

# **Transforming Urban Resilience:**

**The Role of Business Continuity  
Management in Thriving Cities**

**Dr CS Ferguson**

**Academy of Resilience and Continuity**



# Webinar Agenda

Urban Resilience and Business Continuity

Mangaung Metro: A Case Study for BCM

Mangaung Facts

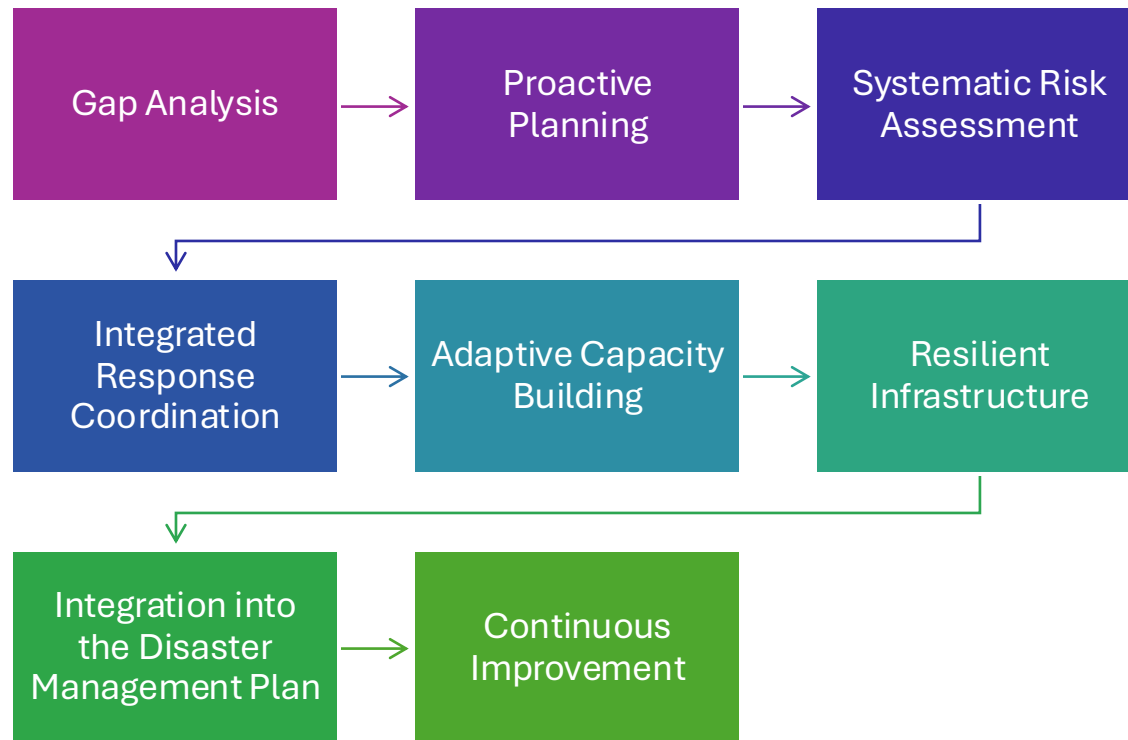
Urban Development and BCM

Technological Innovations in BCM

Application in Urban Resilience

Interactive Q&A Session

# Urban Resilience and Business Continuity





# A BCM Case Study

## Overview of Mangaung Metropolitan Municipality

Mangaung Metropolitan Municipality employs approximately 6,712 staff members.

### FUNCTIONAL OPERATING MODEL – METRO (CATEGORY A) MUNICIPALITY

Municipal Leadership					
Strategy & Performance			Legal, Risk & Compliance		
Strategy & Planning		Monitoring & Evaluation	Legal	Compliance & Risk Management	Internal Audit & Forensics
Municipal Planning	Technical Services	Community Services	Public Safety	Finance	Corporate Services
Spatial Planning & Land Use Management	Energy Management	Customer Services	Disaster Management Centre	Budgeting & Treasury	Stakeholder Management & Marketing
Infrastructure & Capital Project Planning	Water & Sanitation Management	Public Transport Services	Fire Services	Revenue Management	Human Resources
Economic Development	Technical Consumption Management	Childcare Facilities Control	Metro Police & Law Enforcement	Expenditure Management	Information Technology
Environment & Sustainability	Road Infrastructure Management	Recreation & Parks	Municipal Courts	Municipal Accounting & Reporting	Property, Fleet & Records Management
	Capital Projects	Waste Management		Procurement & Supply Chain Management	Executive & Council Support
				Property Valuations	

# Mangaung Fact Sheet

Population approximately 817,885 (2021 Census)

Mangaung's transport and logistics sector is vital due to its central location, facilitating trade across the country.

It is the judicial capital, housing the Supreme Court of Appeal, which is the highest court of appeal in non-constitutional matters in the country.

The city's educational institutions, includes the University of the Free State, contributing to research and human capital development.

5,500 kilometres roads, The water is primarily sourced from the Modder River, Caledon River, and local dams

Average of 3.4 persons per household

79% of households live in formal dwellings, 13.5% of households reside in informal settlements, primarily in Botshabelo and Thaba Nchu

91.4% of households are connected to the Eskom electricity grid.

95.6% of households have access to piped water, either inside their dwellings or within 200 meters.

