



Abstract

A Study of Inferring Factors of the Commuter's Mode Choice considering the Introduction of the Autonomous Driving Shuttle Services

This study conducted an analysis of the commuter's mode choice and the choice factors when the autonomous driving shuttle services are provided for commuting. A total of 60 autonomous driving vehicles made by 28 companies and institutes were temporarily permitted in Korea as of 2018. The Gyeonggi Zero Shuttle was allowed temporary services as of March 2018 and is holding a trial run. Ordinary passengers evaluated the vehicle facility and driving safety of the trial run. An empirical test of the autonomous driving vehicles has been conducted on 10 regions and 17 roadway segments in Korea by June 2020. The test has been focused on the performance examination of the autonomous driving vehicles.

However, an autonomous vehicle will anyhow be used as a transport mode, and particularly the autonomous driving shuttle should cover the demand for transit services. This study thus assumes that the autonomous driving shuttle is used as transit services and analyzes future mode choices of the passengers currently using a car or a transit mode and factors influencing such choices.

An analysis using an experimental design model estimated on the survey data of 'An Empirical Study of Pangyo Zero Shuttle Operation (II)' in 2019 suggests that the transit choice proportion will increase by 17.1% from 57.2% to 74.3%. The analysis of the choice factors reveals that the shuttle services are preferred when the transit fares are cheaper. Also, commuters prefer the transit use when the commuting duration is short as 30 minutes or less or long as 90 minutes or more, whereas preferring the car use when it is around 60 minutes.

The implications of the results are following. First, the commercial operation of the autonomous driving shuttle as a transit service would need commuters to use the shuttle at a low price while connecting the shuttle riding with the use of the existing transit services. Secondly, Gyeonggi Province needs to establish a master plan for introducing the autonomous driving shuttle services, and the municipalities of the province should provide empirical test beds for the autonomous driving, the details of which should also suit the composition of the concerned municipalities' related industries. Finally, a systematic management of the data generated from the autonomous driving shuttle operation is required in order to utilize the big data of the autonomous driving shuttle currently in operation.

Keyword

Autonomous Driving, Commuter's Mode Choice, Pangyo Zero Shuttle, Factorial Design Model, Plackett-Burman