

1. Comprehensive Heatwave Management Measures

□ Implementation of Seoul's Comprehensive Heatwave Plan

○ Establishment and operation of a heatwave situation management system

- Seoul annually formulates a comprehensive heatwave plan and diligently works to safeguard its citizens from heatwaves, including the prevention of heat-related illnesses and the safety of sensitive facilities like gasoline and natural gas installations, from May 20 to September 30.
- During the heatwave action period, the city activates the Heatwave Task Force to bolster preparedness and monitor indications of heatwave damage. In the event of a heatwave warning, the city operates the Comprehensive Heatwave Support Situation Room, engaging in activities such as protecting vulnerable groups like homeless individuals and residents in impoverished living conditions, as well as ensuring facility safety and conducting emergency rescue operations.

○ Implementation of heatwave reduction measures

- Seoul City has installed and operates 5,081 heatwave reduction facilities, including shade structures at 3,547 pedestrian crossings, cooling fog systems, and cooling roads. Annually, the city allocates both national and local funds to expand these facilities. Furthermore, to combat urban heat island effects, 171 road cleaning vehicles are deployed to focus on watering major arterial roads and central bus lanes.

Total	Shade Structure		Cooling Fog	Cooling Road	Cool Roof	Cool Pavement	Shade Tree	Smart Shelter	Hydroponic Facility
	Fixed	Smart							
5,081	3,105	442	164	20	166	5	206	203	578

○ Protection of vulnerable groups

- The city has designated and currently operates over 4,000 facilities, such as senior centers, welfare centers, and community service centers, as heatwave shelters to offer temporary relief for its citizens. Specifically, for vulnerable groups like elderly individuals living alone or those with limited incomes, experiencing difficulty sleeping during tropical nights, safe accommodations are provided at 67 locations.
- Households facing temporary financial hardships due to unemployment, business closures, or other issues caused by heatwaves can receive support from the Seoul Emergency Welfare program. This program provides assistance for living expenses, cooling equipment, and electricity bills, up to KRW 1.62 million for a family of four. Additionally, during heatwave warnings, approximately 27,600 "Disaster Helpers" in 25 districts conduct health and safety checks for vulnerable groups, including elderly

individuals living alone and people with disabilities, using methods such as phone calls, visits, and IoT monitoring.

- Heatwave shelters for homeless individuals and residents in disadvantaged living conditions are operated separately while adhering to hygiene guidelines. In addition, on-site heatwave emergency 119 units equipped with emergency supplies and cooling devices patrol areas frequently visited by homeless individuals, such as Seoul Station and Yeongdeungpo Station, to provide first aid to those exposed to the heatwave.
- When a heatwave warning is issued, construction workers are advised to suspend outdoor work during the midday hours (2 p.m. to 5 p.m.). Additionally, measures to protect construction workers from heat-related illnesses include implementing flexible work hours, ensuring rest breaks, and providing rest areas.

○ **Safety management of facilities**

- Special joint inspections are conducted by the city, districts, fire departments, and the Korea Gas Safety Corporation during the heatwave action period for facilities handling natural gas and gasoline products, where there is a risk of safety incidents.
- To prevent water contamination and prepare for increased water usage during the summer season, outdated facilities and mechanical equipment are repaired. Approximately 100 water supply vehicles and 150,000 bottles of Arisu (Seoul's tap water) are secured as a precaution for potential water shortages.

○ **Promotion of citizen action guidelines for preventing heatwave damage**

- The city disseminates information during heatwave warnings through its official social media channels such as Twitter, Facebook, and Instagram. Additionally, heatwave action guidelines and measures for coping with damage are communicated through outdoor electronic signs and videos inside subway stations.

2. Comprehensive Freeze Management Measures

Direction

To prevent freeze damage during the winter season, a comprehensive cold wave action plan is in place to protect vulnerable groups and ensure the safety of susceptible facilities.

