

ENVIRONMENT, AGRICULTURE AND RURAL DEVELOPMENT PORTFOLIO COMMITTEE

STATUS AND IMPACT OF AIR POLLUTION IN GAUTENG PROVINCE

EMPERORS PALACE CONFERENCE CENTRE
DATE: 19 SEPTEMBER 2026



GAUTENG
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

GGT2030
GROWING GAUTENG TOGETHER

Outline

- Introduction
- Drivers of provincial air pollution
- Legislative framework
- State of air
- Impacts of Air Pollution
- Ongoing programmes and initiatives
- Gaps and Challenges
- Opportunities for Emission reduction
- Provincial AQM priorities
- Conclusion



INTRODUCTION

- Air pollution is one of the most significant environmental and public health challenges facing communities worldwide.
- 99% of the world's population lives in places where air quality does not meet the WHO air-quality guidelines.

Gauteng

- Smallest province by land area (approximately **18,000 km²**) but home to over **16 million** people.
- An economic hub, contributing more than one-third of South Africa's GDP.
- Almost all ambient air quality stations record exceedances of the National Ambient Air quality Standards for PM10 and PM2,5 throughout the year.

DRIVERS OF PROVINCIAL AIR POLLUTION



Industry

- The province has the highest number of industries in the country.



Mining

- quarries and mine tailings (current and old)



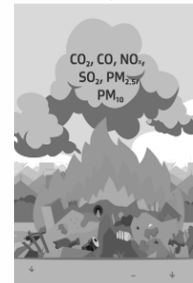
Legal/illegal Landfill site burning

- growing level of Criminal activities
- Poor service delivery



Vehicle tailpipe emissions

- Gauteng has approximately 4.7 million vehicles.
- Around 35% of South Africa's vehicle fleet.



Residential emissions

- Reliance on fossil fuels by low-income communities and burning of waste and other material.



Transboundary air pollution

- Mostly evident during H₂S episodes.



LEGISLATIVE FRAMEWORK

Legislative Requirements

- Section 24 of the Constitution Bill of Rights: Everyone has the right:
 - (a) To an environment that is not harmful to their health or well-being, and
 - (b) to have the environment protected, for the benefit of present and future generations.
- The National Environmental Management: Air Quality Act (39) of 2004 “NEMAQA” is an objectives-based legislative approach that is aligned to South Africa’s Constitution - enhancing the quality of ambient air to ensure an environment that is not harmful to the health and well-being of people.

Provincial Government Role

- In terms of AQA, Municipalities are charged with the responsibility to manage air quality (Develop AQMP, ambient air quality monitoring, licensing of facilities, complaints, etc).
- The Department provides a supportive and oversight role with respect to AQM in the Province.

GAUTENG PROVINCE STATE OF AIR

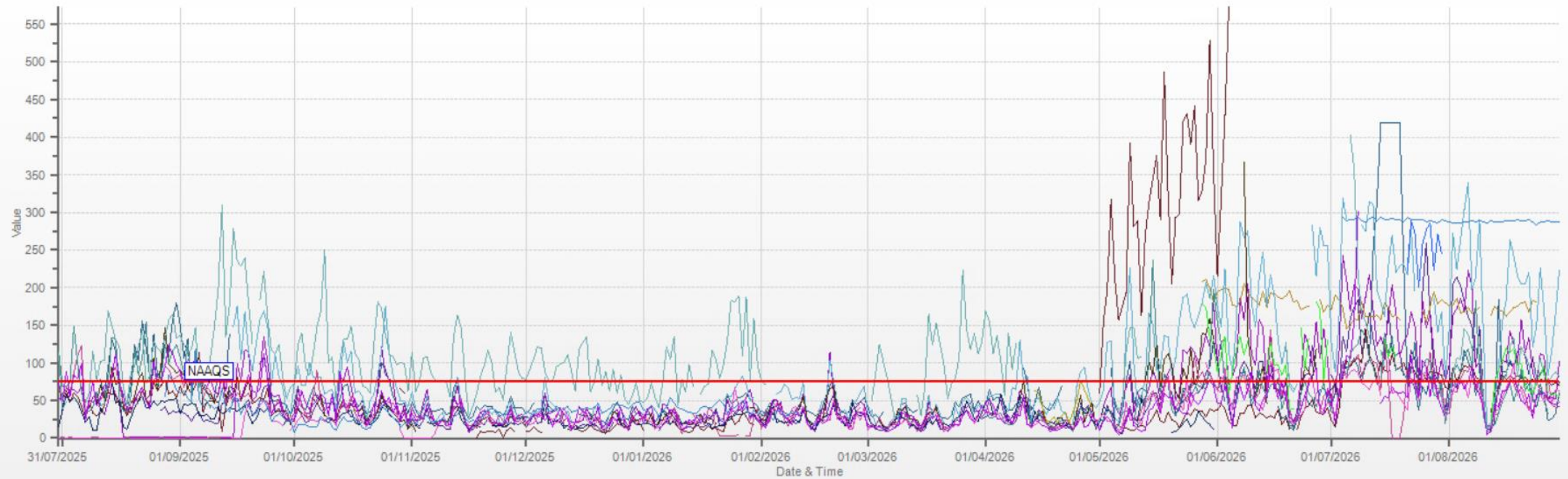
- Ambient air quality monitoring data collected from various stations within the Province.
- 31 government-owned ambient air quality monitoring stations in the province.
- The data is sourced from the SAAQIS, housed by the South African Weather Services.
- Data is analysed against the National Ambient Air Quality Standards (NAAQS)
 - exceedances of these standards indicate pollution above acceptable limits.

