Financial Solutions for City Resilience (Cohort 2)
2nd Nyali Bridge PPP Viability Study (Mombasa, Kenya)

Mark A. Smith
July 2018
PPP Viability Studies: Approach and Methodology

- **Infrastructure Assessment**
  - High level assessment of the key economic activities / drivers of the cities and of the infrastructure that supports these economic activities

- **Legal and Institutional Reviews**
  - Review national and municipal legal regulatory and institutional conditions

- **Site & Infrastructure Evaluation**
  - Support in identification of potential infrastructural challenges
  - Analyze site suitability in terms of ownership, resettlement and relocation, infrastructure availability and utilities

- **Demand supply & Project description**
  - Demand study to provide the basis for a conceptual design, an estimate of the capital investment required and project revenues

- **Viability Assessment**
  - Preparation of financial model, PPP project structure, comparative risk matrix and value-for-money & affordability analyses
  - Preparation of preliminary project implementation plan

- **Workshop and Capacity Building**
  - Workshop to finalise contracting options
  - Assistance in development of capacity for PPP projects
Deloitte.
2nd Nyali Bridge
PPP Viability Study
Transaction Advisory Consortium

In association with

Deloitte.

In conjunction with

Jaunty Business Group

EarthCare Services Limited

IK&M Advocates

DLA Cliffe Dekker Hofmeyr
Feasibility Study

Project Background and Objectives
Introduction

The Current Nyali Bridge

• The existing bridge has served Mombasa for over 35 years.

• Built in 1979 with financing from the Government of Japan.

• Has provided the only direct link between the Mombasa North Coast Mainland and Mombasa Island.

• Mombasa is Kenya’s second biggest city and East Africa’s largest sea port.
Introduction

Mombasa City: Sustaining Growth

• Mombasa county has grown exponentially over the past four decades.
• The population within Mombasa county is expected to rise beyond 1.2 million people by 2025.
• This growth implies increased traffic, which will require sustainability.
Introduction

The 2\textsuperscript{nd} Nyali Bridge: Project Importance

- Mombasa has begun experiencing major traffic congestion, especially during rush hour times.
- The city will require more accessibility to sustain population and economic growth.
- Having a second direct access route between Mombasa Island and the Northern Mainland provides additional security.
- A new bridge will ease congestion on the existing Nyali Bridge and the wider areas either side of Tudor Creek, help reduce wasted time and support Mombasa's economy.
Introduction

The 2nd Nyali Bridge: The Project

• Development, Operation, and Maintenance of a 2nd Nyali Bridge
• PPP Project
• Expected to be tolled
Mombasa: Other Projects Under Consideration

Please note that these drawings were done on an approximate basis and do not provide as a true representation of the eventual developments or the views of any of the parties involved within them.

These are provided for example purposes only.

1. Northern By-pass
2. Ferry
3. A109
4. Donga Kundu Crossing
5. Likoni Crossing
6. B8 Expansion
7. Mariakani Kilifi
8. Port Reitz
Feasibility Study
Traffic Analysis and Modelling
Traffic Analysis
Existing Nyali Bridge traffic

- Some 50,000 trips daily across the Existing Nyali Bridge (excluding motorcycles and tuk tuks)
  - Close to its design capacity
  - AM and PM peaks Illustrate the importance of commuter traffic
Travel between Links/Malindi Rd junction to Saba Saba (8 km) takes up to 49 minutes (Speed over bridge: up to 3.2km/h)
Traffic Modelling
Future Volume Projections

Undertaken using demand modelling on the basis of demographic and economic factors.

Factors considered:
- Population growth
- GDP growth
- Vehicle registrations
- Price elasticity
- Transport sector output
- Planned infrastructure /Port /Bypasses

It is expected that traffic will be grow by up to 2.0 times by the year 2035.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>2013</th>
<th>Growth Rate</th>
<th>2035 Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>1.04M</td>
<td>3.5%</td>
<td>2.95M</td>
</tr>
<tr>
<td>Employment</td>
<td>0.9M</td>
<td>3.2%</td>
<td>1.69M</td>
</tr>
</tbody>
</table>

Historical Population Growth

- Kenya
- Mombasa
Traffic Analysis and Modelling

Conclusions

• Traffic congestion already causes significant economic cost, with travel speeds as low as 6km/h.

• Traffic over the existing Nyali Bridge has an AADT of 46,000, which is close to its design capacity

• Traffic (if unconstrained) is projected to double in the next 20 years, which will cause significant further congestion and delays

  There is a pressing need for a new Nyali Bridge

• The majority of trips over the Existing Nyali Bridge have an origin or destination in the CBD

• A new bridge to the South of the Existing Nyali Bridge would yield the greatest traffic benefits, in terms of traffic operations and capacity, attracted volumes, travel time savings and network connectivity

  Traffic analysis points towards a Southerly bridge
Feasibility Study
Location Selection
Location Selection
Overview of Process

- Traffic Survey & Analysis
- Overview of Engineering / ESIA Factors
- High level financial analysis

Longlisting of Potential Sites

Shortlisting of Potential Sites

Selection of Preferred Site and Project Scope
Location Selection

Started with a Long List of 8 potential sites
Location Selection
Reasons for rejecting certain longlisted options

Options 1 & 2
- Not supported by traffic analysis
- Difficult to link to road network
- Environmental impact on Tudor
- Option 1 only: long bridge

Option 4
- Primary issue is the feeder road network, not the bridge
- Does not create an additional link

Option 7 (Old Nyali Bridge)
- Sharp bend on Mombasa Island side not conducive to traffic flow
- Variants of Option 6 preferable

Option 8
- Unacceptable impact on Mombasa Old Town
The DG of KURA, Governor of Mombasa and TA Team Leader jointly announced the preferred location.

