Concept Note

Low-Carbon Public Transport in Windhoek

Namibia | Development Bank of Namibia (DBN)

26 February 2018
Concept Note

The Green Climate Fund (GCF) is seeking high-quality projects or programmes.

Accredited entities may choose to submit a concept note, in consultation with the relevant national designated authority, to present the proposed project or programme idea in order to receive early feedback and recommendation.

Project/Programme Title: ___ Low-Carbon Public Transport in Windhoek___

Country/Region: ____ NAMIBIA / AFRICA _________________

Accredited Entity (pending): _______DEVELOPMENT BANK OF NAMIBIA (DBN)_____

National Designated Authority: ___ Ministry of Environment and Tourism___
<table>
<thead>
<tr>
<th>A. Project / Programme Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A.1. Project / programme title</strong></td>
</tr>
<tr>
<td>Low-Carbon Public Transport in Windhoek (Move Windhoek)</td>
</tr>
<tr>
<td><strong>A.2. Project or programme</strong></td>
</tr>
<tr>
<td>Project</td>
</tr>
<tr>
<td><strong>A.3. Country(ies) / region</strong></td>
</tr>
<tr>
<td>Namibia / Africa</td>
</tr>
<tr>
<td><strong>A.4. National designated authority(ies)</strong></td>
</tr>
<tr>
<td>Ministry of Environment and Tourism</td>
</tr>
<tr>
<td>Mr. Petrus Muteyauli</td>
</tr>
<tr>
<td>Deputy Director, Multilateral Environmental Agreements</td>
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<td>Department of Environmental Affairs</td>
</tr>
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<td>Tel.: +264 61 284 2701</td>
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<tr>
<td>Fax: +264 61 240 339</td>
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<td>E-mail: <a href="mailto:pmuteyauli@yahoo.co.uk">pmuteyauli@yahoo.co.uk</a></td>
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<tr>
<td>E-mail: <a href="mailto:pmuteyauli@met.na">pmuteyauli@met.na</a></td>
</tr>
<tr>
<td><strong>A.5. Accredited entity (pending)</strong></td>
</tr>
<tr>
<td>Development Bank of Namibia</td>
</tr>
<tr>
<td><strong>A.6. Executing entity / beneficiary</strong></td>
</tr>
<tr>
<td>Executing Entity:</td>
</tr>
<tr>
<td>City of Windhoek (Municipality)</td>
</tr>
<tr>
<td>Beneficiary:</td>
</tr>
<tr>
<td>General Public - Public Transport users</td>
</tr>
<tr>
<td>approx. 170 000 direct beneficiaries</td>
</tr>
<tr>
<td>(Population – approx. 390 000)</td>
</tr>
<tr>
<td>Transport Operator - City of Windhoek (Municipality)</td>
</tr>
<tr>
<td><strong>A.7. Access modality</strong></td>
</tr>
<tr>
<td>Direct ☐ National</td>
</tr>
<tr>
<td><strong>A.8. Project size category (total investment, million USD)</strong></td>
</tr>
<tr>
<td>Micro (≤10) ☐ Small (10&lt;x≤50) ☑ Medium (50&lt;x≤250) ☐ Large (&gt;250) ☐</td>
</tr>
<tr>
<td><strong>A.9. Mitigation / adaptation focus</strong></td>
</tr>
<tr>
<td>Mitigation ☑ Adaptation ☐ Cross-cutting ☐</td>
</tr>
<tr>
<td><strong>A.10. Public or private</strong></td>
</tr>
<tr>
<td>private</td>
</tr>
</tbody>
</table>

1 Please use the following naming convention for the file name: "[CN]-[Agency short name]-[Date]-[Serial number]" (e.g. CN-ABC-20150101-1).
A.11. Results areas (mark all that apply)

Which of the following targeted results areas does the proposed project/programme address?

<table>
<thead>
<tr>
<th>Reduced emissions from:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☒ Energy access and power generation</td>
</tr>
<tr>
<td>(E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)</td>
</tr>
<tr>
<td>☒ Low emission transport</td>
</tr>
<tr>
<td>(E.g. high-speed rail, rapid bus system, etc.)</td>
</tr>
<tr>
<td>☒ Buildings, cities, industries and appliances</td>
</tr>
<tr>
<td>(E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)</td>
</tr>
<tr>
<td>☐ Forestry and land use</td>
</tr>
<tr>
<td>(E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increased resilience of:</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐ Most vulnerable people and communities</td>
</tr>
<tr>
<td>(E.g. mitigation of operational risk associated with climate change – diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)</td>
</tr>
<tr>
<td>☐ Health and well-being, and food and water security</td>
</tr>
<tr>
<td>(E.g. climate-resilient crops, efficient irrigation systems, etc.)</td>
</tr>
<tr>
<td>☐ Infrastructure and built environment</td>
</tr>
<tr>
<td>(E.g. sea walls, resilient road networks, etc.)</td>
</tr>
<tr>
<td>☐ Ecosystems and ecosystem services</td>
</tr>
<tr>
<td>(E.g. ecosystem conservation and management, ecotourism, etc.)</td>
</tr>
</tbody>
</table>

A.12. Project / programme life span

5 (Five)...... years

A.13. Estimated implementation start and end date

Start: ....2018.....................
End: .....2024.....................
B. Project/Programme Details

The Fund requires the following preliminary information in order to promptly assess the eligibility of project/programme investment. These requirements may vary depending on the nature of the project/programme.

**The Move Windhoek project seeks to:**

- Move the majority of the general public passengers from cars (being both public taxis which is the major transport source and private cars) to buses
- Increase the availability and reliability of mass public transport
- Reduce and eventually eliminate fossil fuel use in public passenger transport
- Introduce a Bus Rapid Transit (BRT) system (by 2022)
- Pilot the use of electric and hybrid fuel buses towards replication
- The utilisation of Solar PV electricity production for bus charging/electricity offset
- Utilising water harvesting to support a drought and water use reduction strategy

**Project Area understanding:**

Windhoek is an urban centre and is also the capital city of Namibia housing a population of some 390 000 people as per last Census and projections. Being an urban centre and the capital city, Windhoek plays a major role in the country’s population which is rapidly growing at 3.1 % (listed as 4.3% in some statistics) per annum and is above the national growth rate of 1.4%\(^2\).

![Rapid urbanization issues (Mayoral Report - 2014)](image)

Development of any country is closely linked to people movement. Developing urban centers are known for their congested roadways and increased rates of road related crashes. Windhoek is no exception. As a result, more transportation, new infrastructure and services will be required to meet such demand now and in the future with the resultant negative consequences if not mitigated.

