Determining Sample Measures of Distracted Driving, Distracted Pedestrian Activities and Impacts of Such Behavior on Traffic Operations at Signalized Intersections

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CONVERSION FACTORS

APPROXIMATE CONVERSIONS TO SI UNITS

SYMBOL	WHEN YOU KNOW	MULTIPLY BY	TO FIND	SYMBOL
LENGTH				
in	inches	25.4	millimeters	mm
ft	feet	0.305	meters	m
yd	yards	0.914	meters	m
mi	miles	1.61	kilometers	km
AREA				
in^2	square inches	645.2	square millimeters	mm^2
ft^2	square feet	0.093	square meters	m^2
yd^2	square yard	0.836	square meters	m^2
ac	acres	0.405	hectares	ha
mi^2	square miles	2.59	square kilometers	km^2
VOLUME				
fl oz	fluid ounces	29.57	milliliters	mL
gal	gallons	3.785	liters	L
ft^3	cubic feet	0.028	cubic meters	m^3
yd^3	cubic yards	0.765	cubic meters	m^3
NOTE: volumes greater than 1000 L shall be shown in m^3				
MASS				
oz	ounces	28.35	grams	g
lb	pounds	0.454	kilograms	kg
T	short tons (2000 lb)	0.907	Mega grams (or "metric ton")	Mg (or "t")

*SI is the symbol for the International System of Units. Appropriate rounding should be made to comply with Section 4 of ASTM E380. (Revised March 2003)

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16. Abstract

Distracted drivers and pedestrians pose one of the most difficult challenges to ensuring a safe and efficient transportation system. Modern communications have delivered greater convenience. However, this has come at the cost of attention spans. Safety has been thoroughly explored in terms of distracted driving and pedestrians. However, impacts on traffic operations have received minimal research attention. Few studies provided a theoretical mechanism for affecting intersection operations but failed to quantify the real-life impacts on traffic operations. Furthermore, new Florida laws prohibit cellphone usage while driving but is allowed when the vehicle is stationary, which may result in increased cellphone use at red lights. This research aims to quantify how distracted driving and pedestrians impact vehicle headways at signalized intersections. Thousands of observations were collected from 21 approaches at 15 intersections in Central Florida, covering a variety of land uses, intersection configurations, and periods of high demand. The results demonstrated that the percentage of distracted drivers in the through and left movements were approximately 50% and 87%, respectively. Drivers were more distracted in commercial and tourist areas and less attentive to the signal changes than in school and residential areas. Almost third of the drivers were distracted by their cell phone for the through and left movements which had the primary effect on headway among distraction types with a 20% increase, which resulted in reducing the intersection capacity by 16.5%. Overall, the effect of distraction on the discharge headway at signalized intersections is significant. The base headway increased by 0.93 sec, which resulted in reducing the intersections' capacity by 45.5%. The pedestrians' analysis showed that around half the pedestrians were distracted. Pedestrians are less distracted in school and college land use than other land-use types. Although distractions among pedestrians increased their crossing time by nearly 4%, the extra time caused by their distractions was almost equal to or less than the drivers' startup lost time of 2.0 seconds. Distracted pedestrians did not negatively impact traffic operations at signalized intersections.

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EXECUTIVE SUMMARY

Distracted driving activities pose one of the most difficult challenges to ensuring a safe and efficient transportation system. The impacts of distracted driving on traffic safety have been explored in depth, with statistics showing that texting while driving is so detrimental to reaction time and individual performance that the risks are comparable to driving under the influence. However, the impact on traffic efficiency is one aspect that has been overlooked or has not been explored much in the literature. It is clear that distracted driving can have impacts that negatively affect smooth traffic flow and operations aside from increased accident rates, such as poor speed control, excessive lane variability, lowered reaction times, and increased delays. Furthermore, new Florida laws prohibit cellphone usage while driving; however, use is allowed when the vehicle is stationary, which is more likely to be during the red phase. Often times this results in the driver being unprepared when the signal turns green, causing further delay on top of the initial reaction time. This can be quantified in intersection analysis as part of lost time, which is the difference between the average headway and the headway for the first few cars, which is larger due to perception time, reaction time, and now, distraction time. As such, distracted driving can be a serious detriment to intersection capacity, thereby affecting both operations and capacity. This study aims to determine the impacts of distraction types for both motorists and pedestrians on traffic operations. The study also measures the effects of different distraction types on headway for motorists and crossing time for pedestrians at signalized intersections and consequently its operational capacity by testing the statistical significance between distracted and non-distracted drivers. Data collection was conducted at several locations to cover different land use, intersection configuration, and periods of high demand.

In order to properly observe drivers distracted behavior at intersections, it was necessary to procure high-resolution video cameras to record different types of driver distractions through the vehicle windows across multiple lanes. At the same time, the camera placement is crucial to capture the behavior of as many drivers as possible per lane in the queues without influencing their behavior or grabbing their attention. A solar powered trailer SPTT-3000 was acquired in addition to two (2) high resolution Bosch IP8000i cameras. The trailer is comprised of a 30 ft solar-powered portable tower from Solar Tech. The trailer is powered by batteries that store the power generated by the solar panels connected to the tower.

The data were collected from 21 approaches at 15 intersections in Central Florida, covering a variety of land uses, intersection configurations, and periods of high demand. The data recording schedule was set to occur Tuesday to Friday during the AM peak (7 to 9 AM), mid-day peak (12 to 2 PM), and PM peak (4 to 8 PM). The team developed a customized professional video editing software to observe and analyze the data with high quality. The software assists the researchers in detecting, quantifying, and documenting the level of driver distraction that may occur when a light signal switches to green. Two videos recorded by two cameras at the intersection depict both the drivers stopping at the stop bar and the opposing traffic light. The videos are synchronized, so the delay in driver response is measured accurately.

The collected data included the weather, intersection name, land-use, number of through lanes, lane number, distraction cause (cell phone, eating/drinking, smoking, passengers (the “passengers” distraction is when the driver is distracted by talking to the other passengers in the vehicle.), dashboard (is when a driver is distracted by using the vehicle’s dashboard), other, no distraction

and not identified distraction), vehicle position in the queue, the timestamp when the light turns green and when the vehicle front axle crossed the intersection stop bar. The timestamp was recorded to the nearest two (2) decimal places.

For the through movement, the analysis showed that almost half the drivers were distracted. Several distraction types were extracted from the data. The results revealed that motorists distracted by cell phone usage had a greater impact on headway and increased it by 31% resulting in higher delays. However, other distractions were not accurately identified due to various reasons, such as sun reflection and shadows. Those distractions also had the primary effect on headway (41%). In commercial and mixed land uses, drivers are less distracted in the morning than in the afternoon. Drivers tend to be more focused in the morning to reach their work or destination on time, while they are more distracted and tired in the afternoon. Driving in residential and school land use forces drivers to be alert and less distracted due to students' and pedestrians' crossings. Furthermore, school areas are usually surrounded by law enforcement, reduced speed limit, and warning signs. Motorists are more likely to be distracted by their phones in the afternoon peaks (MD and PM) than in the morning peak (AM). Also, drivers who are considered first vehicle in the queue caused the highest delay compared to the remaining positions. The statistical models proved that distraction has a significant impact on headway with values doubling the mean headway compared to non-distracted drivers. This means that, on average, the gap between any two consecutive vehicles will be doubled, which consequently decreases the intersection capacity by approximately half along with significant delays. The analysis also highlighted an interesting fact that the distraction caused by the tenth vehicle in the queue had a detrimental effect on the intersection capacity because the green phase gaps out before reaching the stop bar.

For the left movement, the analysis demonstrated that most drivers were distracted (87%). Cell phone distractions represented 28% of all distractions and caused the highest delays in the morning peak. Distractions caused by dashboard usage and talking to other passengers were significant and increased the delay in the afternoon peak (PM). Drivers in the first position in the queue were more distracted in the afternoon peak (PM) than those in the morning peak (AM). This result is consistent with the results of the through movement analysis, as drivers, in general, are more focused and alert in the morning peak than in the afternoon peak. Residential & School land use showed less distractions and improved delays, as drivers are cautious when driving in these areas. In contrast, mixed land use increased the delay, especially in commercial and tourist areas, as motorists are usually distracted by the various stores around and searching for their destination.

The pedestrian analysis showed that approximately half of the pedestrians were distracted. Pedestrians, in general, pay less attention to their surroundings. Pedestrians were less distracted in rainy weather than in cloudy or sunny weather, as they tend to cross faster to avoid the rain. Walking in mixed land use (residential and commercial) significantly increased the crossing time than in school and college land uses. This increase in the crossing time is because pedestrians were found to be distracted by retail stores in their surroundings. The analysis demonstrated that the walking speed in rainy conditions is increased in middle/old age groups, especially when being distracted. However, their speed was lower when walking alone and in mixed-use areas compared to when being in groups and in a school/college setting. The leading cause of distractions among groups was talking to each other, which caused a significant increase in the crossing time. The young age was found to be walking slower, especially when distracted by talking to others and in

groups in a school/college setting compared to when being alone and in a mixed-use area. The females were found to be distracted by talking to others which reduced their walking speed compared to the No Distraction case, but they were more alert in mixed-use areas compared to the school/college land use with a faster speed. On the other hand, the males were found to be distracted by "Other" causes such as looking and staring away from the intersection but being more alert, which increased their walking speed, especially in mixed-use areas than in school/college areas. They were also found to be predominantly crossing alone than in groups which also reflected higher speed. Texting/Talking on a phone distraction and other types of distractions contributed to a third of the distraction causes. Most pedestrians in this study were young (98%). In general, the analysis showed that distracted pedestrians did not significantly impact the intersections' traffic operations.

Due to distractions, the headway soared from 2 seconds to 4 seconds. This significant rise resulted in the loss of nearly half the intersection's capacity. In contrast, distracted pedestrians did not significantly impact the intersections' traffic operations. Although distractions among pedestrians increased their crossing time by nearly 4%, the extra time caused by their distractions was almost equal to or less than the drivers' startup lost time of 2 seconds. However, this can be attributed to the fact that pedestrian activity in Central Florida is still considered low and didn't reach the level of affecting vehicular operations especially when compared to heavily walked cities such as New York or Washington DC.

There are several policy implications that can be utilized from this research. As mentioned in the introduction, Florida laws prohibit the use of cell phones while the vehicle is moving but allows it while the vehicle is stationary, which was expected to be at intersections during the red phase. Therefore, one policy implication is to update Florida laws to prevent drivers from using their cell phones while the vehicle is at the traffic light due to its effect on reducing the intersection capacity. Another implication can be related to the traffic engineering field, where the effect of distraction is considered and added to the startup lost time and in designing intersection signal timing, increasing it to 3.5 seconds instead of 2 seconds. Also, distracted driving can be added as a new parameter to microscopic traffic simulation models with different distributions to be modeled at signalized intersections.

On the other hand, the research results and the different distraction types extracted from several footages have shown that distracted pedestrians can be regarded as blind when crossing while distracted. Although some intersection locations were equipped with audible pedestrian signals (APS), it was not concluded whether APS had an effect on their start up time or crossing speed which can be explored in future research.

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I. INTRODUCTION

1.1 Overview

Distracted driving poses one of the most difficult challenges to ensuring safe and efficient transportation. The ubiquity of modern communications and guidance systems, such as in-vehicle displays or smartphone applications, has greatly enhanced the general quality of life by delivering greater convenience and efficiency than seen before. However, this has come at the cost of attention spans, as complex tasks such as text entry and conversations contribute to an increased cognitive workload. In the context of transportation, this poses a major safety issue. As driving is such an overlearned task, it becomes almost automatic or thoughtless, especially in routinized commutes. As such, commuters are easily distracted by tasks other than driving, even though perfect execution of the driving task is necessary to reach their destination quickly and safely. Safety is an issue that has been explored in-depth, with statistics showing that texting, or even cognitive demanding conversations, while driving is so detrimental to the individual performance that the risks are comparable to, or even greater than, driving under the influence (DUI) (Strayer et al., 2006; Sumie et al. 2012). Reaction times have also been shown to suffer from distracted driving, with studies showing increased brake onset time for drivers that are texting (Drews et al., 2009). Studies have also shown that individuals are more likely to commit driving offenses (e.g., speeding, a greater number of lane deviations, failure to stop at traffic controls) when distracted (Beede, 2006). However, the impact on traffic efficiency is one aspect that hasn't been explored as much. It is clear that distracted driving can have impacts that negatively affect smooth traffic flow and operations aside from increased accident rates. Distracted drivers in a highway setting were shown to exhibit behaviors that result in highway inefficiency, such as increased lane change frequency and driving at lower speeds regardless of traffic flow (Cooper et al., 2009). The study showed that despite distracted drivers following more closely, which would theoretically reduce headway and increase flow rate, the overall travel time generally increased.

Intersection operations topic is one area in which capacity can be greatly impacted by distracted driving. However, the impacts of distraction at intersections were less developed. Despite a thorough literature search into the area, only two studies were found to look specifically at the effect of distraction on startup times for left-turning vehicles and pedestrians at intersections (Gillete et al., 2016; Hurwitz et al., 2013). The studies hypothesize that drivers and pedestrians are less likely to react in a timely manner or take precautions even when responding to anticipated stimuli (such as a vehicular or pedestrian signal at an intersection). Furthermore, the methods involved in the majority of the previously referenced studies involved activities that may lead to significant bias in the experimental results (e.g. simulator studies or in-vehicle observations that may affect the participants' driving responses). While Gillette and Hurwitz answer this issue by studying behavior in the field, the observations are limited in capturing behavior under a variety of intersection conditions, such as lane configuration, pedestrian activity levels, and speed levels. This study aims to comprehensively determine these impacts in a variety of contexts for both drivers and pedestrians. Furthermore, distraction types will be categorized for more specific analyses and will capture behavior specific to the Orlando driving landscape. The intersection selection process will also ensure that several population types are covered to analyze the differences between populations, such as students, tourists, and regular commuters. This research aims to address the different distraction parameters and their effects on driving and walking performance to quantify their operational impacts at signalized intersections.

1.2 Objectives

The proposed project aims to measure different distraction types for both motorists and pedestrians to determine the impact of such behavior on traffic operations at signalized intersections.

1.3 Summary of Project Tasks

TASK 1.1: Literature Review
TASK 1.2: Selection and Procurement of High-Resolution Video Cameras
TASK 2.0: Site Selection Criteria and Data Collection
TASK 3.0: Video Data Reduction and Determining Measures of Distraction
TASK 4.0: Statistical Analysis and Modelling
TASK 5.0: Draft Final Report
TASK 6.0: Final Report

II. LITERATURE REVIEW AND VIDEO CAMERA SELECTION

2.1 Florida State Policy on Distracted Driving

Due to the significant economic and safety concerns with distracted driving, policymaking plays a major role in influencing driver habits to reduce these negative externalities. The Wireless Communications While Driving Law, section 316.305, Florida statutes (FLHSMV, 2020), has only recently taken effect as a primary offense as of July 2019. Prior to July, violation of section 316.305 was only considered a secondary offense (as of 2012), therefore, officers could not stop a driver for texting unless they were already committing another primary offense (such as speeding, etc.). Specifically, the first section of the law (316.305) prohibits the operation of a motor vehicle while manually typing or entering information into a wireless device for texting or other messaging activities. The second section (316.306) further prohibits any handheld use in a designated school crossing, school zone, or active work zone.

There are several exceptions that allow use for activities including navigation, safety, law enforcement, and medical purposes (in addition to an exception for the operation of autonomous vehicles). While these exceptions can all be attributed to reasonable use, one exception of concern is that a stationary vehicle is not considered as being operated. Hence, drivers of vehicles at stop lights and stop signs are not subject to the prohibition. This is particularly troubling in the context of intersection performance due to possible increased start-up lost time from distraction, as will be further discussed in the review.

Another weakness of the policy is the exceptions to activities such as eating, conversations, grooming, and the use of hands-free devices (Anderson & Anderson, 2020). A study by the AAA Foundation for Traffic Safety (Strayer et al., 2017) finds that using hands-free technology can be just as distracting and dangerous as using wireless handheld devices. The study also notes that with a variety of hands-free systems on the market, there also exist different levels of cognitive demand to operate these systems. The foundation recommends the automotive industry to design in-vehicle systems that do not exceed low levels of demand and even includes a list that categorizes vehicle infotainment systems by demand levels.

2.2 Experimental Methods

Experimental methods play an important role in accurately quantifying the impacts of distracted driving. A variety of methodologies have been employed in the assessment of driving performance in the context of distracting activities (Luo et al., 2017). Due to the difficulty of observing realistic driver behavior, a majority of studies are likely to suffer from bias due to the participants' awareness of being observed. Especially in the cases of simulator studies, a participant can easily infer the purpose of the study when specifically instructed to engage in distracting activities. Some observational studies answer this issue by collecting data from drivers in a more natural setting. However, the effect of an exposed observer may also contribute to bias in observed distracted behaviors. The following section categorizes experimental studies into three methods: simulator studies, in-vehicle field observations, and out-of-vehicle field observations. The advantages and disadvantages are discussed to justify an ideal method for accurate data collection. Survey studies are another popular method used in distracted driving studies (White et al., 2017; Woods et al., 2018), which often suffer the disadvantage of subjective reporting that cannot be accurately

verified. Moreover, surveys cannot capture quantified performance effects and therefore will not be discussed in the context of driving performance data.

