Analysis of Early Childhood Development (ECD) Facilities within the City of Cape Town

GIS-Based Service Access Planning

Millicent Mokgalaka
CSIR: Built Environment
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Outline

- Introduction
- Contribution to service delivery
- Methodology
- Case study of accessibility analysis for ECD Facilities
Introduction – Service Access Planning

- **Who** has access to **what**, **where** and **how**?

- Geographical Information System (GIS) strategic level accessibility analysis.

- Service access planning tools and inputs:
  - facility provision norms.
  - customized GIS software -Flowmap- to spatially match supply (facilities) and demand (population).
Contribution to Service Delivery

• Develop well provisioned cities with well located services.

• Improve access to social facilities.

• Equity in social investment.

• Minimizing investment in ‘white elephants’.

• Evidence for investment decisions versus political choices.

• Education as a key service
  • Promote ECD facilities to improve school readiness.
Methodology

- Data layers used for accessibility analysis:
  - Road network
  - Facility locations with capacity
  - Population distribution

- All three layers interact based on standards to determine what population travel how far to a facility with capacity.

- Indicate potential catchments.

- Map well and poorly served areas.
Case Study: Accessibility analysis of ECD facilities

ECD facility: any centre providing a programme for the care of more than six young children (0-6 years), e.g. day-care centre, crèche, nursery school, play school, after care and Grade R class.
Aim and Objectives

• Aims
  • To identify areas where the supply and demand for ECD facilities is not balanced.

• Objectives
  • Audit the current situation of accessibility:
    • Travel distance
    • Sufficiency
  • Quantify backlog.
  • Model locations of new facilities to eradicate backlog which also supports future growth.
Provision norms for ECD centres

• Demographic profile

• Provincial policy
  • 40% under 5 years in care
  • 100% 5-6 in Grade R

Crèche — Small (Capacity 35 children younger than 5 years)

Population threshold - 1:1 000 people

Maximum access distance - 2 km

Grade R— Class of 20 children (5-6 years old)

Population threshold- 1:1 000

Maximum access distance- 2 km
Demand and supply of Grade Rs in Cape Town

- Demand: all children aged 5-6 years = 67,000.

- 423 schools offering Grade R classes to 30,600 learners (5-6 years).

- Average of 68 children per school.

- Thus, only meet 45% of the total demand required.
## Analysis performed for Grade Rs

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>All operational Grade Rs (totalling 423).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demand</strong></td>
<td>- 100% of city’s 2008 projected population figures - children aged 5 to 6 years old.</td>
</tr>
<tr>
<td><strong>Travel mode and access distance</strong></td>
<td>- Maximum 2 km walking distance on a road network.</td>
</tr>
</tbody>
</table>
| **Analyses undertaken** | - Unconstrained travel distance analysis to establish distance to their nearest Grade R.  
- Constrained catchment area analysis (limit facility size and maximum travel distance). |
Results:

Travel distance to closest Grade R

<table>
<thead>
<tr>
<th>Distance band</th>
<th>Population percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1 km</td>
<td>53.47</td>
</tr>
<tr>
<td>1 - 2 km</td>
<td>82.26</td>
</tr>
<tr>
<td>2 - 3 km</td>
<td>92.93</td>
</tr>
<tr>
<td>3 - 5 km</td>
<td>98.04</td>
</tr>
<tr>
<td>5+ km</td>
<td>100</td>
</tr>
</tbody>
</table>
Served and unserved areas

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population demand</td>
<td>66 570</td>
</tr>
<tr>
<td>Served population</td>
<td>28 372</td>
</tr>
<tr>
<td>Percentage of population served</td>
<td>42.62</td>
</tr>
</tbody>
</table>
Demand and supply of Crèches in Cape Town

• Demand: Total children under 5 years = 283 000.

• 1 414 crèches serving 73 838 children (0-4 years and 11 months).

• An average of 52 children per facility.

• Thus, only 26% capacity of the 100% demand, and

• If assuming 40% demand = 65%.
### Analysis performed for Crèches

<table>
<thead>
<tr>
<th>Facilities analysed</th>
<th>All operational crèches (totalling 1 432).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Demand</strong></td>
<td>Two Scenarios:</td>
</tr>
<tr>
<td></td>
<td>● 100% demand and</td>
</tr>
<tr>
<td></td>
<td>● <strong>40% demand for City’s 2008 children under 5 years.</strong></td>
</tr>
<tr>
<td><strong>Travel mode and access distance</strong></td>
<td>● 2 km maximum walking distance to the nearest crèche along existing road network/sidewalks.</td>
</tr>
<tr>
<td><strong>Analyses undertaken</strong></td>
<td>● Unconstrained travel distance analysis to establish distance to their nearest Grade R.</td>
</tr>
<tr>
<td></td>
<td>● Constrained catchment area analysis (limit facility size and maximum travel distance).</td>
</tr>
</tbody>
</table>
### Results: Travel distance to closest Crèche

<table>
<thead>
<tr>
<th>Distance Band</th>
<th>Population percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 1 km</td>
<td>68.77</td>
</tr>
<tr>
<td>1 - 2 km</td>
<td>84.50</td>
</tr>
<tr>
<td>2 - 3 km</td>
<td>90.86</td>
</tr>
<tr>
<td>3 - 5 km</td>
<td>97.65</td>
</tr>
<tr>
<td>5+ km</td>
<td>100</td>
</tr>
</tbody>
</table>
Served and unserved areas - 40\% scenario

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total population demand</td>
<td>113 169</td>
</tr>
<tr>
<td>Served population</td>
<td>62 021</td>
</tr>
<tr>
<td>Percentage of population served</td>
<td>54.80</td>
</tr>
</tbody>
</table>
ECD Centre of Excellence: *a mega early childhood development facility that provides outreach services, resources and support to small crèches within the surrounding areas.*

**Proposed provision norm**

- **Population threshold** - 1: 20 000 people.
- **Capacity** A centre of 400 children with resource centre
- **Access distance**: 5 km

In addition to a Centre of Excellence, 6 – 8 smaller crèches are required to optimally provide for 20 000 residents (approx 5000 households) at 40% demand.
Areas not meeting access standards for Créches (40%)

Optimal areas for investment in ECD Centres of Excellence
• Investment in ECD Centres of Excellence at optimal locations to serve worst off areas.
• Prioritize location based on access to other education facilities to ensure follow through.
• Support registration of, or promote licensing of facilities in poorly served areas.
• Support/negotiate with Dept. of Education to expand Grade R facilities in identified areas.
Thank You

Planning Support Systems
Built Environment, CSIR

Supervisors

Cheri Green
Gerbrand Mans