INTRODUCTION

1. Councillor Dr. Rabelani Dagada, PhD (elected public representative)
   Member of the Mayoral Committee for Finance & Leader of Executive Business,
   City of Johannesburg Metropolitan Council

2. Mr. Lawrence Boya, Director: Smart City Programmes
   City of Johannesburg Metropolitan Council

3. Mr. Aubrey Mochela; General Manager for ICT (City Power Municipal Entity)
   City of Johannesburg Metropolitan Council
## SMART CITY IMPLEMENTATION PROGRAMMES

<table>
<thead>
<tr>
<th>Programmes</th>
<th>Catalytic projects</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Universal Access Programme</strong></td>
<td>• Connectivity and e-learning through the City’s broadband infrastructure programme</td>
</tr>
<tr>
<td><strong>Smart Institution Programme</strong></td>
<td>• Business Process Re-engineering, City’s ICT wide enablement</td>
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<tr>
<td></td>
<td>• Electronic Health Record System (additional project started in 2015)</td>
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<tr>
<td><strong>I²OC</strong></td>
<td>• Intelligent Integrated Operations Centre</td>
</tr>
<tr>
<td><strong>Smart Technology Programme</strong></td>
<td>• Delivery of smart meters (electricity, water)</td>
</tr>
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<td></td>
<td>• Smart Transport</td>
</tr>
<tr>
<td><strong>Smart Citizen Programme</strong></td>
<td>• ICT literacy, e-learning</td>
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<td></td>
<td>• Citizen engagement platforms</td>
</tr>
<tr>
<td></td>
<td>• Smart Parks (additional project started in 2016)</td>
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</tbody>
</table>
The approved Smart City Strategy defined the following broad outcomes to be realised by 2021:

- **Improved social development** (e.g. through the provision of internet access in places of learning);

- **Service delivery efficiency** (e.g. via smart-metering for water and electricity services, e-services, and widespread access to broadband);

- **Better decision-making** (e.g. through the integration of city-wide data into a single view – allowing for holistic planning, preventative actions and improved responses in the context of areas such as safety and mobility);

- **An increase in economic activity** (e.g. through providing the necessary technology and connectivity for businesses and entrepreneurs to thrive);

- **Active citizen participation and engagement** (e.g. through a ‘single city wide’ user-friendly Joburg mobile as well as web application) and

- **The creation of a sustainable and liveable environment** (e.g. via technological options that improve resource use, and that allow for planning aligned to urban trends and pressures).
MANDATE
Eradicate poverty
Building and growing an inclusive economy
Social inclusion through support and enablement
Building Sustainable human settlements
Ensuring resource security and environmental sustainability
Good Governance

GDS 2040

City of Johannesburg Policy Drivers
NEW STRATEGIC AGENDA 2016-2021

ELECTORAL MANDATE
- Creating more opportunities and jobs
- Making local government responsive
- Providing better service delivery
- Stopping corruption
- Providing meaningful redress
- Making communities safer

TEN POINT PLAN
1. Recognition by the administrative leadership of the coalition government
2. Responsive and pro-poor government
3. Alignment of plans to achieve the 5% economic growth subsequently reducing unemployment
4. Create a professional public service
5. Corruption declared as public enemy number one
6. Revive the inner city
7. In 60 days produce a report on built houses
8. Fast track the hand over of title deeds
9. Pilot 24hr clinic
10. Business friendly city which attracts investors and entrepreneurs

STRATEGIC FRAMEWORK
- Promote economic development and investment activity
- Re-absorb the Municipal Entities to improve service delivery and responsiveness
- Encourage urban regeneration in key urban nodes
- Resolve billing system problems
- Upgrade informal settlements
- Improve service delivery performance and service delivery culture
- Improve residents safety by improving safety officer numbers to required standard
- Reform public transportation model
NEW STRATEGIC AGENDA 2016-2021

- Translating the New Strategic Agenda into implementation plans the following Priorities have been “Agreed upon”