2.2.1 Simulator Studies

A vast majority of experimental reviews in the literature capture driving behavior through simulator studies (Stavrinos et al., 2013; Ranney et al., 2004; Ranney et al., 2011; Zhang et al., 2014, etc.). This is to be expected as a driving simulator offers several benefits to ease and convenience of data collection. Simulator studies require less setup time, thereby allowing easier data collection on larger samples. Participants can be studied in a safe and controlled environment without the time or cost of traveling into the field and setting up recording stations. Furthermore, high-fidelity driving simulators such as the National Advanced Driving Simulator (NADS) provide easy and accurate data extraction, as they can output high resolution vehicle information such as speed, acceleration, location, and lane deviation without the need for an observer to take manual measurements that may be more prone to error. However, a simulator does not provide a totally realistic driving setting and can miss out on elements that can greatly impact distracted driving behavior. Drivers do not experience realistic feedback, such as vehicular motion, natural lighting, or sound. "Specifically, it may be that research subjects sitting in a simulator may tolerate risks of a virtual collision that they would never tolerate when driving on a real road in a real car." (Scopatz and Zhou, 2016) As mentioned before, these studies are also likely to promote bias as the participants may become aware of the parameters that are being tested, especially in cases where the driver is instructed to actively engage in distracting activities. This may result in drivers altering their behavior, whether to focus more actively on the multi-tasking effort or exaggerating the effects of distraction.

2.2.2 In-Vehicle Field Observations

Field observational methods answer some of these issues yet present some challenges on their own. In particular, in-vehicle observations allow for accurate examination of driver behavior in a more realistic setting than a simulated driving experiment. Several studies observe driver behavior through the installation of cameras in a vehicle and instructing participants to perform runs on a test-track or pre-determined route (Sathyanarayana and Hansen, 2012; Morris et al., 2015; Ranney et al., 2002). Despite the more realistic driving setting, these studies are also prone to bias as the participants are explicitly instructed to engage in distracting activities, and are often aware of being recorded, thereby potentially altering their behavior in response.

Knapper et al. (2006) somewhat answer this issue through a longer-term study that observed 21 drivers over a period of a month. Due to the long-term nature of each observation, it is more likely that participants would quickly return to their natural driving habits after their vehicles are equipped. The 100-Car Naturalistic Driving Study verified this, showing that drivers only require an hour in an equipped vehicle to return to their typical driving habits (NHTSA, 2006). Another weakness of in-vehicle observation is that many of the studies do not equip the vehicles for specific operational evaluations (e.g., start-up time at a controlled intersection) and mainly focus on driver behavior. While studies such as the 100-Car Naturalistic Driving Study were able to provide valuable insights on driver behavior and safety risk, operational effects were not considered in the analysis, perhaps due to the equipment and sample size limitations of the in-vehicle observation method (Klauer et al., 2006).

2.2.3 Out-of-Vehicle Field Observations

The final method to be discussed provides solutions to many of the earlier mentioned weaknesses; however, it comes with a few weaknesses of its own. Out-of-vehicle observations are more ideal for capturing the most realistic driver behavior as they are the least intrusive in terms of participant awareness. Data on performance as well as driver behavior can be captured and correlated without interfering with the natural traffic flow in the field. Cooper et al. (2013) used an out-of-vehicle field observation method to determine the incidence of distraction at controlled intersections as well as the increase in distraction incidence between 2011 and 2012. While a large study sample was collected (n = 5,664), the paper did not explore performance effects, perhaps due to the tediousness of validating the results. A major drawback in performing these studies is the actual data extraction process. In order to extract performance and behavioral measures, it is often necessary that footage be analyzed manually to count individual distractions and driving behaviors. Furthermore, it is essential that in-field observations are validated through the repetition of results to reduce error (Wenners and Knodler, 2014; Wenners et al., 2013). While the experimental results of the first study focus mainly on the incidence of distracted behavior, performance effects were not considered. However, Wenners revisits the limitations of the experimental methodology in the 2014 paper. Between the two papers, several weaknesses are outlined: the inability to capture night-time behaviors due to poor visibility, the inability to capture behaviors while the vehicle is in-between intersections, and, again, the necessity to validate data through repetition of results. On the other hand, it is concluded that the presence of an observer does not significantly influence driver behavior at intersections, which provides a major benefit in reducing bias. It is recommended that video cameras be used in data collection, as in the two studies by Gillette et al. (2016) and Hurwitz et al. (2013). The proposed research aims to utilize a similar methodology in a more comprehensive manner to verify the findings for both drivers and pedestrians, as well as expand the set of parameters (factors specific to the Orlando driving landscape, such as demographics, intersection configurations, different land use, etc.) that may influence distraction at intersections. The more comprehensive analysis may allow for better informed and targeted policy decisions to improve performance at signalized intersections.

2.3 Prevalence of Distraction for Drivers and Pedestrians

2.3.1 Identification and Categorization of Distracted Behaviors

Distracted driving is defined as any external factor that impacts the driver's ability to maintain focus whilst on the road. According to FLHSMV (2020), there are three categories of driver distraction; visual, manual, and cognitive. Visual distractions include any distractions that involve taking the driver's eyes off the road. An example of a visual example would be an outside attraction that attracts the driver's attention whilst he's at the wheel. Manual distractions include any distractions that involve the driver taking his hands off the wheel. An example of a manual distraction would be reaching for an object in the car; by doing so, the driver is physically taking his hands off the wheel. Cognitive distractions are distractions in which the driver has his mind occupied thinking about anything other than driving. Conversing with a passenger would qualify as a cognitive distraction, as it involves concentration that prevents the driver from being fully concentrated on the road.

Categorizing distraction types is important for effective targeted policy regarding distracted driving, as different types of distraction can yield different levels of risk. Even the use of a hands-free device is a form of distracted driving as it degrades the performance of the driver by affecting

his cognitive performance (NHTSA, 2018). Texting on a mobile phone is a combination of all three types of distraction, by texting the driver's hands are no longer on the wheel, the driver's eyes are off the road and they have their mind occupied with tasks other than driving, making it similar to drunk driving, because drunk driving impairs the driver's visual, manual and cognitive abilities (Strayer et al., 2006; Sumie et al. 2012). The different effects of different distraction types have also been quantitatively investigated in terms of perceived risk as well as more objectively in a number of field observational studies. Hurwitz et al. (2013) summarize the prevalence of distracted drivers at intersections, in addition to breaking these distractions down into types, including conversation, dashboard distractions, cell phone usage, and eating/smoking as shown in Figure 2-1. These will be discussed for their impacts in-depth in the following chapter of the literature review (see section 6.4). The following is a list including examples of previously studied distraction categories:

- Mobile Phone use
- Grooming/make-up
- Eating or drinking
- Smoking
- Looking at advertising
- Looking for a misplaced object
- Adjusting a device
- Hands-free kit use
- Conversation with passenger
- Looking for road signs
- Using in-vehicle controls
- Lack of concentration
- Outside object/event

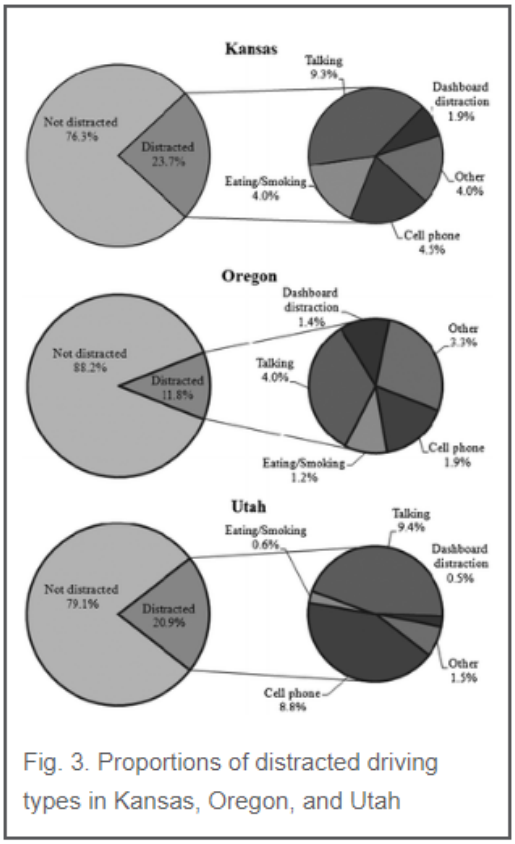


Fig. 3. Proportions of distracted driving types in Kansas, Oregon, and Utah

Figure 2-1: Distributions of Distracted Driving Types at Intersections (Hurwitz et al. 2013)

2.3.2 Rates of Distracted Driver and Pedestrian Activities

Distracted driving has become a growing issue in improving the safety and efficiency of our transportation system. Since the introduction of smartphones, it has become extremely common to see drivers using their smartphones when driving. Numerous studies to date have aimed to investigate the growing prevalence and effects of distracted driving, employing a variety of methods. According to Cooper et al. (2012), the total percentage of drivers distracted by mobile

devices (observed at 129 controlled intersections in California) increased from 4.2% in 2011 to 6.2% in 2012, a substantial increase that contributes to worsened safety and performance. Hurwitz et al. (2013) similarly observed drivers at intersections and found roughly 18% of drivers were engaged in some kind of distraction. Another study in Spain investigated distraction prevalence by gender and age (Prat et al., 2014). The results indicate that males and those under the age of 30 are more likely to engage in distracting activities, as shown on **Error! Reference source not found.**. According to a national survey conducted by the USDOT, NHTSA over 40% out of the 6000 drivers that responded to the survey answered calls whilst driving (Schroeder et al., 2018). Other surveys tend to demonstrate similar patterns, for instance, that over 47% of drivers surveyed use mobile phones while driving and that younger drivers (17-29) are more likely to be engaged in a distracting activity prior to an accident (McEvoy et al., 2007).

Table 2-1: Categories and Involvement of Driver Distraction (Prat et al., 2014)

Percentage of drivers involved in secondary activities by gender (standardised residuals in brackets).

	Males (n = 4489[a])	Females (n = 2076[a])
Mobile phone use	1.2 (−1.0)	1.5 (1.0)
Texting or keying numbers	0.3 (-0.6)	0.4 (0.6)
Drinking	0.1 (0.3)	0.0 (−0.3)
Eating	0.2 (−0.5)	0.2 (0.5)
Smoking	3.9 (1.6)	3.1 (−1.6)
Talking to a passenger	11.3 (1.1)	10.4 (−1.1)
Audio system/navigation device use	0.6 (1.9)	0.2 (−1.9)
Searching, picking up or placing something	1.1 (0.4)	1.0 (−0.4)
Other secondary task	1.6 (0.1)	1.5 (−0.1)
Engaging in any secondary task	19.4 (1.3)	18.0 (−1.3)

[a] The number of participants does not equal the total n due to missing data.

Studies on pedestrian behaviors are less common, however, the consensus appears to agree that distracted pedestrian behaviors are just as concerning as distracted driver behaviors. A study by Bungum et al. (2005) observed that approximately 20% of pedestrians crossing at a selected intersection were engaged in distracting activities, classified as eating, drinking, smoking, cell phone use, or wearing headphones while crossing. According to Gillette et al. (2016), this number is even larger, with 35% of pedestrians observed at three intersections being distracted while crossing. As such, pedestrian activities must remain an important focus in any study documenting the impacts of distraction on intersection operations.

2.3.3 Distraction over Time: A Growing Issue

Distracted driving is a topic that has been studied extensively for many years, with findings as early as 1998 (Nakano, 1998). With advances in distracting technology, advances have also been made in the study methodologies. The methods of monitoring and researching distracted driving have changed over time too. As mentioned, newer studies have implemented smart cameras and sensors deployed inside cars that measure the driver's exposure to distractions (Dingus et al., 2006; Klauer et al., 2006; Stutts et al., 2003). Survey methods have also seen notable changes over the years. While earlier studies did not specifically focus on the details regarding mobile-phone use, newer study methodologies have been more suited to investigating smartphone usage. A national survey conducted by the USDOT, NHTSA in 2018 had a bigger focus on smartphone usage whilst driving and asked more questions regarding the types of mobile applications drivers used when operating their vehicles (Schroeder et al., 2018). This study concluded that around 13% of the

people surveyed used their mobile phones to send or read text messages while driving, with a majority of them being in the 21 to 24 age group. Compared to the study conducted by Cooper et al. (2012), these results also represent an alarming general increase in phone-related distractions. Rates of distraction-related pedestrian injuries are increasing as well. Nasar & Troyer (2013) show that these rates paralleled those of driver injuries from 2004 to 2009, eventually exceeding driver injuries in 2010. It is clear that, over time, the issue of distracted driving and pedestrian activities is evolving and will require constant attention in response to the rapid innovation in distraction sources.

2.4 Impacts of Distracted Driving and Pedestrian Activities

2.4.1 Safety Impacts

Traffic safety is perhaps the most studied topic in regard to distracted driving. A large number of studies have proven that distracted driving is a major contributor to traffic fatalities. According to the National Highway Traffic Safety Administration (NHTSA), 7.8 percent (2,841 crashes) of total fatalities in 2018 were in distraction-related crashes (NHTSA, 2019). While this represents a notable 12% decrease from the previous year (3,242 crashes), the NHTSA attributes this decrease to the general downward trend in traffic fatalities over the past 40 years due to reasons such as improved vehicle safety technology and traffic safety policies.

Another NHTSA report demonstrates that distraction is particularly common among young drivers (18 to 20 years old), as they are 68% more likely to engage in a phone call while driving and also represent the top contributors to phone-related crashes or near-crash incidences (Dingus et al., 2006). The study observed 100 vehicles over a 13-month period and demonstrated that almost 80% of all crashes (previously estimated in the range of 25%) and 65% of all near-crashes are related to taking eyes off the road just a few seconds before the conflict. Eyes-off-the-road incidences represented 93% of rear-end-striking crashes. The 100-car study also showed that younger age group (i.e., 18 to 20 years) were more involved than older age groups in aggressive driving activities, such as judgment error and driving while impaired.

Pedestrian distraction and safety is another issue which has seen notable attention. In 2010, the total number of pedestrian injuries involving mobile phone usage (by pedestrians) was over 1,500, a 35% increase from 2009 (Nasar & Troyer, 2013). Scopatz and Zhou (2016) find that while the literature shows a clear correlation between distracted driving behavior and crash risk, few studies look into pedestrian-vehicle interactions with distraction as a parameter. Furthermore, the reviewed studies found small levels of pedestrian distraction not often related to crash risk. One study stated that approximately 15% of pedestrian fatalities might result from the inattentiveness of the pedestrian (Bungum et al., 2005). The research finds that pedestrians are less likely to exhibit cautionary behaviors at a crosswalk if crossing while distracted. However, this association was found to be weak, only accounting for 1.6% of the variance in cautionary behaviors. Regardless, the review by Scopatz and Zhou still concludes that more naturalistic observational studies are needed to build on this topic.

2.4.2 Impacts on Reaction Time and Cognitive Performance

The effects of distraction on cognitive performance have also been studied in-depth. Cooper et al. (2011) conducted a study on a closed driving course using an instrumented research vehicle to capture driving performance factors, including reaction time. This allowed the authors to obtain naturalistic data from the experiment to evaluate the results from texting while driving on different roadway segments. The experiment demonstrated a marked increase in reaction time, overall speed, the number of missed response events, and the standard deviation of speed on the open roadway sections. It is concluded that overall performance suffered significantly due to texting while driving. Choudary et al. (2017) also demonstrated that distractions such as conversations and texting of varying complexities cause increases in driver reaction-time, with texting accounting for double the delay as conversations.

Distracted pedestrian activities have also been shown to greatly impact cognitive performance. As part of a 2008 study by Nasar et al., two groups of participants were asked to walk along a prescribed route, with half conversing on a mobile phone and the other half simply awaiting a potential phone call (which never came). Among the distracted group, the pedestrians conversing recall fewer features along the route, indicating that the cognitive distraction of a phone conversation may cause a notable reduction in situational awareness. A lack of situational awareness is especially dangerous for a pedestrian in a potential conflict area, such as an intersection crosswalk.

2.4.3 Traffic Operations and Start-up Lost Time

Use of a cellular phone has been associated with a statistically significant reduction in traffic speeds for young drivers in all traffic conditions. Consequently, vehicle headway increased for drivers who were using their phones, though the research stated that headway increase could not be statistically validated because of the strong correlation between headway and speed (Yannis et al., 2010). Another study was conducted to investigate the impact of a distracted driver performing a low distraction task (cellphone-texting) on the performance of the traffic flow using a networked driving simulation platform (Xu and Lin, 2018). The findings of this research showed that texting impacts on traffic flow fluctuate if testing drivers individually or as a four-driver platoon. However, no significant results were found for the different behavior indicators.

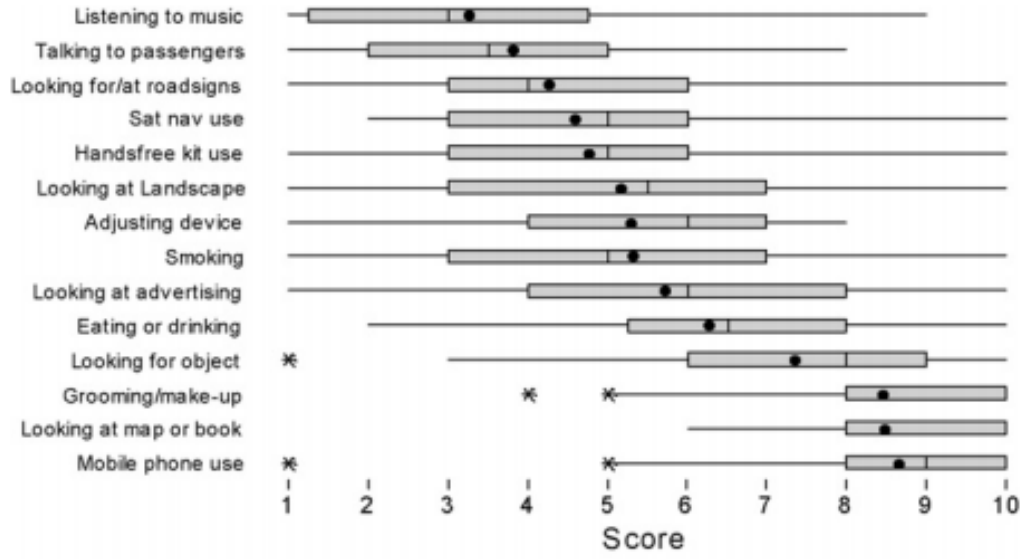
Fewer studies looked at intersection operations in particular. Charlton et al. (2013) observed older drivers' distraction behavior at intersections to determine any behavioral changes in response to increasing cognitive demand for maneuvers (e.g. taking a permitted left-turn and needing to watch for a gap). Several distraction types are observed, and it is shown that older drivers will self-regulate by reducing engagement in distracting activities with more demanding maneuvers. However, this study does not consider quantitative effects on intersection performance factors such as queue discharge rate and start-up lost times. A single study by Hurwitz et al. (2013) was found to answer this by looking at left-turn operations in particular. The study finds that start-up lost times are greatly increased (3.36 to 4.06 s in Kansas, 2.97 to 4.41 s in Oregon, and 2.25 to 5.14 s in Utah) when drivers are engaged in distracting activities.