Pollutant	Averaging Period	Frequency of Exceedances	Limit Value (µg/m ³)	Limit Value (ppb)/(ppm)
Sulphur Dioxide (SO ₂)	10 minutes	526	500 µg/m ³	191
	1-hour	88	350 µg/m ³	134
	24-hour	4	125 µg/m ³	48
	Annual average	0	50 µg/m ³	19
Nitrogen Dioxide (NO ₂)	1-hour	88	200 µg/m ³	106
	Annual average	0	40 µg/m ³	21
Carbon Monoxide (CO)	1-hour	88	30 mg/m ³	26 ppm
	8-hour	11	10 mg/m ³	8.7 ppm
Ozone	8-hours (running)	11	120 µg/m ³	61 ppb
Particulate Matter (PM _{2.5})	24-hours	4	40 µg/m ³	-
	Annual average	0	20 µg/m ³	-
Lead (Pb)	Annual average	0	0.5 µg/m ³	-
Particulate Matter (PM ₁₀)	24-hours	4	75 µg/m ³	-
	Annual average	0	40 µg/m ³	-
Benzene	Annual average	0	5 µg/m ³	1.6 ppb



PARTICULATE MATTER (PM₁₀) (DAILY AVERAGES)

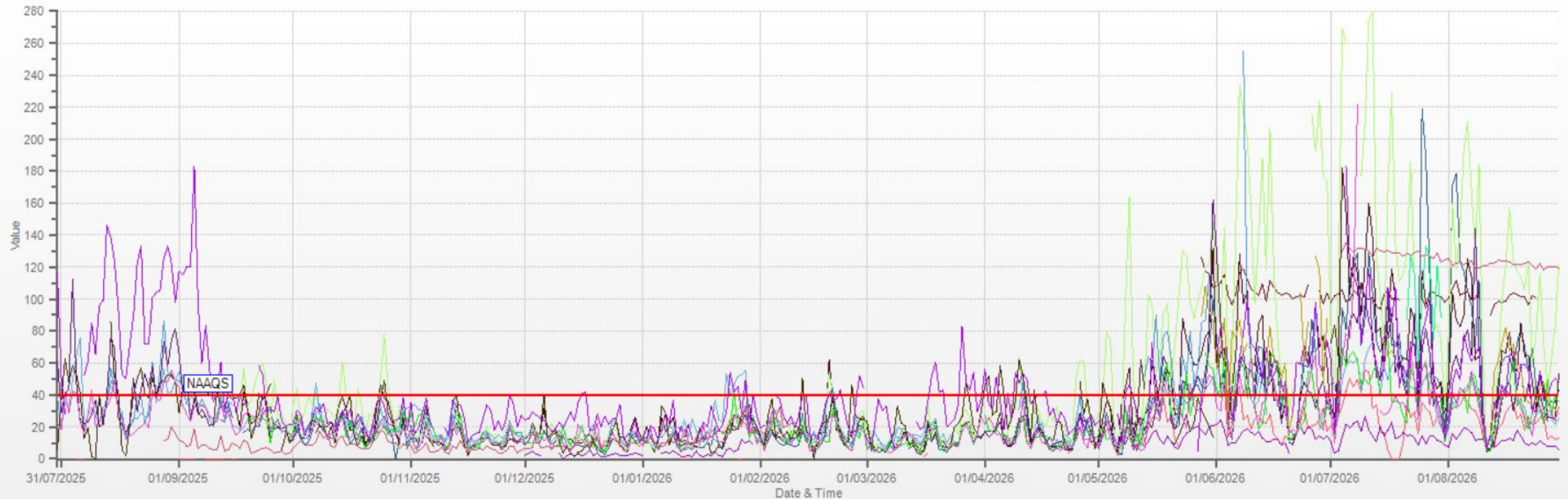
MultiStation: Periodically: 01/08/2025 00:00-30/08/2026 24:00 Type: AVG 1 Day





PARTICULATE MATTER (PM_{2.5}) (DAILY AVERAGES)