Promote Economic Development and Investment – GVA 5% BY 2021

- Increase Infrastructure development to 20% of Budget
- Urban Regeneration of Key Nodes in particular the Inner City, Randburg, etc
- Small and medium business growth
- Promote informal sector growth as a path to small business
- Promote Broadband and free wifi access
- Reduce unemployment to 20% from 39%
- Skills development

Improve service delivery ---> Performance and culture

- Improve services to business and residents
  - Water, electricity cost and reliability
  - Planning, zoning and building plans
- Waste collection
- Enhance adherence to set standards
- Improve by law enforcement

Improve Public safety

- Expand use of modern Technology --> IIOC
- Reduce Crime with a focus on Key nodes (Inner City) and House burglary, petty crimes
- Improve visible policing - Ward based approach
NEW STRATEGIC AGENDA 2016-2021

• Community based planning and execution (health, JMPD, infrastructure and services)
• Customer and citizen centric care
• Expanded social cohesion programme (migrant desk, civic training)
• Development of Urban Culture (Public Space, Use awareness, etc)
• Increased densities, increase access to food, reduced spending on travel resulting in more disposable income
• Reduced cost/capita of infrastructure

Responsive government
(Citizen, customer, business friendly)

• Formalise informal settlements
• Electrify informal settlements
• Inner city and other key nodes
• Corridor Development and social housing
• Corridor development underpinned by good public transport backbone for mixed use, mixed income development
• Increased densities, increase access to food, reduced spending on travel resulting in more disposable income
• Reduced cost/capita of infrastructure

Pro-poor Development and Meaningful Redress including income and spatial income inequality and efficient and effective transport (Public and Freight)

• Anti Corruption Programme
• Review, consider and absorb Municipal Entities
• Professional Public Service Programme
• Customer Service - Centric culture development

Good Clean Governance with focus on eliminating corruption
NEW STRATEGIC AGENDA 2016-2021

Preserving our resources for Future generations

- Water conservation and enhanced water collection and utilization for economic and consumption
- Use of alternate forms of green energy - gas and renewable
- Elimination of water and air pollution such that water ways available for recreation and air free of particulates and bad gasses.
- Address electricity shortages

Enhancing Financial Sustainability

- Financial prudence
- Implementation of the Financial Development Plan
- Attainment of a Clean Audit
- Improve billing inefficiencies
- Retain investor confidence

Smart City and Innovation

- Address digital divide --> access and capability
- E- services
- Improved capability for communication and engagement
- Enhanced social media and inter-active communication with enhanced support systems
# SMART CITY PLANNED OUTCOME

<table>
<thead>
<tr>
<th>Planned outcomes</th>
<th>Ambitions 2021</th>
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<tbody>
<tr>
<td>Development of smart infrastructure</td>
<td>Interoperable ICT architecture &amp; platform adopted across the city</td>
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<tr>
<td></td>
<td>Common data governance implemented: overview of available data; data access; data sharing &amp; re-use; data interoperability</td>
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<td></td>
<td>Citywide ICT enablement of interoperable infrastructure</td>
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<td></td>
<td>On-boarding &amp; integration of multiple domains &amp; entities into the IOC.</td>
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<tr>
<td>Enhanced institutionalized</td>
<td>Smart Institution implemented</td>
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<tr>
<td>technological competency</td>
<td>Establishment of good processes and practices</td>
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<tr>
<td></td>
<td>Better decision-making (e.g. through the integration of city-wide data into a single view – allowing for holistic planning, preventative actions and improved responses in the context of areas such as safety and mobility).</td>
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<tr>
<td></td>
<td>In house Data Analytics, Monitoring &amp; Evaluation</td>
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<td>Asset management &amp; e-maintenance</td>
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<tr>
<td>Smart service delivery efficiency</td>
<td>Citizen engagement driven innovation (living lab)</td>
</tr>
<tr>
<td>and productivity</td>
<td>Smart Delivery and management of Electricity, Water, Billing &amp; Payment, Digital Policing, Social Benefits, Waste Public Safety incl. preventive</td>
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<tr>
<td>Citizen services</td>
<td>City wide e-health patient records interoperable with national MoH</td>
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<tr>
<td></td>
<td>Integration and centralisation of Public Safety information at the IOC leading to enhanced crime prevention.</td>
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<tr>
<td>Enhance citizens’ active involvement</td>
<td>Universal access in the entire city of Johannesburg</td>
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<tr>
<td>and engagement.</td>
<td>Integrated bi-directional citizen engagement (one stop shop) allow seamless online interaction via e-services, with enhanced feedback.</td>
</tr>
<tr>
<td>Improved social development</td>
<td>Providing Digital Advantage to the Citizens.</td>
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<tr>
<td></td>
<td>Provision of internet access in places of learning</td>
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<td></td>
<td>Online access to education enhances changes for (self) learning and employability for the youth.</td>
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</table>
TECHNICAL
"Johannesburg is a world class city that makes decisions and governs through technologically enhanced engagement with its citizens who have universal access to services and information where socio economic development and efficient service delivery is at its core."
Smart City Case Study Relevant for CoJ

