SOUTH AFRICAN CITIES GREEN TRANSPORT PROGRAMME

STAKEHOLDER ENGAGEMENT REPORT

JUNE 2015

Prepared by:
SOUTH AFRICAN CITIES NETWORK
SOUTH AFRICAN NATIONAL ENERGY DEVELOPMENT INSTITUTE
LINKD ENVIRONMENTAL SERVICES

Disclaimer:

THIS PAPER FORMS PART OF A RESEARCH PROJECT, ‘SOUTH AFRICAN CITIES GREEN TRANSPORT PROGRAMME’, FUNDED BY THE GREEN FUND, AN ENVIRONMENTAL FINANCE MECHANISM IMPLEMENTED BY THE DEVELOPMENT BANK OF SOUTHERN AFRICA (DBSA) ON BEHALF OF THE DEPARTMENT OF ENVIRONMENTAL AFFAIRS (DEA). OPINIONS EXPRESSED AND CONCLUSIONS ARRIVED AT ARE THOSE OF THE AUTHOR(S) AND ARE NOT NECESSARILY TO BE ATTRIBUTED TO THE GREEN FUND OR DBSA.
ACKNOWLEDGEMENTS

The South African Cities Green Transport project is consistent with the commitment of the South African Cities Network (SACN) to support cities in fulfilling their mandate to citizens ie the right to clean air. Sandiswa Tshaka of the SACN played the leading role in setting up this project and in providing guidance throughout its implementation. Godfrey Musvoto and Geoffrey Bickford provided valuable additional and on-going support and insight. Carel Snyman, head of the Green Transport Programme and Kevin Nassiep, the CEO at the South African National Energy Development Institute (SANEDI) gave their time in support of this project as part of their broader commitment to developing the national capacity to support a rollout of green transportation technologies and infrastructure.

The project required the participation of stakeholders from a number of national and provincial departments, particularly the National Treasury, Department of Transport (DoT), Department of Environmental Affairs (DEA), Department of Energy, Department of Trade and Industry (DTI), Department of Economic Development, Industrial Development Corporation (IDC), Gauteng Provincial Department of Roads and Transport (GPDRT) as well as the Gauteng Provincial Green Economy Directorate. Officials from these departments are acknowledged for the insights that they shared with the project team and for the guidance they provided on green transport challenges, procurement approaches, and institutional mechanisms.

In particular, gratitude is expressed to officials from SACN member cities that assisted the project team in workshops and in data collection. This project team acknowledges the immense amount of work that the cities are doing and the enormous pressure many officials face in fulfilling their many reporting obligations.

Most importantly the project sponsor, the Green Fund of the Development Bank of Southern Africa (DBSA) for providing the funding to undertake this research at the city level.
# ACRONYMS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRT</td>
<td>Bus Rapid Transit</td>
</tr>
<tr>
<td>BYD</td>
<td>Build Your Dreams</td>
</tr>
<tr>
<td>Capex</td>
<td>Capital expenditure</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CNG</td>
<td>Compressed Natural Gas</td>
</tr>
<tr>
<td>CoJ</td>
<td>City of Johannesburg</td>
</tr>
<tr>
<td>CoT</td>
<td>City of Tshwane</td>
</tr>
<tr>
<td>DBSA</td>
<td>Development Bank of Southern Africa</td>
</tr>
<tr>
<td>DEA</td>
<td>Department of Environmental Affairs</td>
</tr>
<tr>
<td>DoE</td>
<td>Department of Energy</td>
</tr>
<tr>
<td>DoT</td>
<td>Department of Transport</td>
</tr>
<tr>
<td>Dti</td>
<td>Department of Trade and Industry</td>
</tr>
<tr>
<td>GDED</td>
<td>Gauteng Department of Economic Development</td>
</tr>
<tr>
<td>GGDA</td>
<td>Gauteng Growth and Development Agency</td>
</tr>
<tr>
<td>GHG</td>
<td>Green House Gas</td>
</tr>
<tr>
<td>GIZ</td>
<td>Deutsche Gesellschaft fur Internationale Zusammenarbeit</td>
</tr>
<tr>
<td>GPDRT</td>
<td>Gauteng Provincial Department of Roads and Transport</td>
</tr>
<tr>
<td>IDC</td>
<td>Industrial Development Corporation</td>
</tr>
<tr>
<td>ITP</td>
<td>Integrated Transport Plans</td>
</tr>
<tr>
<td>MFMA</td>
<td>Municipal Finance Management Act</td>
</tr>
<tr>
<td>NMT</td>
<td>Non-Motorised Transport</td>
</tr>
<tr>
<td>PFMA</td>
<td>Public Finance Management Act</td>
</tr>
<tr>
<td>PPP</td>
<td>Private Public Partnership</td>
</tr>
<tr>
<td>SABIA</td>
<td>South African Biogas Industries Association</td>
</tr>
<tr>
<td>SACN</td>
<td>South African Cities Network</td>
</tr>
<tr>
<td>SAGA</td>
<td>South African Gas Association</td>
</tr>
<tr>
<td>SALGA</td>
<td>South African Local Government Association</td>
</tr>
<tr>
<td>SANEDI</td>
<td>South African National Energy Development Institute</td>
</tr>
<tr>
<td>SEA</td>
<td>Sustainable Energy Africa</td>
</tr>
<tr>
<td>ToR</td>
<td>Terms of Reference</td>
</tr>
</tbody>
</table>
1. INTRODUCTION

The South African Cities Network (SACN) encourages the “exchange of information, experience and best practices on urban development and city management” and also “identifies, assembles and disseminates information that enhances the ability of decision-makers to learn from the experience of others and efficiently use their resources to build sustainable cities”.

Accordingly, one of the goals of the SACN is to analyse strategic challenges facing South African cities. Transport and urban mobility represent one of the most pressing strategic and sustainability challenges facing South African cities today. Given that the transport sector is the largest greenhouse gas emissions contributor in South African cities and that the legacy of apartheid-related spatial planning perpetuates inequality, cities are embarking on the daunting task of creating a paradigm shift away from “one person, one car economic development” and towards eco-mobility, freedom corridors for non-motorised/low-carbon transit, and urban mass transit systems. Achieving this paradigm shift is a monumental task involving new thinking about spatial planning and spatial form, rethinking commuting/transportation at a societal level, understanding the long-term public health impacts of the diesel/petrol economy, and motivating for budget for a radical change in transportation infrastructure planning and implementation.

This shift is also predicated on a massive public-private infrastructure spend to densify our cities, without which the practical and financial business case for walking, riding, and public transit is more difficult. Lastly, and perhaps most challenging, is the cultural element of change, even presuming that the health benefits of walking or cycling are completely known and that there are seamless intermodal linkages and facilities throughout a city. How can sustainable transportation compete with the prestige, convenience and freedom of owning a car? And what can cities do to turn those perceived advantages into what are clearly large and unsustainable societal and personal negative externalities.

The SACN in partnership with SANEDI received grant funding from the DBSA Green Fund in 2014 to undertake research towards the establishment of a South African Cities Green Transport Programme. The project has a timeline of April 2014 up to September 2015. Linkd Environmental Services (Linkd) provides technical and project management support. The intended beneficiaries of the project are the SACN member cities – Buffalo City, Nelson Mandela Bay Metro, eThekwini, Msunduzi, Tshwane, Ekurhuleni, Johannesburg, and Mangaung.

This Stakeholder Engagement Report is the third of four deliverables of the project. The first report was a “Status Quo and Programme Concept Note” which:

- Defined the research problem,
• Provided an overview of green transport in South Africa, and
• Provided insight into the research and application of green transport technologies across the fuel and propulsion system spectrum.

The second deliverable, “Accelerating the Transition to Green Fleets” looked at the lessons learned globally in introducing green fleets into municipal operations and presented a lifecycle analysis (financial, GHG, and tailpipe emissions) of ethanol, CNG, biogas, and battery electric buses based on South African pilots using locally produced fuels and biofuels at current fuel, repair & maintenance and capital expenditure (capex) prices offered by local manufacturers or global suppliers operating in South Africa.

This third report, the “Stakeholder Engagement Report,” summarises:

• The consultation with government departments, state-owned entities, private sector companies, and cities on the research findings from the technical report and potential mechanisms that could accelerate the transition to green transport.
• The reasons for the immediate focus of the Cities Green Transport Programme on collective target setting, as opposed to a particular strategy such as establishing a transversal procurement mechanism or a green taxi pilot project.
• The outcomes from the workshops held with cities and national government to explore the most viable strategies for government to accelerate the adoption of green transportation;
• Stakeholder input on what the focus of a business case for the Green Transport Programme should be in order to deliver member driven impactful change in the near term.
2. **MAIN OBJECTIVES OF THE PROJECT**

The overarching aim of the Funded Project is to conduct research and pilots in green transport, review international best practice and local experience, evaluate the lifecycle costs and emission profiles of various green transport technologies, and develop a business plan to accelerate the adoption of green transport in member cities. The primary output is a business case that is convincing and pragmatic to provide strong direction to cities in taking up green transport initiatives. The intended outcome of all this research work being to establish a Cities Green Transport Programme.

Taking the Integrated Transport Plans (ITPs) of the member cities into account as well as green transport aspirations of the national government, the business plan that is being developed will take into account the requirements of an integrated transportation system in each member city. That means inter-modal transport, connections between trains, Bus Rapid Transit systems, Metro bus operations, minibus taxi association operations, and commuters who ride bikes or walk, are central to this exercise of supporting safe, greener, and more equitable cities and that no one part of the transportation system can be evaluated in isolation.

The business case for green transport will lay out a funding roadmap to accelerate green transport, a project implementation plan for cities, recommendations on institutional arrangements to ensure the success of the green transport interventions, and procurement arrangements to streamline supply chain management processes.

3. **APPROACH TO THE STUDY**

3.1. **Conceptualization**

While there are compelling international examples of cities implementing green, low carbon transport technologies, and research and testing has been conducted locally, there currently is a need for a coordinated and integrated approach to implementing green transport at a city level, aligned to national and provincial strategies. This effort therefore set out to consolidate the evidence base for the transition to green transport and disseminate information about particular technologies and interventions in appropriate application areas in order to develop a programmatic approach to green transport solutions in our cities.

During the inception meetings between the research team and SACN, discussions focused on understanding international and local experience with green transport interventions, gaining an objective technology comparison using a lifecycle cost and emissions model, and practically identifying which interventions and propulsion systems had a realistic chance of being mainstreamed in South Africa in the near term.

**A scoping study of green transport options, focusing on conversions of municipal bus fleets, was shared with member cities – the findings of which can be summarized as follows:**
In 2015, lifecycle costs of gas buses (Biogas or CNG), Bioethanol buses (agricultural or waste derived ethanol), and Electric Buses (at 2014-2015 Eskom prices) converged to match the lifecycle cost of a Euro V\(^1\) diesel bus (assuming March 2015 $60 a barrel oil). This fact has eliminated any green premium that used to exist - allowing government to secure 70% plus reductions in GHGs, 90% plus reductions in tailpipe emissions, and a 100% reduction in the importation of diesel fuel.

This provides a feasible option for a South African city to lease or purchase any of the above bus technologies (including fuel, fuelling infrastructure at depots, maintenance, and financing) at the same monthly cost as a business-as-usual decision to purchase new Euro V diesel buses.