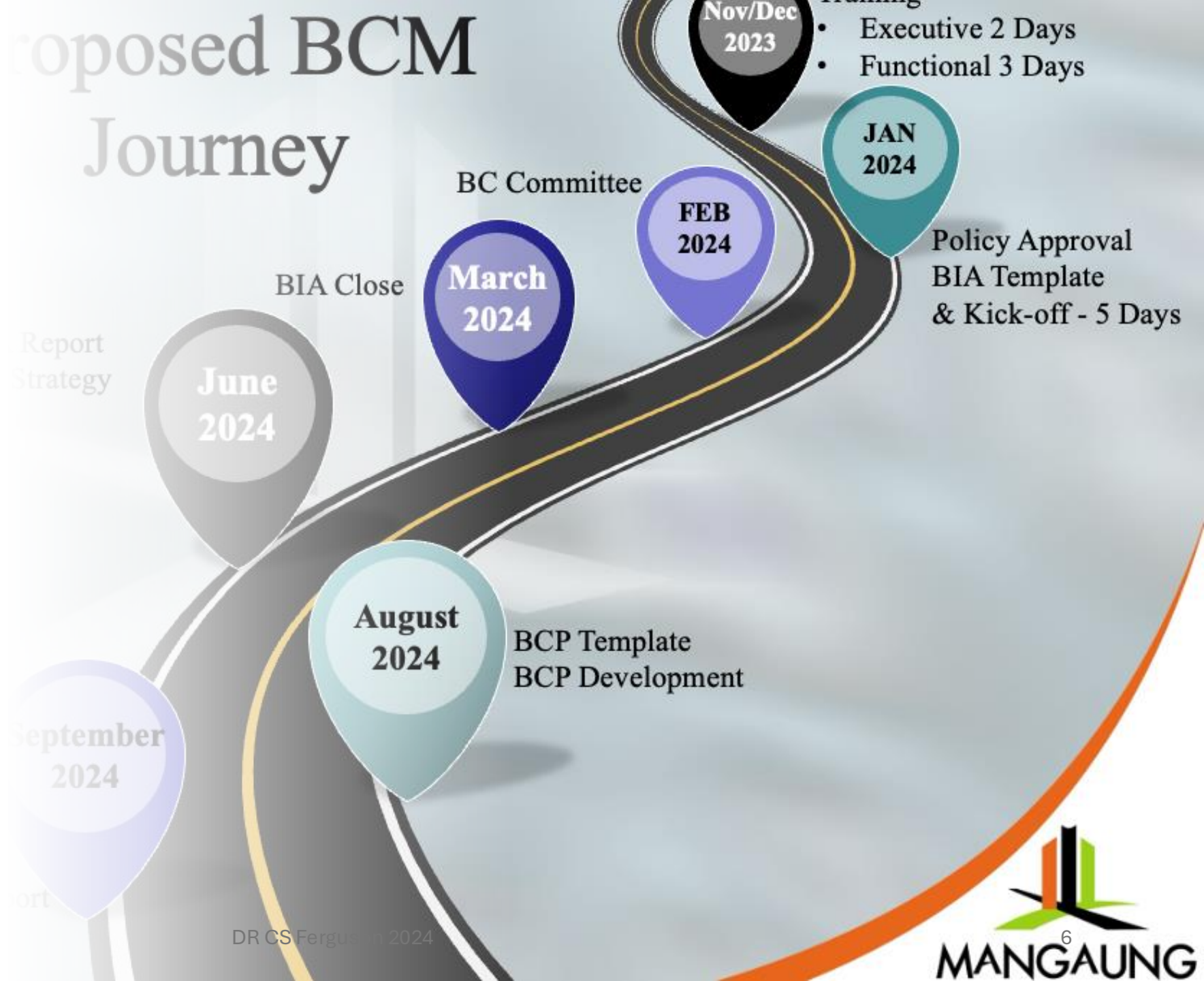
70% roads tarred, especially in informal areas, require maintenance.

Mangaung consumes approximately 76,000 megalitres of water annually.

Government 30% of Mangaung's GDP. Approximately 6.1% to the Free State province's Gross Domestic Product (GDP), equating to about 0.8% of the National GDP

# Proposed BCM Journey

- BCM Induction Meeting
- City Manager
- Executive Committee



A nighttime photograph of a dense urban area, likely Mangaug Metro, showing numerous high-rise apartment buildings with many windows illuminated, creating a bokeh effect of lights in the foreground.