The consolidation of the City Entities can fast track the implementation of a solid and robust Integrated Operations Centre powered by strong Analytics Platform enabling a Digital Smart City.
Smart City Thinking
Know what problem to solve
Smart Approach
To solving the known problem
CoJ Smart City
Enterprise Architecture Approach

Customer and Stakeholder View of the CoJ Smart City

1. Business
2. Data
3. Systems
4. Infrastructure

Smart City Architecture Domains
CoJ Smart City
Enterprise Architecture
### Smart City Case Study

<table>
<thead>
<tr>
<th></th>
<th>Innovation City</th>
<th>Quality of Life</th>
<th>Social and Environmental sustainability</th>
<th>Digital Governance</th>
<th>Key Initiatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vienna</td>
<td>3</td>
<td>4</td>
<td>12</td>
<td>Energy Vision 2050; Roadmap 2020 and Action Plan 2012-2015</td>
</tr>
<tr>
<td>2</td>
<td>Toronto</td>
<td>11</td>
<td>9</td>
<td>2</td>
<td>Smart Commute And Business Analytics Centre</td>
</tr>
<tr>
<td>3</td>
<td>Paris</td>
<td>5</td>
<td>10</td>
<td>20</td>
<td>Transport: Velib and AutoLib</td>
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<tr>
<td>4</td>
<td>New York</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>Smarter Neighbourhoods</td>
</tr>
<tr>
<td>5</td>
<td>London</td>
<td>7</td>
<td>11</td>
<td>9</td>
<td>Smart City Research Centre</td>
</tr>
<tr>
<td>6</td>
<td>Tokyo</td>
<td>25</td>
<td>Above Average</td>
<td>23</td>
<td>Smart town Suburb Pilot; Smart Mobility</td>
</tr>
<tr>
<td>7</td>
<td>Berlin</td>
<td>13</td>
<td>8</td>
<td>21</td>
<td>Vehicle-to-grid</td>
</tr>
<tr>
<td>8</td>
<td>Copenhagen</td>
<td>8</td>
<td>1</td>
<td>18</td>
<td>Energy: Cleantech Innovation</td>
</tr>
<tr>
<td>9</td>
<td>Hong Kong</td>
<td>14</td>
<td>Above Average</td>
<td>5</td>
<td>Smart Card Technologies</td>
</tr>
<tr>
<td>10</td>
<td>Barcelona</td>
<td>56</td>
<td>Above Average</td>
<td>45</td>
<td>Living Lab for Smart City Innovation</td>
</tr>
</tbody>
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## CoJ Smart City Projects