Meetings were held with media, local residents, business representatives and political stakeholders.

The selection of the preferred location was confirmed in a document signed by KURA, Mombasa County Government and Deloitte.
Feasibility Study
Bridge Conceptual Design
Bridge Conceptual Design

Process for Selection of Bridge Structure Type

• Following confirmation of the Preferred location of the 2nd Nyali Bridge, we assessed alternative structure types for the bridge:
  • Conventional concrete bridge
  • Cable stayed bridge
  • Suspension bridge

• The conventional concrete was discounted at an early stage, primarily on cost grounds (with the materials required, especially for numerous pylons and piers in the water to support the deck)

• The TA team presented the cable stayed and suspension bridge options to KURA and Mombasa County Government and invited them to advise on the structure type to be used for the conceptual design taking account of:
  • Design aesthetics, cost and uniqueness (the technical capability and deliverability of the two structure types being similar)
Considering the landmark appearance, KURA and MCG advised that the Suspension bridge option be elaborated further. A conceptual / outline design, construction process and cost estimate has been developed for a Suspension bridge for the 2nd Nyali Bridge.
Bridge Conceptual Design
Delivering the desired capacity

LONGITUDINAL BRIDGE SECTION

typical cross section for dual carriageway
Bridge Conceptual Design

Daytime (Artist’s Impression)
Bridge Conceptual Design

Night time (Artist’s Impression)
Feasibility Study
ESIA issues
## Environmental and Social Impact Issues

### Project Impacts and Mitigation Measures

<table>
<thead>
<tr>
<th>Project Phase</th>
<th>Positive Impacts</th>
<th>Negative Impacts &amp; their mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Social</td>
</tr>
<tr>
<td>Pre-construction</td>
<td>Employment creation</td>
<td>Land acquisition, change in land use</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Loss of structures</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Vegetation clearance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Safety risks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Utility services disruption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gender Inequality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic congestion &amp; diversions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Air pollution</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>Increases Direct &amp; Indirect sources of employment</td>
<td>Safety and Health</td>
</tr>
<tr>
<td></td>
<td></td>
<td>risks</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Utility services disruption</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gender Inequality</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Traffic congestion &amp; diversions</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operation</td>
<td>Reduces traffic congestion, accidents</td>
<td>Tolling Impacts</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Environmental and Social Issues
Resettlement Action Plan (RAP)

Key Impacts (Bridge and immediate approach roads only)

- Affected households: 203 households
- 63 enterprises (employing over 178 people) will be displaced; largely informal, unregistered businesses (Roadside hotels, Kiosks and boat builders/repairers)
- Need for alternative space for traders, No resettlement of residents (as at time of survey) but since changed
- Estimated budget for RAP (including land acquisition): **KES 1.63 Billion**
  - Compensation for land – 622,174,064
  - Compensation for structures – 488,327,385
- RAP implementation schedule: maximum 16 months

*Preliminary estimates for Ph I; Subject to finalization by NLC*
Legal Due Diligence
Legal Due Diligence

1. Policy justification for the Project
2. Procuring Authority Powers
3. Legislation under which the Project is to be procured
4. Legal framework governing roads in Kenya
5. Legal framework applicable to tolling of roads in Kenya
6. Project Procurement Considerations and PPP Options
7. Project Site enablement issues
8. Private Party Project Implementation Issues
9. Project Funding
10. Managing Project Legal Risk
Funding Options
# Funding Options

## Comparison of Potential Funding Sources

<table>
<thead>
<tr>
<th>Funding Options</th>
<th>Revenue Potential</th>
<th>Acceptability</th>
<th>Ease of implementation</th>
<th>Reliability / Predictability</th>
<th>Disbursement Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tolls</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>Matches</td>
</tr>
<tr>
<td>Motor Vehicle Taxes</td>
<td>Low</td>
<td>Low</td>
<td>Easy</td>
<td>High</td>
<td>Partly matches</td>
</tr>
<tr>
<td>Fuel Taxes</td>
<td>Low</td>
<td>Moderate</td>
<td>Easy</td>
<td>High</td>
<td>Partly matches</td>
</tr>
<tr>
<td>Betterment Levy</td>
<td>Low to Moderate</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>Freight Charges</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Matches</td>
</tr>
<tr>
<td>Tax Increment Financing</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>Joint Development</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Partly matches</td>
</tr>
<tr>
<td>Developer / Impact Fee</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Easy</td>
<td>Low</td>
<td>Partly matches</td>
</tr>
<tr>
<td>Vehicle License Charges</td>
<td>Low</td>
<td>Moderate</td>
<td>Easy</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>VAT on vehicle insurance premiums</td>
<td>Low</td>
<td>Moderate</td>
<td>Easy</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>Property Taxes</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>Sale of Property Rights</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>Area Licensing / Permits / Concession Charges</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Partly matches</td>
</tr>
<tr>
<td>Advertising Fees</td>
<td>Low</td>
<td>High</td>
<td>Easy</td>
<td>Moderate</td>
<td>Does not match</td>
</tr>
<tr>
<td>Tax on Lottery winnings</td>
<td>Low</td>
<td>Moderate</td>
<td>Easy</td>
<td>Low</td>
<td>Does not match</td>
</tr>
</tbody>
</table>
Project Summary

