regular (daily or weekly) check-ins at a senior / executive level helped the team to work fast, with agility, but still focus on the right problems while avoiding duplication of effort.

- **The value of rapid prototyping and build.** Given the need to work quickly, it was essential to use the best readily available knowledge and data while not seeking perfection. Such data will produce sufficient insights to inform some decisions, allowing the team to continue working on improvements for future decisions. Furthermore, the willingness to rapidly discard options that have been scoped but no longer make sense was also crucial as our understanding of the pandemic and its potential impact constantly changed.

- **Models are a means, not an end.** Each model required a clear model owner and user. It was essential for the model builder to understand exactly how the particular model's use fitted within the broader strategy and execution.

- **The role of the "data core".** Given the ever-changing environment, number of stakeholders and need to work quickly, it was essential to have a core data team playing a central coordination role of the incoming data requests. This was necessary in order to understand the limitations of the data, ensure "one truth" was being used (as input into all models) and was critical to integrity, efficiency and reducing frustrations within an extremely pressurised data science team.

- **Balancing an open "learning by doing" approach, whilst targeting key experts across the consortium for specific advice.** The coordinating team (City and FCSA) held regular reviews and check-ins and changed the team composition based on the next requirement.

- **Some pieces of work were not as urgent as they felt at the time.** In retrospect, some elements- especially the thought leader pieces and strategy reviews in the recovery work-stream - could have benefited from more time. There was urgency to get a large amount of information together within a short period of time, this was resonant with the pace of work in a crisis and to stabilise related work streams but arguably less appropriate or necessary for strategy pieces of work. This was partly caused by deadlines created by budget availability from the donor, as well as the City not knowing how acute revenue impacts would be and how soon hard choices would need to be made.

City of Johannesburg

CoJ Urban Mobility and Reopening

This project was initially conceived as assistance to help the City of Johannesburg better understand and respond to the effects of the pandemic on mobility planning and bus services contracting in its municipal area (which lie at the heart of its mandate)and to learn lessons about more adaptable governance systems for the future.

To deliver this work, the FCSA project team worked with the CoJ Transport department (with whom they were already working on the main FCSA project - J4IR), and other operational staff of CoJ Transport.

The project's initial scope was ambitious, as it covered all of the services covered by the City, provincial and mini-bus taxi bus services. The intention was to provide data-driven transport-modelling insights into the spread potential of the COVID-19 virus in urban mobility systems (including, as far as possible, gender and social inclusion (G&SI)-related considerations), and also a decision-making tool to test various scenario interventions.

However, data constraints constrained the ability of the project to achieve its full potential. Only very limited ridership and financial data was available, and there was almost no data relating to gender and social inclusion. Given this, the COVID-19 Impact Assessment and Passenger Resilience Report that was produced was more limited in its scope than first intended.

The project highlighted the need for the CoJ to substantially strengthen its basic data and other systems, including access to dynamic mobility-related datasets, essential for operational decision-making in times of disruption.

To strengthen this for the future, the way forward would be for the CoJ Transport department to develop a data strategy to build an accessible data platform covering all essential transport-related data (appropriately linked to other CoJ sectoral and developmental data), including those related to G&SI. The effective use of such a platform would then need to be incorporated into the standard operating practices of the CoJ Transport department and others.

CoJ Soweto Pandemic Impact Study

A centrepiece (and significant differentiator) of the main Soweto Strategic Area Framework (SSAF) project plan had been an intensive survey of community and business activity in the local study area. However, just as the project was getting underway, COVID-19-related restrictions made the survey impossible.

As a result of this challenge, the 'Soweto Pandemic Impact Study' was developed by the FCSA project team and the CoJ's Development Planning department as a way of overcoming the setback. Since the pandemic was clearly an entirely new and profoundly important influence on development trends in Soweto, it was critical for the main SSAF project that these implications be properly understood.

The project utilised electronic movement data and data from electronic surveys of households and businesses in the study area to better understand the impact of (and reactions to) the pandemic and its associated restrictions. Operationally, this was also a good fit with the main SSAF project, and no additional pressure was placed on Johannesburg officials.

The study generated local COVID-19-specific data and insights from the study area, which proved to be different from what would otherwise have been available. Examples include data and information on job losses, income reductions and unemployment; redirection of spending and travel costs; implications for gender & social inclusion (G&SI); and many others. These findings significantly improved the direction and emphasis of the main SSAF project; emphatically located it within the COVID-19-related development challenges of the project area; improved its consideration of G&SI dimensions; and improved its overall credibility to all stakeholders.

The project also enabled the first step on the road from traditional consultancy outputs to far more accessible products, which can be used by residents and businesses as well as professionals and academics. The Story Map that was ultimately [SS2] delivered was a trial run for the use of the same platform for the full SSAF Status Quo report, which is much improved, and which incorporates the COVID-19 project output under a specific tab).

The Soweto Pandemic Impact Study results will be thoroughly incorporated into the main SSAF project, including lessons learned from the use of Story Maps to present the information and make it more accessible.

CoJ Financial Recovery Project

This project was intended to assist the City to recover from the negative financial effects of COVID-19-related restrictions by working with City officials to develop:

- **a scenario model,** intended to facilitate long-term financial planning taking COVID-19 impacts into account (city governments all over the world are having to understand the revenue, expenditure and debt implications of the pandemic on their long-term financial strategy).

