CHALLENGES AND PROPOSED SOLUTIONS FOR DEVELOPING AN EFFICIENT AND SUSTAINABLE ROAD NETWORK
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INTRODUCTION

- Local governments in developing countries face myriad of competing demands with limited resources
- Maintenance of existing infrastructure is neglected
- Focus is on new infrastructure
- Urban sprawl exerting pressure on already overloaded infrastructure
- Decisions based on political objectives and not engineering logic
- Priorities including housing, water, sanitation, energy and roads last on the list
- Approach to deteriorating infrastructure reactive

THIS IS A RECIPE FOR DISASTER
Johannesburg Roads Agency (JRA) is owned by City of Johannesburg (CoJ) and established in January 2001.

Its mandate is to plan, design, construct and maintain road infrastructure on behalf of the CoJ.

Currently employs over 1600 staff with Managing Director as Accounting Officer and has Board of Directors representing the shareholder (CoJ).

CoJ population is over 5 million (at growth rate of approximately 1 million per annum).

Total road network is approximately 15 000km (13 400km tar and 1 500km gravel roads) and over 800 bridge structures.
• Growth in both formal and informal accommodation – cluster homes, townships, informal settlements

• Growth in vehicle quantities – skew balance of 50:50 public and private car usage

• Stubborn apartheid urban typology – poor in marginal areas, high transport cost

• Approximately 5 year lapse in road preservation – sharp deterioration of road quality between 2008 and 2013, slump in funding levels

• Dip in performance of Road Agency for considerable period – efficiency levels, delivery performance, loss of skills

• Road industry that has not used resources to achieve wide and lasting socio-economic transformation
• Social roads focus at the expense of economic and public transport roads

• In the meantime, user based pricing for freeway usage introduced – implications to municipal roads to be considered

• Rapid rail for Joburg-Tshwane-ORT Airport triangle – feeder systems, appetite, future outlook (expansions, modal shifts) implications

• Bus Rapid Transport (BRT) System introduction – not delivered by Road Agency, different designs and maintenance standards

• Revival of commuter rail system – long long term (horizon promise), modal shift
• Different approach by new administration with effect from 3 August 2016 - focus on basics and prioritizing roads, traffic lights, safety and cleanliness

NB! JRA CONTINUED BEING INUNDATED WITH SERVICE REQUESTS AND PUBLIC OUTCRY OVER CONDITIONS OF ROADS: potholes, non-functioning traffic signals, flooding, sinkholes, upgrading of gravel roads to tar, lack of stormwater drainage systems, etc.
• Development of 5-year strategy aligned to CoJ Growth and Development Strategy as well as Integrated Development Plan

• Six strategic interventions identified:
  o **Strategic Assets** - adequately resourced and functioning assets (asphalt plant, soils and materials laboratory, road resurfacing depot, fleet & plant, motorways depot)
  o **Road Network Development** - rollout major capital investment programme, improve CoJ roads’ visual condition index, development of 10yr roads development plan
  o **Traffic Regulation** - functional traffic signals, efficient traffic signal maintenance regime
  o **Stormwater Management** – floodline data and masterplans for decision support
  o **Partnerships** - improved collaboration with public, private, NGOs and community in achievement of CoJ objectives
Six strategic interventions identified:

- **Alternative Funding Options** – secure adequate funding levels for JRA, achieve savings from internal efficiencies (doing more with less) and improved productivity

- Service Delivery Improvement Plan (operations focused)

- Supply Chain Management Strategy developed (infrastructure development focused)
• Significant increase in capex budget for JRA:

<table>
<thead>
<tr>
<th>Financial Year</th>
<th>Total Budget</th>
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<tbody>
<tr>
<td>2012/13</td>
<td>R290m</td>
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<tr>
<td>2013/14</td>
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<tr>
<td>2014/15</td>
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<td>2015/16</td>
<td>R1.340bn</td>
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<td>2016/17</td>
<td>R1.439bn</td>
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</table>

• Launched:
  o Road resurfacing programme in 2014
  o Road rehabilitation and reconstruction programme in 2015
  o Bridge rehabilitation programme in 2015
2016/17 CAPITAL BUDGET BREAK-DOWN