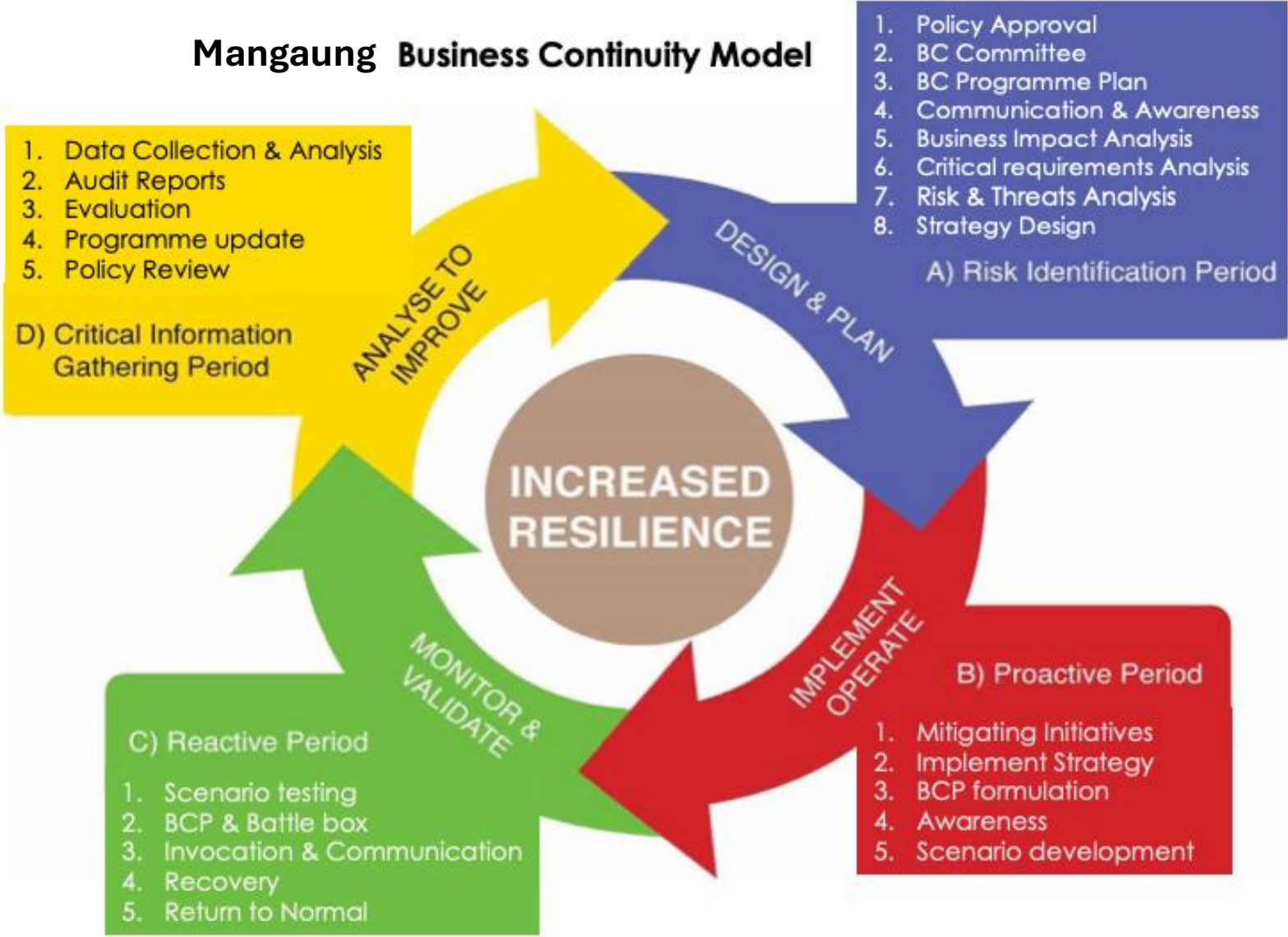
# BCM in Action

## BCM implemented in the Mangaug Metro

- Chief Risk Officer
- City Manager owned
- Adopting the ISO 22301 BCM Standard
- Executive Training
- Policy Formulation
- Instituting a BC Committee
- Sector Training