The report also identified the opportunity to create economies of scale by aggregating demand across municipalities to drive down unit costs of fuel and buses by 5-20% depending on volume as well as to create a long-term off-take agreement with a new biofuel industry consortium to deliver green fuel to municipalities. Such an approach would create local green jobs that to date have not been possible due to fragmented purchasing and lack of availability of both supply and demand of green fuels.

The conclusions from the report provided the basis for the stakeholder engagement. The team deduced that the stakeholder engagement should begin with a concentration on the procurement of gas and the conversion of municipal buses. This was based on gas being the ready technology while efforts on other streams continue in parallel.

4. **STAKEHOLDER ENGAGEMENT**

4.1. **Engagement Methodology**

The stakeholder engagement process was carried out over nine months starting in October 2014 up to June 2015. The process began with the team deriving a list of stakeholders from national government, member cities, private stakeholders in the gas sector, as well as research based organisations. There is prior consultation with other technology streams ie ethanol and electric vehicles that happened during the development of second deliverable.

At the city level, interactions on the 2\(^{nd}\) report were held with officials from both the corporate fleet management departments as well as transport departments. The purpose was to discuss and agree on a common way forward for transitioning to greener transport. This engagement was carried out through a series of informal meetings with the cities as well as two workshops on the 25\(^{th}\) February and 25\(^{th}\) March 2015.

\(^1\) Euro V refers to a European Union Emission standard for diesel buses – replacing aging bus fleets with vehicles adherent to this standard would in itself result in emissions reductions for South African cities.
The workshops provided an opportunity to share the results of the research, discuss the practical implications with the member cities, and to identify areas of potential collaboration to jump start green transport in their cities. Initially the project focused on gas as an alternative low emissions fuel, and researched the procurement of gas, and the conversion of buses and/or taxis to run on gas. However, as a consequence of engagement with the cities the approach shifted towards collective target setting based on emissions reductions achieved through a range of different initiatives as identified through local and international experience, rather than a single green transport technology and transport mode.

Additionally, the project team identified existing green transport plans within cities, received feedback as to what direction cities wanted to pursue with respect to green transport, and engaged on possible options for accelerating the transition to greener transport.

On a national level, the team engaged with the DoT, DTI, DEA, National Treasury, and the DBSA. This engagement was done through a workshop on the 2nd February 2015 (details of the workshop can be found in Annexure 2). Outside of the workshop, the team engaged individually with the various departments on several occasion to ensure alignment of the project with national objectives, and policies.

The team further engaged with other entities, both private and public to gain a deeper understanding of the gas markets and to better understand the challenges facing the gas sector and the potential role of cities in helping to overcome these challenges. These are SCANIA South Africa, Build Your Dreams (BYD) Electric Bus Business Development, Sustainable Energy Africa (SEA), Compressed Natural Gas (CNG) Holdings, NovoEnergy, and the South African Gas Association (SAGA).

(A detailed timeline of the meetings, workshops, and stakeholders can be found in Annexure 1 of this report)

4.2. Summary of Green Transport Stakeholder Engagement

Each of the meetings summarized below, which started during the Public Transport month in October 2014 and ending in June 2015, was organized by and attended by at least one of the following project team members: Sandiswa Tshaka (SACN), Godfrey Musvoto (SACN), Carel Snyman (SANEDI Green Transport), Handel Maletlabo (SANEDI Green Transport), Crispian Olver (Linkd), Matthew Gaylard (Linkd), Richard Doyle (Linkd), Muhammed Suleman (Linkd), and John L. Less. For the sake of repetition, the above names are not for the most part repeated in the summaries below. The project team met on a regular basis internally and with the DBSA as per project requirements. These internal meetings are not reflected in the summary below.

(Detailed minutes of the recorded stakeholder engagements can be found in Annexure 3)

4.2.1. Workshop 1: SACN Green Transport – National & Province
The purpose of the workshop with national departments was to understand how they could support the establishment and sustainability of a municipal green transport program. The workshop made it clear that National supports the idea of the program and is willing to look at possible options. From analysing the outcome of the meeting as per the minutes (see annexure 3), it is evident that the workshop focused on two main aspects; bus and green fuel procurement as well as funding.

The main focus of discussion around buses was to understand the opportunity for cities to convert bus fleets to run on gas. The DoT argued that complex procurement processes within government would make this process difficult to accomplish, particularly in the case of BRT systems, for which new operating companies are being created that will own the fleet and those companies would then require convincing to convert fleets. As a consequence, despite government’s good intentions, converting municipal bus fleets to greener fuels will not be simple, and it was suggested that further investigation of the options was needed.

While obstacles to fleet conversions were anticipated, there was general support for gas as a low emissions alternative fuel to diesel and coal, and it was suggested that procurement of gas would be a better focus for cities. The IDC confirmed existence of opportunities for the private sector green fuel service providers and its appetite to invest in these opportunities. It was further indicated that the potential for green jobs is primarily in the production of green fuels rather than in the manufacturing of buses.

In terms of funding, it was proposed that cities should drive the process, lobby Treasury directly hence the suggestion to use Private Public Partnership (PPP) as the basis for a business case for transversal procurement agreement in terms of the PFMA or MFMA. This point was concluded by a need to identify a champion that would champion the municipal green transport as a flagship programme.

The workshop provided an opportunity for the team to present the main findings from the research to the national departments and received guidance for approaching cities on the following –

a. Transversal procurement for the full package ie buses, fuel, repairs and maintenance for gas buses seem attractive and possible to lobby for its champion
b. The benefit of this option is the aggregated volumes that will be achieved to actually activate the green industry thus contributing to job creation.

4.2.2. Workshop 2: SACN Green Transport – Cities Part 1

The purpose of the second workshop with member cities was threefold:

1. To share the research findings contained in the scoping report: “Accelerating the Transition to Green Municipal Fleets”;
2. To determine if there was sufficient interest from cities for collaboration to unlock the benefits of an aggregated rapid transition to a green transport economy;
3. To identify the procurement approach that would most readily facilitate member city collaboration if desired.

Member cities’ interest in green transport collaboration was high and the workshop attempted to find consensus on the key procurement questions:

- **How** to aggregate municipal green transport?
- **Who** should lead the effort?
- **What** are the low-hanging fruits for green transport procurement?

To address these questions, a number of options and questions were posed to the member cities and the pros and cons of each option discussed collectively. The options considered were:

- Which fleets should be targeted, and at what minimum quantities in order to achieve the benefits of scale?
- What should be the proper scope of green transport procurement (fuel only, vehicle & fuel, and whether the scope should include repairs and maintenance, or operations)?
- Who the parties to contracts should be, and their respective roles (operators, cities, an aggregating entity)?
- Which institutions should participate (municipal, provincial, national, and/or private)?
- Which institution should play the lead role (NDOT, NT, DEA, DTI, EDD, etc)?
- Which procurement path makes the most sense (MFMA or PFMA)?

While no definitive answers were identified in this first workshop with member cities, a decision was taken to collect additional fleet data to determine if the number of vehicles per vehicle class (bus, truck, sedan, bakkie, taxivan) was high enough in any individual city or in aggregate across member cities to achieve the scale required to jump start green fuel or green vehicle manufacturing jobs as well as to realise:

a) The cost savings of volume-based discounts
b) Meaningful environmental gains of green transport at a city-scale.

### 4.2.3. Collecting additional data

A review of the City of Johannesburg’s corporate fleet inventory data between workshops as well as discussions with other cities made it immediately clear that the scale required for new and sustainable green jobs (fuel or vehicle manufacturing), meaningful environmental impact, and volume-based discounts was not possible in any class of municipal owned vehicle other than buses. The scale required by manufacturers to incentivise discounts and manufacturing for the purchase of new vehicles was identified at a minimum of 500 vehicles over 3-5 years. No vehicle class in any city was identified to be anywhere close to that number individually or in aggregate other than buses. While, data pointed to a small opportunity with Quantum’s, Hilux’s, and VWs, currently none of the manufacturers in South Africa offer gas, electric, or ethanol versions of these vehicles, rendering this opportunity impractical in the short term. Data collected on buses were identified in partnership with the DoT and is summarized below.
However, while buses have the required scale to make a difference from a volume-based purchasing perspective, bus purchases are extremely difficult to aggregate across cities for a number of reasons:

- BRT buses are owned by private operators rather than municipalities – the willingness of private operators to purchase alternative propulsion or fuel technologies needs to be considered prior to bus company formation and negotiations.
- Investors in BRT systems that are already incredibly complex are not comfortable with financing new bus technologies not already in operation today on the roads of South Africa.
- There are unique local requirements for individual bus body and chassis types (low floor, high floor, gross axel weight ratings, etc) that vary across municipalities eliminating the hoped for scale.
- Each of the cities have different and moving timelines, specific balance sheet concerns and limitations. Given the complex nature of large-scale infrastructure projects in each city, this make it practically impossible to guarantee a specific number of units per city several years in advance. In short, the consistent timing and number of units required by a manufacturing plant may be at odds with the current timing of large-scale transport infrastructure projects in large cities.

Over and above the practical financing and operational challenges identified by the cities, two key political and environmental challenges were identified that essentially took aggregated bus procurement off the table for consideration:

- Buses only represent 1-2% of vehicles on the road in the member cities, making the environmental gains possible from green bus purchases extremely small.
- Member cities anticipated political resistance to ceding procurement responsibility for such a complex, expensive, and important infrastructure projects to another political entity whether it be municipal, provincial, or national. The benefits of scale would be unlikely to provide sufficient political justification for the operational risk of handing over procurement control to another entity not locally responsible to the Council.

During engagements with cities it emerged that there is a major gap between green transport market opportunities and the ability of municipal transport officials to take advantage of those
opportunities. This makes going green desirable but impractical. Those gaps include municipal budgeting and procurement processes that are not conducive to leasing solutions by limiting municipalities (in practice if not in legislation) to three year budget cycles and make it very difficult to take financial advantage of better lifecycle options.

In addition to budgeting and procurement impediments there are real operational, maintenance, and business model impediments. These include:

- Uncertainty about the future residual value of green vehicles;
- Unwillingness of some suppliers to take on fuel delivery risk;
- Maintenance requirements that do not conform to existing operational requirements;
- Regulatory and tax uncertainty with respect to the treatment of green fuel for transportation; and
- Municipal technical unfamiliarity with new technologies.

Lastly, new technologies add unnecessary complications to bus operations that are already struggling to meet service delivery goals despite the fact that by and large a new green purchase would reduce maintenance costs and times, eliminate break-downs, improve customer service, and enhance the reputation of the operator as clean, green, and professional.

4.2.4. Workshop 3: SACN Green Transport – Cities Part 2

During the third workshop, the above data and feedback was presented and it was agreed that there is no merit in pursuing a business case for greening city owned fleets including buses because of challenges that may be faced by a centralised transversal procurement mechanism at this point in time. Instead, it was suggested that a better approach may be to focus on the existing momentum with CNG taxis as there has already been a lot of work done in this sector. The three cities in attendance agreed that supporting the greening of minibus taxi fleets in their respective member cities represented the lowest hanging fruit in the green transport space since it had the highest likelihood of near-term success and most meaningful environmental impact.

On the basis of already existing momentum with the conversion of minibus taxis identified by the IDC, SANEDI and CoJ, the cities agreed to focus their collective efforts and the next phase of the Green Transport Programme on how to accelerate the conversion of minibus taxis to dual fuel and to investigate the costs of adding CNG refueling infrastructure in their cities along specific corridors to make using gas more attractive to the industry.