<table>
<thead>
<tr>
<th>CoJ Entity</th>
<th>Project</th>
<th>Smart City Value Proposition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CoJ Core (GCSS)</td>
<td>Unified Comms</td>
<td>Connectivity - Innovation City</td>
</tr>
<tr>
<td></td>
<td>WiFi</td>
<td>Connectivity - Digital Governance</td>
</tr>
<tr>
<td></td>
<td>Maru a Jozi</td>
<td>Mobility – Digital Governance</td>
</tr>
<tr>
<td>2. Dept of Health</td>
<td>eHealth Record</td>
<td>Digital Governance</td>
</tr>
<tr>
<td>3. Dept of Comm Dev</td>
<td>eLearning</td>
<td>Social Sustainability</td>
</tr>
<tr>
<td></td>
<td>Open Varsity</td>
<td>Social Sustainability</td>
</tr>
<tr>
<td>4. JRA</td>
<td>Traffic Management</td>
<td>Quality of Life</td>
</tr>
<tr>
<td></td>
<td>Find and Fix</td>
<td>Digital Governance</td>
</tr>
<tr>
<td>5. City Parks / Zoo</td>
<td>Digital Parks</td>
<td>Quality of Life</td>
</tr>
<tr>
<td>6. City Power</td>
<td>Smart Meters</td>
<td>Digital Governance</td>
</tr>
<tr>
<td>7. Dept of Safety</td>
<td>I²OC</td>
<td>Digital Governance</td>
</tr>
</tbody>
</table>
Johannesburg Broadband Network

Economic Impact

- 2500 Jobs created
- 112M economic injection from jobs
- 195M spend on SMME’s
- R2B economic injection from SMME spend
- 600M direct CoJ saving over project period
- 3%GVA increase over medium term
- Projection: R5.7B GVA increase over medium term
Smart City Connectivity Services

<table>
<thead>
<tr>
<th>Line of Business</th>
<th>Portfolio</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socio Economic Development</td>
<td>Citizen/Public Access</td>
<td>Public WIFI, Fibre Backhaul</td>
</tr>
<tr>
<td></td>
<td>Partnership Portfolio</td>
<td>Fibre Access, Dark Fibre, Lit Fibre, Managed Ethernet</td>
</tr>
<tr>
<td></td>
<td>SMME Portfolio</td>
<td>Fibre Access, Lit Fibre, Managed Ethernet, Hosted “Management” Platform</td>
</tr>
<tr>
<td>MTC Lines of Business</td>
<td>Network Services</td>
<td>Fibre Access, Dark Fibre, Lit Fibre, Managed Ethernet</td>
</tr>
<tr>
<td></td>
<td>ICT Services</td>
<td>VoIP, Internet Access, Email, Mobility &amp; Data, LAN/WAN, Server &amp; Web Hosting</td>
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<tr>
<td></td>
<td>“Advisory” Services</td>
<td>Architecture Consulting, Security Advisory</td>
</tr>
<tr>
<td></td>
<td>Wholesale Network Services</td>
<td>Fibre Access, Dark Fibre, Lit Fibre, Managed Ethernet</td>
</tr>
</tbody>
</table>
Connected City Strategic Alignment

**Line of Business**
- Social Economic Development

**Programmes**
- WIFI Programmes
- Incubator/Partnership Programmes
- SME Development Programmes
- Connectivity
- ICT Services
- Smart City Support
- Private Sector
- Public Sector Partnerships

**Strategic Alignment**

1. **Improve Service Delivery**
   - Improved (100MB & 1GB) connectivity between city buildings
   - Self-provisioning & management of network services

2. **Reduce Costs for the City**
   - Market disruption
   - Cost reduction
   - Increase speed

3. **Increase Competition and Entrepreneurship in the Technology Sector**
   - Align to support Smart City Programmes *

4. **Bridge the Digital Divide**
   - Improve access and speed
   - Disrupt the current market
   - Stimulate economic development

**KPI’s**
- Align to NDP & SA Connect KPI’s
- Individual programme KPI’s **
- Align to CoJ’s IDP *

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* KPI’s to be developed with aligned to each programme.
** Individual business cases and KPI’s to be developed as part of a feasibility assessment for each programme.
Smart City Integrated Operations
Reporting & Analysis Workflow

City Manager, Mayor
- City Executives oversee all activities

- Permit Decision Committee
  - Permit Managers make quick and correct decisions about permit applications

- Infrastructure Planners
  - Infrastructure Planners efficiently create accurate infrastructure plans