Implementation Schedule
Implementation Plan
Key Activities

**Procuring Agency**

**Land Acquisition**

- **Substantial LA progress**
- **Ph I: notice of possession**

**Addressing Policy & Guideline Gaps**

**RFQ preparation & Release**

**RFQ Evaluation**

- **Release of RFP**

**Competitive Dialogue**

**RFQ**

- **Preparation & Release**

**Opportunity assessment**

- **Ph I: Project Approval**

**Initial Market Sounding**

**Private Sector/Developer**

**RFQ Submission**

**Consortium finalization**

**Bid Submission**

**Bid Evaluation**

- **Notice of Award**
- **Clearance facilitation**
- **IE Selection**

**Signing CA**

**SPV formation**

**Obtaining Clearances**

**Financial Closure**

**Notice: Indicative implementation plan subject to approvals, land acquisition and publication of RFQ/RFP etc**
## Implementation Plan

### Development schedule

<table>
<thead>
<tr>
<th>Sl.</th>
<th>Key Activity/milestone</th>
<th>Timeline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Approval of final feasibility report</td>
<td>Jul-16</td>
</tr>
<tr>
<td>2</td>
<td>Substantive progress on land acquisition</td>
<td>July - Nov 2016</td>
</tr>
<tr>
<td>3</td>
<td>Finalisation of transaction / prequalification documents</td>
<td>Oct-16</td>
</tr>
<tr>
<td>4</td>
<td>Invitation to pre-qualify</td>
<td>Dec-16</td>
</tr>
<tr>
<td>5</td>
<td>Preparation of Prequalification documents by prospective bidders</td>
<td>Jan-17</td>
</tr>
<tr>
<td>6</td>
<td>Submission of Qualification documents (45 days from invitation)</td>
<td>Jan-17</td>
</tr>
<tr>
<td>7</td>
<td>Prequalification evaluation</td>
<td>Feb-17</td>
</tr>
<tr>
<td>8</td>
<td>Issuance of request for bid proposal</td>
<td>Feb-17</td>
</tr>
<tr>
<td>9</td>
<td>Pre-bid conference</td>
<td>Apr-17</td>
</tr>
<tr>
<td>10</td>
<td>Competitive dialogue</td>
<td>May-17</td>
</tr>
<tr>
<td>11</td>
<td>Bid submission deadline (Contingent on status of Land acquisition)</td>
<td>Jul-17</td>
</tr>
<tr>
<td>12</td>
<td>Bid Evaluation</td>
<td>July - Oct 17</td>
</tr>
<tr>
<td>13</td>
<td>Notice of Award</td>
<td>Nov-17</td>
</tr>
<tr>
<td>14</td>
<td>Agreement signing</td>
<td>Nov-17</td>
</tr>
<tr>
<td>15</td>
<td>Financial Close</td>
<td>Mar-18</td>
</tr>
</tbody>
</table>

*Note: Indicative implementation plan subject to approvals, land acquisition and publication of RFQ/RFP etc*
We are pleased to enclose our presentation on the Project Location and Scope – Stakeholder presentation, in relation to the Provision of Transaction Advisory Services for the Development, Operation and Maintenance of the Second Nyali Bridge PPP project in accordance with our contract with the National Treasury of Kenya dated 25 November 2014.

This presentation contains a number of outstanding matters that require clarification or confirmation. We therefore reserve the right to add, delete and/or amend the presentation as appropriate. In preparing this Presentation, we have relied upon and assumed, without independent verification, the accuracy and completeness of information available from public sources, discussions with relevant authorities and other third party sources. No party is entitled to rely on the Presentation for any purpose whatsoever and we accept no responsibility or liability for its contents to any party.

For your convenience, this presentation may have been made available to you in electronic and hard copy format. Multiple copies and versions of this presentation may, therefore, exist in different media.

Deloitte and/or the Project Consortium do not take responsibility for delays caused by approvals, land acquisition, political, security, or any other factors which are not directly influenced by Deloitte and/or the Project Consortium.

You should not, without our prior written consent, refer to or use our name or the report for any other purpose, refer to them in any investment circular or other document, or make them available or communicate them to any other party (except for your affiliated organisations and your other professional advisors).

Deloitte and/or the Project Consortium accept no liability to any party in connection with this presentation.