## BCM safeguarding Mangaug's urban infrastructure

# Mangaung Business Continuity Model





# Executive Training Agenda

ISO 22301 - The  
Business  
Continuity  
Standard

Introduction to  
the BC  
Practitioner's  
Handbook

BCM Terms and  
Abbreviations

Resilience and  
Continuity

Executive  
Responsibility

Business  
Continuity  
Committee and  
Subcommittees

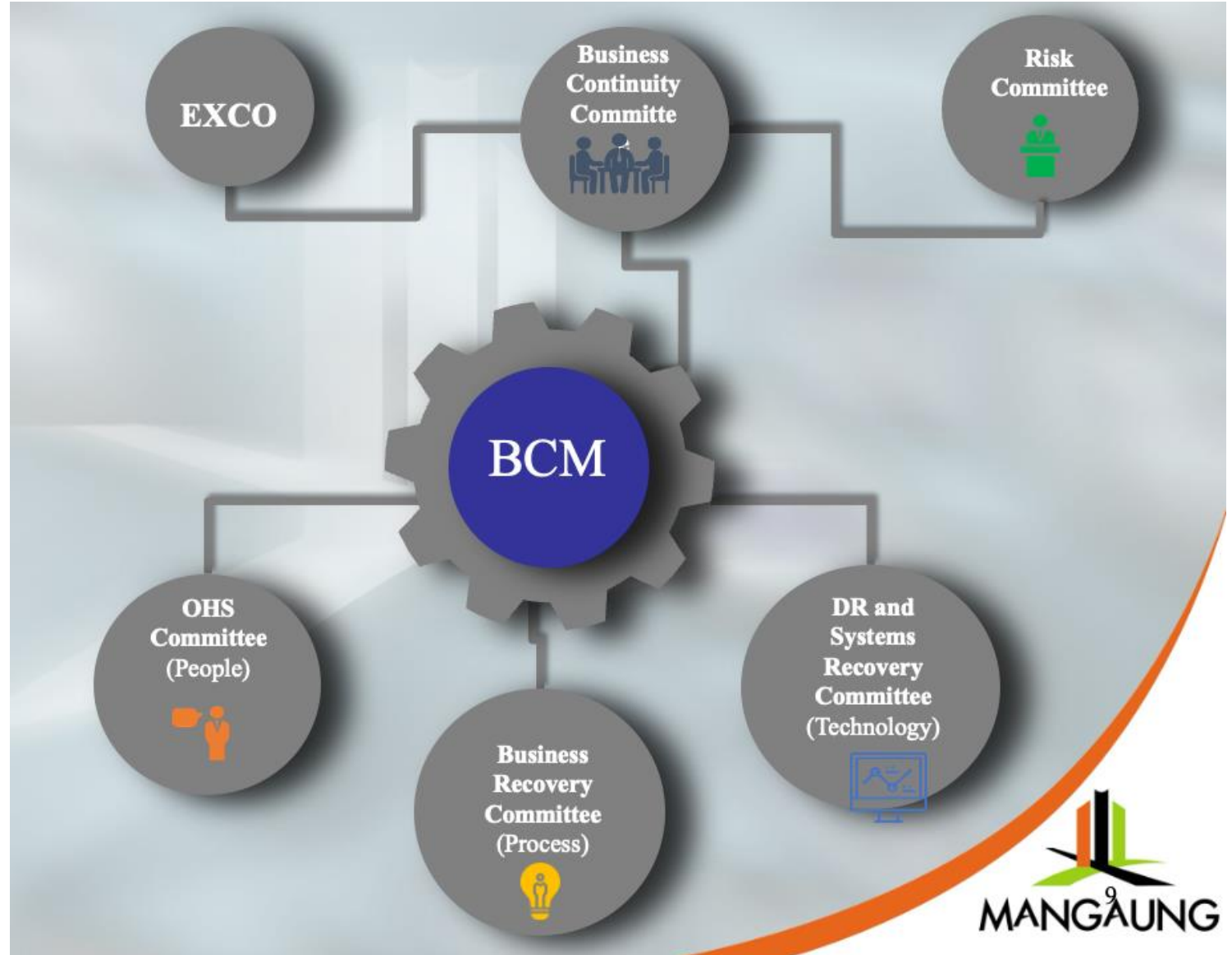
BC Policy  
Discussion

Policy Breakout

BCM Policy  
Finalisation

# BCM Structure

---



# Sector Training Agenda – Day 1



BC Committee  
Terms of reference



BC AWARENESS &  
CULTURE



BC Programme



Business Impact  
Analysis



Critical Resource  
Analysis



Critical Skills  
Analysis

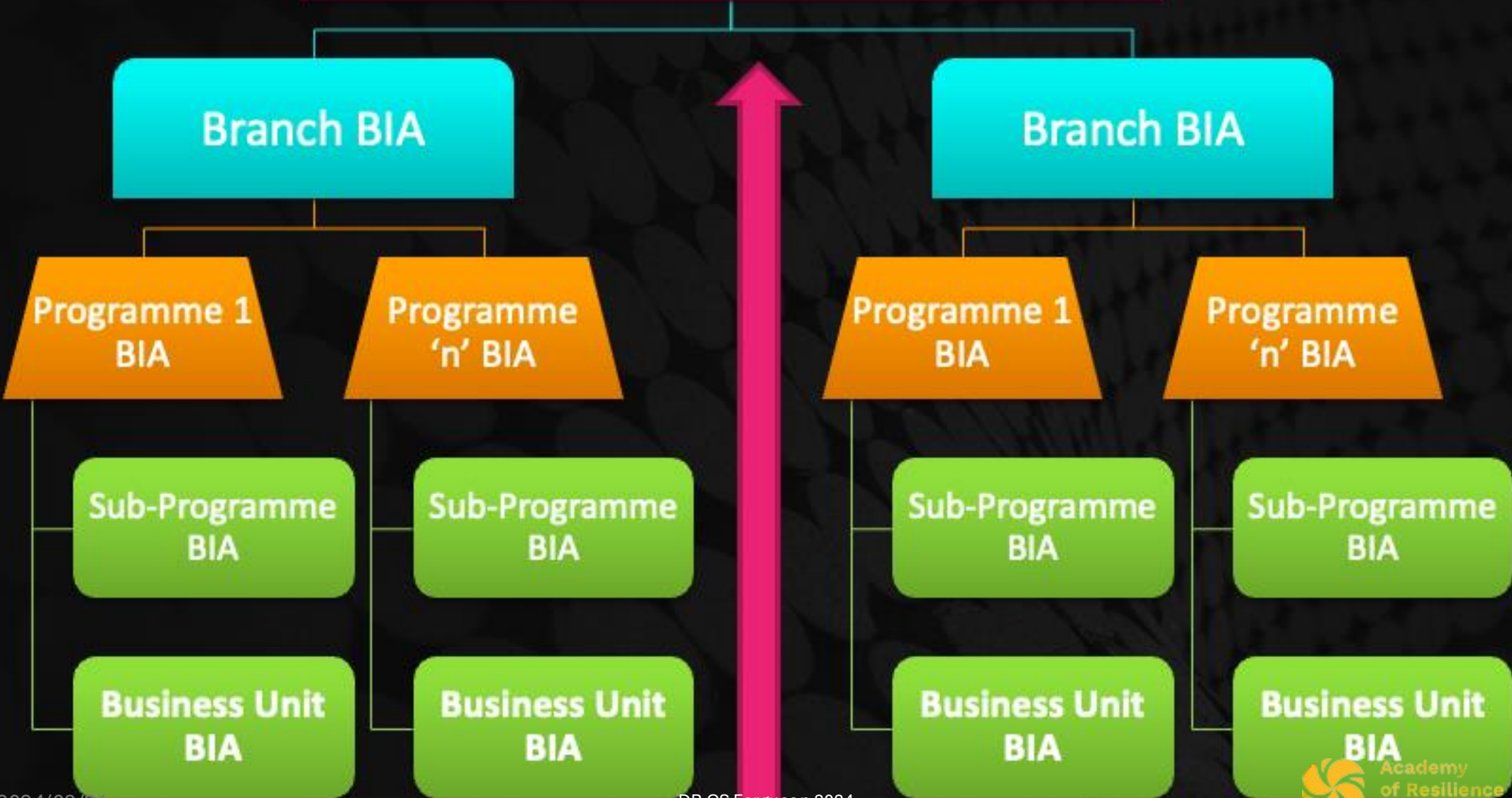


Risk Theory



Threat Risk  
Analysis

# Consolidated Enterprise BIA



# Sector Training – Day 2



METRO STRATEGY  
DESIGN



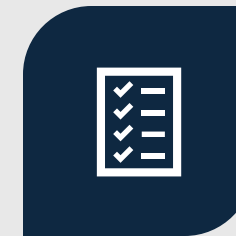
DEVELOPING BCP'S



ALIGNING BCP'S  
WITH BIA'S



DEVELOPING AN  
EASY-TO-USE  
TEMPLATE



BE READY FOR  
TESTING

# Metro Business Continuity Plan (End to End)

## LESSONS LEARNT

Data collected for analysis in a close out report that explains how the invocation saved business versus the actual cost of such.

