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Project 1 (First Draft)

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1 Introduction

New York City (NYC) would like to implement a fleet of autonomous vehicles (AV) by 2020 as part of a larger initiative of establishing itself as a world leader in smart city infrastructure. Because of the still novel nature of AV technology, there is a great amount of uncertainty on how its implementation will affect traffic issues, such as safety, congestion and environmental impacts. In such context, city officials wish to understand which alternatives they should consider and how they should proceed in terms of strategies in regards to AV technology within the NYC fleet of vehicles. This study will focus on the alternatives available to implement an automatic merging system from AutoMerge, Inc. (AM) specifically in NYC's 40-passenger transit buses. It will compare different alternative strategies by performing a Benefit Cost Analysis (BCA) to assess how these different options impact the general population of NYC, which are the main stakeholders in this issue. Among the factors to be included in the analysis are: safety, energy consumption, air pollution, GHG emissions, weather conditions and traffic flow. Section 2 presents a detailed description of the problem and the alternatives analyzed. Section 3 presents the analysis of each alternative and the results found. In section 4 a sensitivity analysis is performed for some inputs. Section 5 discusses the results of the analyses and section 6 presents the conclusion and recommendations of this study.

2 Problem Description

2.1 Benefits & Costs

Table 1 presents the different direct and indirect costs associated with the implementation of AV technology in NYC bus fleet.

2.2 Assumptions

Write about assumptions.

Table 1: Costs associated with implementing the AV technology in NYC buses

Capital costs of installing AM system in buses
O & M costs of AM system
Cost of building simulator facility to train drivers
Traffic fatalities
Traffic injuries
Traffic Congestion
Emission of air pollutants
Emission of Greenhouse gases (GHG)
Cost of potential pilot test (*)

(*) only applicable to alternative 2

2.3 Alternatives

Three different alternatives will be analyzed in this study. The following list presents these three alternatives:

Alternative 1: Do not implement AV.

This is the reference alternative. AV is not implemented and the benefits and costs are the ones already incurred to the population.

Alternative 2: Perform a pilot test with an amount of n buses before deciding to implement AV.

In this alternative, the city performs a pilot test with a predefined amount of n buses. The pilot test has an associated fixed cost, but its brings more information about the actual benefits of AV on traffic congestion.

Alternative 3: Implement AV in the NYC bus fleet.

In this alternative, the city implements the AV technology in the bus fleet directly (without performing any pilot tests).

3 Analysis and Results

Write results

3.1 Alternative 1: Don't Implement AV

3.2 Alternative 2: Pilot test

3.3 Alternative 3: Implement AV

4 Sensitivity Analysis

Write sensitivity analysis

5 Discussion

Write Discussion

6 Conclusion & Recommendations

Write Conclusion and Recommendations