Capital Budget: R1,43 billion

- Resurfacing Programme; R164m
- Bridges; R122.5m
- Stormwater; R54m
- Operational Capex; R102m
- Traffic Signals & Mobility; R167m
- Road Rehabilitation & Reconstruction; R98m
- Conversion of Open Drains; R32m
- Gravel Roads Upgrading; R325m
- Planning Future Schemes; R10m
BENEFITS/ OUTCOME

• Improvement of road conditions evident – less potholes reported
• Improved road user experience – reduced complaints
• Extended lifespan of road infrastructure
• Reduced maintenance costs
• Increased coverage of road infrastructure network
• Balancing between economic, public transport and social infrastructure
• Improved road safety and vehicle maintenance costs
• Focus on preservation of existing road infrastructure

• High impact road infrastructure development now possible – finalizing freeway capacity improvement in partnership with SANRAL likely to result in multi-billion rand programme

• Intense implementation of 10 yr Roads Development Plan

• Venture into innovative and world class infrastructure development – e.g. Advanced Traffic Management Systems

• Capacity development to build and maintain road infrastructure in CoJ based on sustainable funding
FUTURE OUTLOOK (2)
Operations management improvement programme

• Focus on improving productivity and quality of work of internal road maintenance work teams

• Draw on industrial operations management practices such as Total Quality Management, Business Process Reengineering, Continuous Improvement, and Lean Manufacturing, which are currently largely absent in the JRA

• JRA operations management improvement programme is partnership with the Government Technical Advisory Service (GTAC) in National Treasury and the Municipal Infrastructure Support Agency (MISA)

• Diagnosis and planning phase completed, currently entering three year implementation phase
FUTURE OUTLOOK (3)

Improving maintenance planning

- Differentiate between planned and reactive maintenance
- Introduce annual maintenance plans per depot, coordinated at City level – to make maintenance more thorough and systematic, and therefore more efficient and effective
- Avoid unintended consequences of customer charter targets (reactive maintenance disrupting planned maintenance)
- Better prioritization of roads for resurfacing based on road condition index assessments
FUTURE OUTLOOK (4)
Improving productivity

- Focus on all the standard repetitive minor maintenance activities
- Introduce more efficient standardized work operating procedures (SOPs)
- On-the-job training of managers and foremen on new SOPs
- Set reasonable production targets based on work studies
- Record and monitor actual production against targets
- On the job training of managers on how to analyse reasons for not meeting production targets, leading to continuous improvement
FUTURE OUTLOOK (5)
Improving efficiency and quality

- Ensure sufficient resources allocated to work teams
  - Increase personnel budget or provide budget for contractors to supplement internal teams
  - Provide sufficient resources for equipment and materials
  - Measure and improve plant utilization rate

- SCM and logistics improvement plan – ensure that stores never run out of supplies required for maintenance due to logistics weaknesses

- Review and update technical standards and guides

- On-the-job training of foremen on technical standards
### PLANNED FREEWAY CAPACITY IMPROVEMENT PROGRAMME

- Large scale freeway improvement programme will require national funding. CoJ will not be able to fund alone

<table>
<thead>
<tr>
<th>Freeway</th>
<th>Rehabilitation Only</th>
<th>Intermediate Solution</th>
<th>Ultimate Solution</th>
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<tbody>
<tr>
<td>M2 Freeway</td>
<td>0,750 billion</td>
<td>1,67 billion</td>
<td>9,4 billion</td>
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<td>M1 Freeway</td>
<td>1,6 billion</td>
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<td>M70 Freeway</td>
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<tr>
<td><strong>Approx. total cost</strong></td>
<td></td>
<td></td>
<td><strong>17 billion</strong></td>
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CONCLUSIONS

• With comprehensive road development plan public funding is available

• Funding requests must be for sustainable solutions

• Thorough engineering assessment to inform decision making

• Internal and external capacity critical in rolling out programmes

• Impact of interventions on all stakeholders important to secure future funding

• The plan must show implications of no action – e.g. that much of the road infrastructure is ageing and becoming inadequate, that the backlogs are growing, and that there are severe safety and economic risks of not addressing this

• Present prioritised plan as required budgets are often much higher than the available budgets
• Current local government funding in SA is under pressure nationally and requires review. It is becoming increasingly difficult for municipality to be partially funded from surplus of water and electricity sales. Impact of water restrictions and use of alternative energy reduced municipal profit while cost of infrastructure maintenance remained the same or increased with aging infrastructure.
THANK YOU

DISCUSSIONS / QUESTIONS