The Government of the Republic of Namibia is very aware that public transport plays a very important role in the management of a city, town or the country as a whole. Some of the co-benefits of public transport are the reductions seen in pollution and congestion, the affordability of transport

\(^2\) 2011 Namibia Population and Housing Census
for people who cannot afford their own means of transport and thus public transport is one of the location connectivity enablers\(^3\).

Transport affects Windhoek’s resident’s daily lives in different ways, for instance in getting to and from work or being able to get access to essential services such as health, education, recreation and social connectivity in all areas of the City and for all parts of the population. Transport also affects private sector opportunities and the efficiency of the transport system can back-up or constrain business activities. Further, there is the issue of public perception towards public transport systems and in the case of Windhoek, taxis.

The drive for this project supports the view that an efficient transport system is thus required to access economic opportunities and help achieve Government’s national development plans and strategies to which the Government is committed. This project can further impact citizens to provide opportunities through the efficient use of capital at the macro level for economic growth and improved livelihood and resultant poverty reduction at the micro level.

Clear benefits of improved public transport thus accrue such as;

- Increased access to job opportunities
- Poverty reduction impact
- Reduced GHG per km of travel
- Reduced noise and vibration
- Improved air quality
- Higher mobility
- Increased travel safety
- Reduced crashes

The Public Transport Operator:
The City of Windhoek (CoW) is a legacy transport operator and is vigorously striving for an enhancement of the current public transport system, execute passenger / public behaviour...
changes, to increase the quality of life for the inhabitants, public transport users (local, national and international), alleviate traffic congestion (Within the city and immediate surrounding national road networks) and mitigate greenhouse gas emissions from transport use.

The existing mode of transport or system in Windhoek is driven mainly by cars which create congestion, increased road based hazards and high per passenger kilometer fuel demand resulting in higher GHG emissions and particulates. Thus the planned “Move Windhoek” public transport project (www.movewindhoek.com.na).

Project Objectives:
The key objectives of “Move Windhoek” can then be described as;

a) Sustainable transport development and integrated mode network
   *Reliability/ Economic rational / High demand
b) Alignment with the national Sustainable Urban Transport Master Plan (SUTMP)
c) Mitigate greenhouse gas (GHG) emissions
d) Reduction of cars on the road in the urban context
e) Integration with non-motorised transport modes
f) Inclusive and pro-poor facilitation
g) Safer mobility

The “Move Windhoek” project ultimately has a clear alignment that speaks directly to meeting the Sustainable Development Goals and the Government’s strategic aims such as the development National Development Plan (NDP5), the National Climate Change Strategy and Action Plan and other national strategies now being implemented under the Namibian Harambee Prosperity Plan (HPP).

The project which follows on from the national Sustainable Urban Transport Master Plan (SUTMP) is planned to provide a clear pathway for the development and use of a sustainable transport system within the defined central transport hub of Namibia and is coined under the term “Move Windhoek” and fully captured in the SUTMP.

Although the Windhoek Corporate Transport Plan focuses on the city and local transport, the integration of inter-urban and regional public transport is also taken into account in this project. This applies in particular to the terminals of regional bus and minibus services and their integration into the urban public motorised and non-motorised transport network.

Actions required will thus be;

<table>
<thead>
<tr>
<th>Priority - Partial Project in order of priority</th>
<th>Actions / Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Fleet Expansion</strong></td>
<td>Increasing fleet size / reducing car use</td>
</tr>
<tr>
<td>* Windhoek’s public transport fleet itself is a key greenhouse gas mitigator, merely for the fact that it makes a large number of trips by private motorcar or sedan taxi redundant.</td>
<td></td>
</tr>
<tr>
<td>* Increase of fleet size to 116 buses</td>
<td></td>
</tr>
<tr>
<td>2. Hybrid Pilot</td>
<td>Greening of the Windhoek public bus fleet</td>
</tr>
<tr>
<td>* diesel-electric hybrid</td>
<td></td>
</tr>
<tr>
<td>* Solar PV Field / Rooftop systems</td>
<td></td>
</tr>
<tr>
<td>* offsetting electricity needs with Solar PV production</td>
<td></td>
</tr>
<tr>
<td>* reduced fossil fuel use further</td>
<td></td>
</tr>
<tr>
<td>* full-electric bus</td>
<td></td>
</tr>
<tr>
<td>* Solar PV Field / Rooftop systems</td>
<td></td>
</tr>
<tr>
<td>* offsetting electricity needs with Solar PV production</td>
<td></td>
</tr>
<tr>
<td>* eliminate fossil fuel propulsion</td>
<td></td>
</tr>
</tbody>
</table>
4. Rainwater Harvesting

<table>
<thead>
<tr>
<th><strong>Water use reduction</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Installing water harvesting and filtration system</td>
</tr>
<tr>
<td>increase water re-use</td>
</tr>
<tr>
<td>collect run off water</td>
</tr>
<tr>
<td>Water reduction technology</td>
</tr>
</tbody>
</table>

The “Move Windhoek” fleet expansion and modernization project can be seen as the measure which will enable the City of Windhoek to offer a modern bus-based public transport system to all as a substitute to the current system based primarily on taxi (cars) and private cars, and is therefore the centrepiece of the whole scheme.

![Image of taxi-based public transport](Figure 3 Taxi based public transport (Move Windhoek website))

If these steps are not taken, as shown in the referring calculations on existing fleet and replacement provisions, the system, which is already rudimentary today, will probably succumb to private cars and poorly regulated taxi competition within the next few years.

Project Sponsor background:

It is important in providing a background to the project and the project sponsor, that a clear understanding of the country circumstances set the tone.

Namibia is a relatively young country having gained independence in 1990 from South African rule. Additionally, Namibia was prior to independence ruled under the “Apartheid” system which placed restrictions on where people could live and so the design of the urban areas throughout the country is such that there is a clear demarcation between where workers reside and where they work.

Windhoek has a broad distribution of residential areas, is approximately 645 square kilometres in size and is a fairly spread out city (based again primarily on the Apartheid influence and origins) of some 390 000 inhabitants with a comparatively high motorization rate. Expensive residential areas are located in specific parts of the city. Such a settlement structure, however, does not represent the socio-economic characteristics of the different parts of the city. Low income households with large household sizes in high population density areas are located mainly towards the North and North-West.
The areas with the highest population are Okuryangava, Wanaheda, Goreangab and Havana with figures ranging from 4,401 to 28,000 inhabitants. Thus, all the low-income households are generally decentralized from the Central Business District (CBD) and are located to the outskirts of the downtown. This facilitates a clear “peak” traffic flow pattern coupled with high influx of taxis and private cars.