The direction provided by member cities and other key stakeholders was that the SACN can add much greater short term value by getting behind the momentum of the nascent green taxi initiative rather than starting another activity, particularly given the challenges identified in relation to collaboration between cities on green procurement in relation to their own internal fleets.
An additional outcome of the workshop was an agreement that a formal SACN Working Group be established under the SACN Transport Forum to support the member cities in developing and achieving their goals to green their cities transportation through the Green Transport Programme. This was strongly supported by DEA, GIZ and SANEDI who were in attendance.

Member cities requested that the SACN engage with them to focus on short-term, realistic goals that could be achieved in an environment of severe budgetary constraint. Terms of reference (ToR) was to be developed for the Green Transport Working Group under the auspices of the SACN Transport Reference Group. Such a Working Group would comprise of city corporate fleet and transport planning departments, to focus the work of cities around green transport. The SACN hopes to get a consensus on the establishment of this Group during the final stakeholder workshop. The Group should continue to advance the work of greening municipal and private-sector transport even beyond this DBSA funded initiative in September 2015.

4.2.5. Plotting the way forward

As a consequence of the direction emerging from the preceding stakeholder engagements, the project team undertook one-on-one meetings with the stakeholders involved with CNG taxi conversions, including CNG and NovoEnergy, to understand the work currently being done with Green Taxis and the possibility of this project developing a business case around a green taxi corridor pilot project.

Through the CNG and NovoEnergy engagements, it became evident just how much momentum has already developed around Green Taxis and Gas conversions in Gauteng. CNG established the first full Natural Gas filling station in Johannesburg and is funding the conversion of 1000 taxis to Natural Gas. Since then, CNG have setup an additional three filling stations in Soweto, Mamelodi, and Pretoria (http://www.cngholdings.co.za/). CNG indicated that they have 200 conversion kits on hand currently and are ready to setup/install a further 5 filling stations. NovoEnergy has established their flagship station in Benoni along with 2 more stations in Edenvale and Germiston. They are working in partnership with the Benoni Taxi Association to convert around 20% of the entire fleet (http://www.novoenergy.co.za/).

CNG’s recommendations were that the Cities Green Transport Programme should focus on securing funding for the conversion kits. They pointed out that the creation of incentives for the conversion of taxis (as has been done in other countries) was made more complicated locally by the fact that the taxi industry is not fully integrated into the formal economy. CNG also suggested that Cities could help with the procurement of land for refuelling stations and in expediting access to power at the stations. CNG also said that conversion of government fleets would be helpful, pointing to their experience in neighbouring countries where municipal fleet conversion stimulated the market for the taxi industry. They suggested that the government should set fleet targets.

Similar issues were emphasised by NovoEnergy, who suggested that strong political will has moved Mozambique far beyond South Africa in the natural gas industry. They also suggested
that it would be difficult to incentivise the taxi industry, and that conversion kits need to be funded. NovoEnergy added that they had the capacity to capture and polish gas that is currently being wasted at landfills, and that cities should be considering contracting them (or similar service providers) to run their landfills.

CNG Holdings and NovoEnergy pointed the team in the direction of the DoT/GIZ tender to convert 500 taxis to run on CNG, which essentially accomplishes much of what the team had been directed to explore in terms of developing a business case for a CNG taxi corridor. The team engaged with Eddie Cooke from SAGA and SABIA who reinforced the suggestions made by NovoEnergy and CNG Holdings. He also suggested that the team consider a broader range of possible initiatives to incentivise transitions to gas within municipalities, including initiatives such as low emission zones in which only gas or electric powered vehicles are exempt from entry charges.

The team met with DoT for further detail on the DoT/GIZ tender. It is a pilot project focusing on the outcomes of the 500 conversions of conventional minibus taxis to dual-fuel CNG. The first phase involving the conversion of 500 minibus taxis is limited to the Gauteng Province. The DoT suggested that the roll-out of BRT systems represented a useful starting point for green transport initiatives by cities. DoT pointed out that private vehicles form the majority of vehicles on the roads and suggested that cities should find ways to limit their use, or incentivise conversions to green fuels through mechanisms such as Green Zones.

In summary, the findings from the stakeholder engagement pointed to the large momentum that currently exists around Green Taxis. The project team met for a second progress review meeting which shared the outcomes of the above mentioned meetings and reviewed the merits and challenges of trying to align the balance of the SACN project with the 500 minibus taxi tender from DoT/GIZ. It was clear that a business case to run a taxi pilot project would now me duplicating the DoT’s current project. It was recognized that the private sector would likely respond to the infrastructure demand that would come with the DoT project.

Linkd reviewed the additional findings from the external stakeholder engagements including some of the more obvious possible interventions that may have fallen by the way because of the early focus on mass procurement. In particular, the issue of collective target setting was discussed at length and it was agreed that this was a key and technology neutral underpinning any interventions that may follow. It was agreed that the scope and budget of the current project would necessarily limit this work to discussing the high level mechanics only of such interventions, but that creating a framework for cities to both set targets, and monitor and evaluate performance against those targets in relation to a set of environmental and social indicators would be a useful outcome from the project.

4.2.6. Collective target setting

The project team embarked on a roadshow to all the member cities including Cape Town, for co-creating collective targets to accelerate the transition towards green transport. The team
revisited its research to establish international best practice as a starting proposal to take to the cities and socialize this with them (e.g. target emissions, fleet %, and city vehicle %). Other interventions identified in the recent stakeholder engagements such as setting low emissions zones in cities were also explored as means of achieving targets. A crib sheet was developed with different approaches in transitioning to greener transport (see annexure 3).

In engaging cities the team came to understand that each city is working on green transport initiatives, either through implementing higher quality public transport – such as BRT, Non-Motorised Transport (NMT) upgrades and improvements – such as cycle lanes, alternate fuel vehicles – both gas and electric, and low emission zones – such as restricted NMT and public transport routes. Majority of the cities supported the approach of the study and agreed that it would be useful to start setting their own targets. The main issue for them was that at the moment, there are no measures in place that can tell them what their current CO\textsubscript{2} emissions are. It was also made clear that for all cities, funding was the largest issue in terms of carrying out green transport projects; many of them have already committed to development of their public transport/BRT systems or NMT upgrades and would require additional funding if they are to start planning for green transport initiatives.

More interestingly the meetings brought to light that there is limited knowledge of what initiatives other cities are carrying out. For instance, Msunduzi, Buffalo City, and eThekwini were to a large extent unaware of the CNG work been done in Johannesburg. The Mangaung and Msunduzi Municipalities who are interested in promoting cycling are not aware of the eThekwini bicycle project, nor is eThekwini aware of the MyCiti bus system being integrated with cycling. Engaging with each City therefore not only provided an understanding of what Cities are doing, but how Cities could assist one another in moving in the right direction. Many of them are planning to do what other Cities have already done, there are shared thoughts and views across these Cities and plenty that can be learnt if the information was made available.

In relation to CNG, the cities’ main question was the transportation of gas to each city and who would fund the conversions? It was suggested that there should be incentives in place for Cities to convert to gas, incentives for them to fund the conversions. Msunduzi suggested that Cities need to get rid of old municipal vehicles which have a very high carbon footprint and invest in new fleets, but the question is what benefit is there for Cities who do this? Buffalo City made reference to this by stating that aspects such as legislation, rules on modifying fleet vehicles need to be addressed that will direct Cities to move in this direction. It was explained that such changes and incentives would have to come from the national government through collaboration between DEA, DoE, DoT, and Treasury. Cities were interested in finding out more about CNG cost implications, savings and procurement thereof. It was suggested that the Cities Green Transport Program should arrange a site visit during its last stakeholder workshop scheduled for July 2015.

Cities were asked to set collective targets which are not commitments but a basis upon which to build a more holistic understanding of what they can or cannot achieve over time. They were given the table found at the end of annexure 3. Below is an analysis of the targets.
### Options

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Joburg</th>
<th>Tshwane</th>
<th>eThekwini</th>
<th>Msunduzi</th>
<th>Buffalo City</th>
<th>Nelson Mandela Bay</th>
<th>Cape Town</th>
<th>Mangaung</th>
<th>Ekurhuleni</th>
<th>Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets; City not ready for green transport initiatives</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>16</td>
<td>29</td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>7</td>
<td>13</td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>12</td>
<td>21</td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>9</td>
</tr>
</tbody>
</table>

| Scoring                     |                                                                                         |        |         |           |          |              |                  |           |          |            |       |
|-----------------------------|-----------------------------------------------------------------------------------------|--------|---------|-----------|----------|--------------|------------------|-----------|----------|------------|-------|---  |
| 0                           | Strongly Disagree / Unrealistic / Unachievable                                          |        |         |           |          |              |                  |           |          |            |       |     |
| 1                           | Uncertain, it is conceivable, but would require major shifts in the current direction. |        |         |           |          |              |                  |           |          |            |       |     |
| 2                           | Agree that it is realistic if certain structures where put in place to make sure this happens |        |         |           |          |              |                  |           |          |            |       |     |
| 3                           | Strongly Agree / Very realistic and achievable in the context of where we are currently headed |        |         |           |          |              |                  |           |          |            |       |     |

From the above table it is evident that the Cities are ready to work towards Green Transport targets of around 15% reduction in GHG Emissions and towards a 50% Municipal Fleet Conversion. The time period stipulated in the table (which is 2020) is according to many Cities unrealistic, however if this project can breakdown the options in a way that Cities could understand what would be most suitable to them, it may be more perceivable.

There is undoubtedly a huge information sharing gap which needs to be addressed through this project. To disseminate the information of the different projects – what cities are working on, what projects have been completed, and what projects they plan to take on in the future – and combine this into a structured document that could be shared with cities. Additionally, incorporating the above information from the collective target setting exercise with the cities projects can provide a strong breakdown of the different green initiatives, who is leading the initiative, and how it has impacted the city’s transport.

### 5. Conclusion

The stakeholder engagement process began with a concentration on the centralised procurement of gas and conversion of municipal buses. This initial focus experienced numerous shifts as the needs and constraints of member cities became clearer. The initial objective of the project which was to establish a Cities Green Transport Programme remains the same. However, it is important not to lead a path that is bound to face resistance and no uptake by the intended beneficiaries. This on its own provides a good lesson for review, adaptation and urgent acceleration of policy gaps in support of green transport.
An in-principle support for centralised procurement of gas and the conversion of municipal buses through a transversal procurement mechanism was established during the initial workshops. Further detailed engagement highlighted practical concerns of this approach for cities emerged strongly as an obstacle to pursuing it as a primary outcome of the project. As such, the project refocused towards incentivising green taxis, an approach that was discussed by the cities, along with the proposal to establish a Working Group.

Through these engagements, it was established that the most effective way to move forward would be for cities to set collective targets. These targets should not be focused on any particular technology or initiative, but rather on achieving outcomes in terms of emissions reductions through any (and all) green transport initiatives. An appetite for particular targets was evaluated with each of the cities. From the received feedback it is evident that there is an interest in taking on the green transport challenge provided that the outcome from this project clearly describes a way forward that will guide cities along this journey.

Beyond the Green Fund project phase, the most useful functions that the Cities Green Transport Program can play are:

- Provide technical support to cities in setting targets and monitoring outcomes for green transport initiatives.
- Facilitate the analysis and sharing of information between cities on a broad range of green transport initiatives.