Implementation of Seoul's Comprehensive Cold Wave Plan

○ **Establishment and operation of a cold wave situation management system**

- Seoul annually develops a comprehensive cold wave plan and diligently works to prevent winter freeze damage, including the prevention of cold-related illnesses and the

safety of vulnerable facilities such as gas and heat transport pipelines, and water supply systems, from November 15 to March 15 of the following year.

- During the cold wave action period, the city activates the Cold Wave Task Force to bolster preparedness and monitor signs of freeze damage. In the event of a cold wave warning, the city operates the Comprehensive Cold Wave Support Situation Room, engaging in activities such as protecting vulnerable groups like homeless individuals and residents in impoverished living conditions, as well as ensuring facility safety and conducting emergency rescue operations.

○ **Implementation of cold wave reduction measures**

- The city is fully committed to implementing cold wave reduction measures, including operating 4,825 facilities such as smart shelters, windbreak facilities, and heated chairs.

Category	Total	Smart Shelter	Windbreak Facility (Tent, etc.)	Heated Chair	Other
Locations	4,825	203	621	3,909	92

○ **Protection of vulnerable groups**

- The city has designated and currently operates over 1,300 facilities, such as senior centers, welfare centers, and community service centers, as cold wave shelters to provide temporary relief for its citizens.
- Households facing temporary financial hardships due to unemployment, business closures, or other issues caused by cold waves can benefit from the Seoul Emergency Welfare program, which provides support for living expenses, heating equipment, and electricity bills, up to KRW 3 million. Additionally, during cold wave warnings, approximately 27,600 "Disaster Helpers" in 25 districts conduct health and safety checks for vulnerable groups, including elderly individuals living alone and people with disabilities, through phone calls and visits.
- The 119 Life Safety Division conducts disaster prevention patrols to remove potential hazards and operates 119 mobile rescue units to provide first aid to homeless individuals and impoverished residents exposed to the cold wave in areas frequently visited by homeless people like Seoul Station and Yeongdeungpo Station.

○ **Safety management of facilities**

- Special joint inspections are conducted by the city, districts, fire departments, and the Korea Gas Safety Corporation during the cold wave action period for facilities like gas and heat transport pipelines, and water supply systems, where there is a risk of safety incidents.
- To ensure reliable water supply, the city has established a freezing prevention and

rapid recovery system for water supply systems (Water Supply Headquarters, 8 Water Supply Divisions, Seoul Facilities Corporation) during the winter season.

- **Promotion of citizen action guidelines for preventing cold wave damage**

- The city disseminates information during cold wave warnings through its official social media channels such as Twitter, Facebook, and Instagram. Additionally, cold wave action guidelines and measures for coping with damage are communicated through outdoor electronic signs and videos inside subway stations.

3. Comprehensive Heavy Snow Management Measures

Direction

○ **Ensuring Seoul's safety against heavy snow through preparedness for localized unexpected heavy snowfall and proactive snow removal measures**

- **Preparation for Unexpected Localized Snowfall**

- **Securing the golden time for snow removal**

- Snow clouds form along the west coast and typically reach Seoul approximately 50 to 90 minutes later, depending their travel speed (approximately 25 to 50 km/h) due to the influence of prevailing westerly winds. Therefore, proactive initial responses, such as preemptive application of snow removal agents and preparation of automatic snow removal equipment within the golden time for snow removal, are essential.

- **Ensuring adequate snow removal equipment and resources**

- The city will introduce specialized heavy equipment for pushing snow and ice-breaking machines to address compacted and icy areas. Snow removal vehicles will be registered as emergency vehicles, utilizing designated bus-only lanes to improve on-site accessibility for expedited snow removal operations.
- The city will also expand the availability of automatic snow removal equipment (under-road heating and brine spraying devices), snow removal vehicles, and spreaders to strengthen snow removal response capabilities.

- **Alleviating Traffic Congestion**

- **Selecting priority management areas and implementing measures**

- The city will designate and give special attention to areas such as slopes, regions challenging for snow removal, and those affected by heavy snowfall. Automatic brine spraying devices and under-road heating will be installed to facilitate swift snow

removal operations.