Windhoek, the capital of the Republic of Namibia, is no exception to the “peak” traffic flow patterns. This thus presents a clear challenge in public passenger movement and mitigation of the resultant GHG emissions.

Figure 4 City of Windhoek buses (move Windhoek website)

The bus operator, City of Windhoek is a municipality (http://www.windhoekcc.org.na/) that has traditionally operated a bus service pre-1990 and so is not new to bus operations. The bus operator (City of Windhoek) is thus a public entity with no current private partner or influence and is today running a fleet of some 79 diesel buses (whose numbers vary based on maintenance challenges).

The operation itself is handled by the Public Transport Division which is one of nine Divisions at the municipality. This Division is responsible for safe, reliable, effective, efficient and fully integrated public transport provision.

While the City of Windhoek (CoW) operates on a smaller scale compared to most other cities in the world and mostly from Monday to Friday (as part of the legacy phenomena), the present trends observed are comparable. Reduced accessibility and thus social isolation and exclusion caused by inadequate mobility of the urban poor, ever increasing traffic congestion, unacceptable high rates of traffic accidents, high consumer costs, energy dependence and pollution make this project a necessity.

The populace characteristics of Windhoek is mainly comprised of low income earners where it is stated that 87% of them cannot afford to own cars generally; 52% of those low income earners cannot afford it at all.
On average, low income earners spend 24% of their income on mobility. The non-motorised traffic consists above all of walking (more than 97%), while cycling is almost negligible.

In terms of the current bus fleet, these buses vary in age from purchase / acquisition during the period 1975 – 2015 as shown below;

<table>
<thead>
<tr>
<th></th>
<th>Year of Manufacture</th>
<th>Asset Register</th>
<th>Operational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old fleet Mercedes-Benz/Nissan</td>
<td>1975 to 1992</td>
<td>58</td>
<td>15</td>
</tr>
<tr>
<td>Middle Age Fleet Scania/Mercedes-Benz</td>
<td>2010</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>New Fleet of MAN buses</td>
<td>2015</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>104</td>
<td>61</td>
</tr>
</tbody>
</table>

The current fleet is operated on some 13 Lines and various routes covering approximately 7 097 994 km per annum and operated mainly during peak travel periods. The service competes with taxis.

The average operating distance per day in the Windhoek bus fleet, even in the planned scenario is relatively low (220km per day) which fits into the current ranges of electric buses.

The operational lines to be activated fully are;
Describe financial status and how the project/programme sponsor will support the project/programme in terms of equity, management, operations, production and marketing.

Financial Status
CoW budgets on an annual basis for its operations which includes a mix of subsidy support and collected revenue. The financing strategy for this project is proposed as a mix of equity funding (state funding) and soft loans for fleet and infrastructure from the Green Climate Fund or other eligible agencies along with the requisite grant portion to help facilitate fast tracking of “greening” measures and provide financial viability.

A number of assumptions drive the financial model such as:

- The Net Present Value (NPV) is calculated at the discount rate set at 10%, and is applied to operational side only, since infrastructural and fleet/rolling stock acquisition rolling / investments are considered under funding from public sector obligation sources.
- The prices of imported goods (LRT rolling stock and BRT fleets) are included at current market level.
- The level of risks/other costs that may occur during implementation of the project is integrated into the cost mode and is set at 10% for CAPEX and 5% for OPEX.
- The effect of inflation is not taken into account.

Analysis centres on the entire public transport network of Windhoek and the interdependencies with local, national and regional public transport systems.
Table 1 Financing needs based on option combinations

<table>
<thead>
<tr>
<th>Option</th>
<th>Initial Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure</td>
<td>27.11714 USD</td>
</tr>
<tr>
<td>2. Hybrid Pilot</td>
<td>0.869285714 USD</td>
</tr>
<tr>
<td>4. Rainwater Harvesting</td>
<td>0.159285714 USD</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>49.99632367 USD</strong></td>
</tr>
</tbody>
</table>

The operator being a municipality entity is a partially subsidised service from the public sector and all cost will be structured as public funds.

This project is estimated to cost approximately USD49.996 million towards initial investment. The City is trying its best to help itself along with Government and Partner support and so part of the needed bus fleet has been procured already in the interim with the provision of the new MAN Fleet. The fleet additions are co-financed by the Municipality (CoW) and the Ministry of Works and Transport with support by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

### B.3. Market overview

**Market Overview:**

The market dimension is driven in part by the traditional context of the populace being separated by economic lines and the further differentiation of work and residence by distance. There is even further complication to service delivery based on the population numbers in the project area (Windhoek) growing rapidly, along with the seasonal migratory movement of people through the urban centre of Windhoek as they move.

The Labour Force Survey of 2013 counted 158,104 households in the immediate project area. The annual population growth rate nationally is estimated at 1.7% (2011) and in Windhoek between 3 - 5%. The forecast therefore suggests the increase of the population in 2017 to 462,500 inhabitants, and by 2032 to 808,000 persons, which will constitute an increase of about 47%. It is however likely that the Windhoek population will continue to grow at a much higher rate based simply on the impacts of drought and other such factors causing people to seek livelihoods in urban centres. This ultimately attributable mainly to economic migration growth, since the region is one of the most significant economic regions in the country.

One of the implications of this high population increase is that the volume of traffic to transport people to and from their working places will increase considerably. There are indications and reports that point to mobility needs for a million people in Windhoek within twenty years.

The table below (Table 2 Passenger numbers 2015 – 2022) shows how the public transport (bus) market is expected to grow in demand by an average of 226% from 2015 to 2022.
Table 2 Passenger numbers 2015 – 2022

<table>
<thead>
<tr>
<th>Lines</th>
<th>2015</th>
<th>2022</th>
<th>% growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>demand of the maximum intersection</td>
<td>demand of the maximum intersection</td>
<td></td>
</tr>
<tr>
<td>1 North</td>
<td>1180</td>
<td>2607</td>
<td>121%</td>
</tr>
<tr>
<td>1 South</td>
<td>80</td>
<td>357</td>
<td>346%</td>
</tr>
<tr>
<td>2</td>
<td>540</td>
<td>1143</td>
<td>112%</td>
</tr>
<tr>
<td>3 West</td>
<td>260</td>
<td>1040</td>
<td>300%</td>
</tr>
<tr>
<td>3 South</td>
<td>180</td>
<td>460</td>
<td>156%</td>
</tr>
<tr>
<td>4 North</td>
<td>570</td>
<td>1317</td>
<td>131%</td>
</tr>
<tr>
<td>4 East</td>
<td>50</td>
<td>313</td>
<td>526%</td>
</tr>
<tr>
<td>5 North</td>
<td>240</td>
<td>580</td>
<td>142%</td>
</tr>
<tr>
<td>5 South</td>
<td>30</td>
<td>117</td>
<td>290%</td>
</tr>
<tr>
<td>6</td>
<td>190</td>
<td>457</td>
<td>141%</td>
</tr>
<tr>
<td>8</td>
<td>120</td>
<td>400</td>
<td>233%</td>
</tr>
<tr>
<td>11 North</td>
<td>600</td>
<td>1390</td>
<td>132%</td>
</tr>
<tr>
<td>11 South</td>
<td>40</td>
<td>247</td>
<td>518%</td>
</tr>
<tr>
<td>12 North</td>
<td>330</td>
<td>743</td>
<td>125%</td>
</tr>
<tr>
<td>12 East</td>
<td>230</td>
<td>517</td>
<td>125%</td>
</tr>
</tbody>
</table>