Pedestrian start-up time, on the other hand, has not seen as much attention. Gillette et al. (2016) observed pedestrian behaviors (n = 760) at three intersections to determine the impacts of distraction on pedestrian start-up time. The research showed that pedestrians who texted had 21% more start-up time, while those who talked on a phone had 31%. Texting pedestrians were approximately two times less likely to glance before entering the crosswalk in comparison to undistracted pedestrians, while pedestrians on a phone call are about five times less likely to glance. Another study observed crossing speed in addition to cautionary behavior and found that pedestrians using their phones would cross more slowly, also confirming that they are less likely to take cautionary behaviors (Bungum et al., 2005; Hatfield and Murphy, 2007). While these results agree with the general hypothesis on distracted pedestrian performance, more studies are necessary to verify these results in an expanded context.

2.4.4 Weighing the Impacts of Different Distraction Categories

Different distraction types can have different effects on safety risk as well as performance. While intersection performance has not seen much attention in terms of distraction categories, a number

of studies investigated the different levels of safety risk by surveying drivers according to their own risk perceptions of different distractive tasks (Patel et al., 2007; Titchener and Wong, 2010). These particular studies examine how some qualitative characteristics of distraction types affect the drivers' perception of risk level for each type. In the study by Patel et al. (2007), these characteristics include familiarity, knowledge, voluntariness, exposure, probability, controllability, and legality. On the other hand, McEvoy et al. (2007) investigated risk more objectively by surveying hospitalized drivers in the few hours after an accident. McEvoy found that the most common self-reported distraction activities influencing an accident include passenger in vehicle, lack of concentration, and outside person, object, or event, representing over 30% of cases. Surprisingly, mobile phone and in-vehicle equipment uses only account for less than 5% of reported cases. However, per the subjective studies, mobile phone usage, grooming, and searching for an object inside the vehicle showed the highest perceived risk factors, as illustrated in Figure 2-2. This discrepancy demonstrates another major weakness of survey studies in their reliability on participants' perceptions and ability (or willingness) to answer honestly.



Box and whisker plot showing the level of perceived risk associated with each driver distraction. A score of 1 means low risk, and 10 high risk.

Figure 2-2: Subjective Scores of Risk by Distraction Type (Patel et al., 2007)

In the 100-car naturalistic driving study, the issue of subjective reporting was avoided through long-term in-vehicle observations of 100 cars over 13 months. Contrary to the self-reported findings by McEvoy, it was found that wireless communications devices are indeed the most dangerous type of distraction, agreeing with the perceptions demonstrated in the studies by Patel (2007) and Titchener (2010). In fact, wireless device usage contributed to over twice as many crashes as the next highest distraction type, as shown on Figure 2-3. Passenger related tasks also contributed to a surprisingly high number of crashes, which contrasts with the perceived risk ratings in Figure 2-2.

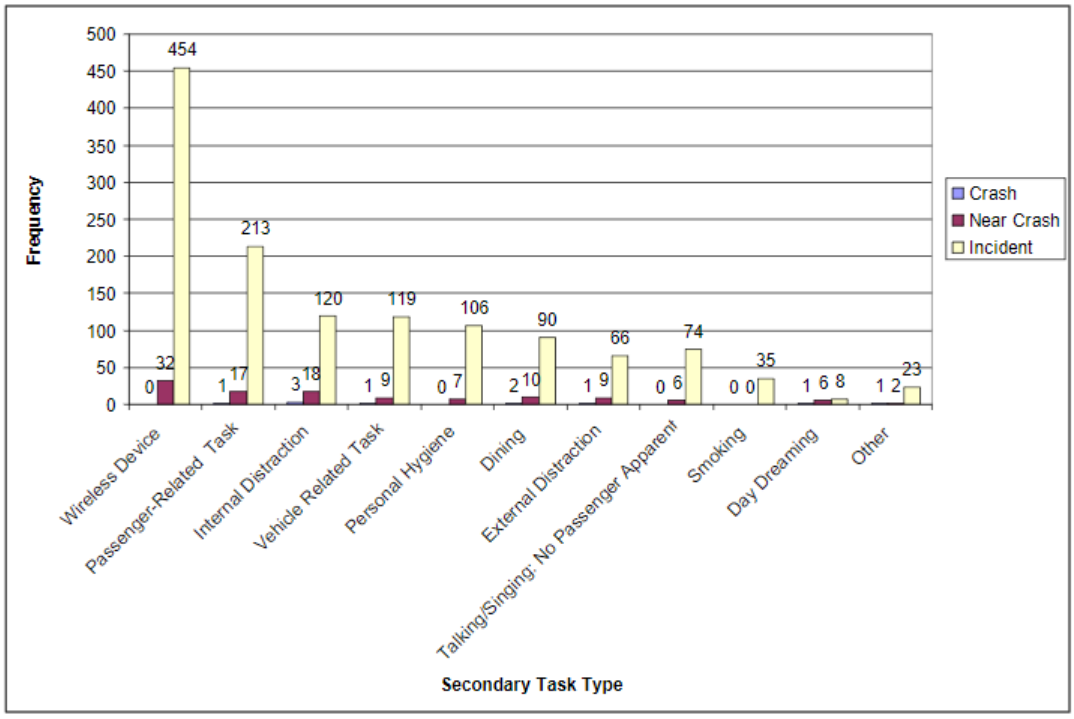


Figure 2-3: Incident Frequency by Distraction Type (Dingus et al., 2006)

As mentioned earlier, intersection performance factors have not seen as much attention compared to safety risk. Only two studies (Gillete et al., 2016; Hurwitz et al., 2013) were found to look at the impacts of different distraction types on start-up lost time for pedestrians and drivers at intersections, respectively. Gillette et al. (2016) found that phone conversations and texting lead to the first and second-highest increases in start-up time for pedestrians, according to a linear model. Surprisingly, some distraction types (listening to music, other) have a lowering effect on start-up lost time. For vehicles, Hurwitz et al. (2013) found that among distraction types, talking, combinations of distractions and other distractions contribute to the highest increases in start-up lost times, however, no distraction type actually results in a lower start-up time as described in Table 2-2. Despite the small literature body on distracted intersection operations, it is clear that distraction categorization plays a major role in the magnitude of distraction impacts for both safety and efficiency.

Table 2-2: Regression Model on Start-up Time by Distraction Type (Hurwitz et al., 2013)

Variable	Coefficient estimate	Standard error	t Value	P-value	Significance
Intercept	2.858	0.039	73.319	$\ll 0.001$	Yes
Kansas	-0.159	0.049	-3.231	0.001	Yes
Utah	-0.035	0.041	-0.857	0.391	No
Cell phone	0.163	0.078	2.086	0.037	Yes
Eating/smoking	0.165	0.142	1.158	0.246	No
Talking	0.527	0.066	7.924	$\ll 0.001$	Yes
Dashboard	0.378	0.163	2.315	0.021	Yes
Other	0.533	0.109	4.889	$\ll 0.001$	Yes
Combination	0.655	0.333	1.969	0.048	Yes
Position 2	0.112	0.045	2.491	0.013	Yes
Position 3	-0.170	0.051	-3.315	< 0.001	Yes
Position 4	-0.431	0.059	-7.243	$\ll 0.001$	Yes
Position 5	-0.570	0.071	-8.069	$\ll 0.001$	Yes

Note: Significance was defined as a confidence of 95% or greater (P-value < 0.05).

2.5 Literature Review Summary and Conclusion

The review of the literature served to identify the key findings and methods in the knowledge body on distracted driving. While distracted driving is a relatively modern issue (with the earliest literature dating to the late 90s (Nakano, 1998)), there have been a significant number of studies dedicated to researching its prevalence, impacts, and implications. Research on distracted pedestrian activities is much less developed but is beginning to see more attention as the issues posed by distracting technology are becoming more apparent with the growing popularity of smartphones. As Florida state policy is now beginning to answer the issues with restrictions on the use of wireless devices while driving, research demonstrates that the exceptions to the statutes may allow for too much leeway in the effort to improve transportation safety and performance. Furthermore, effective targeted policymaking requires precise knowledge on the issues that require the most immediate attention. As such, the review aimed to identify how distraction has been categorized until now, as well as the different risks associated with the various studied distraction types.

Safety is by far the most studied aspect with regard to distracted driving. Multiple studies demonstrated the alarming increase in the risk factors associated with various distraction types, with much of the knowledge body agreeing on mobile phone use, texting in particular, as being the most significant and common contributor to roadway crashes or near-crash incidences. Furthermore, the theory on distraction agrees with accident statistics, as texting while driving poses manual, visual, and cognitive distractions. This is also supported through subjective perceived risk factors, proving that the average commuter understands the dangers of texting while driving, despite how common it is for drivers to continue engaging with their phones while moving on the road. On the pedestrian side, it has also been proven in multiple studies that pedestrians are less likely to exhibit cautionary behaviors while crossing, in addition to paying less attention to their surroundings in general.

Research on performance impacts also demonstrates the detriments to society aside from the substantial social and economic cost of distraction-related traffic incidents. In addition to the operational effects of distraction-related roadway accidents, such as traffic jams due to lane closures, the individual's performance is also shown to be worsened by distractions. Distraction can lead to overall longer travel times due to the need for the brain to multi-task between navigation, the driving task, and the distraction. This is also in addition to increased reaction times, speed variability, and lower recognition of roadway events. While the quantifiable effects on intersection operations have not been studied extensively, the theory holds that distraction results in substantially longer start-up times and, as a result, reduced flow rate through the intersection (effectively reducing intersection capacity due to human behavior). On a large-scale, such effects demand a significant economic and social cost that can be greatly reduced with effective policymaking and educational efforts.

The effects on performance are a less popular research topic than safety, perhaps due to the difficulty of the necessarily large-scale data collection and processing efforts for capturing both performance and behavioral data simultaneously. As such, several methodologies are also identified in the review in order to select the most optimal research approach to capture these effects practically and realistically. The lack of field observations of distraction-related performance effects at intersections represents a large gap in the knowledge, with very few studies being able to employ a methodology to capture both distracted behaviors and intersection performance parameters such as headway, start-up time, and saturation flowrate. This is also very apparent in the lack of studies on pedestrian performance effects, with only one study observing start-up times for pedestrians at intersections. The proposed research effort aims to expand this knowledge in the context of the Orlando driving landscape, which presents its own unique variety of land uses, roadway features, and driver characteristics. Furthermore, pedestrian activities will be given close attention as planning policy is beginning to shift towards a more multi-modal and pedestrian-friendly environment in Orlando. Findings from this research will have major theoretical and practical implications, from the assessment of how distracted behavior influences task performance to the more precise knowledge of distraction risks that will allow for better-targeted policymaking and driver education programs.

2.6 Video Camera Selection

In order to properly observe drivers distracted behavior at intersections, it will be necessary to procure a high-resolution video recorder that is sharp enough to record different types of driver distractions through the vehicle windows across multiple lanes and also capture distracted pedestrians crossing the intersection approaches. At the same time, the recorders must be light and compact in order to ensure easier configuration, as the camera placement will be crucial to capturing the behavior of as many drivers as possible per lane in the queues without influencing their behavior or grabbing their attention. The cameras should be able to record at a 90-degree viewing angle in order to accurately view each approach with high resolution. A user interface that allows magnifying the video whilst filming would also be preferred in order to accurately view through the vehicle window and capture the distracted driving incident. Audio recording capabilities would be preferred for recording the drivers aggressively pressing their horns to grab the attention of the distracted driver at the front of the queue. The following are the different vendors with different camera types that were contacted to procure the suitable type for the project.

2.6.1 Miovision Scout

The Miovision Scout is a 720p portable video collection device. It can be used to obtain several data types, including; Intersection counts, road volume counts, roundabout counts, vehicle gap data, junction counts, pathway counts, and travel time. The Miovision scout is quoted to cost approximately 5,000 USD, including any mounting equipment required to place the Miovision Scout at an intersection. Using the Scout would be beneficial for the fact that it provides the study with useful count data that could be difficult to obtain through manual observation. The Scout is also said to be weatherproof and would be able to handle Floridian climates. However, there are a lot of drawbacks to using the Miovision Scout for the purposes of this investigation. Although the price of the Scout is somewhat reasonable compared to the alternatives, its output resolution is not clear. Also, there are no leasing options available for this type. Additionally, the research investigation requires a camera that can record at a minimum of 1080p to be able to accurately view the drivers at the beginning of the queue. Figure 2-4 and Figure 2-5 show a sample of the camera output and its mounting unit, respectively.

Figure 2-4: Miovision Scout Video Sample

Figure 2-5: Miovision Scout Camera and Mounting Unit

2.6.2 Miovision Smartview 360

The Miovision SmartView 360 is another option supplied by Miovision for real-time traffic monitoring, providing users with 360-degree video monitoring of intersections. It can be used to obtain several types of data, including; Intersection counts, road volume counts, roundabout counts, vehicle gap data, junction counts, pathway counts, and travel time. Miovision provides these counts and their streaming services at an annual fee. The SmartView 360 records in 4K resolution, which is sharp enough to record different types of driver distractions through the vehicle windows across multiple lanes and also capture distracted pedestrians crossing the intersection approaches. However, the Smartview is a fisheye camera that records at a 360-degree

viewing angle which will make it difficult to analyze one specific approach. Additionally, it is considered to be a permanent solution for monitoring traffic, while this project requires cameras that can easily be removed and reinstalled at different locations to analyze different approaches. Additionally, there are budgetary concerns when choosing the SmartView 360, Miovision quoted the camera and the TrafficLink server to cost around $28,000, which is far greater than the budget of $10,000. Furthermore, there are no audio recording capabilities included with the SmartView 360, which is another disadvantage to using it. In conclusion, this camera is not considered to be an alternative that can be used for this investigation. A video sample of the smart view is shown Figure 2-6.

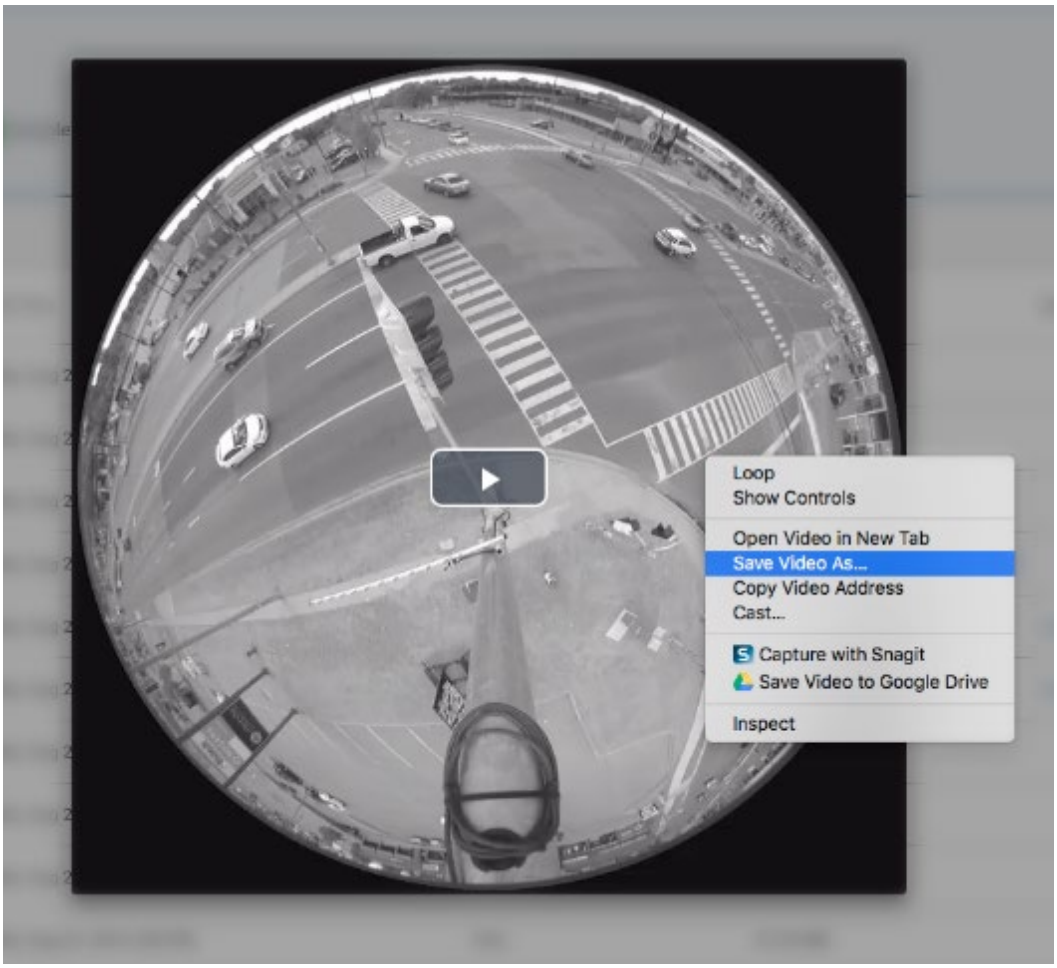


Figure 2-6: Miovision SmartView 360 Video Sample

2.6.3 Bosch Flexidome 8000i

The white FLEXIDOME IP starlight 8000i 4K UHD Outdoor PTRZ Network Dome Camera from Bosch uses a 1/1.8" CMOS sensor to capture 4k resolution video at 30 fps. Bosch Starlight technology provides visibility in low-light conditions. The 3.9-10mm varifocal lens delivers a 117 to 44° horizontal field of view, which satisfies the requirement of a 90-degree viewing angle, as shown in Figure 2-7. The camera features a motorized 0 to 361° pan range, a -3.5 to 89° tilt range, a ±95° roll range, and 2.6x optical zoom. This camera also has audio recording capabilities at a range of up to 120 dB, which is useful for recording the sound of drivers aggressively pressing their horns to grab the attention of the distracted driver at the front of the queue. Additionally, the Bosch Flexidome 8000i has Infra-red filters for night functionality, which will provide the study with the capability of analyzing distracted drivers at night. The 8000i has Bosch IVA (Intelligent Video Analytics) that could be used to provide count data instead of obtaining it manually, which could save a lot of time. The Bosch Project Assistant App could be used to magnify the video whilst recording that can be used to accurately view through the vehicle window and capture the distracted driving incident. Additionally, after contacting Bosch, a leasing option at $12,000, including installations, was provided for these cameras, making them affordable and reasonable within budget for this investigation. In conclusion, the Bosch Flexidome 8000i satisfies all of the camera requirements for the study, making it an ideal candidate for the camera selection phase.