MultiStation: Periodically: 01/08/2025 00:00-30/08/2026 24:00 Type: AVG 1 Day

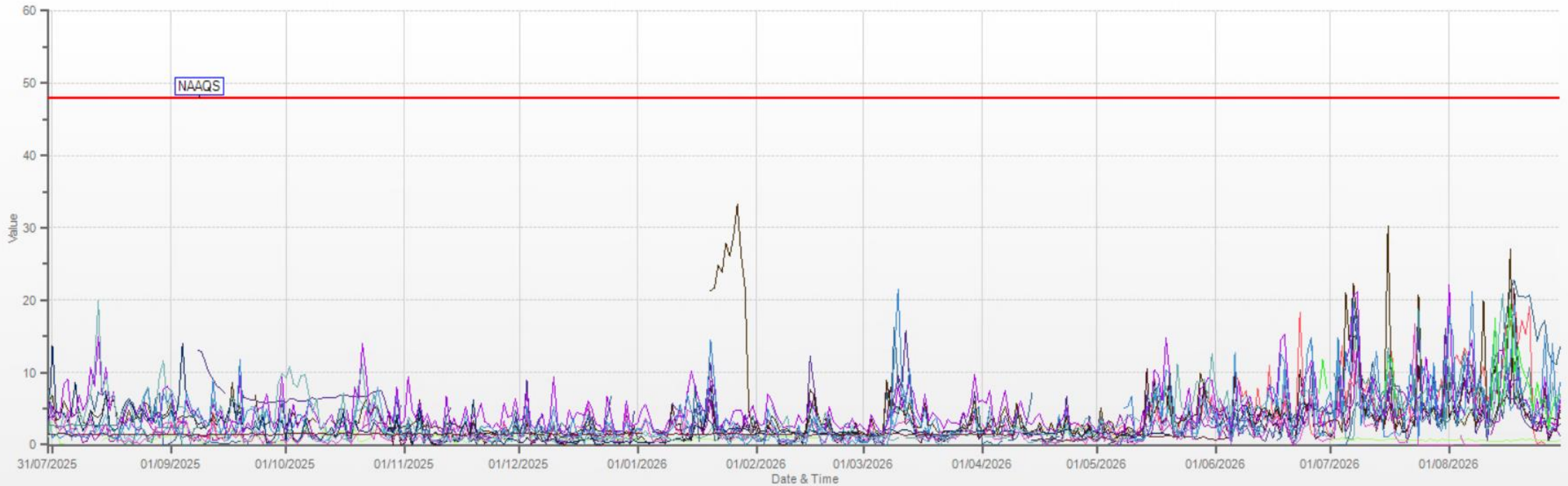


Bedfordview-NAQI(PM2.5 [µg/m3])	Bodibeng-NAQI(PM2.5 [µg/m3])	Bucleugh-NAQI(PM2.5 [µg/m3])	Delta Park(PM2.5 [µg/m3])	Diepkloof-NAQI(PM2.5 [µg/m3])	Diepsloot(PM2.5 [µg/m3])
Ekandustria(PM2.5 [µg/m3])	Etwatwa-NAQI(PM2.5 [µg/m3])	Hammanskraal(PM2.5 [µg/m3])	Ivory Park(PM2.5 [µg/m3])	Jabavu-NAQI(PM2.5 [µg/m3])	Kliprivier(PM2.5 [µg/m3])
Mamelodi(PM2.5 [µg/m3])	Meyerton(PM2.5 [µg/m3])	Olievenhoutbosch-NAQI(PM2.5 [µg/m3])	Olifantsfontein-NAQI(PM2.5 [µg/m3])	Orange Farm(PM2.5 [µg/m3])	PTA West(PM2.5 [µg/m3])
Rosslyn-NAQI(PM2.5 [µg/m3])	Sebokeng(PM2.5 [µg/m3])	Sharpeville(PM2.5 [µg/m3])	Springs-NAQI(PM2.5 [µg/m3])	Tembisa(PM2.5 [µg/m3])	Three Rivers(PM2.5 [µg/m3])
Tsakane(PM2.5 [µg/m3])	Tshwane Market(PM2.5 [µg/m3])	Vanderbijlpark-NAQI(PM2.5 [µg/m3])	Wattville(PM2.5 [µg/m3])	NAAQS [Value = 40]	



SULPHUR DIOXIDE (SO₂) (DAILY AVERAGES)

MultiStation: Periodically: 01/08/2025 00:00-30/08/2026 24:00 Type: AVG 1 Day

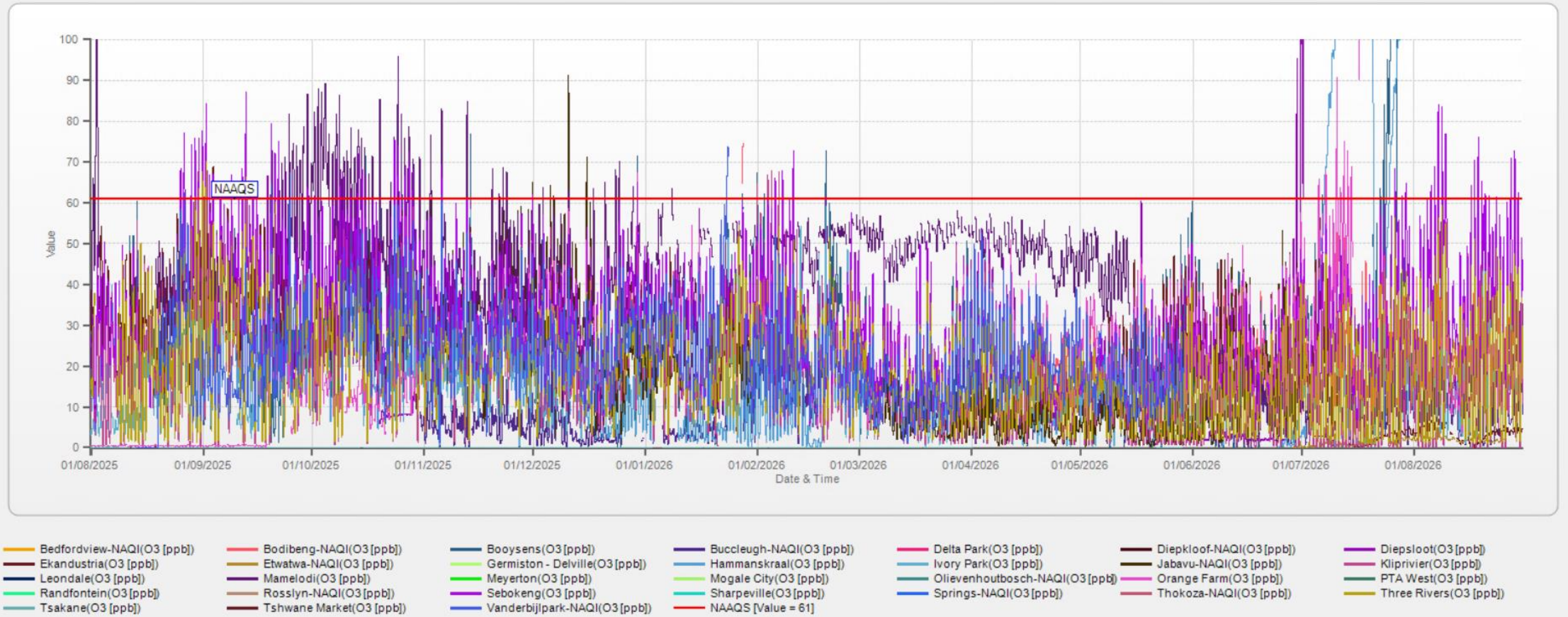


Bedfordview-NAQI(SO ₂ [ppb])	Bodibeng-NAQI(SO ₂ [ppb])	Booyssens(SO ₂ [ppb])	Bucleugh-NAQI(SO ₂ [ppb])	Diepkloof-NAQI(SO ₂ [ppb])	Diepsloot(SO ₂ [ppb])
Ekandustria(SO ₂ [ppb])	Etwatwa-NAQI(SO ₂ [ppb])	Germiston - Delville(SO ₂ [ppb])	Hammanskraal(SO ₂ [ppb])	Ivory Park(SO ₂ [ppb])	Jabavu-NAQI(SO ₂ [ppb])
Kliprivier(SO ₂ [ppb])	Leondale(SO ₂ [ppb])	Mamelodi(SO ₂ [ppb])	Meyerton(SO ₂ [ppb])	Mogale City(SO ₂ [ppb])	Olievenhoutbosch-NAQI(SO ₂ [ppb])
Olifantfontein-NAQI(SO ₂ [ppb])	Orange Farm(SO ₂ [ppb])	PTA West(SO ₂ [ppb])	Randfontein(SO ₂ [ppb])	Rosslyn-NAQI(SO ₂ [ppb])	Sebokeng(SO ₂ [ppb])
Sharpeville(SO ₂ [ppb])	Springs-NAQI(SO ₂ [ppb])	Tembisa(SO ₂ [ppb])	Three Rivers(SO ₂ [ppb])	Tsakane(SO ₂ [ppb])	Tshwane Market(SO ₂ [ppb])
Vanderbijlpark-NAQI(SO ₂ [ppb])	Wattville(SO ₂ [ppb])	NAAQS [Value = 48]			