Competition:
The key competition comes from the taxis (cars) and private cars. This is so as they offer flexibility in door to door delivery and on demand response at the micro and macro levels. Their flexibility further extends to high utilisation of narrow streets. The size of Windhoek’s registered taxi fleet as registered in the Master Plan is about 6,815 taxis, which is equivalent to 190 taxis for every 10,000 inhabitants.

The new public transport system countermands this however in the high volume periods by improving defensive driver behaviour due to the reduced on the road competition and I premised on reduced traffic volumes as people switch to a much more comfortable and faster moving public transport system.
The market in terms of “competing alternatives, has the current passenger movement consisting of private cars 28%, walking 26%, car share 7%, cycling 1%, taxis 34% and buses 4%.

Baseline Scenario: Taxi Operation

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage % (annualized)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effective taxi pass km replaced by public transport system</td>
<td>376,350,000</td>
</tr>
<tr>
<td>Average taxi occupancy (passengers)</td>
<td>2.2</td>
</tr>
<tr>
<td>Taxi km replaced</td>
<td>171,068,182</td>
</tr>
<tr>
<td>Average taxi consumption (litres)</td>
<td>6.9</td>
</tr>
<tr>
<td>Total fuel consumption (litres)</td>
<td>11,803,705</td>
</tr>
<tr>
<td>Total CO₂ generated (to)</td>
<td>33,877</td>
</tr>
</tbody>
</table>

It is therefore apparent that any upscaling in the bus fleet and improved services have a great potential to reduce fuel use, reduce fuel demand imports and increase bus usage / market share and reduce taxi usage.

Previously, the bus service operated with tokens and or cash. A new system utilising smart card technology has already been introduced with an implementation period of three months (May – July 2011) set aside for user awareness and comfort. The implementation period provided smart cards for free as an additional incentive. Since then, a parallel system of tokens, cash and smart cards had been used.

Actual fares are regulated and published annually in the municipality's tariff table which is provided as public information after being tabled before the council for approval.

Income / revenue is gained from fares and non-fare sources as outlined below;

The City of Windhoek is a Municipality and so its bus operations are subject to the regulation of the Ministry of Works and Transport. The Ministry of Works and Transport is responsible for sectoral policy and regulation. The Windhoek taxi industry is regulated by the Ministry of Works and
Transport and the City of Windhoek. The City also through its Department of City Police issues taxi permits for operation within the city limits. This permitting process occurs on a bi-annual basis.

The Ministry of Works and Transport through its’ Directorate of Transportation Policy and Regulation coordinates the;

- Road Traffic and Transport Act (22) of 1999
- Road Traffic and Transport Regulations
- Labour-Based Works Policy
- SADC Protocol on Transport
- SACU (Revised Agreement)
- Almaty Protocol on Transit Transport Cooperation and Corridor Development (United Nations)

As such the regulator and the operator have mutual interlinks and no further licences or permits would be required.

B.5. Implementation arrangements

The overall “Move Windhoek” project has an outlook based on work done in the SUTMP with a timeline till 2032. However, the attached Low Carbon Transport Pre-feasibility Study covers “Phase 1” which has a timeline as per this application Concept Note 2018 – 2024. This timeline is due in part to the fact that the City of Windhoek (The transport operator) has already started implementing the overall project as per the project plan and schedule and with the support of the Namibian Government’s bilateral partner The German government (via its funding and implementing agencies - KfW Entwicklungsbank (Development Bank) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH).

Figure 5 Part of the new bus fleet

<table>
<thead>
<tr>
<th></th>
<th>Length of the route (m)</th>
<th>2017</th>
<th>Level of completion</th>
<th>2018-22</th>
<th>Level of completion</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Phase 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Line T1:</td>
<td>11600</td>
<td>2320</td>
<td>20%</td>
<td>9280</td>
<td>100%</td>
</tr>
<tr>
<td>Line T2:</td>
<td>11400</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>Line T4:</td>
<td>7300</td>
<td>0</td>
<td>0%</td>
<td>3650</td>
<td>50%</td>
</tr>
<tr>
<td>Line T11:</td>
<td>2600</td>
<td>0</td>
<td>0%</td>
<td>1560</td>
<td>60%</td>
</tr>
<tr>
<td>Line T3:</td>
<td>7200</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>40100</td>
<td>2320</td>
<td></td>
<td>14490</td>
<td></td>
</tr>
</tbody>
</table>
Line 1, mainly following the Independence Avenue from City Centre (CBS) via Katutura to Wanaheda, is the most central line and will be the first one to be updated to a higher level of operation. The first upgrade of the system will be from bus to BRT 1.

**Operational Arrangements**
The responsible Division within the City of Windhoek will be the Public Transport Division.

The division is:

- Tasked with the provision of a safe, reliable, effective, efficient and fully integrated public transport in Windhoek
• Tasked with ensuring that public transport best meets the needs of passengers by improving levels of service and the cost thereof
• Tasked with managing the provision of public transport infrastructure
• Tasked with ensuring mobility and accessibility to the residents of Windhoek.

Although construction on many major components have not yet begun, with the acquisition of a part of the new fleet of buses, the new formatted operational regime has already begun (since March 2016).

The new regime has also instituted a new “cashless” ticketing system.

**Key Contractual Agreements.**

The City of Windhoek will be the bus operator and so no contracts or additional operational permits will be required. In terms of road and other such infrastructure, construction will commence once the City’s planning colleagues have fully permitted construction.

Various construction companies will be selected via competitive bidding processes handled through the City of Windhoek’s Tender Board, which is itself regulated and has oversight from the City Council. Further oversight will occur from the competitive tender process according to DBN policies and guidelines and the oversight ministry for local governments (the Ministry of Urban and Rural Development).