- The city will establish area-specific control plans for priority management areas to prepare for scenarios where vehicle passage becomes impossible due to heavy or unexpected snowfall during winter.

Minimizing Inconvenience for Citizens

Strengthening snow removal for sidewalks and side roads

- The city will significantly augment automatic snow removal equipment on residential slopes, transitioning from the existing manual sidewalk snow removal to mechanized methods utilizing equipment. This is aimed at enhancing snow removal efficiency and ensuring pedestrian safety.

Safety management of vulnerable facilities in the transportation sector

- The city will conduct patrols around the clock and deploy snow removal personnel to enhance the safety management of susceptible facilities, including subway stations, areas lacking canopies, and bus stops.

4. Comprehensive Earthquake Management Measures

Direction

- Establishing and implementing a plan to safeguard citizens' lives, property, and critical infrastructure from earthquake disasters, and promoting a uniform citywide earthquake disaster prevention policy.**

Seoul's Comprehensive Earthquake Disaster Prevention Plan (2021-2025) ※ **17 tasks across 4 sectors**

Sector 1

Securing the Seismic Resistance of Key Facilities (3 Tasks)

- ① **Conducting an assessment of seismic reinforcement status and overseeing project execution**
 - Seoul has identified a total of 2,465 public facilities for seismic reinforcement, including 780 public buildings, 868 urban railway facilities, 527 road facilities, 215 water facilities, 11 sewage treatment facilities, 8 utility tunnels, 16 hospital facilities, and 40 recreational facilities. The goal is to achieve a 100% seismic reinforcement rate by the end of 2030.
- ② **Ensuring earthquake resistance of Disaster Safety Headquarters (Comprehensive Situation Room) and public facilities**

- Seoul's initiatives to reinforce the earthquake resistance of public facilities are being implemented by respective departments. The earthquake resistance target has increased from 2,030 locations in Phase 1 (2016-2022) to 2,465 locations in Phase 2 (2023-2030), an increase of 435 locations. This is due to the addition of recreational facilities, expansion of urban railway management facilities, and detailed segmentation of tunnel section facilities.
- Among these, 2,350 locations (95.4%) have already secured earthquake resistance, and the remaining 113 locations are scheduled for reinforcement. A total of KRW 38.6 billion will be invested to complete this by 2030.
- The earthquake resistance of the Disaster Safety Headquarters and Disaster Situation Room (building and power/communication facilities) has been achieved for 18 out of the 26 targeted facilities (earthquake resistance rate of 69.2%).
- Among the 8 remaining unsecured facilities, 2 districts are in progress (completion of earthquake resistance evaluation), and the remaining 6 districts will secure earthquake resistance after the construction of city halls.

③ Policy and institutional support for earthquake resistance enhancement in the private sector - Housing Policy Office

- The operation of the Building Earthquake Resistance Self-Assessment System (Earthquake Safety Portal) allows citizens to make approximate judgments of their building's earthquake resistance without specialized knowledge and provides necessary earthquake preparedness information.
- The Earthquake Safety Facility Certification Support Project supports earthquake resistance evaluations for private building owners that wish to obtain earthquake safety facility certification. The project provides partial support for earthquake resistance evaluation costs and certification fees to encourage earthquake reinforcement.
- Additionally, incentives are provided for earthquake resistance reinforcement of private buildings, including reductions in income and corporate taxes, relaxation of site coverage and floor area ratio, reductions in acquisition and property taxes, and insurance premium discounts.

① Management of outdoor earthquake evacuation sites for citizens' swift evacuation

- Outdoor earthquake evacuation sites refer to safe outdoor spaces (school playgrounds, parks, open spaces, etc.) where citizens can temporarily seek shelter to protect themselves from hazards such as falling debris in the event of an earthquake.

- Seoul City has a total of 1,558 outdoor earthquake evacuation sites, comprising 1,016 school playgrounds, 489 parks, and 53 others (including parking lots).
- These sites are designated and managed by each district, with clear signage installed at easily identifiable locations such as entrances. Responsible managers are appointed for each evacuation site, and management records are created and maintained.
- Seoul City conducts inspections of outdoor earthquake evacuation site designation and management practices at least twice a year and provides citizens with information on outdoor earthquake evacuation sites through Seoul Safety Nuri (website) and the Seoul Safety App (mobile app).