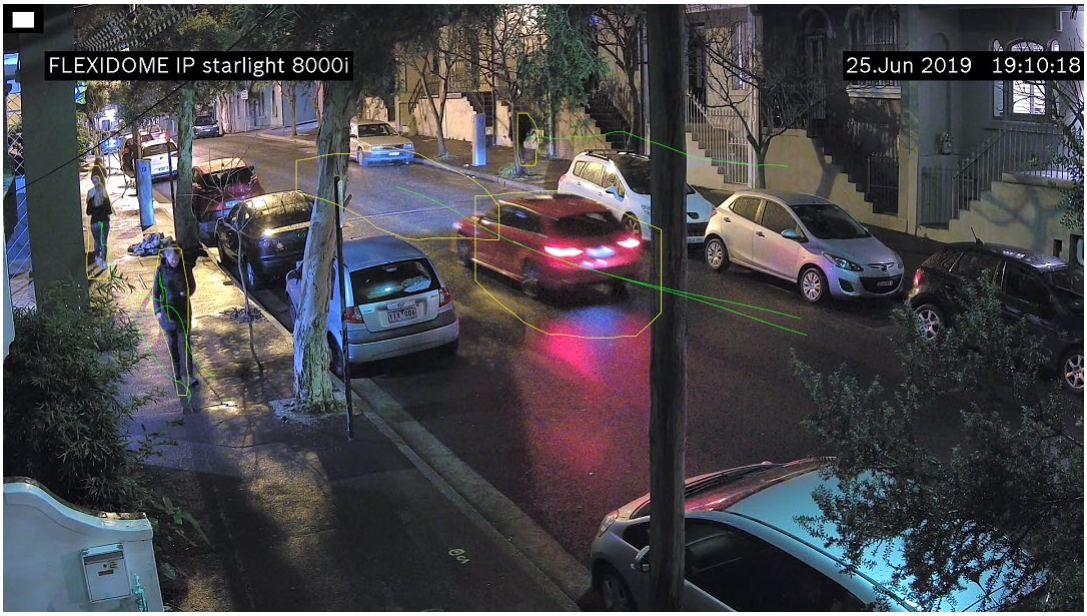


Figure 2-7: Video Sample from the Bosch Flexidome 8000i

The following Table 2-3 summarizes the three camera types along with the different capabilities, prices and technology type.

Table 2-3: Video Camera Type Comparisons

Requirements	Camera Types		
	Miovision Scout	Miovision SmartView 360	Bosch Flexidome 8000i
Budget	Within Budget, costing $5,000 per unit	Excessively over budget, costing $28,000 per unit	Slightly over budget, costing $12,000
Leasing Option	N	N	Y
Counting System	Y	Y	Y
Camera Quality	720p	4K	4K
Audio Recording Capabilities	None Available	None Available	Can record within a range of 120Db
Viewing Angle	90 degrees	360 degrees, fisheye view	44-117 degree viewing angle, capable of 90-degree viewing
Zoom Capabilities	N	Y	Y
IR Technology	N	N	Y

2.6.4 VANTAGELIVE (ITERIS)

In addition to the above options, VantageLive Company was also suggested by FDOT since they provide different services such as video recording at intersections, traffic counts, video detection and video analytics. UCF contacted VantagLive, and they provided a sample video output to determine whether the quality of the video can be utilized in this project. However, it was difficult to get a clear view of the drivers inside their vehicles at the intersection approach. UCF will try to get another video at a different angle to confirm whether to utilize this type of camera compared to the high-definition 4k Bosch cameras.

Finally, due to the use of vendors, whether to help with Bosch camera assembly and mounting at the 20 intersections or providing video recording at the 20 intersections by VantageLive, it is necessary to amend the project contract to add the vendor's services which will be reflected in the upcoming chapter of the project.

2.7 Summary

Chapter 2 was composed of two parts: the literature review and the camera selection. The literature review provided a thorough foundation of knowledge on the topic and identified gaps in research regarding distracted driving and distracted pedestrians' impact on traffic operations at signalized intersections. The camera selection part analyzed and compared the available cameras in the market that suits the project's needs. The best alternative among all the cameras was the Bosch Flexidome 8000i, and therefore was selected for the project.

III. SITE SELECTION CRITERIA AND DATA COLLECTION

3.1 Data Collection Methodology

The following sections detail the data collection process, which involved field examination of distracted drivers at the traffic signal as well as distracted pedestrians crossing the intersection approaches. Drivers that were observed distracted at the traffic signal during the red phase for the through and left-turn movements were captured separately to examine their impact on several operational parameters such as startup lost time, headway, and delay. Distracted pedestrians crossing the intersection approaches were also studied to quantify their effect on traffic operations. A total of fifteen (15) intersections were selected for data collection and analysis of distracted driving and distracted pedestrians, which is explained in the following sections.

To determine the effect of distracted drivers on the operational performance of the signalized intersections, headway and start-up lost were utilized. Headway is one of the main microscopic parameters used in many traffic operations studies to calculate the saturation flow rate at signalized intersections and determines its capacity. Headway is defined as the time interval between two successive vehicles passing a point along the lane (Roess et al., 2019). The headway of the first vehicle in the queue is the difference between the time when the signal turns green and the time the vehicle crosses the stop-line. The headway of the following vehicles is the time interval between successive vehicles crossing the stop-line or exiting the intersection. The first few vehicles in the queue tend to have a higher headway until the fourth or fifth vehicle, where it becomes nearly constant, known as the saturation headway (h). The difference between the first four to five vehicles' headway and the saturation headway is known as the start-up lost time. Start-up lost time is another indicator for the intersection performance. It occurs due to the delayed response from the driver's reaction to the onset of the green signal and the vehicle's acceleration. According to traffic engineering, start-up lost time is approximately 2.0 seconds. On the other hand, the time taken by the driver to perceive and react to the need to stop is called Perception and Reaction Time (PRT). Several factors contribute to PRT, such as the physical condition, driver's age, situation complexity, emotional state, and stimuli strength for this action (Mannering et al., 2013). In highway design and per AASHTO standards, PRT conservatively considers 2.5 seconds (AASHTO, 2011). For signalized intersections, PRT is taken as 1.0 second due to the expected change in the signal phase.

For distracted pedestrians, the goal is to assess how different distraction types such as texting, talking to others, eating/drinking, and other factors such as age, gender, surrounding land use affect the pedestrian's start-up time as well as their crossing time and speed. Pedestrian start-up time is the period between the onset of a Walk signal and a pedestrian stepping off the curb. Several factors may contribute to the increase of start-up time, such as the Perception and Reaction Time (PRT), or a pedestrian is making sure that no vehicles will intercept his path (HCM, 2010), or a distraction. The main focus of the data collection is to calculate the start-up time as well as the crossing time which are affected only by pedestrian distractions. Therefore, observations will not include pedestrians delayed for other reasons, such as the presence of vehicles in the crossing area or approaching it. The pedestrian walking speed is another factor that is investigated. However, since walking speed and crossing time are correlated, only one of them will be considered in the statistical analysis task. See appendixes (A) to (O) for collected data samples.

3.2 Equipment – High Resolution Cameras and Trailer

To properly observe drivers distracted behavior at intersections, it was necessary to procure a high-resolution video recorder that is sharp enough to record different types of driver distractions through the vehicle windows across multiple lanes and also capture distracted pedestrians crossing the intersection approaches. At the same time, the recorders must be light and compact in order to ensure easier configuration, as the camera placement will be crucial to capturing the behavior of as many drivers as possible per lane in the queues without influencing their behavior or grabbing their attention. Several hardware and configuration alternatives were considered to be capable of capturing all drivers during the data collection phase. Camera arrangement and requirements also varied depending on the intersection environmental features such as size, lighting, approach volumes, and lane configurations to ensure full data capture. The main objective of this approach is to provide the most realistic setting possible to be able to truly quantify how distraction affects traffic operations at signalized intersections without any external bias.

3.2.1 Video Camera Selection

To better evaluate the cameras properly, the research team decided to test the proposed cameras in the field to assess several factors such as battery life, camera quality, viewing angle and zoom capabilities. Since the project requires recording for several days and hours, a solar trailer was the best solution to provide the cameras with continuous power. The trailer also allowed the cameras to be raised at a high altitude, which guaranteed that drivers' and pedestrians' behavior won't be affected by observing the cameras. The trailer is comprised of a 30 feet Solar-Powered Portable Tower (SPTT-3000) from Solar Tech. The trailer is powered by eight (8) batteries that store the power generated by the solar panels connected to the tower. The SPTT-3000 is an adaptable solar-powered platform that can be outfitted with lights, cameras, sensors, antennas, and other communication devices.

The two (2) best-proposed alternatives were Bosch Flexidome 8000i and Miovision SmartView 360. The Bosch company was contacted first, and after explaining the project's scope, they sent two cameras as a sample to assist in the project. A test location that simulates the field conditions was selected and several recordings were made with different settings such as 2K (HD 1080p, 6 megapixels) or 4K Ultra HD quality. Identifying the distractions in 2K video quality was not possible, but in 4K, the researchers were able to identify the majority of the distraction types and significantly improved the monitoring process at the approach. Some types of distractions were not identified due to several reasons such as sun reflection, shaded windshield/window, or other reasons. The Bosch camera provided a superior 4K resolution, which was required to accurately view the distraction and record different driver distractions through the vehicle windows across multiple lanes. In addition, the camera offered an excellent viewing angle and zoom capabilities.

Since the cameras were offered as a sample for academic purposes and sufficiently fulfilled the project's requirements, the two (2) high-resolution Bosch IP8000i cameras were selected to be used in the project outfitted in the solar-powered trailer SPTT-3000, as shown in **Error! Reference source not found.**. One Bosch IP8000i camera is shown in **Error! Reference source not found.**.

Based on the data collection methodology, one camera was used to monitor the intersection approach, and the other camera was used to monitor the traffic signal changes. The cameras are

connected to an ethernet switch that allows the user to access the data on the cameras when connected to the hub with an ethernet cable.

Figure 3-1: Solar-Powered Portable Tower Trailer (SPTT-3000)

Figure 3-2: Bosch Camera Starlight IP 8000i

3.3 Site Selection

3.3.1 Distracted Driving

Ten (10) intersections in District 5, Orange County and the City of Orlando, covering thirteen (13) approaches were selected according to the following criteria. First, the intersections cover different land-use designations (residential, commercial, school/college, tourist, and offices). Second, the study approaches contain a different number of through and left lanes (one, two, and three). Third, the data collection covers peak periods during congested conditions, where queues are formed with more than five vehicles in each row. Selected peak periods were 7:00 to 9:00 AM, 12:00 to 2:00 PM, and 4:00 to 8:00 PM. A total of 430 hours were recorded at all intersections. **Error! Reference source not found.** shows the intersections' locations, lane configuration, land use, and the number of observations. **Error! Reference source not found.** illustrates the distracted driving locations (Google Maps, 2022).

Table 3-1: Study Intersections and Their Characteristics (Driving)

No	Location	Land-Use	Approach Configuration	Studied Movement	No. of Hours Collected
1	SR 434 & University Blvd	University/ Commercial		 NBT	56
2	Lake Underhill Road & Woodbury Road	Residential & School		 EBT	32
				 SBL	30
3	Lake Underhill Road & Dean Road	Commercial		 NBT	43
4	SR 50 & N Bumby Ave	Offices/ Commercial		 WBT	40
5	SR 50 & North John Young Parkway	Commercial		 NBT	32
6	SR 482 (Sand Lake Rd) & OBT	Tourist/ Commercial		 SBT	37
				 SBL	33
7	International Dr & Jamaican Ct.	Tourist/ Commercial		 SBT	12
				 SBL	50
8	SR 436 & Wilshire Dr	Residential/ Commercial		 NBL	10
9	Narcoossee Rd & Lee Vista Blvd	Commercial		 NBL	27
10	SR 536 & SR 535	Tourist		 WBL	28
Total Hours					**430**

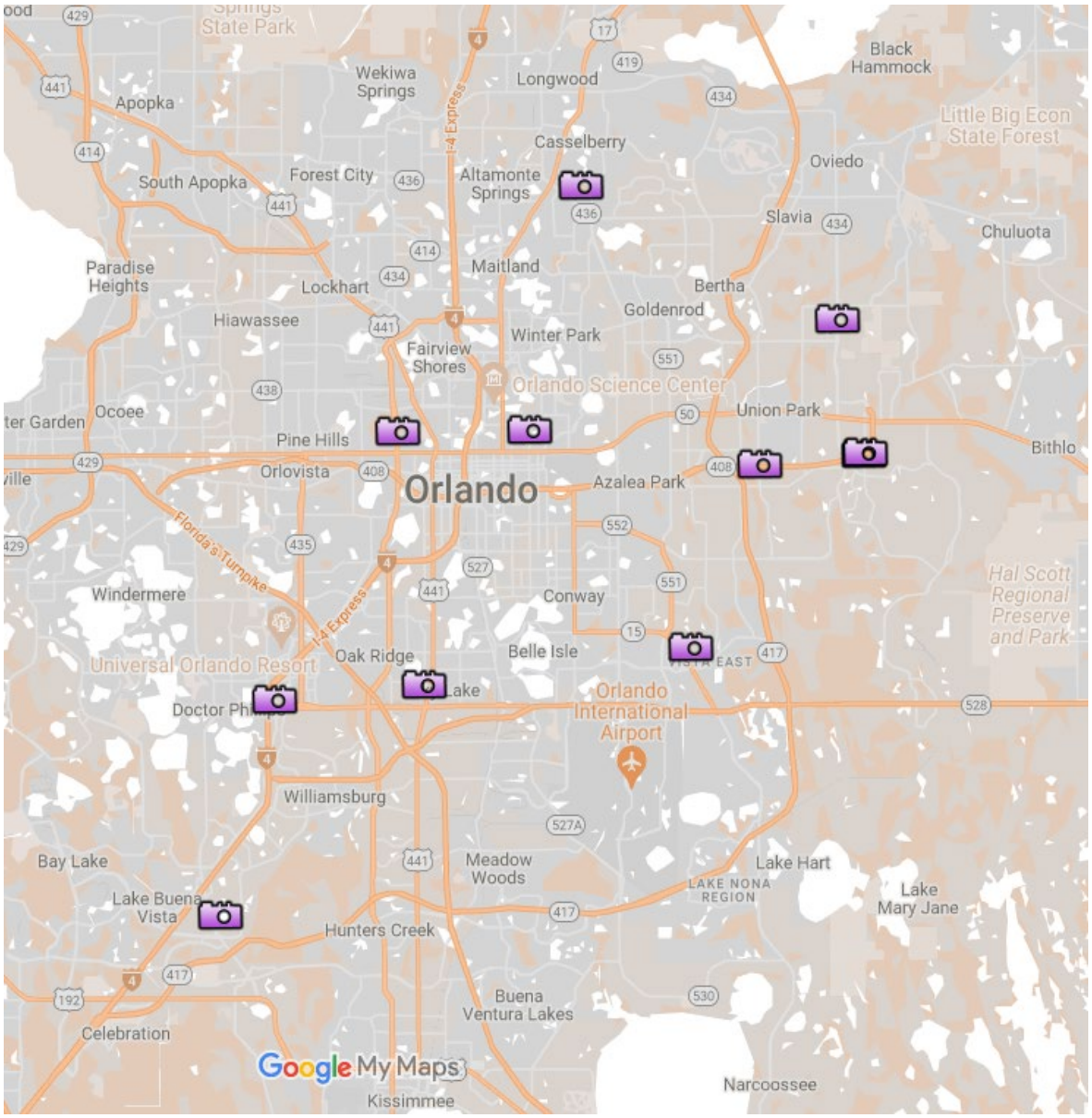


Figure 3-3:Site Locations (Google Maps, 2022)

SR 434 (Alafaya Trail) & University Blvd – NBT Approach

A pivotal step in the data collection is to test the process before the actual implementation in the field. The intersection of SR 434 and University Blvd was the first intersection utilized for data collection and was also considered a pilot intersection. The pilot intersection goals were to give different ideas and approaches that may not have been encountered before; save time and money; minimize the number of unanticipated problems; test several alternatives and choose the optimum approach; conduct a complete and thorough check of the planned process. The following section highlights some of the challenges faced in the pilot intersection.