All projects will be compliant as required by the existing Environmental Management Act (EMA 2007). The EMA 2007 requires an environmental certificate of compliance be issued for projects which are listed as “Listed Activities”. Transportation is listed as a Listed Activity and would therefore require a certificate of compliance. This certificate would be obtainable after an environmental impact assessment (EIA) has been carried out and the projects implications were assessed by the Environment Ministry.

The EIA must be carried out by an independent third party which the EMA 2007 require to be a competent authority.

Full implementation will be developed from the feasibility study to follow.

**Strategic Timetable**

Standard bus routes will be enhanced along with the development of a rapid transit line (T1) through the project period (2018 – 2024). And so, from the introduction of the new service, the network will be served as a whole system according to the demand levels identified by the Sustainable Urban Master Transport Plan model.
The construction timetable sees construction taking place at the following pace:

The timetable also requires development of further supportive actions as detailed below:

<table>
<thead>
<tr>
<th>Phase</th>
<th>Aspect</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>2016</td>
<td>Institutional Framework</td>
<td>Realisation of enabling framework as described in PuT corporate plan</td>
</tr>
<tr>
<td>2016</td>
<td>Taxi Integration</td>
<td>Redefine the roles of taxi according to international best practice to complement PuT backbones and feeders</td>
</tr>
<tr>
<td>2017</td>
<td>Legal Framework</td>
<td>Insure legal framework for provision of public transport service by commercial operators</td>
</tr>
<tr>
<td>2017</td>
<td>Land reservation</td>
<td>Land-use for right of way and supporting infrastructure</td>
</tr>
<tr>
<td>2017</td>
<td>Monitoring urban development</td>
<td>Balanced development according to the master plan</td>
</tr>
<tr>
<td>2017</td>
<td>Revisit demand values</td>
<td>Check the public transport demand values and their impact on SUTMP pre-feasibility study results.</td>
</tr>
<tr>
<td>2017 - 2022</td>
<td>Enable policy reforms for public Transport</td>
<td>Integrate the public transport policy reform agenda into the White Paper on transport and in other strategic level documents</td>
</tr>
<tr>
<td>2017 - 2032</td>
<td>a. Promote the system development</td>
<td>Organise marketing promotion and awareness campaigns</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Coordinate the urban development needs and monitor the development patterns</td>
</tr>
</tbody>
</table>
b. Enable cooperation between the stakeholders

State as a provider of the public transport

c. Earmarking funds for public transport funding

Start the reforms and gradual change in the institutional setting

d. Institutional reform and adherence to mobility charter

Cooperation and coordinated action between all stakeholders involved is a pre-requisite for system development and upgrade.

e. Continuation of cross-institutional cooperation

C. Financing / Cost Information

Grant financing and concessional loans will be required and is being requested to help expand the current public transport system so as to reduce the impact of people movement, reduce fossil fuel usage and thus greenhouse gas emissions.

Namibia as a whole has approximately 43% of its population (based on the 2011 census) living in urban areas coupled with a median age of 21, growing from an urban based population of 28% as measured in 2001.

The project therefore has clear beneficiation when the expansion of public transport helps reduce motor car usage from approximately 376 350 000 km per annum with a corresponding people movement via mass transit to an estimated 7 097 994 km per annum.

Namibia although classified as a middle income country has a Gini Coefficient of around 0.63 elaborating the level of inequality with wealth and income distribution amongst the highest in the world. According to DBN reports, 32% of Namibia’s population lived below the national poverty line, 29% below the international poverty line and 16% in severe poverty in 2013.

The Government of Namibia has committed itself to the “Harambee Prosperity Plan” which is an action plan to fast track activities and policies to reduce hunger,
increase access to decent shelter, improve youth employment and access to basic social services. (www.op.gov.na). Thus a blend of grant funding and concessional loans is crucial to the success of the transport project and increases the impact of other funds such as ticket income, government subsidy funds and the funding from other Direct Finance Institutions.

CoW budgets on an annual basis for its operations which includes a mix of subsidy support and collected revenue. The financing strategy for this project (priority 1) is proposed to be sought as a mix of equity funding (state funding) and soft loans for fleet and infrastructure from the Green Climate Fund or other eligible agencies along with requisite grants to help facilitate fast tracking of “greening” measures.

This phase of the project is estimated to cost approximately USD 50 million towards initial investment. Part of the needed bus fleet has been procured already in the interim with the provision of the new MAN Fleet is co-financed by the Municipality (CoW) and the Ministry of Works and Transport are being supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH.

The table below clearly shows that for a paradigm shift to take place, huge investment needs to take place and is disaggregated here.

Table: CAPEX Financing Requirement

<table>
<thead>
<tr>
<th>ITEM / COST</th>
<th>Initial Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Infrastructure</td>
<td>27.11714 USD</td>
</tr>
<tr>
<td>2. Hybrid Pilot</td>
<td>0.869285714 USD</td>
</tr>
<tr>
<td>4. Rainwater Harvesting</td>
<td>0.159285714 USD</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>49.99632367 USD</strong></td>
</tr>
</tbody>
</table>

Analysis centres on the entire public transport network of Windhoek and the interdependencies with local, national and regional public transport systems. The operator being a municipality is a partially subsidised service from the public sector and all cost will be structured through public funds.

The sub-components minus subsidies are broken down (based on local currency) to be:

<table>
<thead>
<tr>
<th>ITEM / COST</th>
<th>YY 1-7 In USD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Route construction/road upgrade</td>
<td>11.39071</td>
</tr>
<tr>
<td>Facilities construction</td>
<td>7.677143</td>
</tr>
<tr>
<td>Fleet purchase (Conventional)</td>
<td>0</td>
</tr>
<tr>
<td>Fleet purchase (Hybrid)</td>
<td>0.869286</td>
</tr>
<tr>
<td>Fleet &amp; Solar purchase (Solar Plant &amp; Electric)</td>
<td>21.85061</td>
</tr>
<tr>
<td>Rainwater Harvesting</td>
<td>0.159286</td>
</tr>
<tr>
<td>Stations’ construction, incl. CBS and Depot</td>
<td></td>
</tr>
<tr>
<td>Land Acquisition BRT</td>
<td>3.11 USD</td>
</tr>
<tr>
<td>Systems (associated construction, installations)</td>
<td></td>
</tr>
</tbody>
</table>
Revenue Blend:
The financial outlook of the proposed project shows that budgeted income from revenue will only cover USD 68.8 million for the 7 year period. This shows that the level of Grant funding support will be required to facilitate a definitive paradigm shift.