## RETURN TO NORMAL PLAN

The plan on the returning to the original or rebuilt site off the recovery site/s.

## RECOVERY PLAN

RPO and RTO charter on Human movement, Physical & Cyber Security, IT Systems and networks, suppliers, telecommunications, back-up and restore, office space and seating arrangements, products and services versus actual production

2024/08/21



## PROTECTION AND MITIGATION PLAN

Risks identified and mitigation actions, OHS compliance, detection systems, reducing impact of incidents on business

## EMERGENCY RESPONSE PLAN

Incident management, emergency actions such as evacuation, first aid and Fire

## CRISIS MANAGEMENT PLAN

Roles, responsibilities and authority  
Emergency procedures (BC) Crisis Committee  
Crisis Communication

## INVOCATION

Assessment, Invocation notification and mobilisation of Systems Recovery, SHERQ, and Business Recovery teams. Linked to RPO and RTO.

DR CS Ferguson 2024

# Sector Training – Day 3



BCP Testing



Developing Testing Scenarios



Doing the test



Monitoring and Audit



Audit Reports



Executive Action



Continuous Improvement

DR CS Ferguson 2024

# Business Continuity Culture



Leadership  
commitment to  
Business  
Continuity



BC Committee  
and  
Governance  
structure



Emergency  
Number &  
Email



BIA – Bottom Up



Strategy - Top  
Down



BCP - Top Down



Incentivising BC  
adherence and  
participation





# Municipal BC Plan

Business Continuity (BC) and the risk management role

Embedding BC into organisational culture

Importance of a comprehensive Business Continuity Plan (BCP)

Owning the Plan

Doing the plan with Process



# Outcomes and Learnings

## Key achievements

- executive buy in – City Manager and Exco
- Executive team trained
- 26 Sectoral BC Champions trained
- Unified approach
- Risk and Audit teams represented
- OHS integration
- A new team was established

## Challenges

- Initial OHS pushback
- Metro Silos

## Lessons learned

- Bring Executives, Senior and Middle management on board
- Define roles and Responsibilities
- BCM is a journey

2024/08/21

DR CS Ferguson 2024



# Urban Development and BCM

## BCM as a Pillar of Urban Development:

- 1. Ensuring Continuity in Critical Urban Services:** How BCM frameworks maintain essential services (water, power, healthcare) during disruptions.
- 2. Supporting Economic Stability:** BCM's role in safeguarding businesses and jobs during urban crises.
- 3. Enhancing Community Resilience:** Strategies for integrating BCM into community-level disaster preparedness.
- 4. Promoting Sustainable Urban Growth:** Aligning BCM with long-term sustainability goals.

## The Intersection of BCM with Urban Planning and Development:

- 1. Integrating BCM in Urban Infrastructure Design:** Incorporating continuity plans in the development of resilient infrastructure.
- 2. Urban Governance and BCM:** Role of city governance in embedding BCM in planning processes.
- 3. Public-Private Partnerships for Resilient Cities:** Collaboration between government and private sectors for robust urban resilience.
- 4. Adapting to Climate Change:** How BCM frameworks can help cities prepare for climate-related disruptions.

---

# Strengthening Urban Infrastructure

**Risk Assessment and Mitigation:** BCM identifies vulnerabilities in infrastructure and develops strategies to mitigate risks, ensuring continuity during crises.

**Redundancy Planning:** BCM promotes the creation of backup systems for critical infrastructures like power grids and water supplies.

**Emergency Response Coordination:** Establishes clear protocols for rapid response and recovery, minimizing downtime for urban services.

**Stakeholder Engagement:** Involves local governments, businesses, and communities in resilience planning, ensuring broad-based support.

**Infrastructure Modernisation:** Encourages investment in resilient and adaptable infrastructure that can withstand future challenges.

**Regular Drills and Testing:** Ensures that urban infrastructures are regularly tested for resilience, identifying weaknesses before a real crisis occurs.





# Global BCM examples

**New York City (USA):** After Hurricane Sandy, NYC enhanced its BCM strategies, improving flood defences and emergency management, which bolstered the city's long-term resilience and economic stability .

**Tokyo (Japan):** Tokyo's BCM framework focuses on seismic resilience, with rigorous building codes and disaster preparedness plans that have supported the city's growth despite frequent earthquakes .

**Christchurch (New Zealand):** Post-2011 earthquake, Christchurch implemented BCM-driven rebuilding strategies, focusing on resilient infrastructure and community engagement, fostering sustainable urban recovery .

**Singapore:** Singapore's BCM practices are integral to its urban planning, with comprehensive strategies for water security and infrastructure resilience, ensuring continued urban development and economic growth .

# Participation and Involvement



**Inclusive Decision-Making:** Involving diverse stakeholders ensures that all perspectives are considered, leading to more comprehensive and effective BCM plans.

**Enhanced Risk Identification:** Stakeholders from various sectors can identify different risks, improving overall risk assessment and mitigation strategies.

**Shared Responsibility:** Broad participation fosters a sense of shared responsibility, encouraging all parties to contribute to the success of BCM initiatives.

**Resource Optimisation:** Engaging multiple stakeholders allows for pooling resources, knowledge, and expertise, leading to more efficient and effective BCM implementation.

**Trust and Buy-In:** Active involvement of stakeholders, including the community, builds trust and ensures greater buy-in and compliance during BCM execution.