OZONE (O₃) (8-HOURLY AVERAGES)

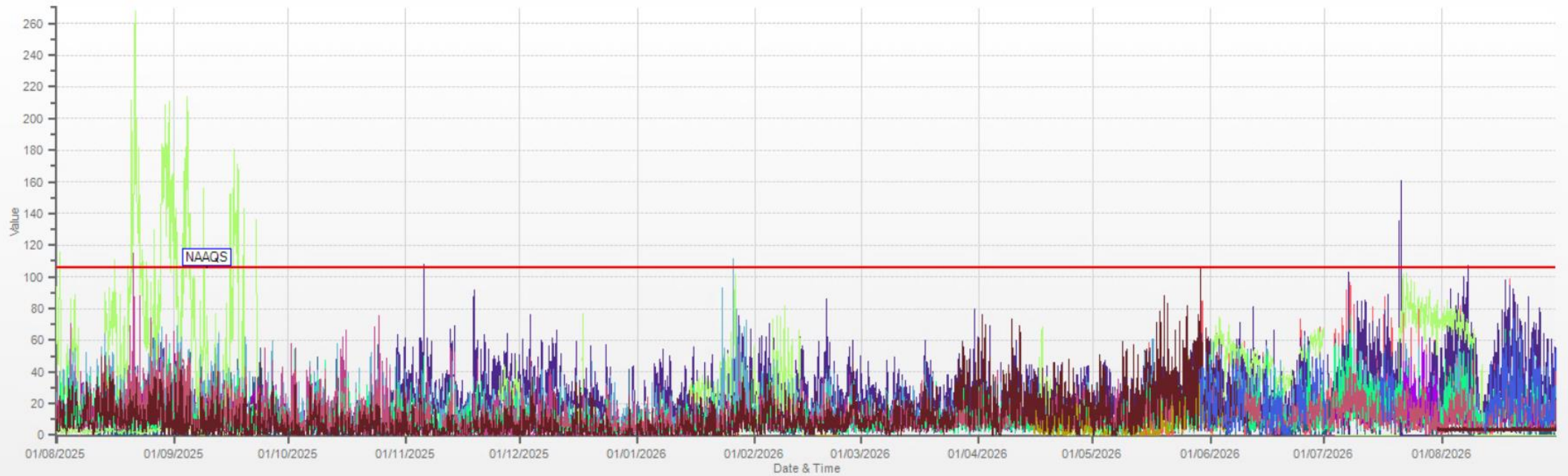
MultiStation: Periodically: 01/08/2025 00:00-30/08/2026 24:00 Type: RunningAvg 8 Hrs.





NITROGEN DIOXIDE (NO₂) (HOURLY AVERAGES)

MultiStation: Periodically: 01/08/2025 00:00-30/08/2026 24:00 Type: RunningAvg 1 Hr.

