

## Mapping of road sections vulnerable to ice in Seoul city using a Mobile Road Weather Vehicle

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Road sections vulnerable to ice are evaluated from the perspective of the road surface material and geometric structure using the data observed by a mobile road weather vehicle in the Seoul city, Korea. The mobile road weather vehicle can measure variables about the road weather in real time. The mobile road weather vehicle measures air temperature, pressure, wind speed, wind direction, precipitation, precipitation detection, solar radiation, net radiation, road surface temperature, and road surface status. Measurement period is winter season in the midmost Seoul city from 7 February 2017 to 10 February 2017. The observation route by the mobile road weather vehicle includes expressways and main roads in the Seoul city. Two surface materials, concrete and asphalt, and four geometric structures, over-ground, bridge, under-path, and tunnel, are considered. The results showed that (1) the road surface temperature in some sections are lower than the mean road surface temperature by more than 10°C; (2) mean road surface temperatures on asphalt roads are higher than on concrete roads in the case of over-ground and bridge structures, while the mean road surface temperatures on concrete roads are higher than on asphalt roads for tunnel structures; (3) road surface temperatures are affected not only by elevation, surface material, and geometric structure, but also by local and temporal shading due to installed soundproof walls or roadside trees. Based on this road surface temperature deviation analysis, vulnerable road sections on observation route are evaluated and can be used to provide an advisories or warnings to drivers.

**Keywords:** Mobile Road Weather Vehicle, Road material and geometric structure, Road weather information system, Seoul city, Thermal mapping