Improving Air Quality Seoul

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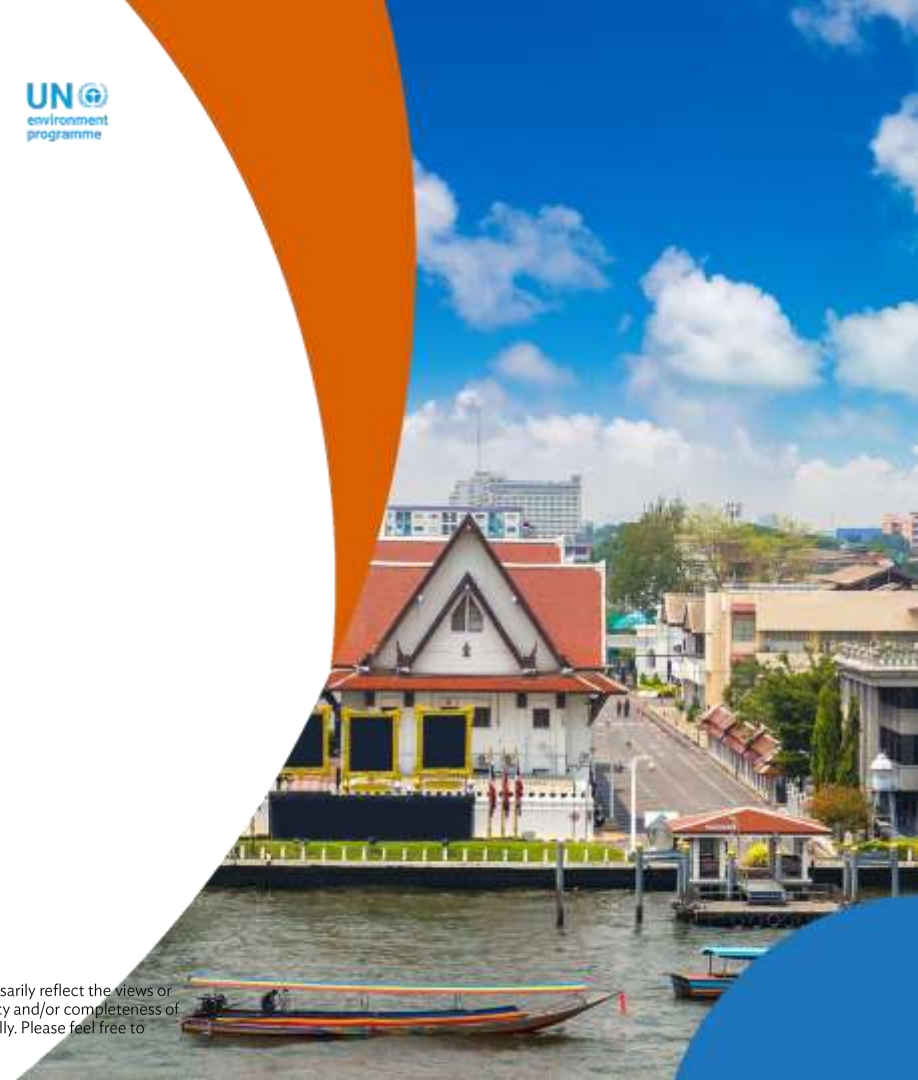


Contents

The gray hazy sky of Seoul in the early 2000s

20 years ago, PM 2.5 levels were over twice
(40 µg/m3 in 2002, 18 µg/m3 in 2025) those of today.
Vehicle emissions were a major source of air pollution in downtown Seoul.
Urgent measures were needed to protect public health.

1. Policy Achievements in Air Quality Improvement

We developed and implemented special measures under “Clear Seoul 2010”

Replaced diesel intra-city buses with CNG buses

- Introduced 8,234 CNG intra-city buses and installed 48 CNG stations (by 2011)

Promoted low-emissions measures by requiring diesel particulate filters (DPFs) for old diesel vehicles and encouraging early scrappage.