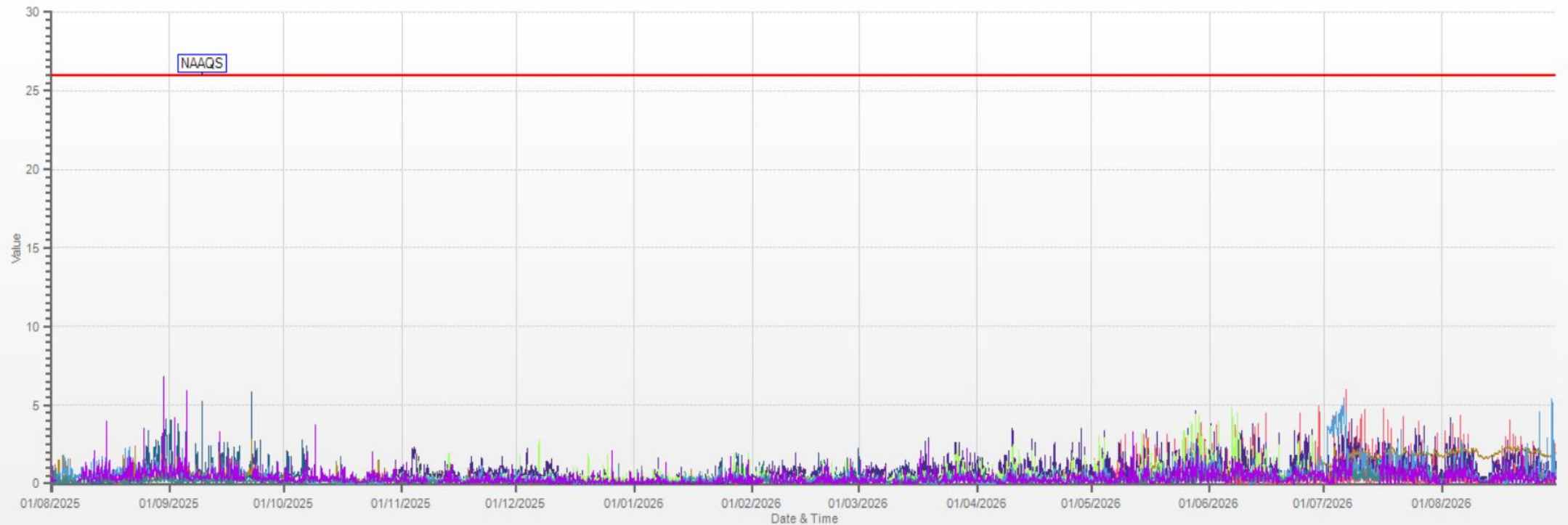


Bedfordview-NAQI(NO ₂ [ppb])	Bodibeng-NAQI(NO ₂ [ppb])	Booyens(NO ₂ [ppb])	Bucleugh-NAQI(NO ₂ [ppb])	Delta Park(NO ₂ [ppb])	Diepkloof-NAQI(NO ₂ [ppb])
Ekandustria(NO ₂ [ppb])	Etwatwa-NAQI(NO ₂ [ppb])	Germiston - Delville(NO ₂ [ppb])	Hammanskraal(NO ₂ [ppb])	Jabavu-NAQI(NO ₂ [ppb])	Kliprivier(NO ₂ [ppb])
Leondale(NO ₂ [ppb])	Mamelodi(NO ₂ [ppb])	Meyerton(NO ₂ [ppb])	Mogale City(NO ₂ [ppb])	Olievenhoutbosch-NAQI(NO ₂ [ppb])	Olifantsfontein-NAQI(NO ₂ [ppb])
PTA West(NO ₂ [ppb])	Randfontein(NO ₂ [ppb])	Rosslyn-NAQI(NO ₂ [ppb])	Sebokeng(NO ₂ [ppb])	Sharpeville(NO ₂ [ppb])	Springs-NAQI(NO ₂ [ppb])
Tembisa(NO ₂ [ppb])	Thokoza-NAQI(NO ₂ [ppb])	Three Rivers(NO ₂ [ppb])	Tsakane(NO ₂ [ppb])	Tshwane Market(NO ₂ [ppb])	Vanderbijlpark-NAQI(NO ₂ [ppb])
Wattville(NO ₂ [ppb])	NAAQS [Value = 106]				



CARBON MONOXIDE (CO) (HOURLY AVERAGES)

MultiStation: Periodically: 01/08/2025 00:00-30/08/2026 24:00 Type: RunningAvg 1 Hr.



Bedfordview-NAQI(CO [ppm])	Bodibeng-NAQI(CO [ppm])	Booyens(CO [ppm])	Buccleugh-NAQI(CO [ppm])	Diepkloof-NAQI(CO [ppm])	Etwatwa-NAQI(CO [ppm])
Germiston - Delville(CO [ppm])	Hammanskraal(CO [ppm])	Jabavu-NAQI(CO [ppm])	Kliiprivier(CO [ppm])	Mogale City(CO [ppm])	Olievenhoutbosch-NAQI(CO [ppm])
Olifantsfontein-NAQI(CO [ppm])	PTA West(CO [ppm])	Randfontein(CO [ppm])	Rosslyn-NAQI(CO [ppm])	Sebokeng(CO [ppm])	Sharpeville(CO [ppm])
Springs-NAQI(CO [ppm])	Tembisa(CO [ppm])	Thokoza-NAQI(CO [ppm])	Three Rivers(CO [ppm])	Tshwane Market(CO [ppm])	NAAQS [Value = 26]



STATE OF AIR SUMMARY

- More Particulate matter exceedances are more prevalent during winter months due to unfavorable atmospheric and meteorological conditions, combined with increased reliance on fossil fuels for residential space heating.
- Ozone (O_3) exceeds the NAAQS in most parts of the province - Availability of O_3 precursors (NO_x , hydrocarbons/NMVoCs), which can be linked to vehicle emissions.
- SO_2 , NO_2 , and CO are mostly in compliance with the National Ambient Air Quality standard.



IMPACTS OF AIR POLLUTION IN THE PROVINCE

Health

- According to the WHO, air pollution is the greatest environmental threat to health and a leading cause of non-communicable diseases such as heart attacks and stroke.
 - 7 million premature deaths every year due to the combined effects of outdoor and indoor air pollution.
 - An estimated 16,000 premature deaths in Gauteng were attributable to PM_{2.5} air pollution in 2023, highlighting the significant public-health burden of air pollution in the province.
- A study published by the South African Medical Journal which Estimated the burden of disease attributable to ambient air pollution in South Africa for 2000, 2006 and 2012 concluded that the highest number of deaths due to PM_{2.5} exposure occurred in Gauteng, KZN and EC.
 - Lower respiratory infections in Gauteng are the leading causes of deaths attributable to PM_{2.5}
 - Climatic conditions in Gauteng also favors the formation of secondary PM_{2.5} and other secondary pollutants.
- A detailed study conducted by University of Pretoria for Buccleuch's outdoor PM_{2.5}, (conducted between 2020 and 2021) revealed a PM_{2.5} concentration which exceeds the World Health Organization (WHO) annual guideline of 5 µg.m³ - peak spikes occurred during winter and autumn.

Economy

Poor air quality has economic implications that extend beyond health.

- **Increased healthcare and household costs** – respiratory and cardiovascular illnesses increase costs for households, employers and the public health system.
- **Reduced productivity and absenteeism** - due to illness and fatigue
- **Higher business costs** – companies may face increased healthcare, employee replacement and operational costs in areas with persistent pollution.
- **Reduced investment attractiveness** – poor air quality can affect the attractiveness of cities and industrial areas to businesses, skilled workers and investors.

ONGOING PROGRAMMES AND INITIATIVES TO ADDRESS AIR POLLUTION



Industrial emissions management

- Issue licenses for municipal-owned facilities and provide oversight of Municipal Licensing function.
- Monitor and track the progress of AELs across Municipalities.
- Provide licensing related trainings.
- Implement the requirements of the National Dust Control Regulations.
- Post AEL issuance follow-up inspections in facilities issued with AELs.
- Collaborate with EMIs to improve compliance monitoring in Air Quality Regulatory Space and strengthen enforcement.



Management of emission inventories

- All industries (Sec 21 and 23) and other data providers are required to report their emissions to the Licensing Authorities.
- Provide support to municipalities in terms of facilities reporting and auditing of facilities.



Emission reduction strategies

- Gauteng vehicle emission testing programme – developed and conduct vehicle emission testing operations, in collaboration with municipalities and Gauteng Traffic Dept, to raise public awareness on vehicle emissions and to encourage compliance with emission standards set in municipal by-laws.
- Emission Reduction Recognition programme - Identification and recognition of the best performing industries in emission reduction to encourage continuous improvement.
- Industrial offset program - Lobby industries to participate in the offset programme - to fund emission reduction in communities.



Ambient Air Quality Monitoring

- There are 31 reference stations and 127 low-cost sensors in the province which all must be operational and reporting data to SAAQIS and relevant sensors dashboards respectively.
- Department provides support (technical and physical) to various municipalities.
- Compilation of Provincial State of Air for presentation at various Forums.