**Tailored Response Strategies:** Diverse input helps tailor BCM strategies to specific needs and contexts, ensuring they are relevant and practical for all stakeholders involved.



# Integrated Risk Assessment

1. **Identification of Potential Disruptions:** Risk assessment identifies threats that could impact critical urban infrastructure and services.
2. **Prioritization of Risks:** It helps prioritize risks based on their likelihood and potential impact, guiding resource allocation.
3. **Informed Decision-Making:** Provides data-driven insights for developing BCM strategies that are relevant and effective.
4. **Proactive Mitigation Planning:** Enables the development of proactive measures to mitigate identified risks, reducing vulnerability.
5. **Holistic Approach:** Combines assessments of natural disasters, infrastructure weaknesses, and socio-economic factors.
6. **Cross-Departmental Collaboration:** Involves various municipal departments, ensuring all risks are considered and addressed.

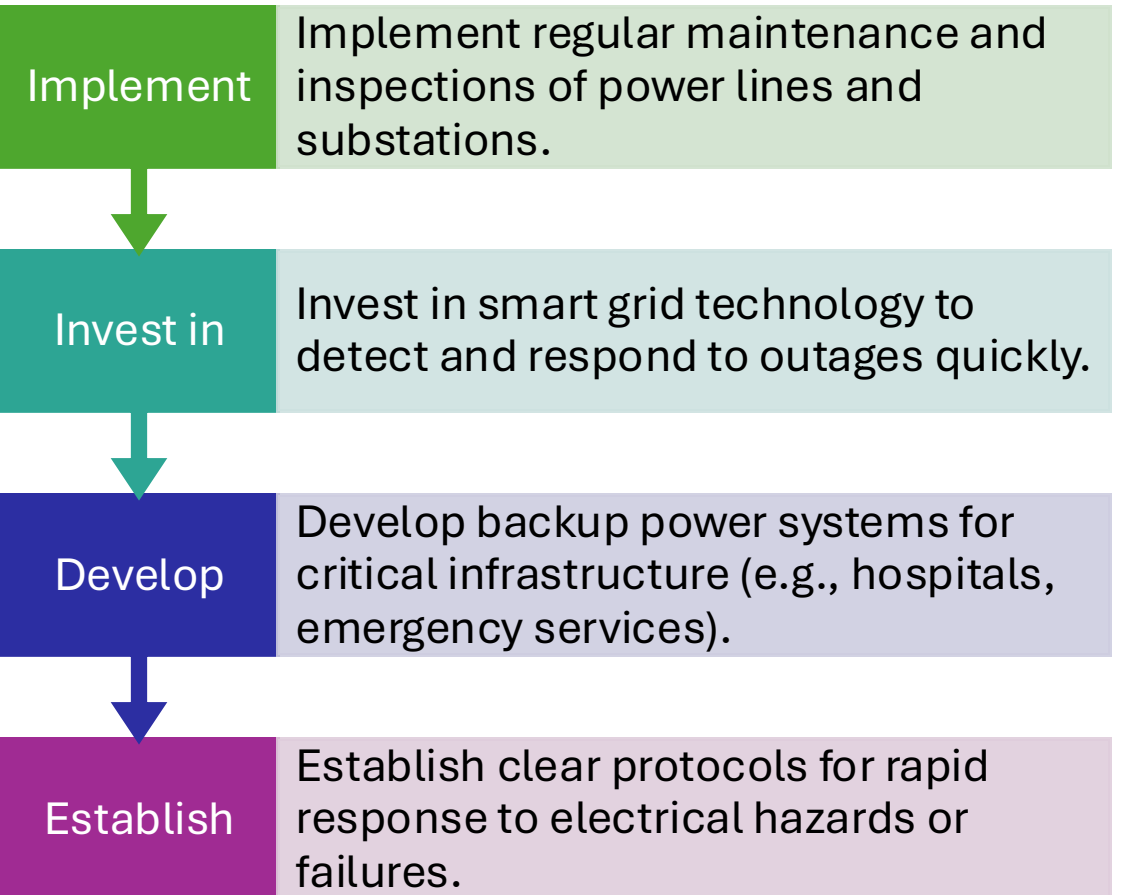
# Mitigating Risks through BCM

## In Practice





# Electricity Risk Mitigation



# Water Risk Mitigation

Upgrade  
and  
maintain

Upgrade and maintain water treatment facilities to prevent contamination.

Implement

Implement water conservation programs and infrastructure to manage demand.

Develop

Develop flood control measures and maintain drainage systems to prevent water logging.

Test and  
monitor

Regularly test and monitor water quality to ensure safety and compliance with standards.



# Sanitation Risk Mitigation

## Enhance

Enhance waste treatment facilities to handle varying loads and types of waste.

## Implement

Implement regular inspections and maintenance of sewage systems to prevent blockages.

## Promote

Promote public education on proper waste disposal and hygiene practices.