The intersection at North Alafaya Trail is running in North-South direction & University Blvd running East-West, as shown in **Error! Reference source not found.**. The North approach along Alafaya Trail has three (3) through lanes, one (1) dedicated right, and two (2) dedicated left-turn lanes. The east approach along University Blvd has two (2) through lanes, one (1) shared through right, and two (2) dedicated left lanes. The camera was located at the southeast corner to monitor the Northbound traffic. This intersection is near a college land use (The University of Central Florida-UCF) and commercial land use on the northwest corner.

One of the challenges in this task was to find an appropriate location to fit both Bosch IP8000i cameras with PTZ (Pan, Tilt, Zoom) capabilities to monitor both the traffic approach and the traffic signal. Due to the large size of the trailer, finding a suitable and safe location in the public right of way was a repeated challenge. In several preselected locations, the public right of way was narrow; and sometimes did not fit the trailer or allow a researcher to safely park near the trailer to download the video recordings from the two cameras.

Initially, the trailer was placed at a location further from the intersection, and the full height of the mast arm was used in order to monitor the approach and traffic signal. After reviewing the video data from this trailer configuration, it revealed that leaving the mast at full height, monitoring the distractions was a little bit difficult due to the cameras' optical zoom capabilities. Following this, the trailer was relocated to a position closer to the intersection. The mast arm was lowered to better view the vehicles and the drivers but was lifted high enough to avoid any influence on the drivers' behavior or grab their attention.

Though the internal clock of the cameras was manually synced together, a time deviation was observed after a certain period. Therefore, syncing the cameras was a repeated task that had to occur regularly due to the lack of an automated method to sync the cameras instead of the manual one. Since each camera is separate, syncing the clock between them was crucial for the accuracy of the data collection process. Usually, the internal clock of any device drifts over time and causes a time error. If not resolved regularly, this time error could lead to discrepancies in time calculation and hence inaccurate results. After investigation and research, both cameras' internal clocks were synced through an internet connection to a time server, which solved the issue. The previous two issues caused some delay and added more days to compensate for the un-synced recordings.

Moreover, the export process of the videos was lengthy and took a significant amount of time. One (1) hour, two (2) hours, four (4) hours of recording data takes around 30, 50, and 110 minutes respectively to be exported. Occasionally, though the export process indicates that the export

process was completed successfully, the exported hours were not complete and consequently had to be exported again. Figure 3-5 shows the BVMS used to export the videos.

Collecting the recordings from the camera was another challenge. The Bosch camera is a security camera. Therefore, setting up the cameras and downloading the recorded videos was not an easy process, but after consulting a specialized technician and contacting Bosch customer support frequently, the data collection process became more manageable and went smoothly afterward. Fifty-six (56) hours in seven (7) days were recorded during the pilot study for the NBT movement during the month of February 2021. Unfortunately, due to the effect of the pandemic, the traffic was not yet back to normal, and there were very few vehicles on the road except during certain times of the day, which deemed the collected data not fully usable.

The pilot study took 48 days in duration and discovered many challenges to overcome in the following locations and provided the research team with several lessons learned that saved a significant amount of time afterward and improved the work process and operation.

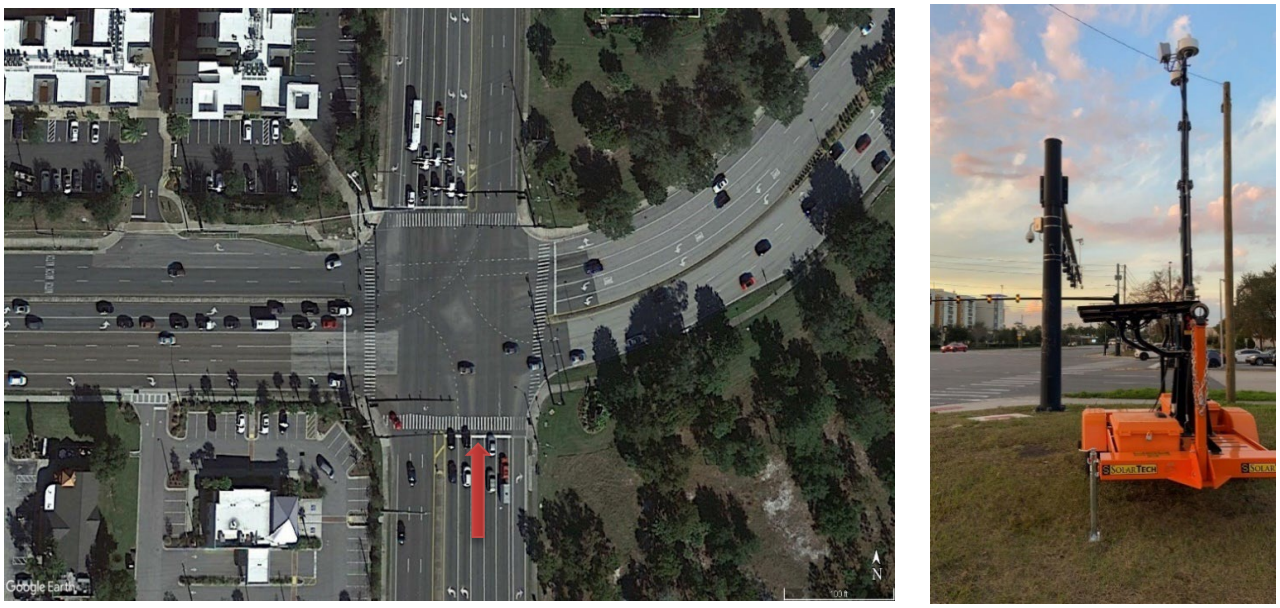


Figure 3-4: North Alafaya Trail & University Blvd.

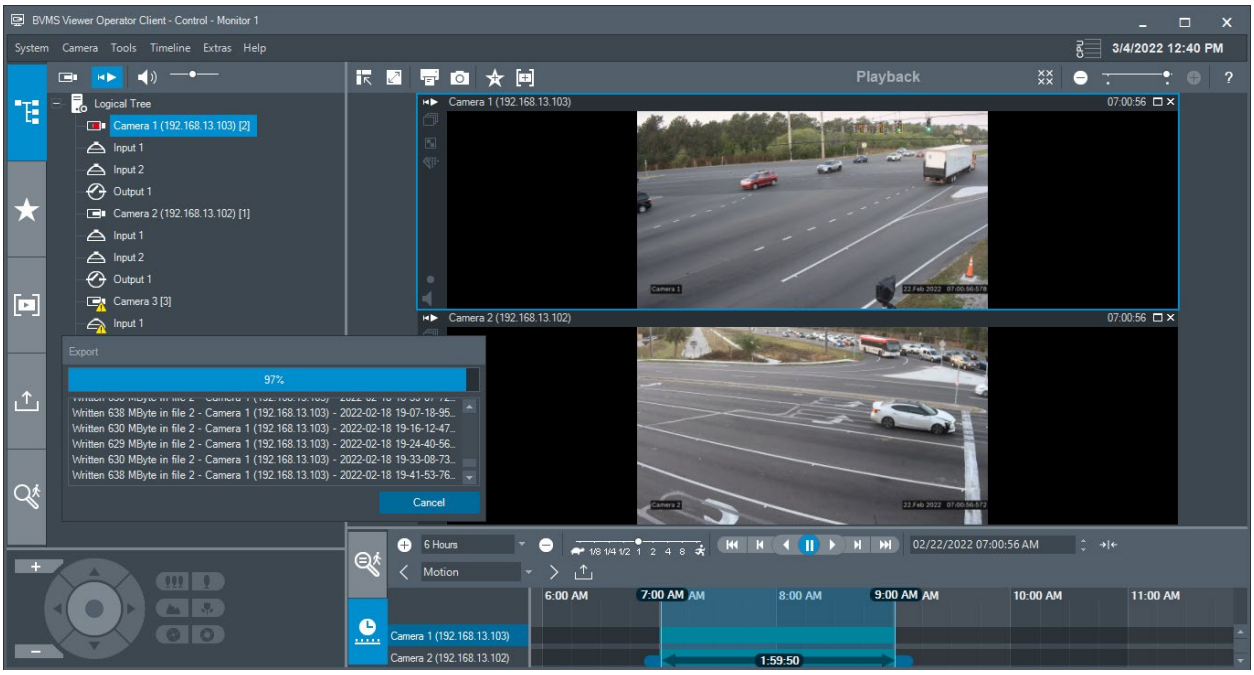


Figure 3-5: Bosch Video Management Software (BVMS)

Lake Underhill Road & Woodbury Road – EBT & SBL Approaches

The following intersection was Lake Underhill Road (East-West) at Woodbury Road (North-South), as shown in Figure 3-6. This intersection was selected because it combines residential and school land uses. Lake Underhill Road is considered the major road with 1 dedicated left, 2 through lanes, and 1 dedicated right along both approaches. The side street is Woodbury Road, with 2 left lanes and 1 shared through and right along both approaches. The camera was located at the Southwest corner to monitor the Eastbound through traffic and then later relocated to the Northeast corner to capture the Southbound left. The school land use is an elementary and a middle school in the Southwest and Southeast corners, respectively. The residential area is in both the Northeast and Northwest corners. The total number of recorded hours was 32 and 30 for the EBT and SBL movements, respectively.

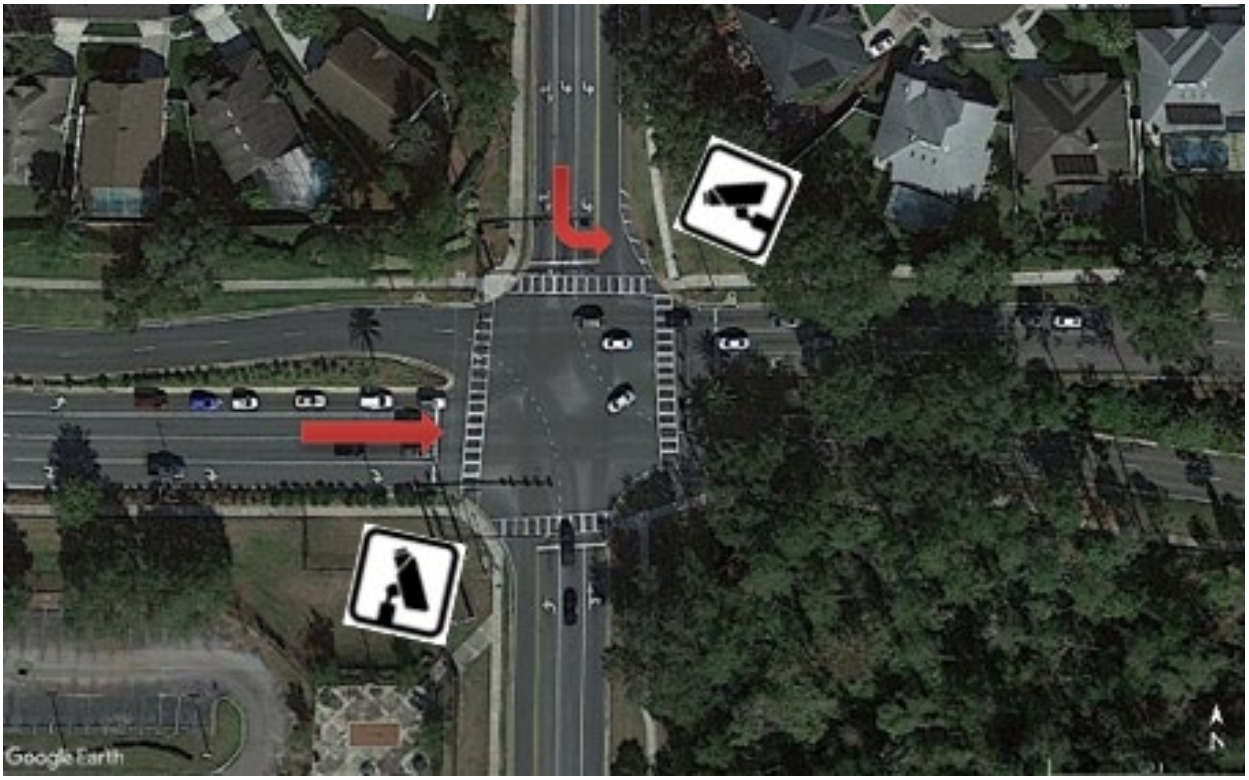


Figure 3-6: Lake Underhill Road & Woodbury Road

Lake Underhill Road & Dean Road – NBT Approach

The intersection of Lake Underhill Road at Dean Road, as shown in Figure 3-7, was selected with Lake Underhill Road running East-West and Dean Road running North-South. The data was collected in the northbound through (NBT) direction along Dean Road which has 1 dedicated left turn, 1 through lane, and 1 dedicated right, Lake Underhill Road has 1 dedicated left, 1 through lane, and 1 shared through and right lane in the westbound approach and 1 left, 1 through and 1 right turn lane in the eastbound approach. The camera was located in the Southeast corner to monitor the Northbound through movement. The intersection is located within a predominantly commercial area. The total number of recorded hours was 43 for the NBT movement.

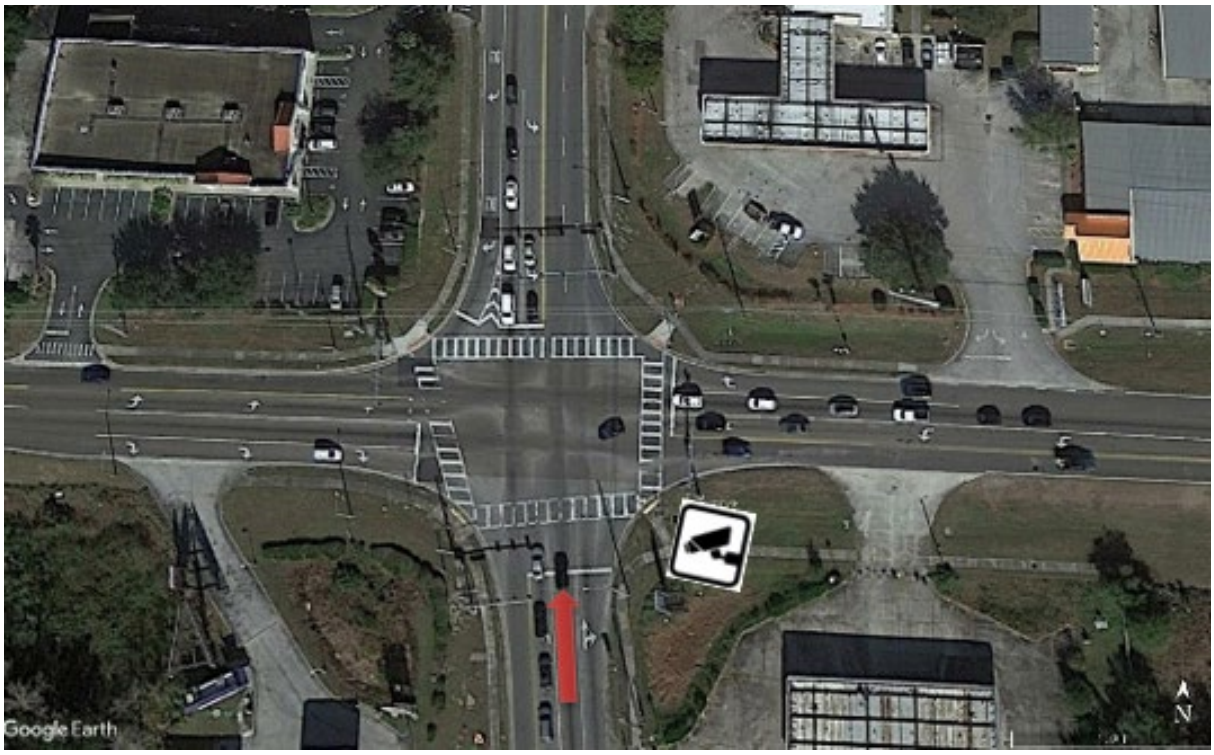


Figure 3-7: Lake Underhill Road & Dean Road

SR 50 & N. Bumby Ave – WBT Approach

The next intersection was SR50 (E Colonial Drive) and N. Bumby Ave, as shown in Figure 3-8. The data was collected along SR 50 in the westbound approach which has 2 through lanes, 2 dedicated lefts, and 1 shared through and right lane. Bumby Ave is running North-South where the northbound approach has 1 left turn lane, 2 through lanes and 1 exclusive right turn lane. The southbound approach has 1 dedicated left, 1 through lane, and 1 shared through and right lane. The camera was located at the Northeast corner to monitor the Westbound through movement. The intersection was selected to investigate the drivers' distractions surrounding office, and commercial land uses. The total recorded hours were 40 for the WBT movement.

Figure 3-8: Intersection 3 SR 50 & N Bumby Ave

SR 50 & North John Young Parkway (JYP) – NBT Approach

The following intersection was SR 50 and North John Young Parkway (JYP), as shown in Figure 3-9. This intersection was selected because of the heavy congestion along both roadways in the peak hours as well as its proximity to the Downton area. The land use surrounding the intersection is mainly commercial. Both SR50 and John Young Parkway are configured with 2 dedicated left lanes, 3 through lanes, and 1 dedicated right lane. The camera was located in the intersection's southeast corner to monitor the Northbound through movement. More than 30 hours were recorded for the NBT movement.