- **an analysis of commercial losses** relating to the pandemic (most metros have faced a cash crunch as taxpayers reduced and delayed their municipal payments. A sound commercial analysis is important to ensuring appropriate credit control responses and quickly improving cash inflows). The FCSA team worked with the nominated CoJ focal point and the CoJ Revenue team to deliver this work.

The groundwork for some of these project offerings had previously been developed for the City of Cape Town. Therefore, this support was offered and accepted as specific fully funded and pre-prepared work packages (entirely separate from the core FCSA projects at the CoJ).

The COVID-19 Finance products offered (a) a COVID-19-aware evidence-base to inform the city budget strategy and (b) a strategic approach to pandemic-related credit-control operations.

The project highlighted the need to substantially strengthen basic data and other systems necessary for city resilience. To strengthen this for the future, a way forward would be for the CoJ Finance team to build an accessible data platform to leverage for deeper insights into their customers and revenue. This should be incorporated within an overall city data strategy.

eThekwini Municipality

Data Pilot Project – Specific focus on informal settlement data collection and analysis for eTH Water and Sanitation Unit

The Informal Settlement Information Management Solution (ISIMS) project, as part of the main programme, focuses on improved data integration, management and analysis in the space of informal settlements. The assistance offered through the COVID-19 response workstream to eThekwini Municipality (EM) took the form of additional/adapted technical support to the current and existing project to support the Human Settlements Unit (HSU), eThekwini Water and Sanitation (EWS), and the Cleansing and Solid Waste (CSW).

The HSU needed information on the number and location of all communal ablution blocks (CABs). Despite having delivered these assets, the data about the functionality of these assets was scant and not well coordinated across Municipal departments. Thus, the pilot project sought to enhance the Municipality's ability to gather and assess data from different Municipal departments and informal settlement communities. The intention was to use this data to facilitate informed and efficient service delivery to informal settlements at a time when addressing basic issues around water, sanitation and waste removal was so central to the COVID-19 pandemic response. The work was also intended to be a pilot project or use-case, so that learnings from this could help inform further up-scaling, if appropriate, and could be further applied to the ISIMS.

As part of this project, the following KOBO[1] and CKAN[2] tools were delivered:

- **An app was designed to assess the services provided for informal settlements**, e.g. to see whether the CABs were serviced, whether they worked, and within which approximate area. This was critical to enable an interface in terms of

[1] KoBo Toolbox is a free, open-source tool for mobile data collection, available to all. It allows you to collect data in the field using mobile devices such as phones or tablets, as well as with paper or computers.

[2] The Comprehensive Knowledge Archive Network (CKAN) is an open-source, API-capable, open data portal for the storage and distribution of data, both securely within an organisation and with external users.

community-generated data feeding into the Municipal service delivery systems. This helped the Municipality to understand the condition of those CABs and facilitated the repairs for these. The concept behind the creation of this app was to provide the Municipality with the ability to interface with the fault reporting system, so that faults could be reported timeously and addressed. At the time of reporting, 18 CABs/water stations were serviced - but as a note, a cab has multiple functions - wash-basins, toilets, showers, sinks, and so within each CAB there were a variation of works that were performed. One CAB may have had a few call outs for different issues.

- **Kobo data collection portal and spatial data layering system was developed.** This will go live in the ISIMS Phase 2. The aim of the spatial representation alongside the data portal was to help with understanding the protocols around data sharing arrangements etc.

The eThekwini Economic Impact project

The eThekwini Economic Impact' project aimed to equip eThekwini Municipality with a numerical model to allow for testing of general economic policy interventions addressing the COVID-19 induced recession. It also aimed to equip the Municipality with a simulation model and system which would guide policy responses to all shocks to the economy and could be used beyond the COVID-19 pandemic. The development of a Sustainability Filter to accompany the model was aimed at evaluating how well economic projects align with broader Municipal sustainability priorities, thereby considering the socio-economic and ecological externalities related to economic interventions and helping to direct the Municipality towards a 'green recovery'.

Working with the Economic Development Unit (EDU), the Coordination Team from the Sustainable and Resilient City Initiatives (SRCI) Unit and other representation from the Engineering Unit and Environmental Planning and Climate Protection Department, the pilot delivered the following:

- an updated Social Accounting Matrix (SAM) including an improved impact model, which entailed an Economic Impact Assessment (EIA) model;
- an Economic Impact Assessment Tool; and
- A Sustainability Filter

This suite of models allowed the testing of various positive or negative impacts (such as COVID-19 or policy interventions) on Durban's economy. It created an excellent opportunity for integration between departments that had not cooperated on a common objective before. The EDU Team had limited experience in implementing or running an economic simulator model, and a capacity building and training session was held to ensure skills transfer.

The Sustainability filter is a very promising tool to get key decisions tested, and some further development of the tool is underway to prepare it for use.

FUTURE CITIES SA

Future Cities South Africa (FCSA) is the delivery partner for the South African component of the Global Future Cities Programme, funded by the UK Government's Foreign, Commonwealth and Development Office (FCDO). FCSA is an alliance of organisations and individuals led by PwC (UK & ZA), and includes the Isandla Institute, Open Cities Lab (OCL), Palmer Development Group (PDG), Violence Prevention through Urban Upgrading (VPUU NPC), Zutari and others, together with a range of independent specialists.