The team plans to share an outline of the proposed Business Plan together with this stakeholder report at the workshop scheduled for July 2015. The workshop is a key platform in the research process as it will provide the opportunity for stakeholders to engage in crafting the Business Plan thus forging a way-forward for a sustainable transition to green transport.
## Annexures

### Annexure 1: Timeline of Stakeholder Engagements

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Stakeholders</th>
</tr>
</thead>
<tbody>
<tr>
<td>SACN Workshop – City Fleets: Best Practice Benchmarking Workshop</td>
<td>27/10/2014</td>
<td>CoJ, CoT, Nelson Mandela Bay Municipality, Mangaung District Municipality, Buffalo City, City of eThekwini, Msunduzi District Municipality</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>13/11/2014</td>
<td>DBSA</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>17/11/2014</td>
<td>CoT</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>19/11/2014</td>
<td>The Dti</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>20/11/2014</td>
<td>National Treasury</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>24/11/2014</td>
<td>National Treasury</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>25/11/2014</td>
<td>DoE</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>26/11/2014</td>
<td>DEA</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>27/11/2014</td>
<td>Scania South Africa</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>1/12/2014</td>
<td>IDC, CoJ</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>2/12/2014</td>
<td>CoT</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>3/12/2014</td>
<td>The Dti</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>4/12/2014</td>
<td>City of Ekurhuleni</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>8/12/2014</td>
<td>DoT</td>
</tr>
<tr>
<td>Workshop 1: Green Transport (National)</td>
<td>2/2/2015</td>
<td>DOT, DEA, National Treasury, The DTI, DBSA, GPDRT</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>9/2/2015</td>
<td>National Treasury</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>12/2/2015</td>
<td>DoT</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>16/2/2015</td>
<td>IDC</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>17/2/2015</td>
<td>GDED</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>24/2/2015</td>
<td>National Treasury</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>24/2/2015</td>
<td>BYD Electric Bus Business Development – Brazil</td>
</tr>
<tr>
<td>Workshop 2: Green Transport</td>
<td>25/2/2015</td>
<td>eThekwini Municipality, CoT, CoJ, Nelson Mandela Bay Municipality, Mangaung Metropolitan Municipality, Rustenburg Metrobus, National Treasury, IDC, GDED</td>
</tr>
<tr>
<td>Event Description</td>
<td>Date</td>
<td>Organizers</td>
</tr>
<tr>
<td>--------------------------------------------------------</td>
<td>----------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>Stakeholder Session</td>
<td>4/3/2015</td>
<td>SANEDI</td>
</tr>
<tr>
<td>2nd National Biogas Conference 2015</td>
<td>5-6/3/2015</td>
<td>Eskom DoE DoT SANEDI IDC SABIA DEA</td>
</tr>
<tr>
<td>Workshop 3: Green Transport</td>
<td>25/3/2015</td>
<td>CoJ GIZ DEA Rustenburg</td>
</tr>
<tr>
<td>Stakeholder and Partner Discussion</td>
<td>1/4/2015</td>
<td>CoJ IDC SANEDI CNG Holdings SABIA</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>6/5/2015</td>
<td>CNG</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>6/5/2015</td>
<td>NovoEnergy</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>7/5/2015</td>
<td>SAGA and SABIA</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>7/5/2015</td>
<td>DoT</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>4/6/2015</td>
<td>CoJ</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>4/6/2015</td>
<td>CoT</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>8/6/2015</td>
<td>eThekwini Municipality</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>9/6/2015</td>
<td>Msunduzi Municipality</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>10/6/2015</td>
<td>Buffalo City</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>11/6/2015</td>
<td>Nelson Mandela Bay Municipality</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>12/6/2015</td>
<td>City of Cape Town</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>15/6/2015</td>
<td>Mangaung Municipality</td>
</tr>
<tr>
<td>Stakeholder Meeting</td>
<td>17/6/2015</td>
<td>City of Ekurhuleni</td>
</tr>
</tbody>
</table>
Annexure 2: Minutes from Workshops Stakeholder Engagements.

**Minutes of Workshop 1:**
Green Transport – National Government Engagement, 2\textsuperscript{nd} February 2015 at Metro Centre

**Present:**
- Ibrahim Seedat (DoT)
- Molotsoane Reitumetse (DEA)
- Will Bautista (NT)
- Ntuli Ntombifuthi (DTI)
- Philip Ninela (DTI)
- Marasela Loyiso (Gauteng)
- Najma Mohamed (DBSA)
- Michelle Layte
- Natasha Trainor
- John L Less
- Gerard Fourie

**Reason for Meeting:**
The meeting formed part of the SACN Green Transport project workshoping how national government could support the municipal green transport programme.

<table>
<thead>
<tr>
<th>National Department of Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Challenges:</strong></td>
</tr>
<tr>
<td>- The Department of Transport would like to see green requirements placed on bus procurement but National Treasury sees such requirements as unfunded mandates that increase the cost of bus procurement. We will likely have to take the longer path towards legislating green transport rather than doing this through the public transport network operations grants.</td>
</tr>
<tr>
<td>- Complex procurements that include intelligent transportation systems (ITS), vehicle operations, fuel supply contracts, dedicated bus lanes, etc require skilled professionals that can run multifaceted, multi-billion rand procurement efforts. Lack of capacity is the bigger problem in seeing successful implementation of public transit systems</td>
</tr>
<tr>
<td>- There are minimum economies of scale with buses due to different local body requirements, smaller numbers, inconsistent demand, and narrow specifications in tenders.</td>
</tr>
<tr>
<td>- With respect to Bus Rapid Transit (BRT) purchases, new operating companies are being created that will own the fleet and both those companies and their lenders will require convincing so it is not as easy as government wanting to go green. Is there a better fleet to recapitalize rather than buses: corporate and shared services vehicles, waste trucks, or taxivans?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Opportunities:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Fuel could be a better area to focus on with respect to bulking up procurement and giving cities choices.</td>
</tr>
<tr>
<td>- Since there are a lot of BRT buses being procured, Joburg (277), Cape Town (320), Tshwane (130), Ekurhuleni (50), eThekwini(50) plus Rustenburg, if you could convince all of these municipalities to write an open specification that is technically neutral, you may be able to get the scale required to create green manufacturing jobs and reduce costs to cities, but it's tough</td>
</tr>
<tr>
<td>- Institutionally the Cities have to drive this and lobby Treasury directly</td>
</tr>
</tbody>
</table>
### National Treasury

**Challenges:**
- Treasury is focused on transit systems and transportation infrastructure. We look at the big picture financial metrics rather than prescribing narrow specifications

**Opportunities:**
- Value for money, expenditure moderation, meeting broader economic and environmental goals, and reducing consultant spend all line up nicely to support municipal pooled procurement or the use of a transversal mechanism to achieve economies of scale
- The PPP unit has funds to help create business cases and feasibility studies to help create a case (whether it’s a transversal or other MFMA or PFMA approach) but the Treasury won’t drive this process, it has to be requested by Cities
- As long as there is a national or provincial champion, a transversal (similar to the existing rental car and diesel fuel transversals) can be used by any public entity to procure goods and services. The opportunity is to have one government entity, Treasury, negotiate volume based pricing and pass those savings on to cities

### Department of Environmental Affairs (DEA)

**Opportunities:**
- Municipal green transport can be championed as a flagship programme
- Municipal green transport can be funded via designation as a Nationally Appropriate Mitigation Action (NAMA)

### Industrial Development Corporation (IDC)

**Challenges:**
- The IDC will not fund cities and it’s difficult to get a bankable off-take with a municipality for fuel
- As investors we look at 10 year plus off-take arrangements and municipalities can rarely commit that far out

**Opportunities:**
- There is an opportunity to fund private sector providers of green fuel, particularly gas, and engine conversions and we have invested in these opportunities
- If our goal is green jobs, we are not going to get them in bus bodies, we will get them in fuel. Over 60% of the opex spend for a transport company is fuel.

### South African National Energy Development Institute (SANEDI)

**Challenges:**
- Budget to fund programs or invest in projects is very limited

**Opportunities:**
- Sanedi’s green transport programme can provide the capacity required at a technical and
supply chain management level to support aggregated procurement of green transport goods and services

Minutes of Workshop 2: SACN Green Transport, 25th February 2015 at Metro Centre
Present:
Malcolm Joshua (City Fleet HoD, eThekwnin
Nthabiseng Mabuela (Tshwane TBS)
Alex Bhiman (CoJ)
Devesh Mothilall (CoJ)
Adv Bernard Hutton (NMB Director Support Services)
Willem Pretorius (Fleet Manager, Mangaung)
L.Moleme (Fleet Mgr Rustenburg)
Vusi Sithole, Metrobus
Hilton Hink (NMB)
Ben Nswenya (Head: Bus Ops eThekwni)
Benny Makgoga (CoJ)
Will Bautista (NT)
Raoul Goosen (IDC)
Nonhlanhla Machere (Tshwane)
N.Shibambu (Rustenburg)
Lerothodi More (Rustenburg)
Ntombi Radebe (GDED)

Reason for Meeting:
The meeting formed part of the SACN Green Transport project workshop shopping how best to collaborate and to accelerate the adoption of green transport technologies and fuel in their cities.

The below table summarizes the key inputs that respective member cities provided to the project team when workshop shopping how best to collaborate and to accelerate the adoption of green transport technologies and fuel in their cities. The purpose of the meetings, the agenda, and the discussion topics has been articulated above in the section summarizing the discovery process.

The main outcome (aim?) of the workshop as discussed above was to gather additional data on corporate fleets to determine if the number of vehicles per vehicle class (bus, truck, sedan, bakkie, taxivan) was high enough in any individual city or in aggregate across member cities to achieve the scale required to jump start green fuel or green vehicle manufacturing jobs as well as to realise: a) the cost savings of volume-based discounts, and b) meaningful environmental gains of green transport at a city-scale.