Table: Revenues

<table>
<thead>
<tr>
<th>Category</th>
<th>YY1-7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fare revenues</td>
<td>59.44</td>
</tr>
<tr>
<td>Revenues on Weekdays</td>
<td>44.81</td>
</tr>
<tr>
<td>Revenues on Saturdays Christmas and NY eves</td>
<td>8.72</td>
</tr>
<tr>
<td>Revenues on Sundays and public holidays</td>
<td>5.92</td>
</tr>
<tr>
<td><strong>Other revenues</strong></td>
<td>9.37</td>
</tr>
<tr>
<td>Bus hire of weekends</td>
<td>1.04</td>
</tr>
<tr>
<td>Target Advertising Revenue</td>
<td>3.34</td>
</tr>
<tr>
<td>Smart card replacing</td>
<td>0.09</td>
</tr>
<tr>
<td>Fine collection</td>
<td>4.33</td>
</tr>
<tr>
<td>Miscellaneous (selling buses)</td>
<td>0.57</td>
</tr>
<tr>
<td><strong>Total revenues</strong></td>
<td>68.8</td>
</tr>
</tbody>
</table>

- a financial model that includes projection covering the period from financial closing through final maturity of the proposed GCF financing with detailed assumptions and rationale;

A number of assumptions drive the financial model such as:
- The Net Present Value (NPV) is calculated at the discount rate set at 10%, and is applied to operational side only, since infrastructural and fleet/rolling stock acquisition rolling / investments are considered under funding from public sector obligation sources.
- The prices of imported goods (LRT rolling stock and BRT fleets) are included at current market level.
The level of risks/other costs that may occur during implementation of the project is integrated into the cost mode and is set at 10% for CAPEX and 5% for OPEX.

The effect of inflation is not taken into account.

<table>
<thead>
<tr>
<th>Financial Instrument</th>
<th>Amount</th>
<th>Currency</th>
<th>Tenor</th>
<th>Pricing</th>
</tr>
</thead>
</table>
| Total project financing \((a) = (b) + (c)\) | $50\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots..
D. Expected Performance against Investment Criteria

Please explain the potential of the Project/Programme to achieve the Fund’s six investment criteria as listed below.

<table>
<thead>
<tr>
<th>D.1. Climate impact potential [Potential to achieve the GCF’s objectives and results]</th>
</tr>
</thead>
<tbody>
<tr>
<td>The project has definitive mitigation impacts as clearly highlighted with the:</td>
</tr>
<tr>
<td>• change in mobility behaviour (Shift from cars to buses)</td>
</tr>
<tr>
<td>• reduction in vehicle kilometers (From 171 million km to 7 million km)</td>
</tr>
<tr>
<td>• low carbon impact pathways (Solar Power generation – 0.4 MW)</td>
</tr>
<tr>
<td>• low carbon transportation (Hybrid / Electric – 17 buses)</td>
</tr>
<tr>
<td>• reduced fossil fuel use</td>
</tr>
<tr>
<td>• corresponding GHG reductions outlined in the estimates.</td>
</tr>
<tr>
<td>• high direct beneficiary numbers (170,000 direct beneficiaries)</td>
</tr>
<tr>
<td>• High replicability</td>
</tr>
</tbody>
</table>

It is expected that the implementation of the proposed project elements (fleet expansion, solar pilot, hybrid pilot and rainwater harvesting) will save approximately 25,000 tonnes of CO$_2$ per annum, out of which more than 24,000 will stem from the implementation of the fleet and network expansion project described in more detail in the pre-feasibility study of June 2015.

This saving would occur on a continuous and sustainable basis and the initial impacts are disaggregated below;

**Mitigation Potential**

<table>
<thead>
<tr>
<th>CO$_2$ saving tons p.a. (against the Baseline Scenario)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fleet Expansion Diesel</td>
</tr>
<tr>
<td>LPG full fleet</td>
</tr>
<tr>
<td>Solar pilot</td>
</tr>
<tr>
<td>Solar park</td>
</tr>
<tr>
<td>Hybrid pilot</td>
</tr>
<tr>
<td>Full hybrid</td>
</tr>
</tbody>
</table>

**Beneficiaries:**

As the project targets public transportation within the capital city which itself also acts as a cross road to the country and regional transport movement, the number of direct beneficiaries will be in excess of the city’s public transport population which currently stands at approximately 170,000 persons.

<table>
<thead>
<tr>
<th>D.2. Paradigm shift potential [Potential to catalyze impact beyond a one-off project or programme investment]</th>
</tr>
</thead>
<tbody>
<tr>
<td>The proposed Move Windhoek project has the following potential areas;</td>
</tr>
<tr>
<td><strong>Scaling-up</strong></td>
</tr>
<tr>
<td>The options 5 (hybrid buses) and 7 (electric bus / solar component) offer clear opportunity for upscaling to 100% of the bus fleet once a clear study has been undertaken to identify any risks or challenges that the bus operation faces with these technologies identified.</td>
</tr>
<tr>
<td><strong>Knowledge sharing</strong></td>
</tr>
<tr>
<td>Clear lessons can be gathered and shared from the Move Windhoek project. Option 7 has a definitive mitigation and paradigm shift benefits and are encouraging to say the least at this time with a sister city (Cape Town, South Africa) embarking on a tender to procure a similar technology. This would provide near field added support to the CoW operations.</td>
</tr>
</tbody>
</table>
The initial pilots in both Namibia and South Africa would be complementary and the launch needed to provide on the ground knowledge banks and ensure a base for sustainability.

Further, Move Windhoek has already committed to carrying out fleet expansion and testing of new bus types⁴ such as the articulated buses with the current test bus being 22 meters long and has a seating capacity for up to 120 passengers plus additional standing passengers.

**Enabling Environment**
Options 5 and 7 of the Low Carbon Transport pre-feasibility study as stated above provide clear opportunities to transform urban transportation in Africa and beyond while providing compelling evidence of a low-carbon way forward for transportation and knowledge growth. This project once fulfilled will definitely help move perceptual barriers to low carbon transport use especially for urban transport use.

The public transport system although now reformed, existed before the project and in essence is a paradigm shift from the status quo. As such the project possesses a natural sustainability effect if implemented fully and consistently. The sustainability of the project is clearly defined by the implementation plan as outlined by the SUTMP and the initiative of the initial steps already taken.

**Regulation and Policy**
Being a break away from the status quo transport system that exists, this project helps inform regulation and policy in so many ways. Least of which will be how law makers can set incentives for transport operators that demonstrate clear commitment to low-carbon pathways. Impacts on the future national climate change strategy / strategies will also benefit from this project as any future inputs or decisions will be effectively informed. We also see further impacts on the energy industry when the technology starts to be mainstream and charging stations become relevant.