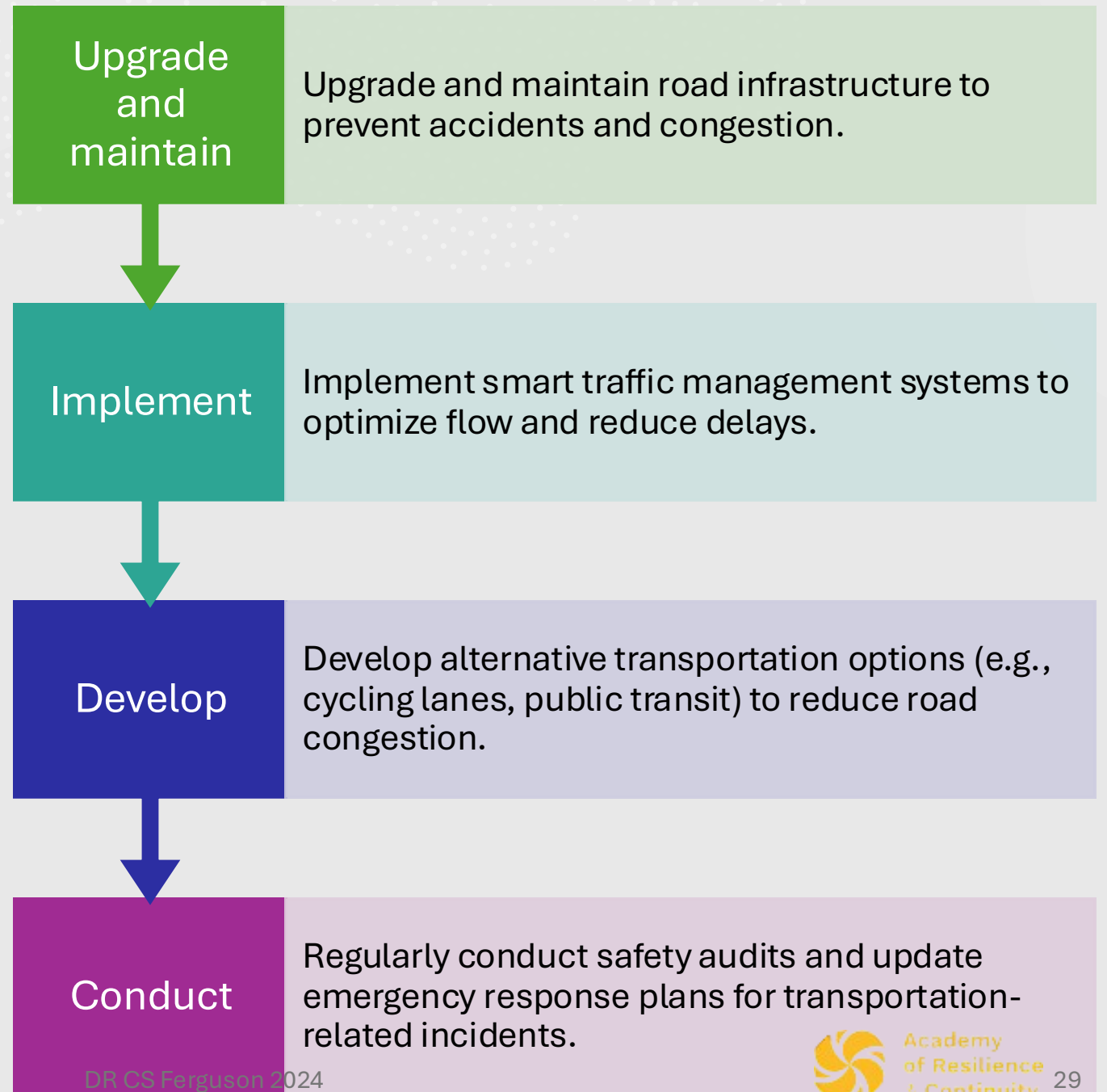
## Develop

Develop contingency plans for handling sanitation emergencies (e.g., sewer overflows).

# Refuse Collection Risk Mitigation

Optimise	Optimise waste collection routes and schedules to improve efficiency and reduce delays.
Invest in	Invest in waste sorting and recycling programs to minimize landfill use.
Implement	Implement public awareness campaigns on reducing, reusing, and recycling waste.
Ensure	Ensure adequate and well-maintained refuse collection equipment and infrastructure.

# Transportation Risk Mitigation



# Emergency Services Risk Mitigation

Develop and test

Develop and test comprehensive emergency response plans for various scenarios (e.g., natural disasters, civil unrest).