<table>
<thead>
<tr>
<th>City of Johannesburg</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Challenges:</strong></td>
</tr>
<tr>
<td>• It was very difficult for cities to purchase large quantities of buses at one time due to balance sheet concerns – making aggregation difficult</td>
</tr>
<tr>
<td>• Cities would be reluctant to give up their technology choices, particularly as many cities have already made decisions and have procurement processes underway as well as give up the supply chain process to a national or provincial entity</td>
</tr>
<tr>
<td><strong>Opportunities:</strong></td>
</tr>
<tr>
<td>• However, aggregating supply chain management expertise that could be provided to cities from a central point without every city having to hire consultants made a lot of sense, particularly since the SCM process is a bigger head ache than the issue of cost.</td>
</tr>
</tbody>
</table>
• Jobs is the clear goal and there are a lot of actors both private and public sector sitting on the fence and waiting for somebody to move forward. Our role in local government can and should be to go first but we need to do it in a sustainable fashion

**City of Tshwane**

**Opportunities:**

• We are actively looking to secure electric vehicles for our corporate and metro police fleets and are moving ahead with gas bus purchases.
• There is a strong desire to work with other cities on procuring green transport

**City of eThekwini**

**Challenges:**

• There are real operational, maintenance, and support reasons why green transport decisions are difficult to make. For instance, Euro 6 engines do not cool fast enough to allow our maintenance crews to get in and do the work they need to do in the middle of the day
• Every region has its unique operational issues and requirements. Durban has high humidity and Mangaung has high dust levels. Each bus company is going to make a unique decision on technology and maintenance due to local factors
• Currently, our financial model for bus procurement places a residual value of 30% on the bus after its operating life. Can we assume green buses will have a similar residual value? BRT buses with higher axel weights can’t operate on other roads – what residual value should be placed on those buses

**Opportunities:**

• We will be purchasing hundreds of buses over a 5 year period and could commit to greening a small percentage and increasing that percentage over time

**Mangaung**

**Challenges:**

• What we need to focus on is not the bus but on the engine. We need greener engines and can buy new engines or convert engines in existing buses. So the focus of aggregation should be engines and then the fuel and the green jobs will follow

**Opportunities:**

• I have seen security companies with thousands of vehicles look to the municipalities on fuel, propulsion, ore technology decisions. If a municipality goes gas, you can be sure that those private sector actors will follow
Minutes of Workshop 3:  
Green Transport Project, 25th March 2015 at Metro Centre  
Present:  
Alex Bhiman – CoJ  
John Less – Linkd  
Godfrey Musvoto – SACN  
Carel Snyman – SANEDI  
Malettabo Handel – SANEDI  
Matthew Gaylard – Linkd  
Richard Doyle – Linkd  
Muhammed Suleman – Linkd  
Olga Koma – SACN  
Linda Phaletse – GIZ  
Shadrack More - Rustenburg  

Reason for Meeting:  
Status Quo and Next Steps

In April 2014, the SACN commissioned Linkd to undertake research and pilot implementation for a green cities transport program. The funder was the DBSA through the Green Fund and the anticipated Phases as originally envisaged were as set out below:

1. Phase 1:  
a. Inception Meeting and confirmation of Project Plan  
b. Inception Report  
c. Project Work Plan  
2. Phase 2:  
a. Status Quo Report  
b. Assess and Develop Business Plans per pilot project  
c. Regulatory and Legal Framework Report  
d. Commencement of Pilot Projects  
3. Phase 3:  
a. Finalise Business Plans per Pilot Project  
b. Development of Funding Roadmap  
c. Development of Business Models for Implementation

Much progress has been made and there have been three meetings of a “working group” constituted by the SACN with the assistance of Linkd. Four reports have been generated;  
1. An Inception Report  
2. A Status Quo Report  
4. A Stakeholder Engagement Report

During the course of the work a number of key findings emerged:
1. There is broad readiness for green transport initiatives in all cities and many have advanced pilot schemes or even budgeted green fleet commitments  
2. There are a number of other disparate activities, many with high level support from IDC, DoT, SANEDI, GIZ and other  
3. Cities need to play an enabling and even catalytic roll in providing the infrastructure, political and purchasing “pull” and momentum to convert NGO, governmental and even industry (SANTACO) interest into activity and implementation  
4. From an early stage, the project quite naturally focused on the potential procurement aggregation possibilities offered through SACN that are not available to any single city  
5. Consequently, an early decision was made to develop a business case for a transversal procurement activity, facilitated by Treasury and that might focus, for example, on Green Bus procurement  
6. A considerable amount of effort was spent on this and provides ongoing reference data  
7. However…… early feedback on the business case provided two key messages:  
a. Transversal procurement interventions are complicated and, more importantly,
b. Cities are ready to start with significant green transport interventions immediately, especially for the taxi industry

8. The most recent meeting of the SACN “working group” held on the 25th March applied its mind to this new information and the following additional key points emerged:
   a. A formal SACN Working Group is a key part of the green transport future moving forward and the attendees were unanimous in moving to recommend the formal recognition of the Working Group and to establish a Terms of Reference for the group. This was strongly supported by DEA, GIZ and SANEDI who were in attendance. Unfortunately not all cities could attend due to competing activities and a key next step is to caucus to get their inputs and potential support
   b. The Cities offer a formidable negotiating platform that can attract support from National Government, can negotiate with the taxi industry and that can offer agglomerated procurement.
   c. Enormous momentum already established by SANEDI and CoJ in particular on greening taxis is constrained now by a single barrier that cities can unlock – selection of one or more transport precincts/nodes to test the green taxi program at quasi-commercial scale to allow some of the following questions to be answered:
      i. Procurement questions and possible need for capital subsidies initially
      ii. Infrastructure issues
      iii. Effectiveness – no “dead kilometres” incurred by needing diversions to refuel.
      iv. Incentives for taxi industry to move over
      v. “Ownership” by taxi industry
      vi. Supply side effectiveness (fuel) and eventually
      vii. Transition to biogas
   d. SANEDI and CoJ have requested that SACN provide assistance with:
      i. Identifying possible tests sites in different cities
      ii. Workshops to develop metrics/criteria to select the test sites
      iii. Raising funding to fund the further studies needed
      iv. Assisting with developing the ToR for this next Phase of Greening the Taxis. This does not preclude expanding this to part of city fleets but this would be at a later stage.

Differently stated, the message that has come back from the cities (that were at the meeting) and other key stakeholders is that the SACN can add much greater short term value by getting behind the momentum of the nascent taxi initiatives rather than starting another activity like a transversal procurement activity.

On this basis, it was agreed that a recommendation be made to SACN that the Business Case to be produced will be shifted from a focus on transversal procurement to the green taxi node project

Phase 4 of the project will therefore involve the following activities:
- The Stakeholder Report be finalized
- The Transverse Procurement Business Case be replaced by the Taxi Business Plan
- Linkd will work with SACN to establish both the Reference Group as well as the Taxi Working Group
- A dissemination plan for the project outcomes will be developed and shared with Stakeholders.
Minutes of Stakeholder Meeting: CNG/NGV 6th May 2015 at CNG/NGV at Northriding (Felstead Business Park).

Present: Stephen Rothman (CEO) Gerald Ganesh (Sales and Marketing Manager) and Lerato Tsiki (Financial Manager) for CNG/NGV and Richard Doyle for Linkd

Reason for Meeting: An exploratory meeting to assess the views of CNG Holdings on what is constraining a transition of the taxi industry to CNG and what South African Cities can possibly do to assist in accelerating the process.

- Richard provided a short background to Linkd, SACN and a summary of the project and status.
- Gerald indicated that he has been in intermittent discussions with CoJ (Lisa S) about CNG for some time and these discussions included facilitating introductions for the City to Taxi Associations as well as discussions about the possible contribution of the City of land for filling stations
- There was some discussion on the DoT/GIZ tender for conversion of 500 taxis to CNG. It is believed that there are 4 bidding parties being CNG, NOVO, Autogas and SANTACO. The tender does not anticipate infrastructure or conversion facilities and it is expected that the winning party will approach one or both of CNG or NOVO who are currently the only players in the space.
- Questioned on why the considerable cost saving realized in CNG vehicles would not, on its own, lead to expansion, CNG responded that infrastructure needs to be developed in parallel.
- Asked why they did not simply build more filling stations, CNG responded that
  - they are indeed working with a number of BBBEE partners but these needs funds and
  - conversion of a filling station requires both capital (R400k) and approval for electricity (300W – 90kW) which leads to complicated processes and long delays
  - CNG has the equipment ready to open a further 5 filling stations subject to the point above (see also below)
- Returning to the role of SACN/Cities, Stephen gave some history. CNG produced a business plan for 200 taxis and 200 buses for SANERI as long ago as 2008 but this was too early and the technology and economics are now unfortunately out of date
- Subsequently CNG engaged with CoJ on the losses being incurred by Metrobus. This was partly due to exorbitant maintenance costs (R5.20 to R7.00 per km). Iveco offered to reduce these to R1.50 per km against a contract for 5 years. CoJ decided not to proceed. A project followed driven by Clinton Climate Initiative and Volvo (with John Less) based around Ethanol. CNG lobbied for CNG on the basis that SA does not have ethanol but CoJ continued and the project died. CNG went back to its business
- CNG then put up its flagship filling station (R9m capex). Linkd is invited to visit Langlaagte.
- The business model takes R1.26 per liter of gas sold for payment of conversion kits (free) and maintenance workshops/fine tuning/battery resets etc
- CNG is hunting for (BBBEE) partners that have workshops that are washing their faces that can expand into CNG
- It takes 3 years of experience to get a Certificate of Competence (CoC) in gas
- CNG now have filling stations at
  - Lanlaagte
- Autogas
- Mamelodi and
- Watloo

- CNG has 200 kits on hand at any time and is ready to convert/install a further 5 filling stations
- CNG recommendation for SACN: fund the conversion kits. Apparently filling stations not the issue and lots of interest and funds (including a big multinational that wants to open 6 a year) to do so but nobody wants to fund the kits
- A large filling station can service, say, 500 vehicles a day with 500l per month so needs a capacity of about 250kl per month
- Other countries created kickbacks and incentives but difficult with taxis because not part of formal economy
- CoJ could help CNG NOW with land in Protea Glen, Alex and Downtown.
- Cities can also help expedite access to power – slow (7 months) and expensive and a barrier
- Conversion of government/city fleets will also help, even though relatively small. This stimulated market in other countries. Government to set targets for its own fleets – x% by 20xx
- Gerald will set up a visit for Linkd to Langlaagte and to meet one or more taxi associations – DAJOTA, Alex or Mamelodi

Present: Andri Hugo – CEO NOVO Energy
Abhinash Ragu – Commercial Manager NOVO Energy
Richard Doyle – Linkd Environmental Services
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting: An exploratory meeting to assess the views of Novo on what is constraining a transition of the taxi industry to CNG and what South African Cities can possibly do to assist in accelerating the process.

- Richard provided a short background and summary.
- Andri also summarized the background of Novo and the role and contribution of IDC/SANEDI to date
- CNG is about 7 – 7 years old in SA
- It was agreed that taxis are the best place to focus on for fast effect in greening city transport but with the caveat that international best practice largely cannot be applied.
  - The ratio of savings (litres of fuel saved per R1 of capital) with taxis is round 2:1 as compared to buses which is around 8:1 (for a R20,000 conversion on taxis you replace about 10,000 liters of fuel)
- It was agreed that CNG was a good focus and that biogas or other NMT options act to defocus
- Andri emphasized that Mozambique has moved fast and beyond SA in CNG due to strong political will and support
- Andri emphasized his belief in only changing one factor of economics or technology at a time (in the move toward an eventual hydrogen economy)
- Andri and Abhinash emphasized the importance of education and awareness – as barriers to adoption of CNG (especially in taxi industry). Customer behavior and behavioral barriers are important. There is scope to do some more work here?
- Andri shared his analogy of the 3 interrelated phases – one aspect cannot be addressed in isolation. The three phase are:
  - Gas supply
  - Infrastructure
  - Technology
- Suggested studies that we could look at for more direction and to ensure we are not duplicating:
  - Kfw study presented by E&Y
  - PWC Study
  - NOVO Energy Study – economic benefits
  - IDC study / reports – ask Raoul to supply
- In explaining the barriers, Andri mentioned that firstly, it is about switching costs – based on technology, the networks and infrastructure are not in place. It is hard to get the ball rolling on this because interests are not aligned. There is quite a lot of pre-investment required for a filling station … land “donation” by cities could assist
• Going back to the taxi industry, both Andri and Anhinash mentioned that we would need to incentivize the taxi drivers as well as the owner if we want them to come on board.
  o Owner owns asset (and therefore kit)
  o Driver derives benefits
  o If owner buys kit he wants more pay from driver but driver not interested
  o Average “tenure” of taxis before crash, sale or repossession is only 3 years! This means very short-term finance tenor
  o Look at the IDC study
  o NOVO has a GIS system mapping out taxi routes and ranks, so if they can do a project and put up stations, they would know exactly where to do it.
  o Conversion kits unlikely ever to be sold. Need to be funded as incentive
  o NOVO has partly “given up” on difficult taxi industry to focus on industrial customers – lower hanging fruit