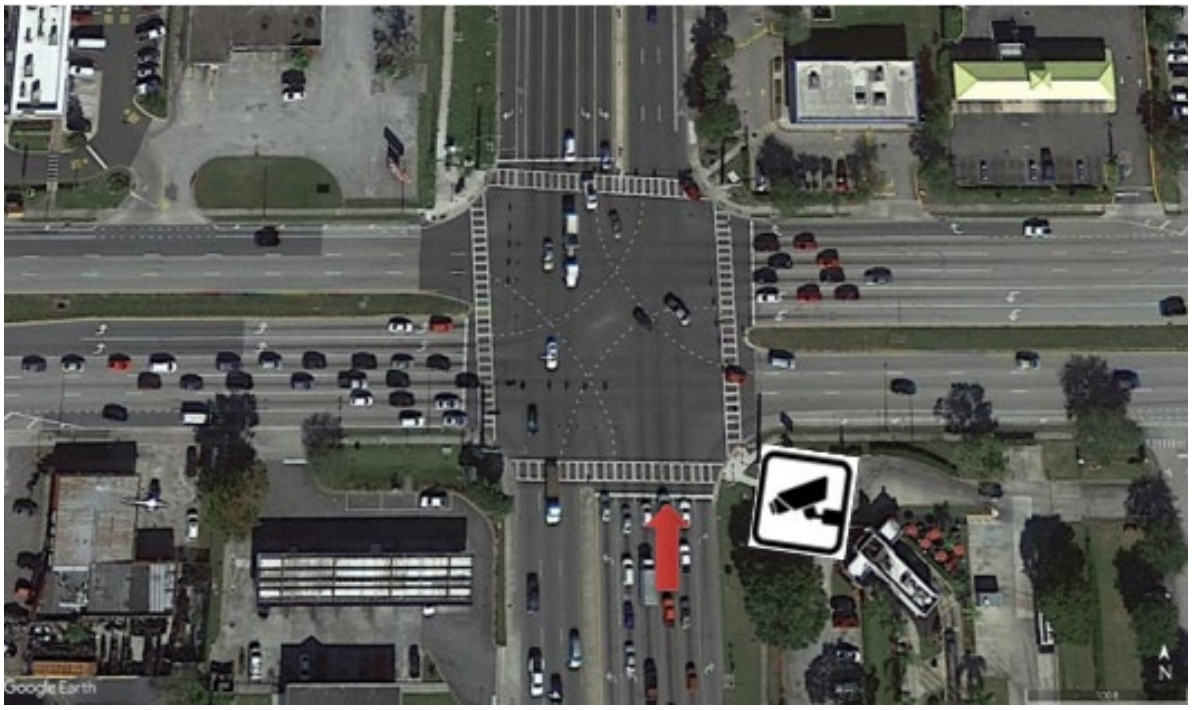


Figure 3-9: Intersection 4 SR 50 & North John Young Parkway (JYP)

SR 482 & Orange Blossom Trail (OBT) – SBT & SBL Approaches

The next intersection was SR 482 (Sand Lake Road) and Orange Blossom Trail (OBT), as shown in Figure 3-10. Both SR 482 and OBT have 2 dedicated left lanes, 3 through lanes, and 1 dedicated right lane. The camera was located in the northwest corner to observe the southbound through and left. The data was collected for both the southbound through and left lane movements. The land use of this area is predominantly commercial due to its proximity to Florida Mall and the presence of tourists. 37 and 33 hours were recorded for the SBT and SBL movements, respectively. It should be noted that this intersection was also utilized to collect pedestrian data, as will be explained later.

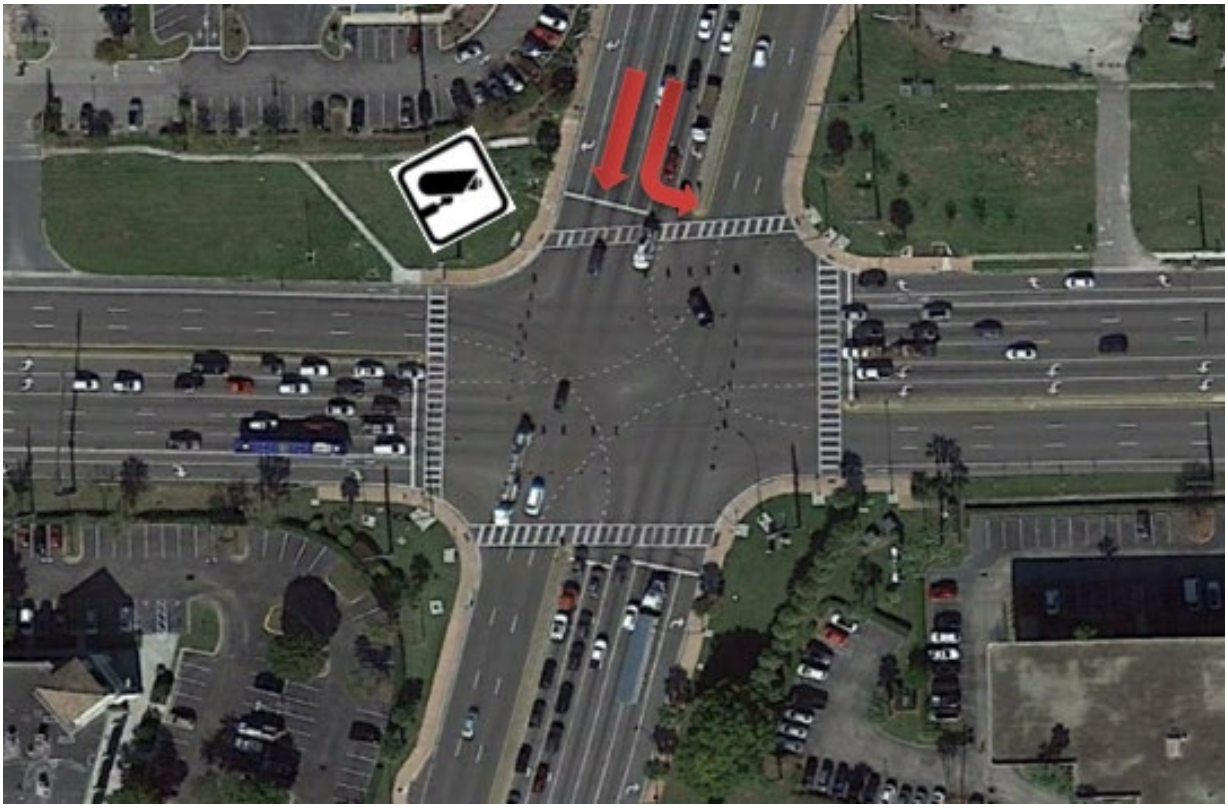


Figure 3-10: Intersection 5 SR482 (Sand Lake Rd) & OBT

International Drive & Jamaican Court – SBT & SBL Approaches

This intersection was selected because of its unique land use, as it has a tourist attraction and some commercial facilities nearby, as shown in Figure 3-11. The major road is International Drive with one 1 dedicated left turn, 2 through lanes, and 1 dedicated right, along both approaches. The side street is Jamaican Court with 1 shared through left and 1 right along both approaches. The total number of recorded hours was 12 hours for the through lanes, and 50 hours from the left lanes. The camera was located in the northwest corner to monitor the Southbound through and left lanes. It should be noted that this location was used to collect pedestrian data due to the relatively high tourist pedestrian activity along I-Drive and Jamaican Court.

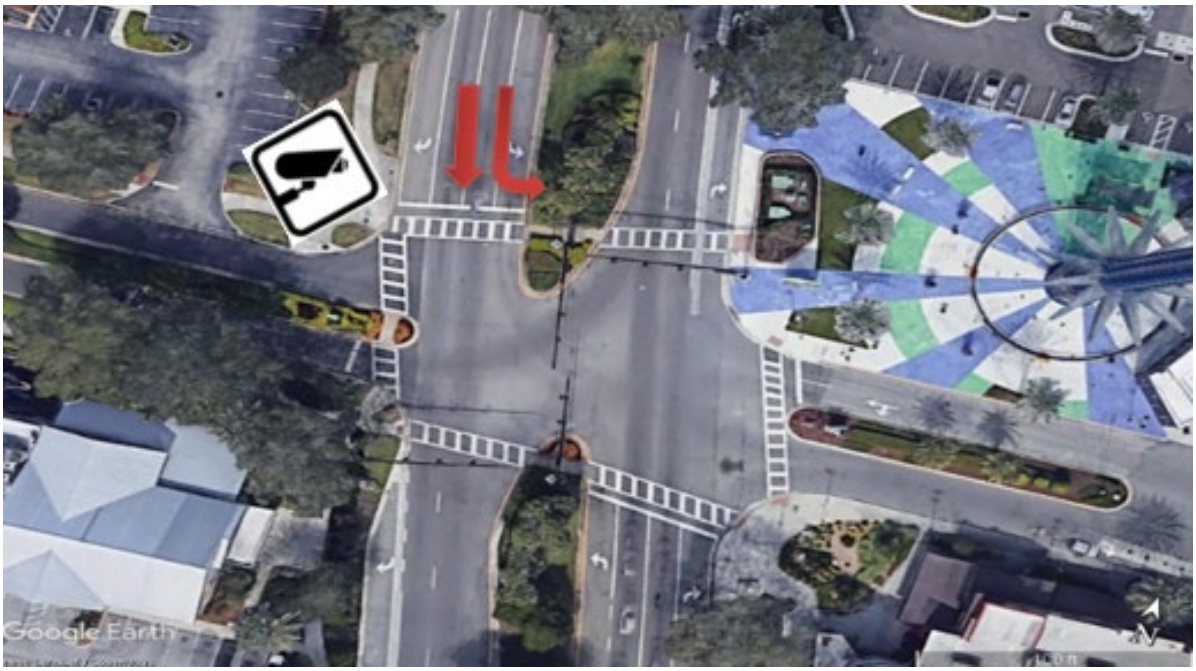


Figure 3-11: I-Drive and Jamaican Court

SR 436 & Wilshire Drive – NBL Approach

This intersection was selected due to its mixed land use, as it is surrounded by residential and commercial areas, as shown in Figure 3-12. This location helps in studying the effect of residential and commercial land use interaction on the drivers' distractions. The major road is SR 436 with 1 dedicated left, 3 through lanes, and 1 right lane along both approaches. The side street is Wilshire Drive, with 1 dedicated left lane and 1 shared through and right lane. The relatively small intersection size allowed the cameras to have a clear view at the southeast corner to monitor the Northbound left turn movement. The total recorded hours were 10 for the NBL movement.

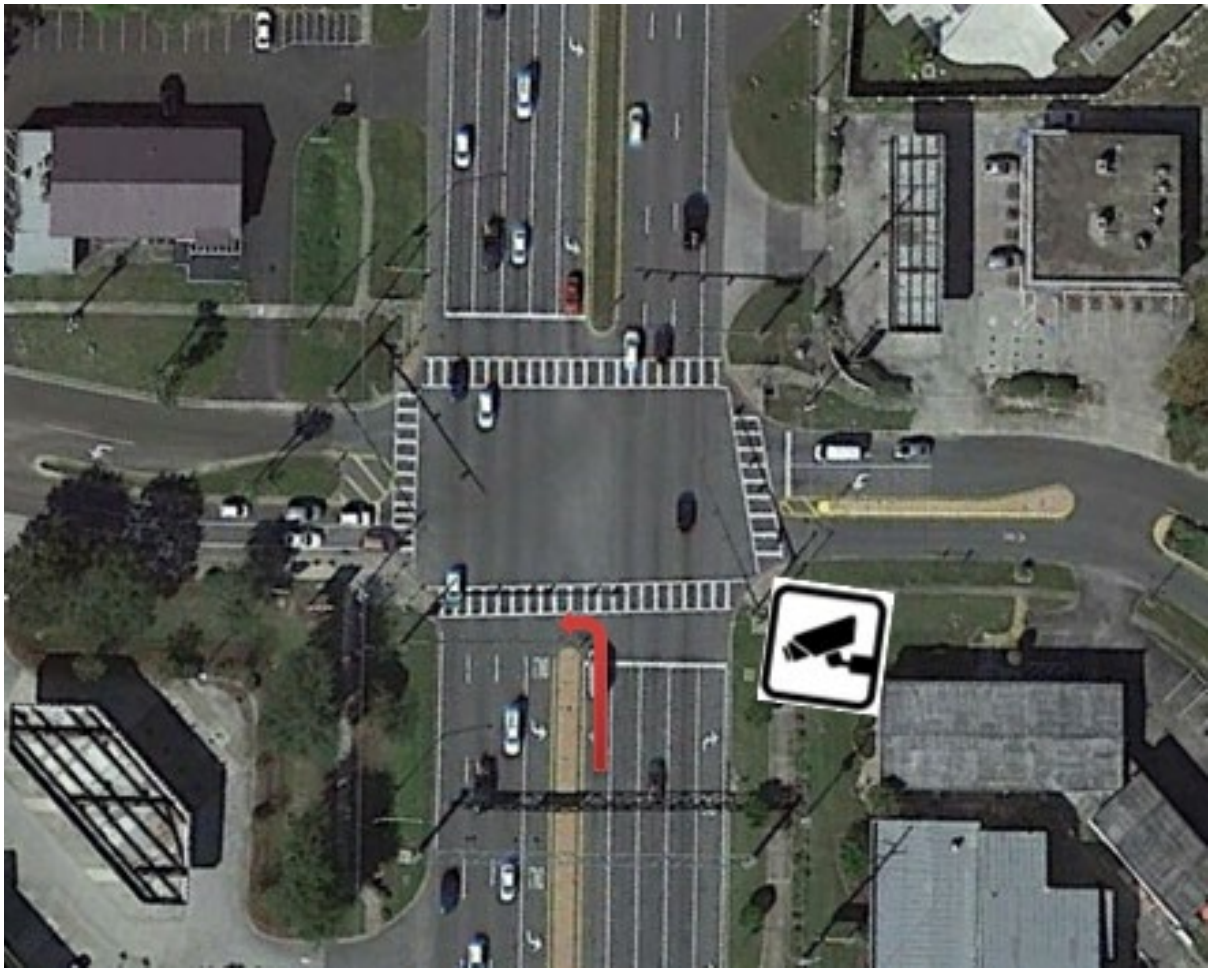


Figure 3-12: SR 436 & Wilshire Drive

Narcoossee Rd & Lee Vista Blvd – NBL Approach

The next intersection was Narcoossee Rd and Lee Vista Blvd, as shown in Figure 3-13. A commercial area surrounds this location. The major road is Narcoossee Rd, with 1 dedicated left, 2 through lanes, and 1 right lane. The side street was Lee Vista Blvd, with 1 dedicated left, 2 through lanes, and 1 right lane. The target movement was the NBL, and the cameras were placed at a proper location in the southeast corner. 27 hours were recorded for the NBL direction.

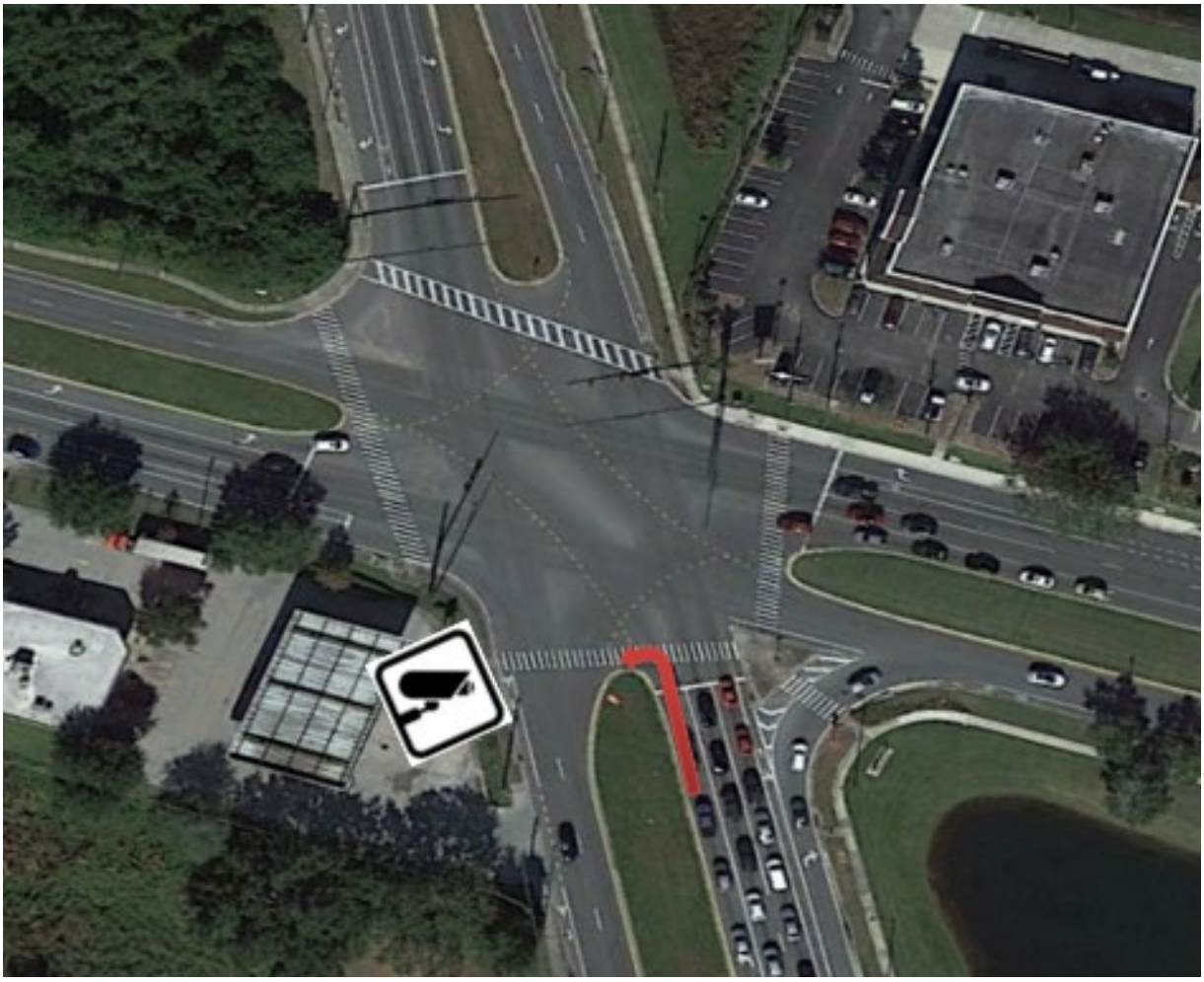


Figure 3-13: Narcoossee Rd & Lee Vista Blvd

SR 536 & SR 535 - WBL Approach

As shown in Figure 3-14, the intersection of SR 536 and SR 535 was selected due to the touristic land use of this area. The data were collected along SR 536 for the 2 left lanes in the Westbound direction. The SR 536 (World Center Drive) comprises of 2 left lanes, 2 through lanes and 1 dedicated right turn along both approaches. SR 535 (S Apopka Vineland Rd) is composed of 2 dedicated left lanes, 3 through lanes, and 1 dedicated right turn lane along both approaches. The cameras were placed in the northeast corner to capture 28 hours of the WBL movement.