Research Development & Regulatory Development

- Development of Emission Reduction plans for different sectors (Transport, Industry, Mining, Residential)
- Support municipalities on Listed activities interpretation, Coordination of training and capacity building programmes for authorities and stakeholders.
- Provide technical support to municipal studies, eg Source Apportionment Study.



WAR ON WASTE

- A provincial initiative aimed at ending illegal dumping and open waste burning.
- The department facilitates continuous roll-out of enforcement joint operations to combat illegal dumping and burning of waste, in hotspot areas such as Kya Sands and Mooiplaats.
- Successful collaboration with multiple law enforcement agencies and stakeholders like various sections of municipalities, SAPS, DoCS, DFFE, DoH, DoL and private security.



APPROACH TO HOLISTIC EMISSION REDUCTION: REGIONAL COORDINATION

– *Gauteng province has taken a Regional Coordination approach to effectively reduce emissions in the province.*

Rationale

- GP is very small, densely populated with intense economic activities putting pressure on AQ across the province
- Vehicles travel across multiple municipal boundaries daily for work, business and freight, making transport emissions a regional challenge.

Core pressures

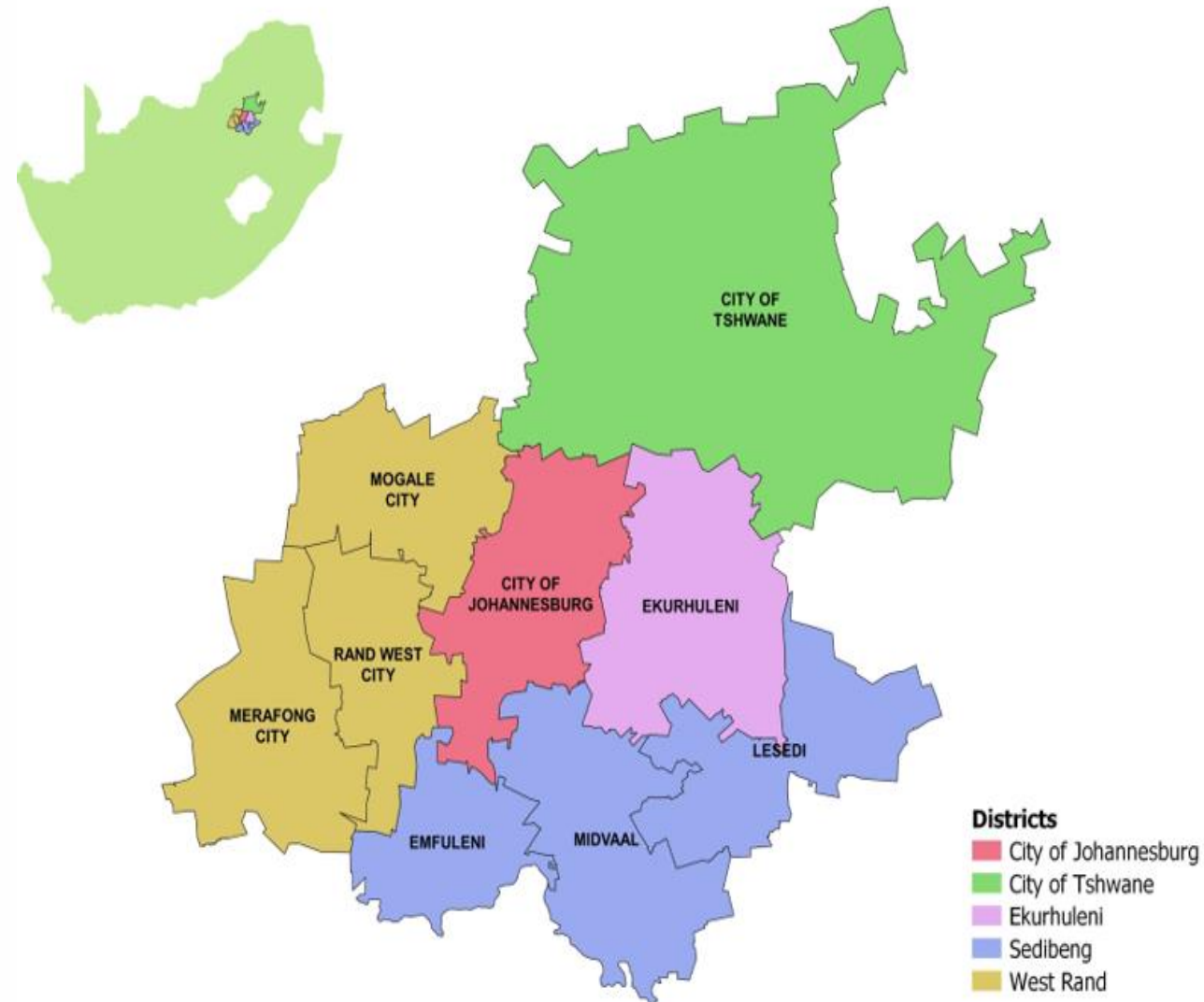
- Municipalities face common challenges including limited technical & human capacity, ageing monitoring infrastructure, funding constraints, outdated AQMPs, data gaps, etc.