- Investigators

- Analysts
  - Fraud analysts and investigators collaborate to find and remediate unlicensed businesses

- City Data Repository

- City Data, Infrastructure Data, Permits
Smart City Operations Services
Economic Impact

- More than 800 Jobs created
- More than 100 SMMEs participate in the economic injection
- More than 500M spend on SMME’s
- 170 000 Smart Meter Rollout
- Non-technical loss reduction from 32% to 22% within 3 years
- Investor confidence increased by ability to monitor bill
- Economic Growth expanded by ability to do Demand Side Management
- Smart Home Automation enabled
Smart Grid – Smart Metering

1. Automated Billing
   - 100000 Smart Meters Rolled Out to date
   - Protective Structures

2. Time of Use (ToU)
   - Customer Cost Saving Benefit
   - Peak Load Reduction

3. Load Limiting & ARAC
   - Enforce Domestic Load Reduction
   - Reduce Load Shedding
   - Works with ToU

4. Web Portal
   - Customer Billing Analysis
   - Trending of usage
   - Works with ToU
CoJ Sample Smart City
Successful Projects

- Smart Meter Solution for Smart Grid Networks
  - Automated Meter Data Reading
  - Load Limiting with Smart Home Automation
  - Basic Free Electricity Programming
  - Time of Use
  - Realtime Energy Usage Web Portal

- Integrated Intelligent Operations Center (I^2OC)

- 170,000 Smart Meter Rollout
- Non-technical loss reduction from 26% to 22% within a year
- Employ more than
CoJ, World Bank and FMDV Engagement - CoJ Pipeline Smart City Projects

- Project 1 - Creation of a fully functional integrated Intelligent Operations Centre (I²OC) for well-coordinated, integrated and responsive service delivery; Coordination of CRM and Back Office

The vision is to create a ‘state-of-the-art’ data analytical center to help the City’s management with better decision-making and to provide a 360° view on strategic and operational issues through effective information-gathering, processing, and efficient dissemination of intelligent information.

The plan is to expand the I²OC offerings to include City Wide Integrated Services Operations Centre for the additional domains as the developed blueprints;

- City planning & operations
- Energy
- Water
- Transportation

On-boarding the Public Safety department offerings where we integrated new and existing CCTV cameras as part of crime prevention and enhancing the Johannesburg Metropolitan Police Department’s incident management operations and included enhancements to the video analytics and event reporting capabilities, as well as high availability of Intelligent Law Enforcement (ILE) and Intelligent Video Analytics (IVA), backup of ILE and IVA data, server monitoring and alerts, additional training of JMPD staff working at the (I²OC).
CoJ, World Bank and FMDV
Engagement - CoJ Pipeline Smart City Projects

Project 2 – Development of an integrated City wide unified communications platform that enables digital city

The vision is to create a ‘state-of-the-art’ IoT infrastructure that will deliver a Digital City

The plan is to consolidate the different communications networks and platforms of the City using a Telco Grade infrastructure that will service the City offices, Utility infrastructure, Business Community and the Citizens / Residents of Johannesburg. The solution will be primarily used to service

- Energy
- Water
- Transportation
- Security
- Health
City of Johannesburg believe that smart technologies can contribute to improve our municipal management

The main accomplishments/services of City of Johannesburg regarding the use of SMART technologies in municipal management is in communications and energy management

One specific project that has brought interesting results (goals of the projects, achievements, difficulties) is Waste to Energy

The advice to other cities around the world that wish to implement SMART initiatives regarding: the main challenges we have encountered and the key elements that ensured the success of SMART initiatives are multidimensional

The introduction of IoT and associated instrumentation, supported by powerful analytics platform, deliver Smart City

The City has managed to breach the digital divide in areas that were historically disadvantaged, providing them access to business opportunities and job employment

The City was able to created high number of job opportunities and additional revenue stream while dealing with cleanliness.

The funding should be PPP based for large scale projects that are community facing. Rollout should be agile and phased. Involvement of communities from concept inception is critical
THANK YOU