• Looking at infrastructure, Andri mentioned that pre-planning would have to be done to make sure that the support structures are in place before creating the market
  o Provision of gas, securing property, establishing gas connections, servitudes
  o The biggest problem is conventional refueling stations are not willing to give up space
    ▪ Franchises work on an integrated model which they are not planning to amend
    ▪ Franchises generally not interested however, recently a Total station was converted - why? Worth looking into
    ▪ Again, it is based on an incentive scheme

• Latest figures show that you get around 36% real life saving per/km against petrol (93)
  o Currently sitting at R4.62 savings or “profit” per liter of gas (including gas) before VAT
  o Pricing is in public domain but not regulated so margins a bit of a secret
  o Gas is sold in “litre equivalent” to ensure parity of comparison

• Dimensions that can be explored for the SACN business case:
  o Switching costs or funding – but not really the business of cities. See DopT/GIZ Tender
  o Access to land in cities for filling stations, quick procurement of land
  o Access to information from gas suppliers – Sasol and Egoli say NO gas available for CNG
  o Running landfill sites to polish the gas that is currently being wasted – City can facilitate
  o Not for cities but one way would be to retain part of permits (DoT) for Green Vehicles only

• Importantly, you need to ensure that the demand exists before investing in the landfill sites
  o Could use the gas for alternate means while the transport industry catches up
    ▪ Options include power, industry

• The DoT/GIZ tender that is current aims to “test” the impact of 500 conversions on job creation etc. However there are open questions on land availability, filling stations, city approvals, electricity tariffs to be levied, access to gas etc…… and there is NO gas available currently!

• Egoli gas will only enter into large supply agreements on a 90% take-or-pay basis

• Biogas not economic for electricity but is for CNG
Minutes of Stakeholder Meeting: Eddie Cooke 7th May 2015 at Linkd Environmental Services.

Present: Eddie Cooke – Director of South African Gas Association, and Vice-Chairman of Southern African Biogas Industries Association
Richard Doyle – Linkd Environmental Services
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting: An exploratory meeting to assess the views of Eddie on what is constraining a transition towards greener transport, and what South African Cities can possibly do to assist in accelerating the process.

- Richard provided a background of the project
- Eddie provided a background of his work experience in the green transport sector
  - He started with LPG about 16 years ago
  - He started working on CNG in 2004
  - He worked at Novo Energy in since 2008 till 2014
  - He is the convener for standards (SABS) for CNG and Biogas in SA
  - He is technical director of SAGA
  - He was a founding member of SABIA
  - Eddie assisted John Less on the Clean Cities project providing all inputs on CNG and Biogas

Discussion: Eddie’s view:

- Methane is the last step before hydrogen (fuel cell)
  - You need to take one technical step at a time, one cannot just leap into the future, but you can work in such a way from now that you are planning for the future.
- Currently, the resource/supply of natural gas is limited, and in South Africa, biogas would play a big role in filling this gap – waste crops are ideal for biogas and we have a lot of it (ethanol has been precluded because it competes with edible crops)
- There are some interesting developments in Germany where it has been shown that methane, CO2 and H2 can reversibly be cracked and reformed
- Landfill sites are a big opportunity, unfortunately they were contracted to ‘Ener-G’/David Cornish by the city of Johannesburg three years ago. Idea would be to make an alternative offer (because economics at the time driven by CDM/Carbon Credits and now worthless).
  - Could use a study done by SABIA and NOVO regarding the use of landfill sites (Eddie can make this available)
- Other ideas from Eddie include
  - Electric hybrid buses that are available off the shelf
  - Conversion by cities of BRT to full electric, full CNG or hybrid
- Green Zones, global tradition of making the city centers green zones and allowing only green transport to enter the CBDs
  - e.g. Europe, China, India (Delhi and Mumbai), Shanghai, Italy, Rome, Bellonia, Netherlands, Sweden, Sao Paolo
Permit to allow green taxis into green zone: Incentive

- A sustainable gas project: create a ‘Combined Solution Centre’
  - build the network, identify current trends,
  - Take the GIS info and overlay it with information from SANTACO, BRT, PUTCO, etc...

- Have your gas stations close to municipalities fleet storage
- Tender for DOT between CoJ and Tshwane – 500 taxis converted
  - Where will they refuel? Is there supply for them?
- Regarding the Taxi:
  - Thailand and Japan have a similar taxi industry and gov does conversion kit and each kit has a tagging system, if you don't use your kit, you pay, if you use it, its free

Richard explained that the next step was to write all of this up, put it together, then go back to the SACN to workshop a preferred way forward.

Eddie: another idea

- have a pipeline supply and a biogas solution fits into your pipeline supply
  - ideal condition: pipeline used for supply and as a back-up
  - virtual pipeline, in time as biogas is brought online it can be converted

Difference between dual-fuel and biogas

- CNG works with spark ignition – so it works with petrol conversion
- Compression combustion works with diesel - dual fuel, reduce amount of diesel to the proportion of energy you replace for gas. Basically a 20% diesel to 80% gas, the diesel is used to create the spark.
- advantage of dual fuel is, if you run out of gas you can go onto 100% diesel
- more useful for long distance

- NOVO and CNG - spend a lot of money on gas convergence and then realized that the returns are not that good. biggest reason is because they need government support

Richard: what else can biogas be used for?

- biogas - industrial (thermal + trigen) mines, power (trigen, kogen), transport
- Phase it in with industrial 1st and then move over to transport when transport is ready
Minutes of Stakeholder Meeting: National Department of Transport, 7\textsuperscript{th} May 2015 at NDOT Offices, Pretoria

Present: Kemantha Manilal – Taxi Recap Programme; Happy Mathebula and Bopang Khutoane (Climate Change) - National Department of Transport
Richard Doyle – Linkd Environmental Services
Muhammed Suleman – Linkd Environmental Services

Apologies Themba Tenza, Chief Director Research and Innovation and Jacob Dikgang - DoT.

Reason for Meeting: An exploratory meeting to assess the views of National Department of Transport on what is constraining a transition towards greener transport, and what can be done at a local City level to assist in accelerating the process.

- Richard provided a background of the project
- Kemantha explained that the taxi tender for 500 taxis to be converted is a pilot project.
  - What are the results from these conversion telling us?
  - The service provider will collate the data
  - The first phase of the project is limited to Gauteng
  - A proposal is in place for a Steering Committee but this has not yet been finalised
- It was agreed upon that infrastructure is critical to making this work
  - One of the requirements for bidding is for all bidders to already have existing infrastructure
- Kemantha mentioned that a previous project saw Province, through the AIDC, running around 400 vehicles which were converted to LPG.
- Kemantha pointed us in the direction of Kibi Manana who is responsible for public transport strategies
  - Could look at BRTs as a starting point with Cities
  - We can get an update on which Cities are running public transport projects, which have completed, and which are still to start
- Richard proposed the idea of creating green zones
- Kemantha suggested that we meet with SALGA who would be one of the key stakeholders
  - Need to provide incentive to the private drivers as they form the majority of the drivers on our roads – green zones could achieve this
  - Kemantha please to send name of person to contact
- Capacity may prove to be a bit of a challenge
  - Currently SA is importing gas from Mozambique
  - There are possibilities – with the LPG project, SASOL came on board
    - Kemantha can make the results of the study available to us (supplied name at AIDC).
• It was AGREED that Linkd pick up discussions with Ms Manana but keep all in copy as project develops.
Minutes of Stakeholder Meeting: City of Johannesburg 4th June 2015 at Linkd Environmental Services.

Present: Alex Bhiman – City of Johannesburg; Transport
          Muhammed Suleman – Linkd Environmental Services

Reason for Meeting: The meeting formed part of the stakeholder engagement process for the SACN Green Transport Project.

The interaction between CoJ and Linkd has been continuous throughout the project and therefore the meeting was merely to explain the new direction of the project. Alex supported the new direction – proposing a variety of initiatives that could assist cities in accelerating towards green transport – and explained that the project fits the direction which the Transport Forum is encouraging cities to follow.

- Alex mentioned that a project like this will bring the cities together, challenge, incentivise, and motivate them to accelerate the transition to greener transport.
- He explained that Joburg is looking at alternate fuels such as gas for municipal fleets, buses and taxis.
- City has intention to fleet Rea Vaya Phase 1C with gas propelled buses. City is taking up provision of NMT facilities evidenced by the dedicated cycle lanes already in place on certain routes, and fitting of bicycle racks at BRT stations.
- It was noted as well that there is a big gap between cities regarding green transport initiatives, there is not much education and awareness surrounding the field. Alex supposed that a project like this will provide an opportunity to understand what challenges the cities are facing and how they could share experiences to help overcome those challenges.
- Considering the current projects which City of Johannesburg has planned for the coming years, it would be realistic to target choices A, B, and C:

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>City not ready for green transport initiatives</td>
<td></td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td>3</td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td>3</td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td>2</td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td>3</td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td>2</td>
</tr>
</tbody>
</table>

Scoring Metrics:

0 | Strongly Disagree / Unrealistic / Unachievable
1 | Uncertain, it is conceivable, but would require major shifts in the current direction.
2 | Agree that it is realistic if certain structures where put in place to make sure this happens
3 | Strongly Agree / Very realistic and achievable in the context of where we are currently headed
Minutes of Stakeholder Meeting: City of Tshwane 4th June 2015 at University of Johannesburg Bunting Road Campus.

Present: Mike Krynauw – City of Tshwane  
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting: The meeting formed part of the stakeholder engagement process for the SACN Green Transport Project.

Muhammed provided a background of the project, what it aims to achieve, and the reasons for the stakeholder engagement process.

Mike shared his enthusiasm for Green Transport and how Tshwane has been focusing on Green Transport over the past few years.

- Mike was aware of the work done so far by CNG as well as by the Gauteng Province, the National Department of Transport, City of Joburg, and Tshwane
- He informed me that CSIR has developed and electric charging stations and that DEA has purchased a few electric vehicles.
- He explained that Tshwane is looking into alternate fuel and is committed to accelerating the transition from fuel to gas.
  - The main issues they are facing is policy decision making
  - They need to get their house in order before they can make commitments to these targets.
- Looking at Low Emission Zones, Mike noted that Tshwane is looking at converting 2 major streets within the Tshwane CBD to NMT and public transport streets only. This project is as well a strong factor in improving NMT facilities
  - The project shows that even though Cities in SA are not ready to implement low emission zones, it is possible to create these zones through changes such as this.
- Also, the recently implemented BRT systems is looking at converting the buses to alternate gas, this has not been done yet but it is in the discussions. This relates to High Quality Public Transport as well.