② **Enhancing earthquake preparedness education and training**

- Since 2017, the Fire and Disaster Headquarters has been operating earthquake experience facilities to provide citizens with opportunities to experience and learn about earthquake disasters. Currently, these facilities are installed and operated in 21 fire stations.
- The 4 fire stations that are not yet operational (Jungbu Fire Station, Seodaemun Fire Station, Jongno Fire Station, and Jungnang Fire Station) are scheduled for sequential expansion and installation by 2025.

③ **Promoting and enhancing citizen action guidelines for earthquakes**

- Continuous efforts are being made to educate and promote citizen action guidelines for earthquakes to ensure citizen safety in the event of an earthquake. The Seoul Metropolitan Office of Education conducts mandatory disaster education for elementary, middle, high schools, and daycare centers twice a year. The citizen action guidelines are also consistently displayed on screens in city and district offices, as well as on websites.
- Additionally, citizen action guidelines for earthquakes are displayed on 43 screens in various locations within subway stations and on approximately 20,000 screens inside subway trains, promoting earthquake safety in the daily lives of citizens.
- Furthermore, the earthquake disaster on-site action manual is revised and managed twice a year to ensure rapid earthquake response. The disaster response system and procedures, roles and responsibilities of response departments, and cooperation protocols are consistently updated and managed to maintain current effectiveness.

④ **Installing and operating seismic accelerometers**

- Seismic accelerometers, mandated by Article 6 and 7 of the Act on the Preparation for Earthquakes and Volcanic Eruptions and Article 5 of the Enforcement Decree of the same Act, are installed in the country's key facilities to measure vibrations caused by earthquakes and to evaluate the safety of facilities (such as damage or integrity).
- In Seoul, 29 facilities are subject to legal installation, including City Hall, 25 district

offices, and three cable-stayed bridges. Currently, seismic accelerometers are installed and operational in 26 facilities.

- The remaining three district offices (Gwangjin-gu, Dongjak-gu, Jongno-gu) are scheduled for installation after the construction of new office buildings in 2025.

⑤ **Strengthening Collaboration for Earthquake Research (Earthquake Safety Center)**

- Pursuant to Article 6 (Earthquake Disaster Prevention Project) of the Seoul Metropolitan Government Ordinance on Earthquake Disaster Prevention, a team of experts in earthquake research has been organized and operated within the Seoul Institute since January 2020 to enhance Seoul's capability to respond to seismic disasters.
- The Disaster Safety Research Center at the Seoul Institute is engaged in earthquake-related disaster preparedness education, exhibitions, promotions, research, and policy development to enhance Seoul's earthquake and multi-disaster response capabilities.

Sector 3

Developing Response Plans for Earthquake-Related Disasters (6 Tasks)

- In preparation for various disaster scenarios that may arise in the event of an earthquake, the relevant departments are operating in coordination with the on-site action manual.
- The Fire and Disaster Headquarters oversees ① rescue and first aid measures (Disaster Response Division), ② measures for large-scale fires in densely populated areas (Disaster Response Division), and ③ measures for hazardous substance leaks (Prevention Division).
- The Citizens' Health Bureau oversees ④ health and medical measures in response to earthquakes (Medical and Health Policy Division), while the City Transportation Office coordinates the management of ⑤ land freight transport measures (Logistics Policy Division) and ⑥ measures for major subway accidents (Rapid Transit Division).

Sector 4

Response and Recovery for Early Stabilization (3 Tasks)

① **Disaster psychological recovery support measures - Disaster & Safety Management Division**

- Disaster psychological recovery support is provided to individuals such as disaster victims, temporary evacuees, eyewitnesses at disaster scenes, and participants in disaster relief and recovery activities, in accordance with Article 66 (5) of the Framework Act on the Management of Disasters and Safety and Article 73-2 of the Enforcement Decree of the same Act.

