GEOGRAPHICAL INFORMATION SYSTEM BASED VALUATION ROLL FOR OPTIMAL LAND TAXATION IN NAIROBI CITY COUNTY

Prepared by;

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INTRODUCTION

NCC is formerly Nairobi city Council (CCN) which became NCC upon the inauguration of the new constitution in the year 2012
Introduction cont…

• Nairobi is the capital and largest city in Kenya.
• Total area 700 Sq Kms, and  a population >3m people (Kenya Census, 2009).
• NCC is home to >100 major international bodies and companies viz the UNEP, World Bank, headquarters for the UN in Africa & Middle East.
• The first valuation roll in CCN was done in 1941.
• The latest dates to 1980.
• Consequently many properties have not been captured..

LAND TAXATION STATUS

• The land rate stood at 17% of the 1980 market values up to 2013.
• To mitigate for the disparity between current market values and values in the VR (1980) the rates were increased to 34% awaiting preparation of new Valuation Roll (Finance Act, 2013).
Using GIS in land valuation process

- Integrated County Information System (World Bank, 2013)

Functional qualities that affect value of properties
## Land Valuation Factors

1. **Location of the property**
   - Street frontage
   - Distance from nuisance/noise
   - Distance to city center
   - Dist. to educational services
2. **Highest and best user:**
   - Permitted No. of floors
   - Permitted construction area
   - Permitted user
3. **Nearby development and infrastructure**
   - Electricity
   - Water
   - Roads
   - Shopping center
   - Schools health centers
4. **Land character**
   - Size
   - Shape
   - Topography
   - Soil condition
5. **Social-Economic factors**
   - Inflation/federation
   - Micro and macro economic changes
   - Supply and demand
   - Political changes

- In mass valuation situation like VR, is practically impossible to inspect every plot physically
• Each land valuation factor does not have the same effect on the total value.
• Each of the ‘value factors’ that affects a given parcel needs to be assigned a “weight”. The weight so assigned must be derived from market survey.

\[ V = \text{AREA} \times \sum_{i=1}^{n} (P_i \times W_i) \]

Area: Land parcel size (or pixel size)
P: Factor value
W: Factor weight
n: Total number of factors

• Any ‘movement’ on any of the value factors means ‘movement’ of land value.

Land Rates Billing

• The current land rates billing system is manual.
• This process is slow, cumbersome, tedious, and resource-consumptive process, prone to mistakes and irregularities.
• GIS system allows for data exchanges between the land valuation system and the land rates calculations and billing system.
### Unrated properties identification

<table>
<thead>
<tr>
<th>Zone</th>
<th>No. of plots in VR</th>
<th>No. of plots in GIS database</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>9472</td>
<td>9622</td>
<td>150</td>
</tr>
<tr>
<td>T</td>
<td>7342</td>
<td>7458</td>
<td>116</td>
</tr>
<tr>
<td>U</td>
<td>1319</td>
<td>1547</td>
<td>228</td>
</tr>
<tr>
<td>TOTAL</td>
<td>18,133</td>
<td>18,627</td>
<td>494</td>
</tr>
</tbody>
</table>

The plots highlighted in red were not rated.
Details of the unrated properties

<table>
<thead>
<tr>
<th>LR Number</th>
<th>Serial Number</th>
<th>USV 1980</th>
<th>Plot Size (Ha)</th>
<th>Ownership details</th>
</tr>
</thead>
<tbody>
<tr>
<td>209/149990/12</td>
<td>G/1481/10</td>
<td>207,500</td>
<td>0.2757</td>
<td>x</td>
</tr>
<tr>
<td>2/709</td>
<td>G/4622</td>
<td>719,500</td>
<td>0.4455</td>
<td>x</td>
</tr>
<tr>
<td>7158/603</td>
<td>T/1031/1/1</td>
<td>258,000</td>
<td>0.495</td>
<td>x</td>
</tr>
<tr>
<td>7785/1381</td>
<td>T/1697/5/G/46</td>
<td>117,500</td>
<td>0.2182</td>
<td>x</td>
</tr>
<tr>
<td>12239/24</td>
<td>T/1697/5/G/47</td>
<td>117,500</td>
<td>0.2182</td>
<td>x</td>
</tr>
<tr>
<td>119/1354</td>
<td>U/8733</td>
<td>298,500</td>
<td>0.0308</td>
<td>x</td>
</tr>
<tr>
<td>74/402</td>
<td>U/783/7</td>
<td>296,500</td>
<td>0.0287</td>
<td>x</td>
</tr>
</tbody>
</table>

Parcel valuation data page (with search option)
Rates billing system

GIS based sales tracking map
Conclusion

• The traditional preparation of Valuation Roll and land rate billing does not capture all the eligible owners of ratable properties.

• GIS is able to aid in capturing up to date changes in land ownerships, new land registrations, amalgamations, subdivisions and any other changes relating to land that affect its value and rating status.

• In addition storage and retrieval of properties and ownership details is simplified hence a realized ease in payment.