Mike was of the opinion that the targets may be very realistic but cities would have to concentrate the first few years solely on getting their house in order
- Concentrating largely on policy decision making

Considering the current projects which Tshwane has planned for the coming years, it would be realistic for Tshwane to target choices A, B, and C:

**City Targets:**

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
</table>
| Choice A | No commitment to targets  
City not ready for green transport initiatives | 0 |
| Choice B | Commit to 15% reduction in Green House Gas Emissions by 2020 | 3 |
| Choice C | Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020 | 3 |
| Choice D | Commit to 35% reduction in Green House Gas Emissions by 2020 | 2 |
| Choice E | Choice B + Choice C | 3 |
| Choice F | Choice C + Choice D | 2 |
Minutes of Stakeholder Meeting: eThekwini Municipality 8th June 2015 at the eThekwini ETA Building – City Engineering Complex.

Present:
- Monaj Rampersad – Transport Office eThekwini Municipality
- Logan Moodley – Transport Office eThekwini Municipality
- Susanna Godehart – Energy Office eThekwini Municipality
- Itumeleng Masenya – Energy Office eThekwini Municipality
- Muhammed Suleman – Linkd Environmental Services

Reason for Meeting:
The meeting formed part of the SACN Green Transport stakeholder engagement process.

The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process. Muhammed was then provided with a background of what is the current status of green transport and public transport in eThekwini.

- There are currently around 15,000 taxis in eThekwini
- The aim is to use the planned BRT system to decrease dependency on taxis
- City fleets are not interested in going green, at least not at this point
- The latest statistics have shown that 25% of peak transport is NMT
  - They are looking to focus a lot more on NMT in the coming years
  - A big win would be to find a way to positively integrate NMT and BRT system
  - (Muhammed made note that Cape Town is making progress in this area)
- Ideas to use public transport to promote Local Economic Development

In terms of setting targets, it was noted by Susanna and the team there is a gap in terms of monitoring the targets in our cities. The best way to incentive and accelerate change is if the push comes from a higher governmental level; such as grant conditions.

Looking at the options for accelerating the transition, the team responded with the following:
- Alternate fuels: a possible option for buses and feeder buses for the newly planned BRT system, however, this would need to be investigated at length first. Is it sustainable, is it feasible? How do we get/procure gas in the city, what about the infrastructure, who is going to pay/fund such projects???
- Low emission zones: Not an option.
- Public transport: currently it is poor but there is a strong focus to improve the status of pt. Both in terms of rail and BRT
- NMT facilities are also a strong focus: recently the city implemented a cycling program for City employees.
  - The program was kicked off with the COP17
  - Stations are being erected at all municipal buildings and City staff can tag a bicycle out so long as they are registered on the system.
  - Currently there are over 250 registered staff members and all the bicycles are tagged out almost every day.
  - They also provide a competency and learning program for those staff willing to learn.

EThekwini committed to the following target:

<table>
<thead>
<tr>
<th>City Targets:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Options</td>
</tr>
<tr>
<td>Choice A</td>
</tr>
<tr>
<td>Choice B</td>
</tr>
<tr>
<td>Choice C</td>
</tr>
<tr>
<td>Choice D</td>
</tr>
<tr>
<td>Choice E</td>
</tr>
<tr>
<td>Choice F</td>
</tr>
</tbody>
</table>
The reason for the above target was simply due to lack of funding. I was asked by the team to analyse certain documents and return to them with a suggestion of what realistic targets would be.
Minutes of Stakeholder Meeting: Msunduzi Municipality 9th June 2015 at A.S. Chetty Buidling

Present: Lindelwa Mngenela – Transportation Planning
Mthandeni Ngcobo – Fleet Management
Nelly Mkhize – Transportation Planning
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting: The meeting formed part of the SACN Green Transport project stakeholder engagement process.

The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process.
Fleet raised the issue that going gas requires investment, which requires funding, which they do not have.
The following suggestions were made by fleet.
- To get rid of old vehicles which have much higher emissions
- To arrange a meeting with the gas companies to see how the gas system works
  - This could be arranged as a site visit during the workshop in mid-July

In terms of what Msunduzi is doing at the moment, Lindelwa explained that they are looking at converting Church Street to a public transport and NMT street only.
- This is a type of Low Emission Zone and similar to what Tshwane is doing
- NMT upgrades are in place as well as per the ITMP

Going back, it was raised again that funding is the main issue, how do we get the infrastructure and technology to Msunduzi??
Fleet suggested that it would be lot more feasible if manufacturers made gas vehicles, standard of the floor.
Incentives was raised as an accelerator to greener transport.
- Overseas you are taxed for CO₂ emissions
- There should be incentives in place for municipalities to get newer vehicles with lower emissions and to scrap older vehicles.

Msunduzi scored the following:

<table>
<thead>
<tr>
<th>City Targets:</th>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets City not ready for green transport initiatives</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Scoring Metrics:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Strongly Disagree / Unrealistic / Unachievable</td>
</tr>
<tr>
<td>1</td>
<td>Uncertain, it is conceivable, but would require major shifts in the current direction.</td>
</tr>
<tr>
<td>2</td>
<td>Agree that it is realistic if certain structures where put in place to make sure this happens</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Agree / Very realistic and achievable in the context of where we are currently headed</td>
</tr>
</tbody>
</table>

Minutes of Stakeholder Meeting: Buffalo City Metropolitan Municipality 10th June 2015 at 26 Oxford Street, East London
Present: Ayanda Skwebu – Senior Engineer at City Transpor Department
Muhammed Suleman – Linkd Environmental Services
Reason for Meeting: The meeting formed part of the SACN Green Transport project stakeholder engagement process.
The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process. It was explained that for such interventions there needs to be changes which come from higher levels of government.

- Aspects such as current legislation, rules, modification need to be addressed that will direct Cities to move in a certain direction.

Why aren’t manufacturers selling gas vehicles off the floor? This would keep warranties in place and make it easier for fleet to purchase.

- Muhammed explained that manufacturers overseas have started to do this, but only once demand for gas vehicles increased.

The current public transport system in East London is Mayibuye Transport, they are not government owned; municipality does not have its own bus system.

The only way that they will make a commitment is if there is a clear understanding on the following:

- Getting the gas infrastructure, cost, service providers, etc.
- Benefits, to fully understand why we should go gas, to see how the system works.
  - Muhammed explained that it is possible we setup a site visit to the Gas station in Langlaagte during the mid-July workshop.
- If Environmental Departments get involved to incentivise; such as DEA and DOT.

Buffalo City scored the following:

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>City not ready for green transport initiatives</td>
<td></td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td>2</td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td>0</td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td>0</td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td>0</td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td>0</td>
</tr>
</tbody>
</table>

Scoring Metrics:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Strongly Disagree / Unrealistic / Unachievable</td>
</tr>
<tr>
<td>1</td>
<td>Uncertain, it is conceivable, but would require major shifts in the current direction.</td>
</tr>
<tr>
<td>2</td>
<td>Agree that it is realistic if certain structures where put in place to make sure this happens</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Agree / Very realistic and achievable in the context of where we are currently headed</td>
</tr>
</tbody>
</table>
Minutes of Stakeholder Meeting: Nelson Mandela bay Municipality 11th June 2015 at Lillian Diedericks Building

Present:
Adv. Bernard Hutton – Senior Director: Support Services
Tony Arthur – Senior Director: Strategic Projects
Shaun Abrahams – Civil Engineering Technologist: Transportation Planning
Zama Kele – Civil Engineering Technologist: Transportation Planning
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting:
The meeting formed part of the SACN Green Transport project stakeholder engagement process.

The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process.

The Municipality has established a twinning relationship with Gothenburg, to learn from their ways and experiences.

According to the researchers from one of the Universities, NMB has been cautioned to follow what Johannesburg has done in terms of Gas (CNG’s).

However, there are other focus points for green transport, such as NMT, electric vehicles, and improving public transport systems.

- Alternate fuels: still at a research level,
  1. there is a lot of gas being used in industry, but not vehicles.
  2. Looking at electrical vehicles; the university manufactured their very own electric vehicle which is in operation;

- Public transport – the city does not run its own public transport systems.

At this point in time it is looking at the role out of the IPTS (Integrated Public Transport System)
NMT lanes run from the City right into Kwadwesi. There are plans to implement more cycle lanes and to run a program at university level to increase cycling.

How do we move green transport forward?

- The Municipality must work towards greening its fleet which will inevitably mean to make mistakes.

- To build an understanding around the infrastructure and technology, and how can it be made accessible?
  - Study specific vehicles
  - Muhammed mentioned that this study was already done by the IDC

- A detailed plan for moving forward – Rollout plan describing different phases
  - Such a plan would need to be done by the municipality as they are most knowledgeable of their municipality, its character, needs, resources, etc.

- If Cities are to commit to such targets, they would require the following:
  - Financial assistance
  - Information and statistics on what are the current emissions
  - Guidelines to control vehicles – making sure that taxis on gas fill up gas.

- Quick wins as described would be:
  - Universities to run pilot projects within or surrounding their campuses

- It is important that projects like this receive guidance from National departments

Nelson Mandela Bay scored the following targets for the future:

City Targets:

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>City not ready for green transport initiatives</td>
<td></td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td>1</td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td>1</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------------------------------------------</td>
<td>---</td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td>2</td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td>1</td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scoring Metrics:</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
</tbody>
</table>
Minutes of Stakeholder Meeting: City of Cape Town 12th June 2015 at Cape Town Civic Centre
Present: Niki Covary – City of Cape Town Transport
Rahul Jobanputra – City of Cape Town Transport
Sivuyile Johazi – City of Cape Town Transport
Helen ????
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting: The meeting formed part of the SACN Green Transport project stakeholder engagement process.

The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process.

Cape Town focuses on small scale creative ways that require minimum investment but can yield great rewards.

- Currently running a smart driving program for fleet drivers which teach them how to be more conservative and economical on the road.

Scholar transport strategies would be an interesting space to look into – schools and universities

- Implement a bus or cycle system for schools as all kids finish at the same time.
- Lots of congestion, maybe implement parking charges to reduce private vehicles

What is really holding Cities back is National Government.

- They need to unblock – allow permission for cities to setup gas infrastructure
- To provide energy security

We also need to understand current statistics.

- PRASA and Transnet, establish connections
- What is ridership? What is the emission footprint?
- What is our current CO2 emissions?

Alternate Fuels is something that is being looked at:

- Biofuels and Bioethanol – mainly for fleet
  - But they would need a contract that allows them to fill up at certain stations.
- What about electric vehicles? That would seem more realistic for Cape Town.
- Cape Town focuses on small scale creative ways that require minimum investment but can yield great rewards.
  - Currently running a smart driving program for fleet drivers which teach them how to be more conservative and economical on the road.
  - No budget / in-house
- With regards to CNG they need to firstly understand the infrastructure and technology side before making any commitment and/or investment

Public transport

- The MyCi is being extended
- Have a strong Metrorail system

NMT

- Looking at a staff bike project
  - Muhammed mentioned the eThekwini project which CT was not aware about. Information to be passed on.
- Education and awareness programs, travel behavioural change

City of Cape Town scored the following targets for the future:

- **City Targets:**

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets</td>
<td>0</td>
</tr>
<tr>
<td>Choice</td>
<td>Description</td>
<td>Score</td>
</tr>
<tr>
<td>----------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td>1</td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td>0</td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td>0-1</td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td>0</td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td>0</td>
</tr>
</tbody>
</table>

- **Scoring Metrics:**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Strongly Disagree / Unrealistic / Unachievable</td>
</tr>
<tr>
<td>1</td>
<td>Uncertain, it is conceivable, but would require major shifts in the current direction.</td>
</tr>
<tr>
<td>2</td>
<td>Agree that it is realistic if certain structures where put in place to make sure this happens</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Agree / Very realistic and achievable in the context of where we are currently headed</td>
</tr>
</tbody>
</table>
Minutes of Stakeholder Meeting: Mangaung Metropolitan Municipality 15th June 2015 at Bram Fischer Building, Bloemfontein

Present:
Willie Loftus – Mangaung Metropolitan Municipality - Transport Planning
Willem Pretorius – Mangaung Metropolitan Municipality - Fleet Management & Engineering Support
Muhammed Suleman – Linkd Environmental Services

Reason for Meeting:
The meeting formed part of the SACN Green Transport project stakeholder engagement process.