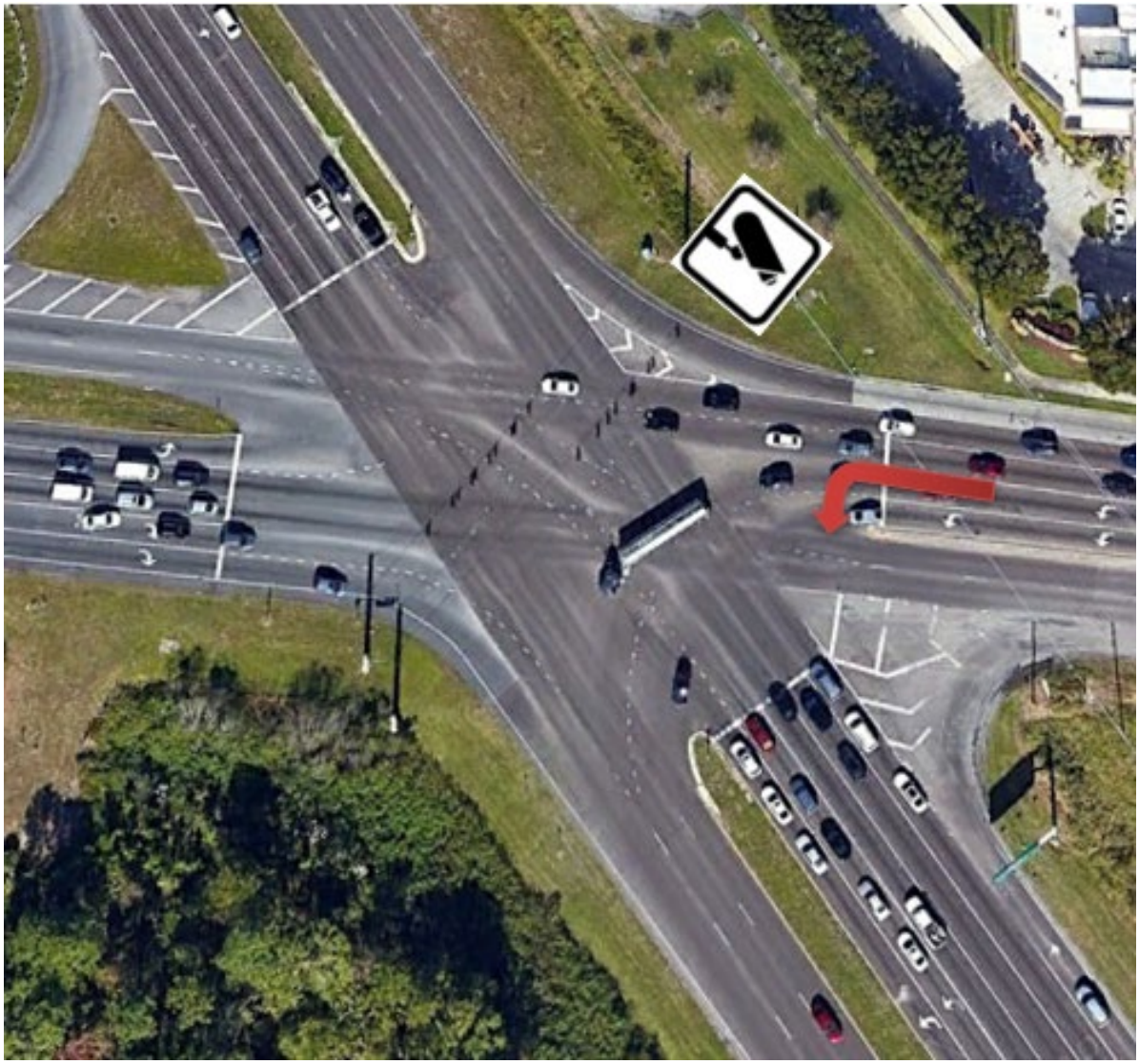


Figure 3-14: SR 536 & SR 535

3.3.2 Distracted Pedestrians

The following section describes the data collected at different locations to identify distracted pedestrians at signalized intersections.

The data were collected at five (5) intersections within District 5 (Figure 3-15) covering eight (8) approaches. The intersections were selected to meet the following criteria. First, there is a moderate to a heavy number of pedestrian activities. Second, they cover different land uses (residential, school area, college, and commercial).

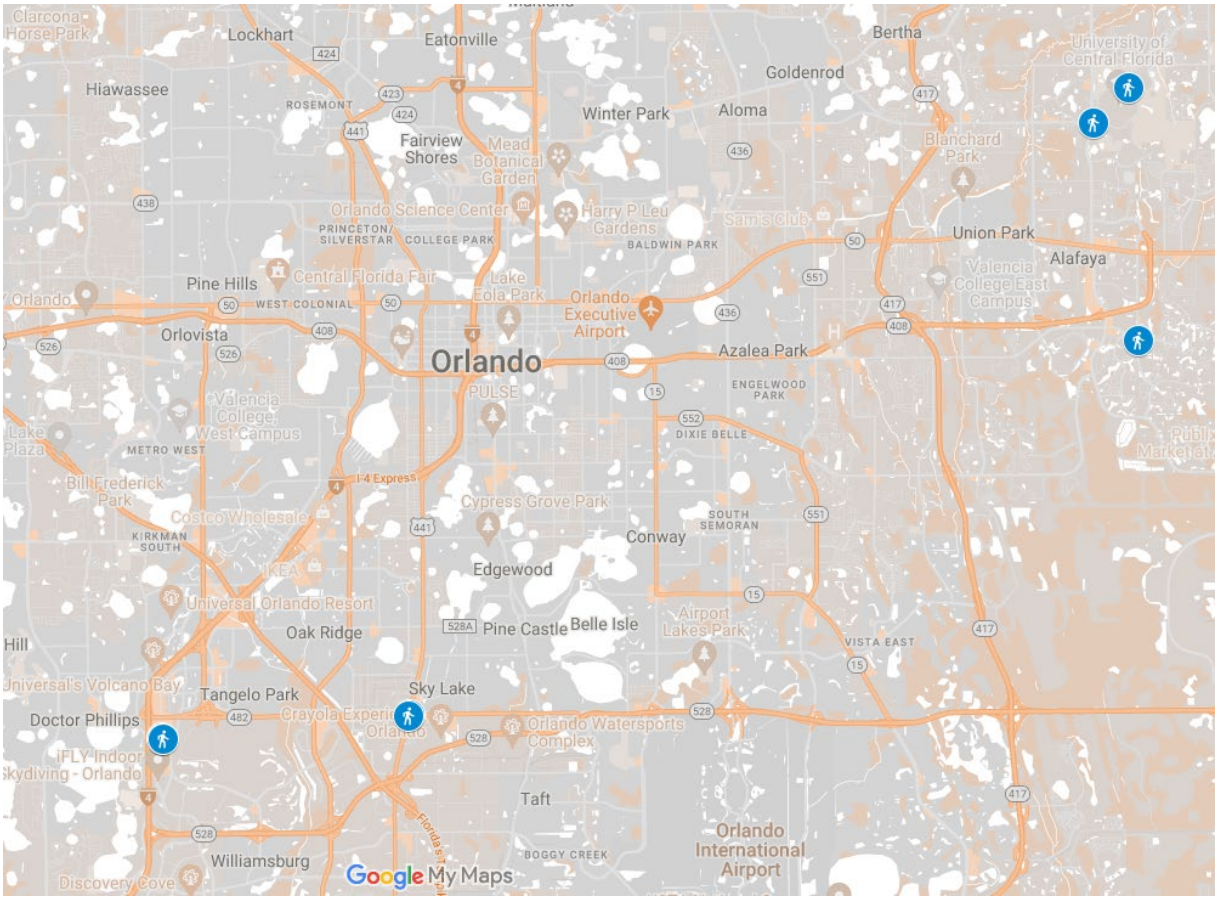


Figure 3-15: Pedestrians' Site Locations

Table 3-2 summarizes the study locations and identifies each approach. The locations are SR 434 and University Blvd (Figure 3-16)., Lake Underhill Road and Woodbury Road; Gemini Blvd and East Plaza Drive; SR482 (Sand Lake Rd) and Orange Blossom Trail (OBT); International Drive (I-Drive) and Jamaican Court (Gemini Blvd and East Plaza Drive – West Approach

Figure 3-17 and Figure 3-18). Each intersection was recorded from the approaches with a significant number of pedestrians.

Four (4) out of the five (5) intersections were covered thoroughly in the distracted drivers' section. The only one not covered is Gemini Blvd. and East Plaza Drive, as only pedestrian data were collected from this location.

The intersection of Gemini Blvd and East Plaza Drive was selected because it is adjacent to UCF and has a high pedestrian movement. Gemini Blvd has 1 shared through and left, and 1 shared through and right lane. East Plaza Drive is configured with 1 shared left, through, and right. The camera was located in the Southwest corner to monitor the West approach. The land use at this intersection is School/College.

It should be noted that the first location was the intersection of SR 434 at University Blvd as described earlier, being a pilot location and due to its proximity to UCF and the heavy pedestrian activity in and out of the UCF Campus. However, because of the pandemic and remote learning, there was very minimal pedestrian activity recorded at this location despite the extended number of hours collected (50 hours).

Table 3-2: Study Locations and Their Characteristics (Pedestrians)

No.	Location	Land-Use	Study Approach	No of Lanes crossed	Pedestrian Activity	No. of Hours Recorded	
1	SR 434 & University Blvd	College & Commercial	South	9	Heavy	50	
2	Lake Underhill Road & Woodbury Road	Residential & School Area	South	4	Light	12	
3	Gemini Blvd and East Plaza Drive	School/College	West	4	Heavy	33	
4	SR 482 and OBT	Tourist/ Commercial	North West	9 9	Light	23 65	88
5	I-Drive and Jamaican Ct.	Tourist/ Commercial	North West South	7 2 6	Moderate	12 18 12	42
Total Hours						**225**	

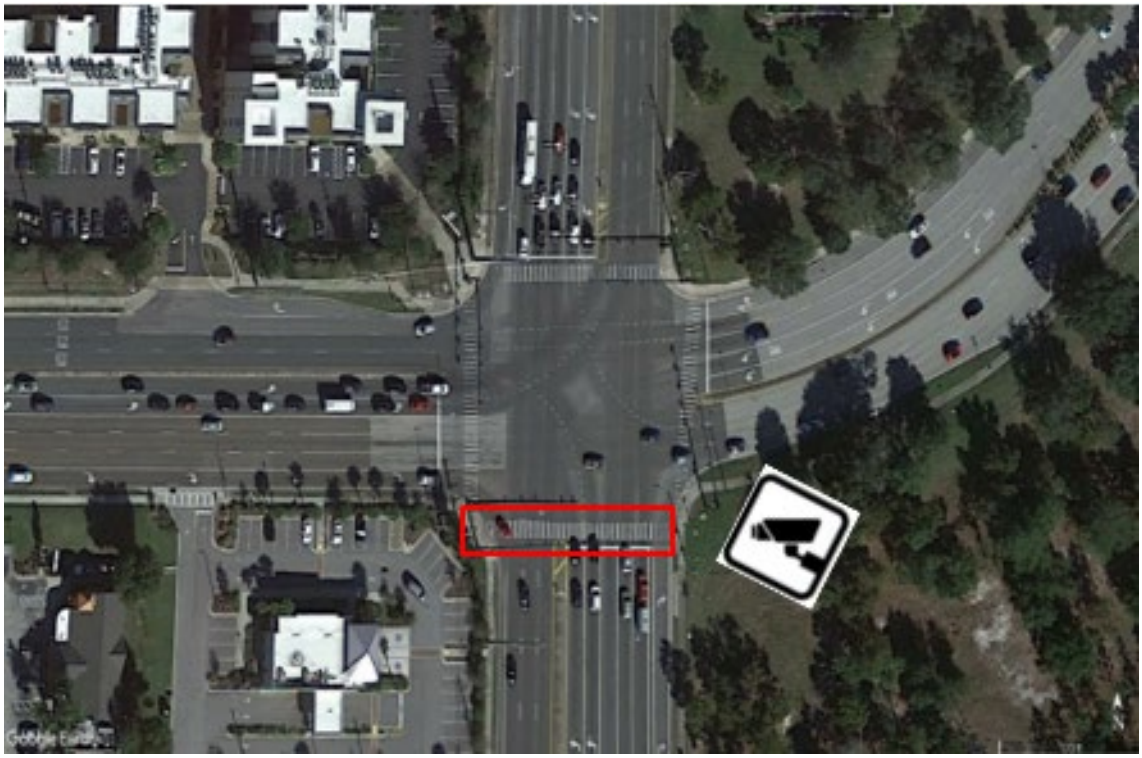
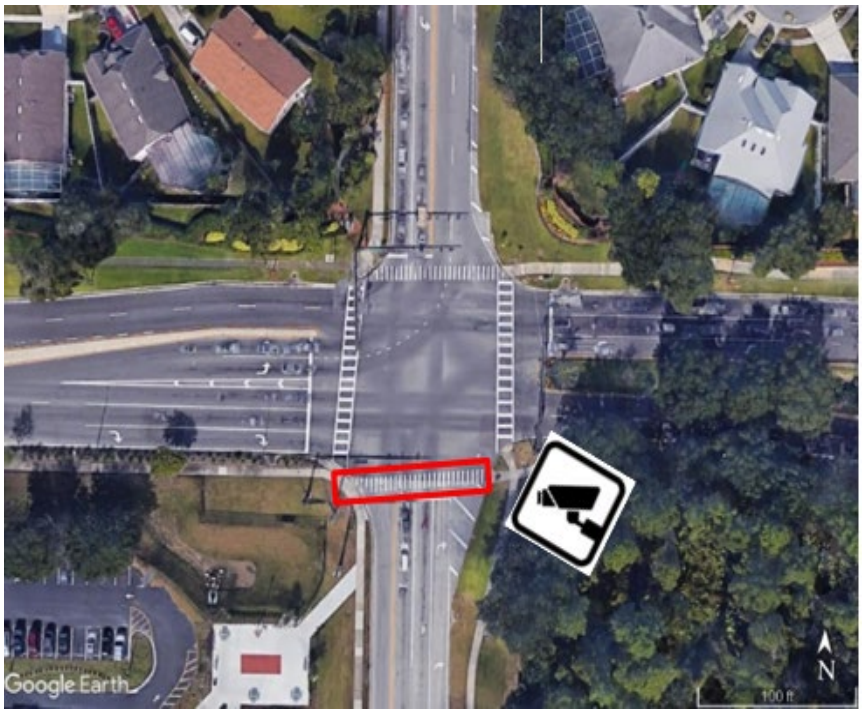
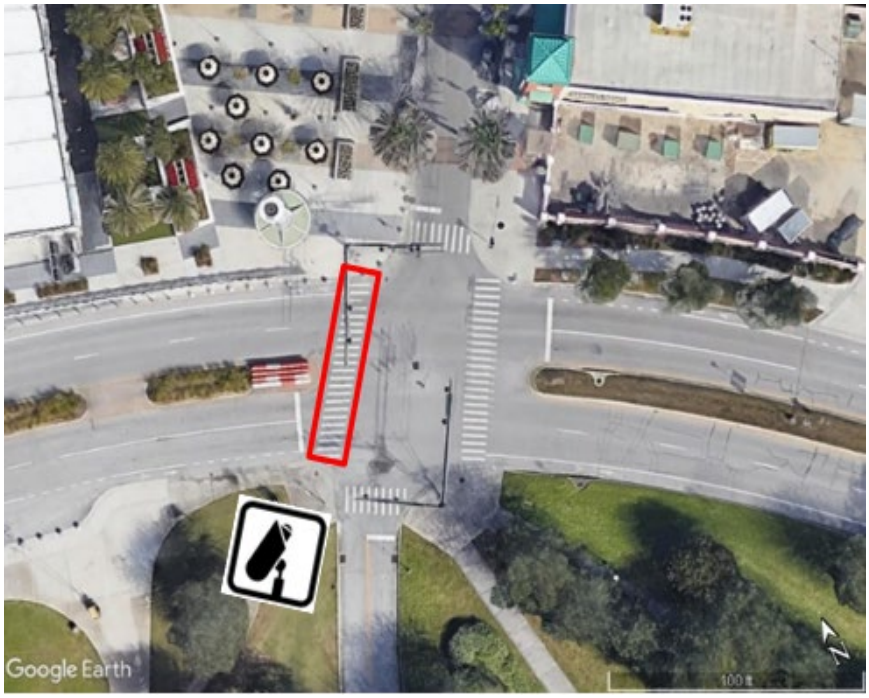