- Key activities include providing counseling services through the operation of disaster psychological recovery support centers. During normal times, psychological counseling, training for counseling volunteers, and management of a pool of expert personnel are conducted. In times of disaster, on-site counseling centers are set up in coordination with relief activities, and experts are dispatched.

② Establishment of a Disaster Relief System (Management of Disaster Relief Supplies, etc.)

- Seoul establishes and implements its disaster relief plan in accordance with Article 5 of the Disaster Relief Act (Formulation of Disaster Relief Plan) and Article 4 of the Enforcement Decree of the same Act.
- The purpose of disaster relief is to conduct relief activities for disaster victims and temporary disaster-affected evacuees to ensure the protection and stability of their lives.
- Key activities include support and management of disaster relief supplies, designation and operation of temporary shelters, support for medical and quarantine activities, and operation and management of disaster relief funds (for recovery expenses, livelihood support, etc.).

③ Formation of an Earthquake Damage Cause Investigation Team and Seismic Facility Risk Assessment Management Team

- The Seoul Seismic Facility Risk Assessment Management Team is established and managed in accordance with Article 21 (Risk Assessment of Damaged Facilities) of the Act on the Preparation for Earthquakes and Volcanic Eruptions and the Seoul Metropolitan Government Ordinance on the Management of Seismic Facility Risk Assessment.
- The primary objective of the Seoul Seismic Facility Risk Assessment Management Team is to ensure the safety of citizens by preventing secondary damage such as additional collapses of structures after an earthquake. The team consists of a total of 20 individuals (1 leader and 19 members) in 10 fields including earthquake phenomena analysis, architecture, and transportation.
- The Seoul Earthquake Damage Cause Investigation Team is formed and managed based on Article 20 (Investigation and Analysis of Causes of Earthquake and Volcano Disasters and Organization and Operation of Committees for Investigating Causes of Earthquake and Volcano Disasters) of the Act on the Preparation for Earthquakes and Volcanic Eruptions and the Seoul Metropolitan Government Ordinance on the Establishment and Operation of the Seoul Earthquake Damage Cause Team.

- The main objective of the Seoul Earthquake Damage Cause Investigation Team is to investigate and analyze the causes of earthquake damage in affected areas, and incorporate the findings into earthquake preparedness measures to mitigate future earthquake-related disasters. The team is composed of 16 individuals (1 team leader and 15 members) in five fields, including architecture, civil engineering, and geotechnical engineering.

5. Comprehensive Measures for Storms and Floods

Direction

- Achieving zero casualties through comprehensive disaster preparedness
- Maximizing the utilization of local resources until disaster prevention facilities are expanded, enhancing response capabilities through cooperation with relevant agencies, and instilling safety awareness

Safety Measures for Storms and Floods

○ Flood Forecast and Community Partner System

- In 2023, Seoul became the first city in Korea to implement a "flood forecast and warning system" to notify citizens of impending floods. The city also introduced the "Community Partner" service, where neighboring residents assist in the rapid evacuation of basement households during flood forecasts or warnings. When flood forecasts or warnings are issued, districts, police, fire departments, community partners, and citizens respond as per their respective situations. Upon flood forecasts, community partners promptly visit vulnerable households and assess nearby hazards. Upon flood warnings, they swiftly evacuate affected residents to safety. District offices, police, and fire departments also prepare for flood situations according to their respective protocols. Seoul will continuously work on promotion, education, and training to firmly establish these safety measures.

• Overview of Flood Forecast and Warning System •

- ✓ **(Flood Forecast)** ① Triggered by any of the following: ① Simultaneous occurrence of 20mm of rainfall in 15 minutes and 55mm of rainfall in 1 hour, ② 30mm of rainfall in 15 minutes, ③ Road flooding reaching 15cm (City → District, Relevant Agencies)
 - ※ **Advance Notice:** Automatic text message sent when 20mm of rainfall in 15 minutes or 55mm of rainfall in 1 hour is reached
- ✓ **(Flood Warning)** Issued as necessary based on CCTV and on-site confirmation (District → General Public)