The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process.

Response / Discussion:
Mangaung Metropolitan Municipality does not have a public transport service of its own as yet, and relies on the minibus taxi system as well as one of the private stakeholders (Interstate Bus Lines) who run commuter buses.

Our biggest question, what do the municipalities benefit from this project?
- Muhammed explained that through the project, we can learn and share experiences from other municipalities. Some of whom may have a similar character to Mangaung and may be thinking on similar. The most beneficial thing to do is to see and learn from one another so we do not make the same mistakes. To understand what the benefits of certain systems are, which are already in place rather than to reinvent the wheel.

Municipality cannot make many changes, reach is limited, the only way we can assist is with fleet conversion, and we are very interested in how we can get that going. Other areas, such as taxis, it is out of our reach. Currently the province deals with taxis.

According to the municipal finance management act, legislation allow the municipality to finance the implementation of green transport infrastructure and technology such as gas filling stations for municipal usage. It means that the municipality can implement green transportation on municipal fleet. However, clarity needs to be obtained whether it will be possible to use municipal funding for implementation of green initiatives to support private fleet owners to convert to green transportation. It is recommended that green transportation for private owners would be possible when
- The central government provide incentives for converting to green transportation.
- Approach needs to be top-down

What we need is a clear set of options on how to go green
- Option 1 – funding
- Option 2 – stakeholders
- Etc…

Gas conversions. Who does them? Where does the gas come from? Who funds these projects?
- Guidelines on how to go gas, how much would it cost? This needs to be investigated and the results needs to be made available
- Create incentive, what are the benefits?

Current focus:
- Currently, the main focus is to reduce private vehicles by implementing an Integrated Public Transport Network.
- The Municipal fuel contractors currently stipulated that services providers may be required to provide alternative fuel sources such as automotive gas.
- The sub-directorate Fleet Management & Engineering Support is investigating the possibility to provide electric powered motor cycle to some of the internal stockholders for the purpose of carrying out monitoring functions, traffic control, etc.
- The municipality is investigating the possibility of building a solar farm that could assist with the provision of electricity to the municipality.
- There is also led conversion to municipal building which is sponsored by gov.
- Currently, the city has around 1200 vehicles
  - 9 filling depots (could convert the depots to gas, which would incentivize the conversion from fuel to gas within the municipality)

Freedom Ride idea sounds interesting, would like more information on the ride.
Mangaung Metropolitan Municipality scored the following targets for the future:

- **City Targets:**

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
</table>
| Choice A | No commitment to targets  
City not ready for green transport initiatives | 0 |
| Choice B | Commit to 15% reduction in Green House Gas Emissions by 2020 | 2 |
| Choice C | Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020 | 2 |
| Choice D | Commit to 35% reduction in Green House Gas Emissions by 2020 | 0 |
| Choice E | Choice B + Choice C | 2 |
| Choice F | Choice C + Choice D | 0 |

- **Scoring Metrics:**

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Strongly Disagree / Unrealistic / Unachievable</td>
</tr>
<tr>
<td>1</td>
<td>Uncertain, it is conceivable, but would require major shifts in the current direction.</td>
</tr>
<tr>
<td>2</td>
<td>Agree that it is realistic if certain structures were put in place to make sure this happens</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Agree / Very realistic and achievable in the context of where we are currently headed</td>
</tr>
</tbody>
</table>
Minutes of Stakeholder Meeting: City of Ekurhuleni 17th June 2015 at Civic Centre, Kempton Park
Present: Yolisa Mashilwane – Ekurhuleni Head of Transport
Wonder Matshiga – Ekurhuleni Transport
Muhammed Suleman – Linkd Environmental Services
Reason for Meeting: The meeting formed part of the SACN Green Transport project stakeholder engagement process.

The meeting began with a background from Muhammed on the project and what it aims to achieve through the stakeholder engagement process.

Response / Discussion:
It was mentioned that at the moment the taxis are the main source of public transport, and some of these taxis have been converted to run on CNGs. This is in the Daviton area where there is apparently a gas pump.

What would be useful to assist the City in transitioning to greener transport would be a table of figures explaining the footprint.

- E.g. what would 100 buses onto CNG do?
- To have a scoring system which could incentivise the transition. E.g. if you score above this points you receive the following benefits…
- It would be vital for the City of Ekurhuleni to bring municipal fleet on board as well as the environment department. This will provide the opportunity for monitoring and measuring and will ensure the acceleration towards greener transport.

Question. What about the supply of gas?
- Muhammed explained private stakeholders are willing to supply the gas so long as they can procure land. That is their largest challenge.
- This was confirmed during the meeting by Yolisa through another source of intel.

Broadly, the City is on board for gas.
- We have a commitment for our new depots to accommodate gas pumps and gas vehicles
- Environmental department would in certain ways need to lead.

City of Ekurhuleni scored the following targets for the future:

- City Targets:

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
</table>
| Choice A | No commitment to targets  
City not ready for green transport initiatives | 0 |
| Choice B | Commit to 15% reduction in Green House Gas Emissions by 2020 | 2 |
| Choice C | Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020 | 1 |
| Choice D | Commit to 35% reduction in Green House Gas Emissions by 2020 | 0 |
| Choice E | Choice B + Choice C | 2 |
| Choice F | Choice C + Choice D | 0 |

- Scoring Metrics:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Strongly Disagree / Unrealistic / Unachievable</td>
</tr>
<tr>
<td>1</td>
<td>Uncertain, it is conceivable, but would require major shifts in the current direction.</td>
</tr>
<tr>
<td>2</td>
<td>Agree that it is realistic if certain structures where put in place to make sure this happens</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Agree / Very realistic and achievable in the context of where we are currently headed</td>
</tr>
</tbody>
</table>
Annexure 3: Crib Sheet

South African Cities Green Transport Programme

Accelerating the Transition to Green Transport

Some of the Greenest Cities across the World include, Copenhagen, Amsterdam, Columbia, Stockholm, London, Berlin, and Singapore. These invariably start with buying into a need to reduce emissions and then move to agreeing reasonable and realizable targets, these targets include, for example:

1. **Alternate fuels**: Natural gas burns which more cleanly than diesel and petrol, reducing emissions by up to 30% (Lave et al. 2000) depending on the vehicle. Fuel switch from gasoline to CNG always result in substantial greenhouse gas (GHG) emission reductions (~25%).

2. **Low emission zones**: restricting vehicle access into certain areas through a cost implementation. Exemptions are made for taxis (in some case), public transport, alternative fuel vehicles, disabled people and emergency vehicles. These initiatives help to reduce traffic congestion, improve environmental situation, road safety, and street level-environment.

3. **High quality public transport**: Bus rapid transit (BRT) systems which run along dedicated lanes. These are integrated with pedestrian and bicycle paths to increase modal share, as well as bicycle parking (see TransMilenio BRT, Bogota).

4. **Improve NMT facilities**: NMT refers mainly to walking and cycling. There is a point in every journey where we become NMT users, either between stops or at parking points. Improvements often lead to increased use of public transport and more efficient parking (Strompen, Litman, and Bongardt, 2012).

5. **Education and awareness**: A constant flow of information is important to ensure the public is aware of the reasons behind the measures and how these measurements can benefit the individual.

6. **Involving private stakeholders and including the public

7. **Inter-governmental cooperation and Institutional setup

The results of these interventions have already been realized in these Green Cities. Stockholm began charging vehicles upon entering the city area on weekdays, this was a trial which ran for 7 months. Taxis, buses, alternate fuel vehicles, and hybrid cars were allowed to enter restricted zone free of charge. The number of alternate fuel vehicles registered in the area increased from 3% to 13%. In this time, Stockholm improved the public transport networks leading into the zone. The locals voted for the system to be implemented on a permanent basis. The same can be found in Berlin, London, Singapore, and Milan (Strompen, Litman, and Bongardt, 2012).
In an 8km$^2$ area in Milan (Italy); a much smaller than that of London (22km$^2$) and Stockholm (47km$^2$), a 15% CO$_2$ reduction was achieved in one year through implementing a low emission zone.

On May 24, 2010, 99 parties filled submissions with the U.N. Climate Change Secretariat to pledge specific actions which they will undertake to mitigate greenhouse gas emissions. South Africa was one of these and pledged the following (Center for Climate and Energy Solutions, 2015):

**Figure 3**: South Africa’s pledge to the Copenhagen Accord (Center for Climate and Energy Solutions, 2015)

8. Linkd has been mandated by the SACN to get buy-in from South African cities to set its own targets. The benefits can be expected to be similar to those above if a proposed target is 12 - 15% reduction in the next 5 years.

9. Should the cities buy into this, Linkd will generate a high level implementation plan that will include detailed targets, low emissions zones, vehicle labeling, alternative fuel option, etc.
City Targets:

<table>
<thead>
<tr>
<th>Options</th>
<th>Green Transport Targets</th>
<th>Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Choice A</td>
<td>No commitment to targets</td>
<td></td>
</tr>
<tr>
<td></td>
<td>City not ready for green transport initiatives</td>
<td></td>
</tr>
<tr>
<td>Choice B</td>
<td>Commit to 15% reduction in Green House Gas Emissions by 2020</td>
<td></td>
</tr>
<tr>
<td>Choice C</td>
<td>Commit to 50% of Municipal Fleet conversions to alternate fuel by 2020</td>
<td></td>
</tr>
<tr>
<td>Choice D</td>
<td>Commit to 35% reduction in Green House Gas Emissions by 2020</td>
<td></td>
</tr>
<tr>
<td>Choice E</td>
<td>Choice B + Choice C</td>
<td></td>
</tr>
<tr>
<td>Choice F</td>
<td>Choice C + Choice D</td>
<td></td>
</tr>
</tbody>
</table>

Scoring Metrics:

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Strongly Disagree / Unrealistic / Unachievable</td>
</tr>
<tr>
<td>1</td>
<td>Uncertain, it is conceivable, but would require major shifts in the current direction.</td>
</tr>
<tr>
<td>2</td>
<td>Agree that it is realistic if certain structures where put in place to make sure this happens</td>
</tr>
<tr>
<td>3</td>
<td>Strongly Agree / Very realistic and achievable in the context of where we are currently headed</td>
</tr>
</tbody>
</table>
References

- Center for Climate Change and Energy Solutions, *Targets and Actions under the Copenhagen Accord*, Accessed online at: [http://www.c2es.org/international/negotiations/cop-15/copenhagen-accord-targets](http://www.c2es.org/international/negotiations/cop-15/copenhagen-accord-targets), Published on Center for Climate and Energy Solutions (www.s2es.org)