A. Characteristics of missing pattern

In our study, two main missing types were considered, i.e. random missing, and block missing. As shown in Figure S1, the missing data under random missing are scattered in different time positions, and the missing data under block missing shows continuous distribution in time. Similarly, in the spatial dimension, random missing means that the traffic flow data of the target road section is missing, and the traffic flow data of its adjacent road sections are probably not missing. Block missing means that the traffic flow data of the target road section is missing, and the traffic flow data of its adjacent road sections are missing with a high probability. In the real scene, the random missing is mainly caused by the poor signal, and the random missing is generally caused by equipment failure or power failure.
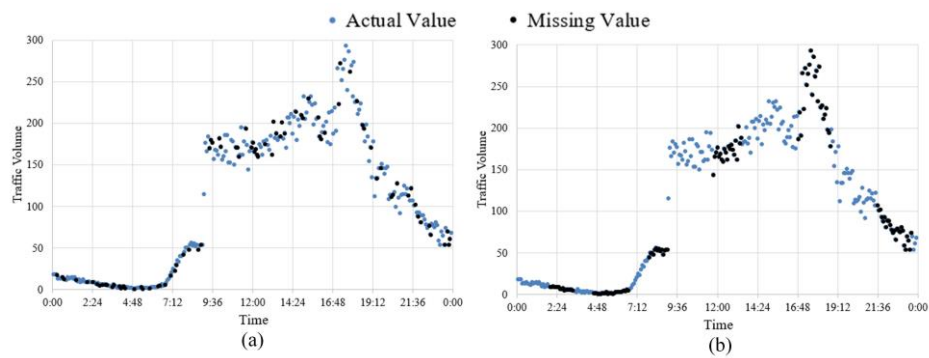

Figure S1. Illustration of missing traffic flow on a specific road segment: (a) random missing, (b) block missing