- Enacted the Ordinance of Designation and Restricted Areas of Pollution-causing Vehicles Operation and Driving Restriction of Such Vehicles (Sep. 2010)
  and took low-emission measures for 232,378 old diesel vehicles (by 2011)

Launched “Green Car Smart Seoul” initiative to accelerate electric vehicle adoption (2010)

- Deployed 410 electric vehicles—including buses operating around Namsan—and installed 62 temporary EV charging stations.

Our efforts continue to make Seoul's skies clearer

Continued low-emissions measures for old diesel vehicles; final project stage in 2022

- Implemented low-emission measures for 520,000 Level-5 vehicles by 2024 and are addressing the remaining 4,000 vehicle

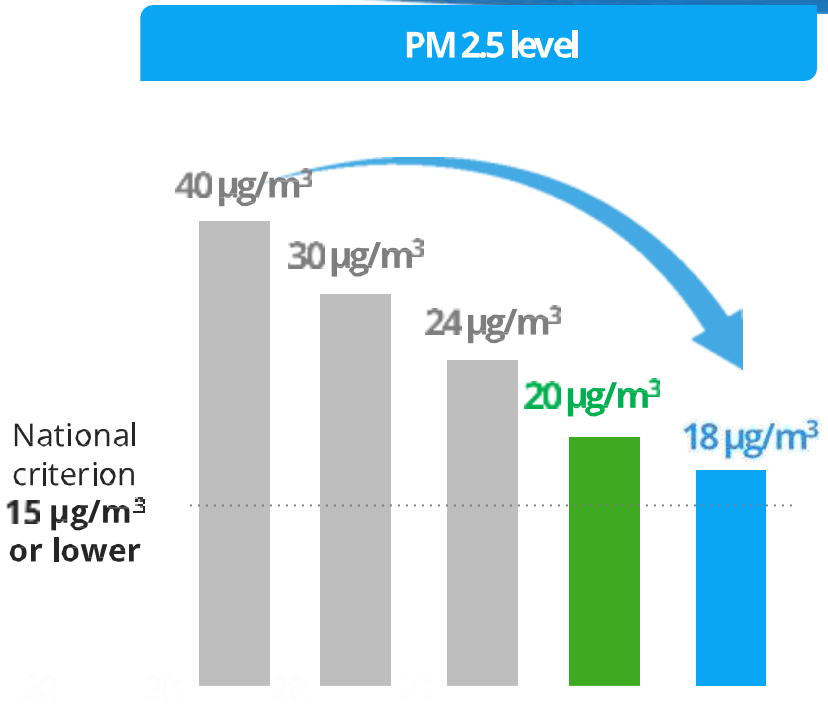
Introduced Green Transport Zones to limit traffic in the city center for the first time in the country (2019)

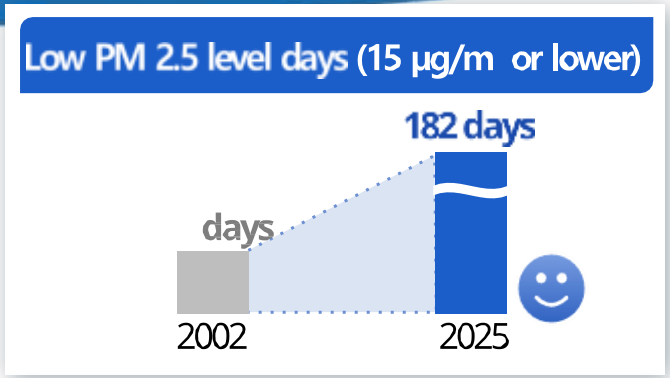
Introduced the emergency reduction measures (2017) and the Seasonal Management System (2019) to lower high PM levels