Ensure

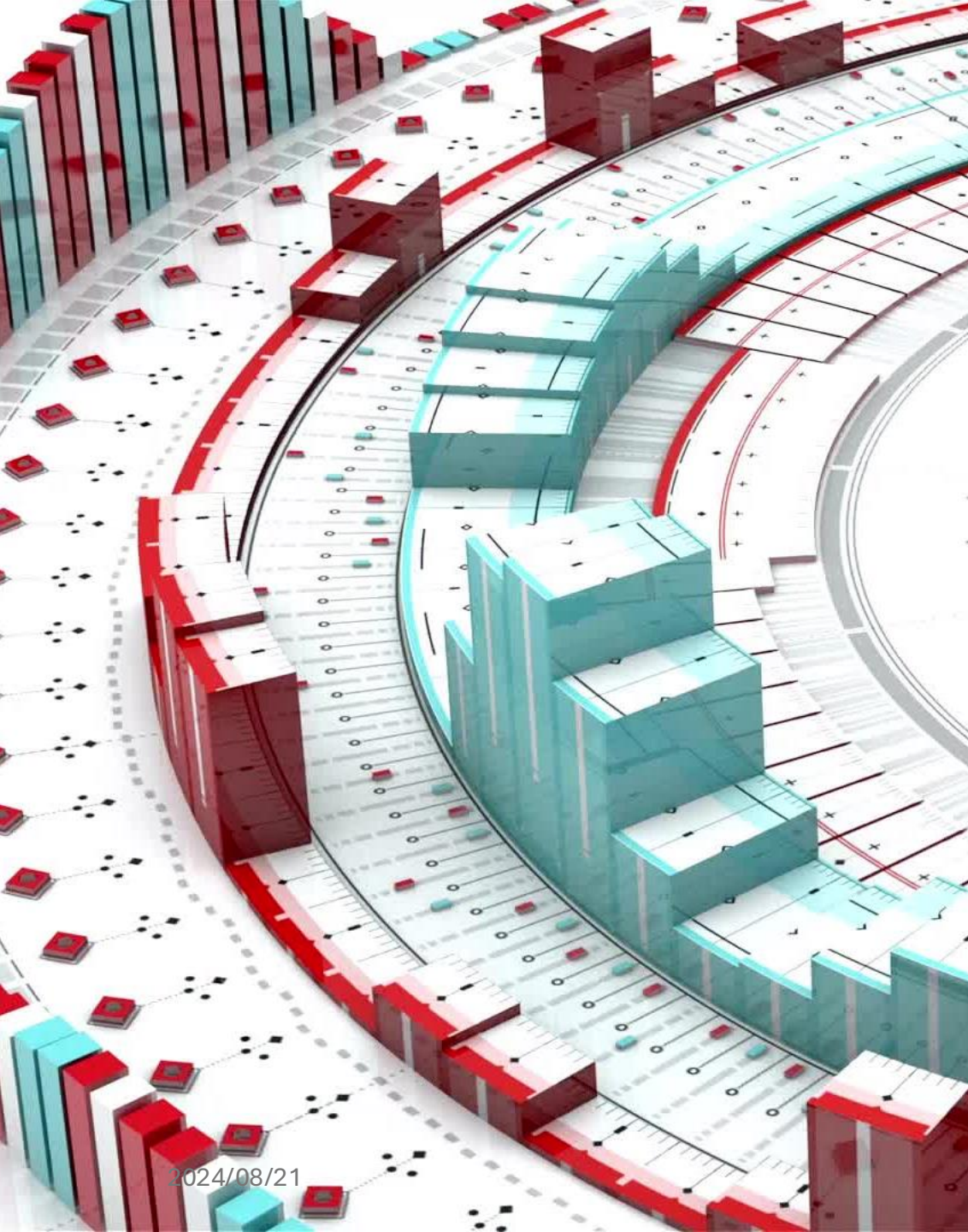
Ensure clear communication channels and coordination between different emergency services.

Invest in

Invest in training and drills for emergency personnel to enhance preparedness and response.

Equip

Equip emergency services with the necessary tools and resources for effective disaster management.



# Technological Innovations in BCM

**Artificial Intelligence (AI) and Machine Learning**

**Blockchain Technology**

**Cloud Computing**

**Internet of Things (IoT)**

**Big Data Analytics**

**Cybersecurity Technologies**

**Robotic Process Automation (RPA)**

**Drones and Remote Sensing**

**Virtual and Augmented Reality (VR/AR):**

**Communication and Collaboration Tools**

# Application in Urban Resilience

**AI** - Enhance predictive models for urban risks and automate emergency response

**Blockchain** - manage and verify critical infrastructure data

**Cloud Computing** - Scalable data storage and backup solutions and remote working

**Internet of Things (IoT)** - Monitor and manage urban infrastructure (e.g., traffic lights, water systems) in real-time to prevent and respond to failures.

**Cybersecurity Technologies** - Protect urban infrastructure and data

**Robotic Process Automation (RPA)** - Automate routine urban management tasks and public service requests.

**Communication and Collaboration Tools**- Facilitate real-time coordination between city agencies, emergency services, and the public during crises. Support remote work and collaboration to ensure continuity of essential urban functions.





# Future Outlook

**Enhanced Risk Management – AI and Big Data**

**Improved Crisis Response – Automated Coordination**

**Resilient Infrastructure – SMART computing**

**Adaptive Urban Planning – Data Driven**

**Enhanced Public Safety - Early Warning Systems**

**Sustainable Operations – energy Efficiency**

**Inclusive and Accessible Services – Remote Services**

**Economic Efficiency – Cost saving and resilience investments**



# BCM Success Stories

**Singapore**, managed to maintain essential services effectively, minimizing economic disruption (Source: World Economic Forum, 2020).

**Copenhagen**, have benefitted from reduced insurance costs due to enhanced infrastructure resilience (Source: Insurance Journal, 2022).

**New York City's** financial district during Hurricane Sandy showcased the importance of BCM in sustaining economic activities (Source: FEMA, 2013)

**Walmart** has implemented BCM strategies to ensure supply chain continuity, enhancing their operational efficiency (Source: Harvard Business Review, 2021).

**New Orleans**, supported by BCM strategies, led to increased property values and local economic recovery (Source: Urban Land Institute, 2019).

---

## 8. Interactive Q&A Session

- **Engage with the Audience**
- Address questions and comments from participants
- Encourage discussion on the practical application of BCM in urban resilience

# Conclusion and Closing Remarks

BCM and emerging technologies play a crucial role in enhancing urban resilience by improving risk management, crisis response, and infrastructure durability.

They impact both macro and micro economies by ensuring stability, attracting investment, reducing costs, and supporting continuous business operations.

Effective BCM practices contribute to a more resilient and adaptable urban environment, fostering economic growth and sustainability.

# Closing Thoughts

Business Continuity Management (BCM) is not a one-time solution or a mere book on the shelf; it is an ongoing journey that requires continuous improvement and adaptation.

To ensure urban resilience, BCM must be viewed as a dynamic system that evolves with emerging threats, technologies, and changing urban landscapes. It demands regular updates, proactive risk assessments, and constant engagement from all stakeholders.

Embracing BCM as a perpetual process ensures that cities can withstand disruptions, recover swiftly, and thrive amid uncertainty, ultimately fostering a more resilient and sustainable urban environment.



# Thank You

**Dr Cliff Ferguson**

**[drcliff@academyrc.co.za](mailto:drcliff@academyrc.co.za)**

**+27 12 653 6167 / +27 61 063  
4455**

