

The Evidence of Critical Issues in Transportation Infrastructures of Bangladesh to Introduce Connected and Autonomous Vehicles

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Abstract - Connected and Autonomous Vehicles (CAVs) have been around for quite some time, and the last decade has seen an upswing of the technology in the transport industry. While some countries have already been laying the groundwork for the successful implementation of CAVs, developing countries like Bangladesh in particular have been lagging in the process. However, Bangladesh is investing in road infrastructure development to comply with Intelligent Transportation Systems (ITS) demand, with the introduction of Electronic Toll Collection (ETC) system establishment in major highways. Introduction of CAVs to any country, of course, depends on market dynamics shaped by people's willingness to pay. The real challenge however lies with the sophisticated connectivity and maintenance demand of CAVs, built upon an infrastructure that requires exacting standards. This study explores such requirements, ranging from traffic signs and road markings, and adequate parking facilities to proper drainage and geometric structure of roadways, following existing guidelines and/or common practices in some of the developed countries. A qualitative evidence synthesis approach is undertaken later to investigate the current infrastructural capability of Bangladesh with respect to these observed benchmarks. In order to assess geometric features, pavement condition, and road markings, a total of 1036 photos were collected and later analyzed from three important intersections of the city of Dhaka. This method was backed up by an extensive literature review of previous studies pertinent to the features that fall under the purview of this study. Key limitations found through the study were assessed in the light of possible measures to overcome them. Finally, recommendations are presented, which albeit need to be investigated of their feasibility and economic viability first. This study intends to provide a baseline of the infrastructure required for introducing the CAVs, which is believed to be applicable for other developing countries with a similar situation.

Keywords: Connected and Autonomous Vehicles (CAV), Autonomous Vehicles (AV), Infrastructure Requirements, Bangladesh