Room also exists for a better understanding of the operational metrics that would ultimately inform the role of Public/Private partnerships (PPP) or other such cooperative models.

<table>
<thead>
<tr>
<th>D.3. Sustainable development potential [Potential to provide wider development co-benefits]</th>
</tr>
</thead>
</table>

The project will be a game changer for Namibia and so benefits will be felt across the socio-economic groups affected. Concrete estimates related to the direct and indirect monetary as well as non-monetary co-benefits due to the upgrading of the present bus service are provided in the Corporate Plan of the Pre-Feasibility Study for the SUTMP.

Jobs created will amount to approximately 60 direct jobs added resulting in a final full time direct job number of 330. Indirect jobs have not been quantified at this stage but up to a 1000 indirect jobs is not unrealistic.

According to the findings of the SUTMP, an average four-person household will save about USD50 per month, which is about 36% of the average household’s transport budget. Moreover, persons travelling for education (i.e. pupils and students) will benefit most from the improved public transport system with an estimated cost saving of 43%. In terms of absolute numbers, the cost savings were estimated as

---

- USD9.64 per average worker per month
- USD16.43 per average pupil/student per month
- USD7.14 per average part time/unemployed person per month.

Based on an estimated 150,000 person trips utilizing public transport per week as a result of the project, the estimated total household savings are on the order of USD5 million per annum.

Foreign currency savings will also accrue based simply on the fact that Namibia is not an oil producing nation and imports a major portion of its electricity. However, the foreign currency impact has not yet been fully quantified.

Transport affects Windhoek’s resident’s daily lives in different ways, for instance in getting to and from work or being able to access essential services such as health, education, recreation in all areas of the City and for all parts of the population. Clear planning in the SUTMP has taken into account the needs for access to services. The Move Windhoek project once fully implemented will improve access to all social services that would otherwise be delayed or even restricted.

No clear environmental impact assessment has been carried out at this stage but the indicative outcome of the project has clear benefits that will benefit air quality and GHG reductions to very appreciative levels once fully implemented. This is a matter to be fully defined in further studies.

The Project provides improved gender sensitive access. In the Windhoek area, 76% of income is derived from salaries and 66.2% are female headed households that depend on their salaries. It stands to reason therefore that effective transport will be a clear impact on income availability and quality of life.

The Move Windhoek project will definitely enhance access to work and increase productivity levels and certainty.

<table>
<thead>
<tr>
<th>D.4. Needs of recipient [Vulnerability to climate change and financing needs of the recipients]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namibia has had noticeable changes in climate as captured and detailed in the Namibian Vulnerability and Adaptation assessment report (2008). The report indicates that increased droughts and higher variability in rainfall can be expected and are currently being experienced.</td>
</tr>
<tr>
<td>The predicted increases in temperature and evaporation, and increased rainfall variability, will exacerbate the existing challenges faced by Namibia as the driest African country south of the Sahara. From the perspective of this project, the indication is therefore increased urbanization as the effects of climate change increase hardship on rural residents. This in turn will increase mobility of the populace and definitely increase the rate of public transport or even general mobility needs overall.</td>
</tr>
</tbody>
</table>
Namibia is a signatory to United Nations Framework Convention on Climate Change and has thus prepared its National Communications up to and including the most recent Third National Communication to the UNFCCC (Ministry of Environment and Tourism, 2015).

As a response to Namibia’s obligations under the United Nations Framework Convention on Climate Change (UNFCCC) as ratified in 1995, Namibia was one of the first countries in Africa to have developed and prepared a comprehensive Climate Change Policy (GRN, 2011) as well as a Climate Change Strategy and Action Plan (GRN, 2015).

While the National Policy on Climate Change of 2011 formulates the national vision on addressing climate change, the National Climate Change Strategy and Action Plan is the key instrument to implement the Policy over a period of eight years from 2013 – 2020. Namibia is implementing the National Climate Change Strategy & Action Plan (NCCSAP) for the periods 2013 – 2020.

A number of strategic aims are outlined in the NCCSAP (2013 – 2020) framework covering the agendas of Adaptation, Mitigation and Cross-cutting issues. Under mitigation and specifically towards “sustainable energy and low carbon development”, the strategic aim is to:

I. Foster other forms of transportation that do not contribute or have less GHG emissions by introducing improved transportation systems
II. Promote fuel efficiency in transport systems toward low GHG emission
III. Promote and develop renewable energies at all levels to reduce GHG
IV. Develop and diversify secure energy backup system (energy security) and efficient use of energy
V. Promote reduction of GHG emissions from industries (both public and private)

Namibia’s Climate Change Action Plan Framework breaks down the activities under each transport-related strategic aim in more detail.

The following activities, which would be an integral part of the proposed project, are listed explicitly:
- Look into ways to improve the transport system e.g. through transport master plan including biking, walking particularly in urban towns and sustainable public transport
- Explore other possible means of transportation that have less or do not contribute to GHG emission
- Improve quality of services (especially in terms of duration of travel to desired destination and cleanliness) to attract mass population e.g. public transport
- Encourage fuel switching, for instance to the use of LPG.

Namibia’s Vision 2030 envisages that, by 2030, a “safe and cost-effective transport infrastructure is available throughout the country, as well as specialized services, in their different modes, to balance its demand and the supply thereof, in an economically efficient way.” The proposed project would contribute directly towards the achievement of this vision.

Namibia’s Fourth National Development Plan NDP5 covers the period 2017 – 2022. Among others, a desired outcome of NDP5 with regards to public infrastructure is that “By 2022, Namibia shall have a well-functioning, high quality transport infrastructure […]”. The proposed project is fully aligned with this outcome.
Given Namibia’s history, the City of Windhoek has a considerable history of providing public transport and other public service delivery such as Fire, Police and Rescue Services. These all require an active fleet, well trained personnel and responsive scheduling.

The Municipality (CoW) and the Ministry of Works and Transport is being supported by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, who have over-seen the elaboration of the “Sustainable Urban Transport Master Plan for Metropolitan Windhoek (MWT, 2013)” and a pre-feasibility study titled “Pre-Feasibility Study for the Sustainable Urban Transport Master Plan (SUTMP) for Windhoek including Rehoboth, Okahandja and Hosea Kutako International Airport” of June 2015.

The CoW has along with its partners and key stakeholders, have conducted various community forums, meetings and has an active web portal http://www.movewindhoek.com.na/ which details all actions and receives public comments and complaints towards system improvement.