Strategic benefit

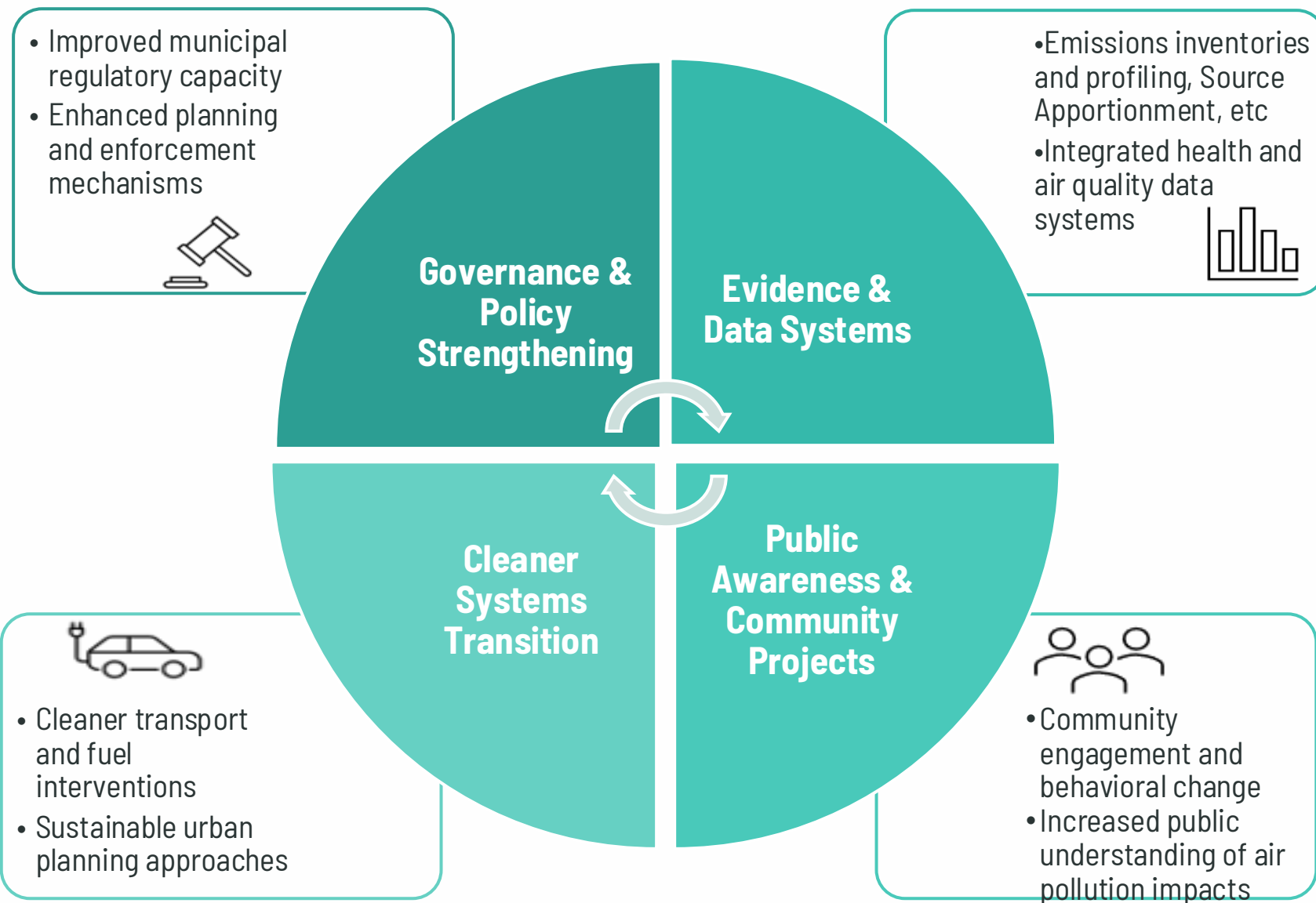
- Regional coordination enables leveraging of resources, technical expertise, sharing best practices and allows municipalities to work on complementing projects.

KEY ENABLER: PROVINCIAL GOVERNMENT- CAF PARTNERSHIP

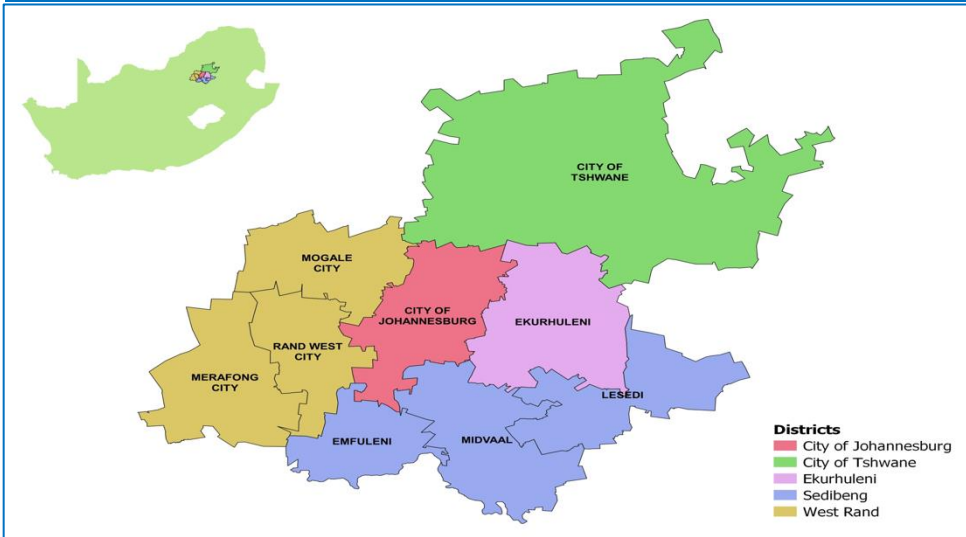
- **Gauteng Department of Environment and CAF** engaged on ways to strengthen collaboration on emission reduction, community awareness and stakeholder engagement initiatives.
- Parties entered into an **MOU** and agreed on a **co-leading implementation approach** to improve alignment, visibility, and shared ownership of interventions.
- The need for a more structured and recurring Stakeholder Engagements was emphasized to mainstream air quality management, strengthen coordination and implementation planning.
- **This collaboration is in addition to programmes implemented through Breathe Cities in the two Metropolitan Municipalities (COJ & COT).**



REGIONAL COORDINATION: PRIORITY INTERVENTIONS



HOW DOES A “WHOLE OF GAUTENG” APPROACH LOOK LIKE?



