MATC BARRIER: METHOD OVERVIEW

A complimentary system is proposed which operates independent of existing ADAS. The method involves infrastructure technology to provide a new level of redundancy to elevate the functionality of vehicle autonomy. The method consists of three sections denoted as: Local Path Generation, Localization/Communication and Vehicle Guidance/Warning. The proposed method aims to identify geometries of travel lanes and develop a target path, independent of the vehicle. The system will also triangulate the vehicle’s position, and transmit the path data to the vehicle for both immediate and future paths. Then, the vehicle will identify its current position and kinematics with respect to the path and determine what corrective actions, if any, are needed.

**Objectives**

A series of independent objectives were created to evaluate the feasibility of each of the three sections and the implementation of them to determine to best overall solution. The objectives for each independent sub-system are able to be evaluated under different criteria.

**Local Path Generation**

Selecting a proper road geometry mapping method was based as per vehicle dynamics limits’. The method needs to work with all types of vehicles, as long as they have the necessary hardware to receive the data.

**Localization/Communication**

The data being transmitted to the vehicle needs to be comprehensive enough to provide necessary information so the vehicle can stay on the roadway. Also needs to be reliable in all environments and conditions so that the vehicle can effectively navigate the roadway at all times. Finally, data transmitted cannot require a significant amount of transmission bandwidth or processing time.

**Vehicle Guidance/Warning**

A vehicle controller needs to be developed to verify that the information sent to the vehicle can be successfully used to navigate the given roadway while minimizing data transmission. The control algorithm can work in two parts. First, it must be able to warn the driver that the vehicle is trending off of the road or the vehicle has left the road. Secondly, as an autonomous navigation tool to operate without the involvement of a human driver.

**Implementation**

In future phases of the project it will be used as the basis for a proof of concept prototype. Such that the method chosen must able to be realistically installed and maintained with a reasonable amount of cost to the public and monitoring agencies.