<table>
<thead>
<tr>
<th>D.6. Effectiveness and efficiency [Economic and financial soundness and effectiveness of the proposed activities]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide details of the below and specify other relevant factors (i.e. debt service coverage ratio), if available.</td>
</tr>
</tbody>
</table>

**Overview**

<table>
<thead>
<tr>
<th>Reference fleet</th>
<th>CO2 Saving</th>
<th>Investment</th>
<th>Operational Cost Differential</th>
<th>Required Subsidy for first 7 yrs</th>
<th>Mitigation Cost per ton of CO2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solar pilot</td>
<td>58</td>
<td>3,538</td>
<td>305.90</td>
<td>21,71</td>
<td>108,30</td>
</tr>
<tr>
<td>Hybrid pilot</td>
<td>10</td>
<td>244</td>
<td>-0.11</td>
<td>-0.92</td>
<td>3,604</td>
</tr>
</tbody>
</table>

- Co-financing ratio (total amount of the Fund’s investment as percentage of project)
- Economic and financial rate of return
  - With the Fund’s support
  - Without the Fund’s support

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**E. Brief Rationale for GCF Involvement and Exit Strategy**

Please specify why the GCF contribution is critical for the project/programme.

Please explain how the project/programme sustainability will be ensured in the long run, after the project/programme is implemented with support from the GCF and other sources.

Should there be no support for the establishment of a high-performing public transport system in Windhoek during the next few years, it is to be expected that the presently predominant private taxi system will fill the gap and establish itself as the main form of public transport.
In future, it would then be very difficult to replace the present vehicle sizes by more eco-friendly and less traffic-space consuming vehicle types.

F. Risk Analysis

Please describe the financial and operational risks and discuss mitigating measures.

Based on the fact that the operator is a Municipality, the risk factors are very different from that of a private operator. However the risk profile is very relevant and cannot be dismissed. The table below outlines the risks and the mitigation that would mitigate the effect of the risk. The highest risk comes from sustainability and passenger acceptance.

<table>
<thead>
<tr>
<th>Risk factor</th>
<th>Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial risks:</strong></td>
<td></td>
</tr>
<tr>
<td>CAPEX cost inflation</td>
<td>Further costs reassessment at the feasibility study level</td>
</tr>
<tr>
<td>Lack of funding</td>
<td>Earmarking funds for public transport funding - Institutional reform and adherence to mobility charter - Continuation of cross-institutional cooperation</td>
</tr>
<tr>
<td>High CAPEX costs</td>
<td>Grant funding to cover initial CAPEX items such as Hybrid, Electric busses and the needed infrastructure, training and regulations to ensure continuity of the paradigm shift.</td>
</tr>
<tr>
<td><strong>Operational risks:</strong></td>
<td></td>
</tr>
<tr>
<td>Uncertainty in system acceptance</td>
<td>Work with marketing department at early stages of the system introduction to assure public awareness - Campaigns to advertise the system – improve image - Adherence to implementation and operational concepts</td>
</tr>
<tr>
<td>Passenger number miscalculation – higher than anticipated</td>
<td>Constant monitoring of passenger numbers / economic signals</td>
</tr>
<tr>
<td>Passenger number miscalculation – higher than anticipated</td>
<td>Constant monitoring of passenger numbers / economic signals</td>
</tr>
<tr>
<td>Change in mobility pattern</td>
<td>Constant system monitoring Legislation / Possible toll fees to dissuade use of other mobility methods</td>
</tr>
<tr>
<td>Residence distribution</td>
<td>Monitor inhabitant behaviour</td>
</tr>
<tr>
<td>Absence of the policy environment for system improvement</td>
<td>Integrate an public transport policy reforms into the White Paper on transport and other strategic level documents - Adherence to corporate plan</td>
</tr>
</tbody>
</table>
At this point, no environmental impact or social safeguard has been carried out to date. However, the SUTMP feasibility study annexed to this Concept Note delves into the environmental aspects (Pre-feasibility study section 8.5.1) of the project from a purely engineering point of view.

<table>
<thead>
<tr>
<th>Key area / activity</th>
<th>Issue raised</th>
<th>Mitigation required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land Use/Right of Way</td>
<td>Planned operational improvements 2018 – 2024 period.</td>
<td>Construction to take place within the existing right of way and so no new right of way / land challenges are expected during the expansion beyond this involving expansion of the BRT systems will however necessitate additional construction works and acquisition of improved right of way lands</td>
</tr>
<tr>
<td>Planned operational improvements 2024 and beyond.</td>
<td></td>
<td></td>
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</table>

### G. Multi-Stakeholder Engagement

On Wednesday 18 November 2015 a great milestone for the urban transport system in Windhoek was reached by officially launching “Move Windhoek”, the brand for the implementation of the Sustainable Urban Transport Master Plan (SUTMP) for City of Windhoek and its surrounding areas. At the launch the first new bus was officially handed over to the City of Windhoek.

On the 24th of November “Move Windhoek” started its tour through Windhoek with an information bus. The goal of this bus is to introduce the population of Windhoek to a modern bus network. The City Of Windhoek together with GIZ created the information bus, which will explain to the people how the bus system works and convince them from its advantages. Every Tuesday and Thursday the bus will be placed at different locations in Windhoek and inform people about the new bus lines which are operating since mid of August in Katutura.

The kids are not left out either, they can also engage in the Information desk by creating their own buses. The company MAN, who also produced the new buses for Windhoek, sponsored bus...
templates for the kids. While the kids enjoy making the little bus templates the adults have the chance to ask questions about the project and get the timetables for the new bus lines.

Figure 7  Stakeholder briefings – 2015 (move Windhoek website)

H. Status of Project/Programme

1) A pre-feasibility study is expected to be completed at this stage. Please provide the report in section J. PROVIDED

2) Please indicate whether a feasibility study and/or environmental and social impact assessment has been conducted for the proposed project/programme: Yes ☐  No X
   (If ‘Yes’, please provide them in section J.)

3) Will the proposed project/programme be developed as an extension of a previous project (e.g. subsequent phase), or based on a previous project/programme (e.g. scale up or replication)?
   Yes ☐  No X
   (If yes, please provide an evaluation report of the previous project in section J, if available.)

I. Remarks

J. Supporting Documents for Concept Note

X  Map indicating the location of the project/programme
X  Financial Model
x  Pre-feasibility Study (SUTMP)
☐  Feasibility Study (if applicable)
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>Environmental and Social Impact Assessment (if applicable)</td>
</tr>
<tr>
<td>☐</td>
<td>Evaluation Report (if applicable)</td>
</tr>
</tbody>
</table>