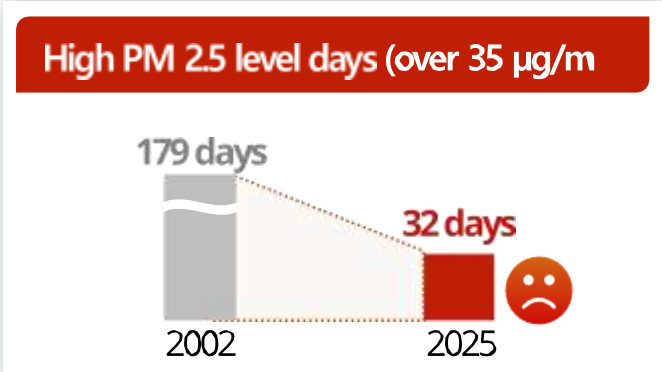
- PM2.5 concentrations have steadily declined, reaching their lowest levels during the seasonal management period (Dec–Mar)
- * 35μg/m^3 in 2018 → 28μg/m^3 in 2019 → 27μg/m^3 in 2020 → 25μg/m^3 in 2021→ 26μg/m^3 in 2022→ 22μg/m^3 in 2023

Announced a target to achieve a10% EV adoption rate by 2026 (Jan. 2022)

As a result, Seoul's skies are becoming clearer and brighter.







Toward even clearer skies in Seoul

Reach a PM 2.5 level of 15 μg/m³, comparable to Jeju, by 2026

Become one of the world's top 10 cities with the low PM 2.5 levels, comparable to London and Paris by 2030

PM 2.5 (μg/m³)	2021	2026	2030
	20	15 (National air quality criterion)	13

Halve air pollutant levels by 2030

Air pollutants (nitrogen oxides)	2021	2026	2030
	71,000 tons	53,000 tons	35,000 tons

Three key implementation strategies for “Clearer Seoul 2030”

1 | Accelerate the transition from diesel to low-emission vehicles

2 | Expand restrictions on high-polluting vehicles across Seoul

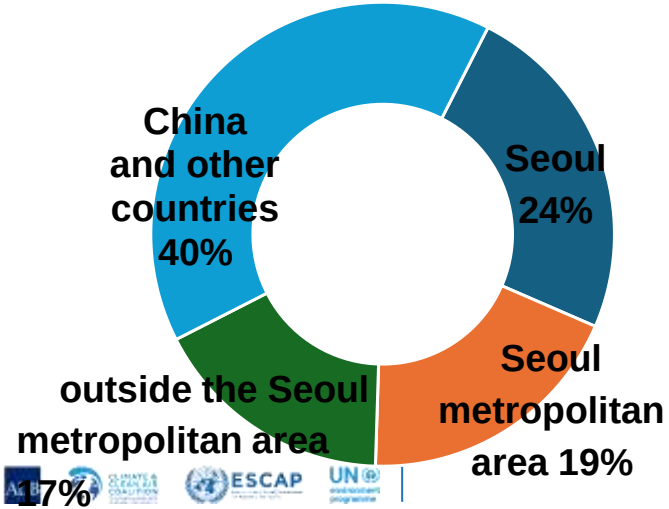
3 | Ensure clean air for all

Regional and Source Contributions to PM2.5 in Seoul

Regional

☞ Overseas sources including China: 40%

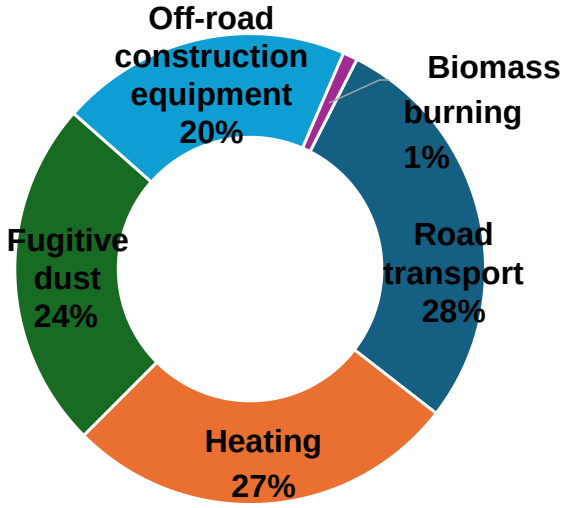
☞ Seoul : 24%, domestic sources including the Seoul Capital Area: 36%