Provincial
Government

Memorandum of Understanding with CAF



Sedibeng District
Municipality



West Rand
District
Municipality



City of
Ekurhuleni
Metropolitan
Municipality



City of
Johannesburg



City of
Tshwane

SA Cities Programme of Support

CLEAN
AIR
FUND

Breathe Cities Supported Programmes

Breathe
Cities

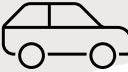
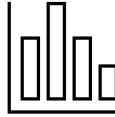
BREATHE CITIES PROJECTS

CITY OF JOHANNESBURG

Project	Outputs
1 Jo'burg Comprehensive Source Apportionment study	• High resolution data that specifically targets the contribution of sources to concentrations of PM10, PM2.5, NO2 and SO2 in Johannesburg. • Repository of credible data and information that will be used for the City's Air Quality Management Plan.
2 Comprehensive Real-world Emission Testing, Analysis and Reporting	• The first roadside remote sensing project in Africa • Detailed data on the city's vehicle fleet and their emissions • Improved accessibility to vehicle fleet and emission data of the City of Joburg & Gauteng Region • Policy recommendations for the development & adoption of the Clean Air policy
3 Community-centred assessment of ambient air pollution health impacts in Johannesburg	• Human health risk assessment (HHRA) - equitable exposure based on pollutant concentrations and their association with morbidity and mortality indicators. • A household-level knowledge, attitudes and practices (KAP) survey was conducted to explore community understanding of air pollution. • Focus group discussions with air quality policymakers and health practitioners to identify barriers to effective air quality management.
4 Empowering Communities for a Healthier Future	• 35 Community-Based Organisations (CBOs) across Johannesburg are capacitated on air quality management - they demonstrate improved capacity to design and deliver localised air quality awareness campaigns. • 35 CBOs have been supported to deliver community campaigns across the 7 regions of the City of Joburg • A digital platform is developed, launched, and is live, publicly accessible, and used by community members.
5 Development of Air Zone policy for Joburg	• Aims to significantly improve air quality by designating specific areas where stricter emission controls are enforced. • Policy targets high-pollution zones, focusing on reducing emissions from key sources such as traffic, industrial, and residential fuel burning.

CITY OF TSHWANE

- Working towards future air quality policy development - laying foundation for future development of an ambitious air quality policy that will address trans-boundary emissions, eg. Clean Air Zone policy
- Current COT projects include **Finalization of AQMP, Community awareness programme & Capacity building workshops on AQ**

Sector	Intervention	Output/Outcome
City of Ekurhuleni  Transport • Polices & Plans	Clean Air Zone Policy - limiting and managing high-emitting activities in certain areas	Comprehensive, transport and vehicular emissions inventory. - Enabling detailed pollution profiling and hotspot identification - use data to design and implement Clean Air Zones. • Policy • Transport Planning Framework
City of Ekurhuleni  Industry • Drive	Clean Fuels Policy - Policy to enable a structured transition to cleaner fuels in the industrial sector.	• Policy
Sedibeng + West Rand  City Planning • Evidence • Policies & Plans	Development and update of emissions inventories - for the purpose of emission reductions target-setting. Emission Reduction Targets Setting & AQMP development - Align with Priority Area Regulations and other AQM policies	• Emission Inventories • Emission Reduction Targets • AQMP + Implementation Plan
Sedibeng + West Rand  City Regulation • Policies & Plans	By-law development - To technically review, adopt, and promulgate legally sound and enforceable municipal Air Quality Management By-laws. - to effectively prevent, control, and management of air pollution.	• Municipal Bylaw
TBC  Health • Evidence	To systematically integrate air quality monitoring data into the national and subnational health information system to support evidence based public health decision-making and burden of disease analysis.	• Data Platform

Province-wide Community Awareness

Ongoing until September 2027



Province-wide public awareness and behavioral change-initiatives focusing on waste, fuel and domestic burning as well as transport & vehicular related emissions.



GAPS AND CHALLENGES

- **Limited funding:** affect data availability, compliance and enforcement, AQM planning, emission reduction, mainstreaming, etc.
- **Functionality and reliability of ambient air quality monitoring stations:** Some monitoring stations are not fully operational or do not consistently meet the required data recovery targets.
- **Increasing illegal and unregulated emission-generating activities:** difficult to monitor and regulate because they may occur intermittently, move between locations, or operate outside formal regulatory systems.
- **Limited integration and coordination between sector departments:** Effective AQM requires coordination between government departments, municipalities and other stakeholders.



OPPORTUNITIES FOR EMISSION REDUCTION

- **Regulations for implementing and enforcing Priority areas Air Quality Management Plans.**
 - Setting of Emission Reduction Targets
 - Mandatory submission of Emission Reduction & Management Plans
 - Holding all stakeholders accountable.
- **Clean fuels 2 Regulations**
 - Government initiative designed to upgrade petrol and diesel quality by reducing Sulphur and other harmful pollutants.
 - Coming into effect in July 2027
- **National Dust Control Regulations, 2026**
 - Provides for proactive approach to dust management
 - Mandatory submission of Dust Management Plans
- **Partnerships**
 - for funding and collaboration.



PROVINCIAL AQM PRIORITIES

Priority	Description
Emission reduction across sectors - Compliance with NAAQS	• Achieve compliance with National Ambient Air Quality Standards and protect the health of Gauteng communities. • Develop sector specific interventions.
Responsive AQMPs - Address outdated AQMPs	• Air Quality Management Plans that address both current and emerging air quality risks facing our communities.
Develop policy instruments - Address various AQ issues	• Develop Provincial Emission Reduction Regulations and other policies, like CAZ and Clean Fuels policies
Compliance & Enforcement - AELs, WMLs & by-laws	• Enhancing compliance monitoring and enforcement mechanisms to ensure adherence to emission standards.
Improve data availability - Address current data gaps	• Maintaining and modernising ambient air quality monitoring networks to improve data collection.
Air quality Mainstreaming - Making air quality everyone's business	• Promoting inclusive and participatory governance by empowering communities, particularly young people and vulnerable groups, to actively participate in clean air initiatives.

CONCLUSION

- Addressing Gauteng's complex air quality challenges requires a more coordinated, region-wide strategy that reflects the interconnected nature of the Gauteng City Region.
- The projects implemented and currently underway demonstrate the critical role of sustained funding and strategic partnerships – with specific reference to the Clean Air Fund and Breathe Cities support.



GAUTENG
PROVINCIAL GOVERNMENT
REPUBLIC OF SOUTH AFRICA

GGT2030
GROWING GAUTENG TOGETHER

Thank you

Lydia Muditambi

tel: 011 240 3193

email: lydia.muditambi@gauteng.gov.za