# Abstract

# Introduction

## Traffic in The District of Columbia

Add source and info here for how bad traffic is

In order to combat the heavy volume of traffic into the District of Columbia, Virginia has added tolling lanes to Interstate Route 66. These lanes flow eastbound in the morning and westbound in the evening, according with the heaviest traffic. These lanes function as both High Occupancy Vehicle (HOV) lanes, which can be used for free, and tolling lanes for those travelers who wish to pay.

## Problem Statement

The goal of adding tolling and HOV lanes can be interpreted as to adjust traffic patterns of travelers. The goal of this study is to measure if consumers have changed their traffic patterns. This study is focusing on measuring if traffic patterns have changed based on the origin and destination of the trips. This means that the entire traffic of roadways will not be the main focus of the study but rather the proportion a pathway is used relative to the entire traffic for specific starting and ending locations.

## Inrix Data

Inrix operates as a third-party data compiler to mediate the data exchange between GPS service companies and data analysts. These GPS service companies provide consumers with GPS traveling information, which include but are not limited to: route planning, travel times, and police locations. These companies store the data that the consumer devices send to them. These data include the consumers position and speed. Companies likely store this data to make travel time predictions and sell to third parties such as Inrix. Inrix compiles traffic data from multiple different service companies including add companies that inrix pulls from. This compilation of data sets is then cleaned and processed. This process involves encoding user identifications and company identification for privacy.

The Virginia Department of Transportation (VDOT) has purchased multiple Inrix data sets. The data sets used for this study were the Inrix waypoint and the Inrix trips data sets. The time period for the data sets purchased were two three-month periods, March through May, for 2017 and 2018 resulting in a total of six months’ worth of data. The data sets provided were for all twenty four hours seven days a week. The Waypoint data set includes what is the waypoint data. The Trip data set is organized by individual trips made by a consumer. Each unique trip contains a unique trip identifier, trip start and end coordinates, start and end time of trip and other attributes not used in this study.

The Inrix data was provided to VDOT via “gz” zipped files. The size of the trips data set was size of trips data set (zipped or unzipped). This data set was provided in 5 files for each year, for a total of 10 files. The size of the waypoint data was size of waypoint data. This data set was provided in number of files.

# Literature Review

# Methodology

## Date Filtering

As the problem the study attempts to solve involves the I-66 HOV and toll lanes the dates of the study were carefully selected to best isolate the possible changes.

Need to have the only one dependent variable, and that is that there are now tolling and HOV lanes. This means we can only look at days where the tolling is active. Only dates where tolling was active were dates that were considered for the study.

## Origin and Destination Mapping

The purchased data set was for Northern Virginia. To best fit the study at hand, the trip search area was condensed. The study was condensed into two separate grids, one for the Northern Virginia (NOVA) area, and the other for the DC area. These two regions were identified in order to best represent the commuter traffic into and out of the DC area. See grids

Each point on each grid (NOVA and DC) represent a

## Time Mapping

## Path Mapping

# Findings

# Conclusion

# Sources