Source

☞ Road transport : 28%, Heating 27%, Fugitive dust: 24%,

Off-road construction equipment: 20%, Biomass burning: 1%



Electrifying trucks and motorcycles by 2030

Diesel courier vehicle

- Diesel courier vehicles emit GHGs twice more than passenger cars; 10 years old or older diesel vehicles account for 20%.
- Introducing and distributing EV charging stations optimized for courier vehicles in logistics centers

Delivery motorcycles

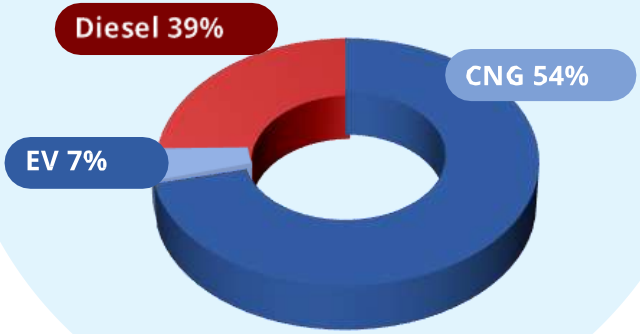
- Delivery motorcycles emit five times more air pollutants than passenger cars, and their numbers are rising with the growth of the food delivery market.
- Install 1,000 battery-swapping stations using public phone booths by 2025.

Diesel cleaning vehicles

- Transition diesel road sweepers and collection trucks to CNG and electric vehicles based on readiness by vehicle type.

Transition diesel buses entering Seoul to low-emission vehicles by 2030

39% of Gyeonggi and Incheon buses entering Seoul are still diesel vehicles



Coordinate the introducing low-emission buses through the Seoul-Gyeonggi-Incheon consultative body

Include a contractual clause requiring the use of for eco-friendly buses when negotiating new bus routes entering Seoul

Extend diesel vehicle operation restrictions to intra-city and town buses

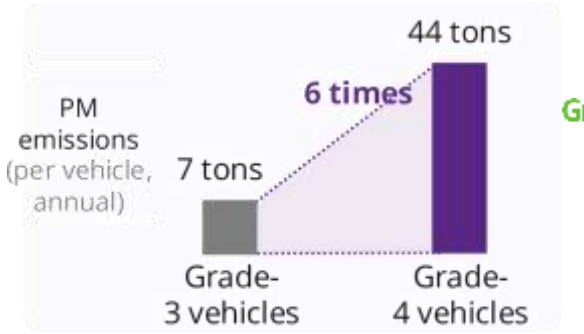
Expanding the operation restriction of vehicles that cause pollution to entire Seoul

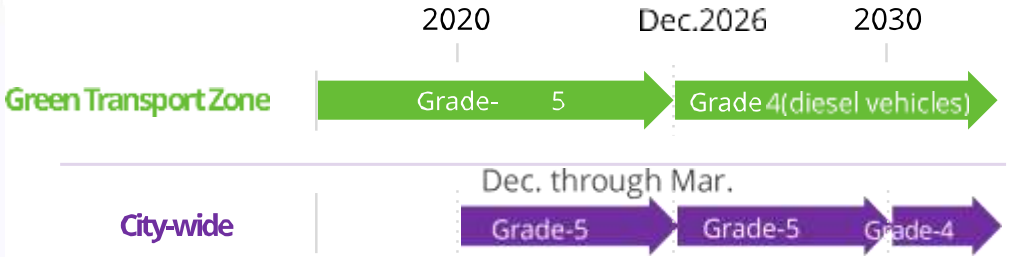
Grade-5 vehicles

Grade-5 vehicles are banned in Green Transport Zones year-round and during the Seasonal Management Period (Dec–Mar).The restriction will expand citywide in Dec 2026.

