Smart Intersection Construction Project

Direction

○ To address traffic congestion, the Seoul Metropolitan Government is installing smart intersections at six intersections along Hwarang-ro in northeastern Seoul, notorious for chronic traffic problems. Through these intersections, we will continuously collect traffic data and develop optimal signal operation strategies to minimize waiting times.

□ 2030 Master Plan for Intelligent Transport Systems (ITS)

○ Expansion of the Smart Signal Operation System

- The Ministry of Land, Infrastructure and Transport (MOLIT) is mandated to devise a national-level foundational plan for intelligent transport systems every decade, pursuant to Article 73 (Creation of Master Plans for Intelligent Transport Systems) of the National Transport System Efficiency Act.
- Accordingly, MOLIT has established the master plan for intelligent transport systems (ITS) and crafted a scheme to implement a citywide transportation management system. This system optimizes network signals based on real-time analysis of traffic patterns in the road network, using data from smart intersections.
- According to a MOLIT press release dated April 2021, smart intersections have been deployed in 1,224 locations across 31 local jurisdictions in South Korea. They have proven effective in enhancing traffic flow on major roads during both peak and off-peak hours.
- Seoul City has developed plans to establish a digital road infrastructure in line with the 2030 Master Plan for Intelligent Transportation Systems (ITS). This initiative includes implementing adaptable signal operation on major arterial roads in northeastern Seoul (Hwarang-ro, Nowon-ro, and Dongil-ro), which suffer chronic traffic congestion due to vehicles entering and exiting the city borders and expressways.
- Major arterial roads in northeastern Seoul exhibit an average driving speed 6.2% lower than the Seoul average. This necessitates signal operation plans tailored to the area's unique characteristics. Consequently, smart CCTV will be installed at six intersections in the region for continuous traffic volume monitoring to derive an optimal signal operation strategy.

□ Functionalities and Plans of Smart Intersections

- **Continuous collection of intersection traffic information using AI CCTV and LIDAR detectors, alongside automatic generation and analysis of intersection operation metrics.**
  - Seoul City aims to continuously collect and analyze traffic data, including lane-specific traffic volume, approach road data, vehicle-specific (rotational) traffic volume, occupancy rates, speeds, and queue lengths. Additionally, the city seeks to automatically extract traffic metrics and employ deep learning image analytic algorithms for service level assessment.
- **Formulation of a flexible and intelligent signal operation strategy considering intersection characteristics.**
  - Seoul's objective is to offer optimized signal waiting times through the implementation of a dynamic and intelligent signal operation strategy. This strategy factors in not only simple intersection traffic volume but also road occupancy status. By utilizing intersection traffic data collected at all times, customized signal operation plans will be developed for each season, day of the week, and time of day. The city also plans to analyze the effectiveness of delay reduction through pre- and post-implementation comparisons.
- **Enhancing intersection safety through continuous monitoring**
  - Seoul aims to promptly address events (traffic accidents) by identifying unexpected situations, such as stopped vehicles, while strengthening pedestrian safety by monitoring approaching traffic volume by direction and detecting pedestrians.