Grade-4 vehicles

Restrict the operation of Grade-4 vehicles in Green Transport Zones year-round from Dec 2026, and citywide across Seoul from 2030.





※ Pilot operation from Apr. through Nov. 2026 (No fines imposed; notification texts to be sent)

Early scrappage support for Grade-4 diesel vehicles

“Before implementing the operation restriction,”

Grade-5 diesel vehicles

- Low-emission measures have been implemented for 530,000 vehicles since the project began in 2007 (as of 2025).
- The low-emission vehicle program is nearing completion, with about 4,000 vehicles remaining.

Grade-4 diesel vehicles

- The early vehicle retirement program launched in 2023 has retired 26,000 vehicles as of 2025.
- Support the early retirement of 70,000 vehicles by 2030.

Promoting greener construction sites across Seoul

> "Public complaints about large construction sites (10,000 m² or larger) are increasing.
>
> Fugitive dust accounts for 24% and construction machinery for 20% of total PM emissions.

Establish a full-time construction site management system

- Install a dedicated PM emission monitoring system at large construction sites (10,000 m² or larger)
- Operate 206 green construction sites in Seoul
- Use low-emission construction machinery, implement vehicle ID, and clean nearby roads

Restrict outdated construction machinery and expand support

- Early retirement of construction equipment and other low-emission programs: 6,162 units completed (as of 2025)
- Environmental impact assessments restrict outdated construction machinery at construction sites with a floor area of **100,000 m²** or larger

  → The total floor area threshold for the restriction will be lowered to **1,000 m²** by 2030.

Expand air pollution prevention facilities

> "Heating and businesses account for 27% of the total PM 2.5 emissions"
>
> **However, occasional on-site inspections alone are insufficient for small businesses.**

Heating facilities

- 1.51 million Eco-Friendly Boilers and 6,823 Low-NOx Burners replaced(by 2025)

Small businesses (painting and plating facilities)

- Establish a real-time IoT system to monitor emission control facilities at all 635 industrial sites by 2025.

Enhance ozone management as an emerging risk factor

Annual average ozone concentrations have steadily increased over the past 20 years.

Long-term exposure to high ozone levels may cause lung damage and neurological disorders.

Reduce Public Exposure to Ozone

Ozone Action Day

- Ozone Action Day – Establish public action guidelines and develop outreach materials

Adjustment of Ozone Alert Zones

- (1995) 4 zones (Northeast / Northwest / Southwest / Southeast)→ (2011) 5 zones (including the Central Urban Area)→ (Apr 2025) Integrated into a single zone

Enhance the Forecast System

- (Previous) Apr. 15 – Oct. 15 → (Expanded) Apr. 1 – Oct. 31

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Pollutant Emission Reduction

Inspection and Guidance for Emission Sources

- Inspection and compliance guidance have been strengthened for VOC-emitting facilities with a significant impact on ozone formation.

Management of Unregulated Emission Sources

- Phased Mandatory Use of Eco-Friendly Coating Materials
- Support for VOC Abatement Facilities in Small-Scale Laundries
- Promote the Use of Eco-Friendly Consumer Products

Strengthening Policy Capacity

Establishe a Science-Based Policy Foundation

- Enhanced Research on Ozone Formation Mechanisms and Response Measures

Cooperation with the Central Government

- Strengthening Air Quality Cooperation between the Ministry of Environment and Local Authorities in the Seoul Metropolitan Area(Seoul, Incheon, and Gyeonggi Province)

2. Institutional Framework for Sustaining Policy Momentum

Institutional Framework for Sustaining Policy Momentum

Embedding Air Quality Monitoring and Reporting into Standard Operating Procedures

:Real-time data integration for immediate administrative respons

Maintaining Consistent Policy Implementation through a Performance-Based Evaluation System Linked to Long-Term Goals: Aligning Departmental Performance with "Clearer Seoul 2030"

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Thank you