Figure 3-16: SR434 (Alafaya Trail) & University Blvd – South Approach

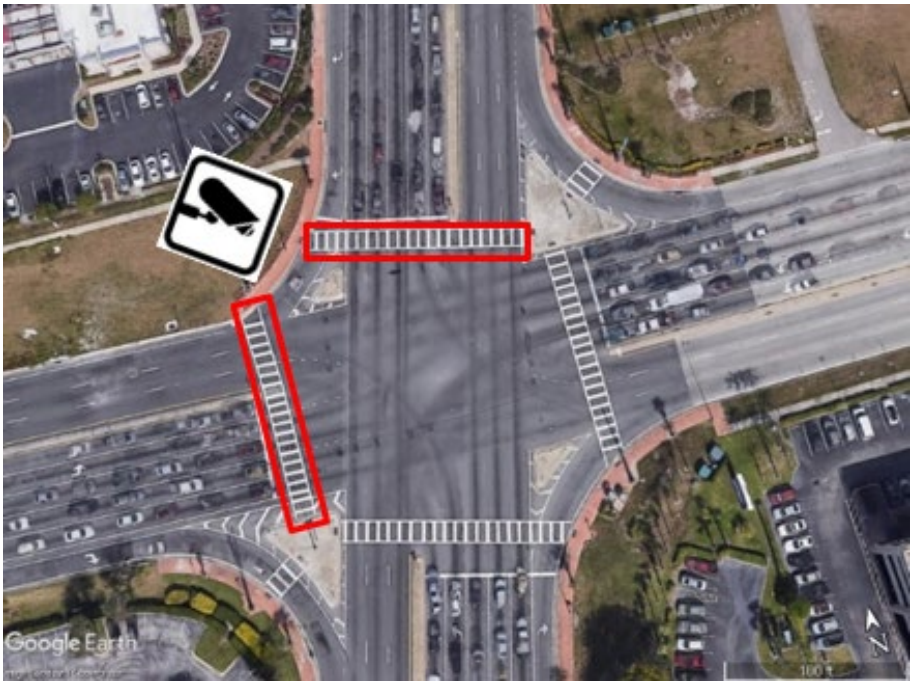


(a) Lake Underhill Road & Woodbury Road – South Approach

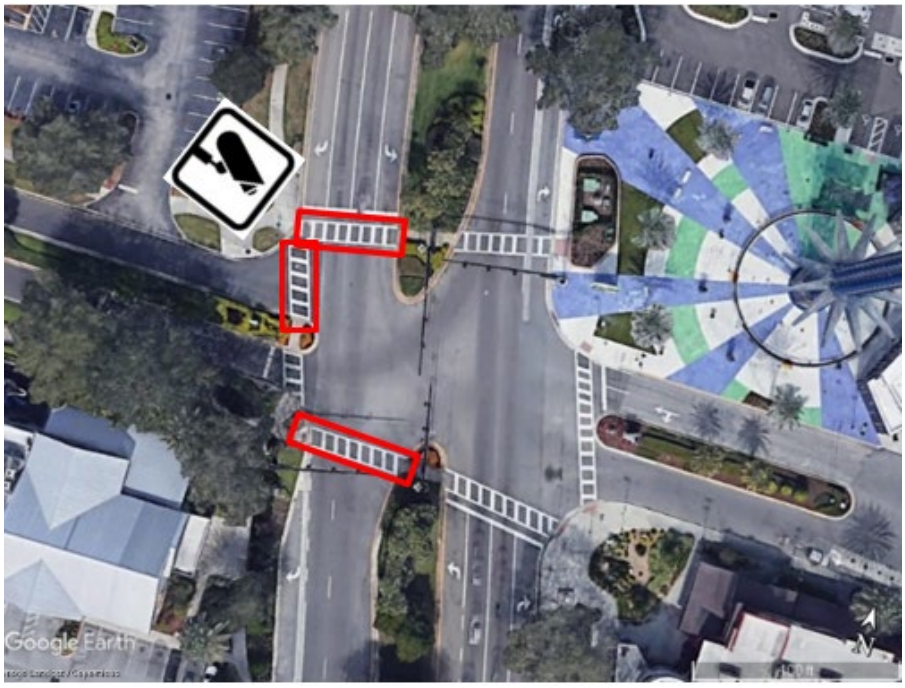


(b) Gemini Blvd and East Plaza Drive – West Approach

Figure 3-17: Intersections Locations and Geometric Configurations (a & b)



(c) SR482 and S OBT– North and West Approaches



(d) I-Drive and Jamaican Ct.– North, South and West Approaches

Figure 3-18: Intersections Locations and Geometric Configurations (c & d)
(Google Earth 2022)

3.4 Summary

This chapter covered the data collection methodology, camera selection, and determining the study locations. In Chapter 2, several cameras were proposed for the study, and after a field test, the Bosch camera was selected for the study as it fulfilled the study requirements. Several intersections were selected to cover various land use, a different number of through and left lanes as well as several cross walks, and peak periods of high demand.

IV. DATA EXTRACTION & MEASURES OF DISTRACTION

4.1 Parameters Selection

Due to the collection of the sufficiently large data sample at each location, preliminary observations were required to determine the type and measure of distraction to identify any notable variability in the observed distractions. Therefore, distractions were categorized for their intensity (ordinally) or by distraction type (categorically, for example, conversation, texting, eating, dashboard use, eyes-off-the-road, etc.). The actual extraction process was initially performed manually by having two researchers watching the footage and reporting on observations. Having agreement on the data was necessary for data consistency as the final selected distraction measures are solidified. Image processing software was also explored for faster data processing. In addition to the distraction data, other parameters were extracted from the video data collection, such as startup lost times, perception reaction times (PRT), headways, saturation flow rate, approach volumes, queue lengths, and other intersection features, as well as driver/pedestrian characteristics including gender and approximate age (young, middle age, old age). The above-mentioned process would allow for more robust modeling in the data extraction task.

4.1.1 Distracted Drivers

Table 4-1 lists the factors that were recorded during the data extraction process for the through and left movements. The main parameters used in the distracted drivers' data collection were Weather, Distraction Cause, and Green/Crossing Times. The weather might have a significant effect on drivers' behaviors. For example, drivers tend to drive slower in rainy weather, consequently increasing the headway. Distraction cause is a significant factor in causing delays and therefore increasing the headway. Several timings were recorded to measure the response time of the driver. The researcher will record the timestamp when the signal was green (Green Start), when the driver crossed the stop-line (Crossing Time), and when the signal was red (Green End). Subtracting the crossing time from the green start will provide the headway for the first vehicle in the queue. For the following vehicles, the headway is the time difference between successive vehicles crossing the stop-line. Peak hours (AM/MD/PM) were identified from the timestamp to measure the significance of each one on the response variable (headway). Drivers' recordings were collected during the peak hours on weekdays during the AM peak (7-9), MD peak (12-2), and PM peak hours (4-8).

The weather parameter was classified as Sunny, Rainy, and Cloudy. Though previous research avoided data collection in rainy weather, the 4K cameras recorded the distractions clearly with their efficient optical zoom. The distraction cause parameter contained several effects, which are listed in Table 4-1. "No Distraction" effect was used when the driver's headway was within two (2) seconds, and the driver clearly was looking ahead with no distractions observed. The "Cell Phone" effect was categorized when the driver used his cell phone. "Dashboard" was classified when the driver was using the dashboard. "Passenger" distraction was categorized when the driver talked to passengers in the car. Finally, the "Other" category was used for any other distractions not considered in the above parameters. Figure 4-1 illustrates one of the typical distraction types, which is a cell phone distraction.

Table 4-1: Distracted Drivers' Parameters and Effects

Parameters	Effects
Weather	Sunny Rainy Cloudy
Distraction Cause	No Distraction Cell phone Dashboard Eating/Drinking Not Identified Distraction Passengers Smoking Other
Green start	The timestamp when the drivers' signal turned green
Cross time	The timestamp when the driver crossed the stopping line
Green End	The timestamp when the green signal ended

Figure 4-1: Cell phone distraction

4.1.2 Distracted Pedestrians

Distracted pedestrians' parameters were selected carefully to record all potential effects related to distractions. Data were collected on weekdays. The solar panels in the trailer allowed the researchers to record for a straight 12 hours (7 am to 7 pm). Weather conditions included Sunny, Rainy, and Cloudy. Land use was a vital parameter and was considered for each location (School, College, Residential, and Commercial). The Distraction Cause parameter, as shown in Table 4-2, recorded all potential distractions. The "No Distraction" parameter was recorded when the pedestrian startup time is less than or equal to two (2) seconds, and he or she is not distracted. The "Texting/Talking on a phone" is recorded when the pedestrian is distracted by his cell phone. "Talking to others" was categorized when a group of pedestrians is distracted by talking to each other while crossing. The gender parameter (Male/Female) and Age (Young/Old) were collected. The pedestrians were categorized either in a "Group" or "No Group." Different events' timestamps were captured. The "Green Start" is the time when the pedestrian signal turns green. The "Crossing Time" is when the pedestrian starts to cross. "Clear Time" is when the pedestrian finishes or clears the crossing. The "Green End" is the time recorded when the green signal ended.

Table 4-2: Distracted Pedestrians' Factors and Effects

Parameters	Effects
Weather	Sunny Rainy Cloudy
Land Use	School/College Residential/Commercial
Distraction Cause	No Distraction Texting/Talking on a phone Talking to others Eating/Drinking/Smoking
Gender	Male Female
Group Status	Group No Group
Age	Young Old
Green Start	The timestamp when the pedestrian signal turned green
Crossing Time	The timestamp when the pedestrian started to cross
Clear Time	The timestamp when the pedestrian cleared the crossing
Green End	The timestamp when the green signal ended

4.2 Data Extraction

The data collected for both distracted drivers and pedestrians were video recordings with around 900+ hours (see Appendix P to Z), which counted 3+ Terabytes (TB). This large amount of data was difficult to be transferred online. Therefore, the data extraction process was conducted in the field using a direct ethernet connection to the cameras to ensure high-speed data transfer and avoid any connection lag/errors. The extraction was performed using a laptop with the BVMS viewer 10.1, a software developed by the camera manufacturer (Bosch).

A minimum of 24 hours at each intersection was recorded for distracted driving and 10 hours for distracted pedestrians. The recording schedule for distracted driving was set to occur Tuesday to Friday during the AM peak (7 to 9 am), mid-day peak (12 to 2 pm), and PM peak (4 to 8 pm). Recording hours for distracted pedestrians were 12 hours (7 am to 7 pm) or 6 hours (4 pm to 10 pm), depending on the location and pedestrians' activity. For example, the 4-10 pm were selected for the tourist areas near the I-Drive location.

A team of researchers analyzed the videos at the University of Central Florida (UCF) transportation lab. Distraction types were analyzed either by a specialized program or professional video editing software, as explained in the following sections.

4.2.1 The Slicer Software

The video files extracted from the Bosch cameras had a 4K resolution, and consequently, those files had a large file size and were difficult to process. Therefore, a specialized software called "Slicer" has been developed to facilitate this task and assist in the video analysis and data extraction. Figure 4-2 shows the main user interface. The Slicer converts the video into frames or pictures, as shown in Figure 4-3 and Figure 4-4, which are later loaded to another software, "the Distracted Driving" or "Distracted Pedestrians," Additionally, the Slicer software was developed to solve another issue that was encountered during the research process. The issue is that the Distracted Driving and Pedestrian software both use many sequential video files for the same study because the camera software outputs the video in pieces. Working with multiple video files in the same study causes the researcher to lose information at the beginning and the end of each video file because cycles straddling video files cannot be processed. The Slicer software solves this problem by extracting the frames from multiple sequential video files and, in essence, stitching them into one large set of frames, minimizing the number of cycles lost. The software applies parallel processing techniques by utilizing multithreading to extract the video frames efficiently. Each set of extracted frames is stored in a folder named after the first video filename in the corresponding video set.

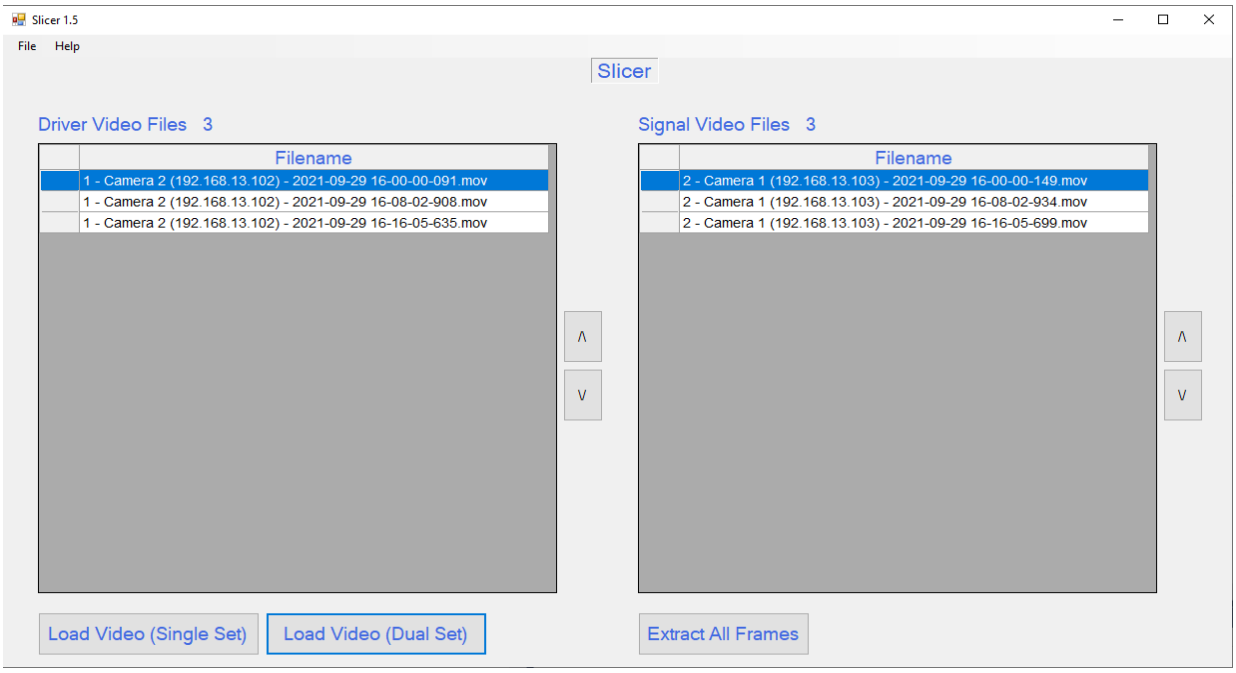


Figure 4-2: The Extraction Software "Slicer"

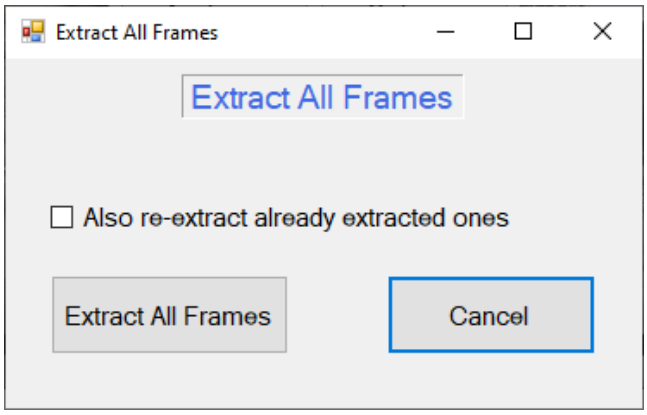


Figure 4-3: Frame Extraction Screen

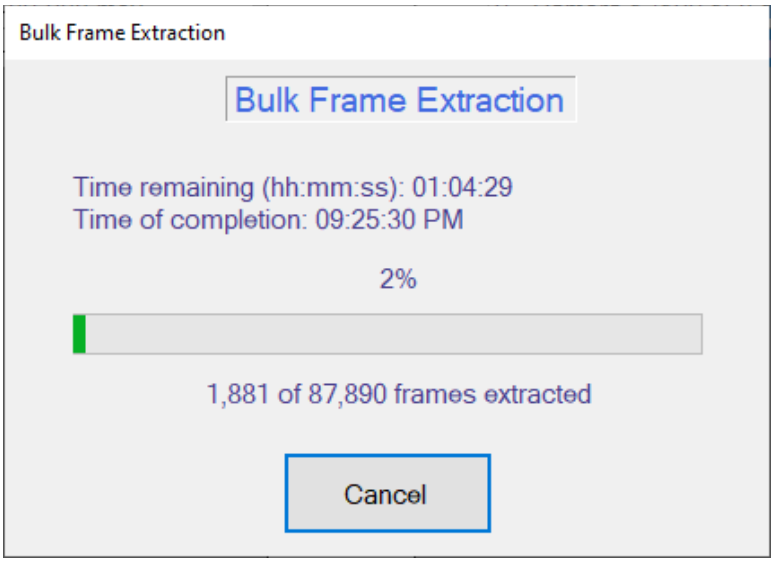


Figure 4-4: Frame extraction progress

The User Interface

The user interface is simple and allows the user to load a single or a dual video set for extraction, as shown in Figure 4-5. The typical option is to load the videos in a dual set, which load both the driver and signal video. This is the default usage so that the researcher can determine the green cycle start and end. However, the single set option is used for the special cases when the researcher is only observing the driver videos, providing that he had already captured the cycle start and end timings directly by playing the videos from a media player.

The software automatically sorts the files in each set according to their names. The researcher can still override the sorted sequence, if needed, by using the up and down arrow buttons to move individual files up or down the list. The final sequence of the files determines the order of the extracted frames based on the corresponding video files.

Figure 4-5: The Single and Dual Set Loading Options

4.2.2 Distracted Driving Software

The distracted driving software has been developed to analyze distracted driving behavior at intersections. The software assists the researcher in detecting, quantifying, and documenting the level of driver distraction that may occur when a light signal switches to green. Two videos recorded by two cameras at the intersection depict both the drivers stopping at the stop bar and the opposing traffic light. The videos are synchronized, so the delay in driver response is measured accurately. Figure 4-6 shows the main user interface. Additionally, the software provides playback speed controls, like any standard media player, allowing the user to play the video either by standard video speed or frame-by-frame. The software also allows the researcher to easily navigate the video timeline and record the required events with high precision.

The software allows the analyst to precisely record the timestamp by clicking on designated buttons to record the time when the signal turned green, the driver crossed the stopping line, and when the signal turned red (Green End). The frames from both videos are precisely timestamped each by their cameras at the time of recording, as shown in Figure 4-7. This allows the software to synchronize the videos during the analysis process.

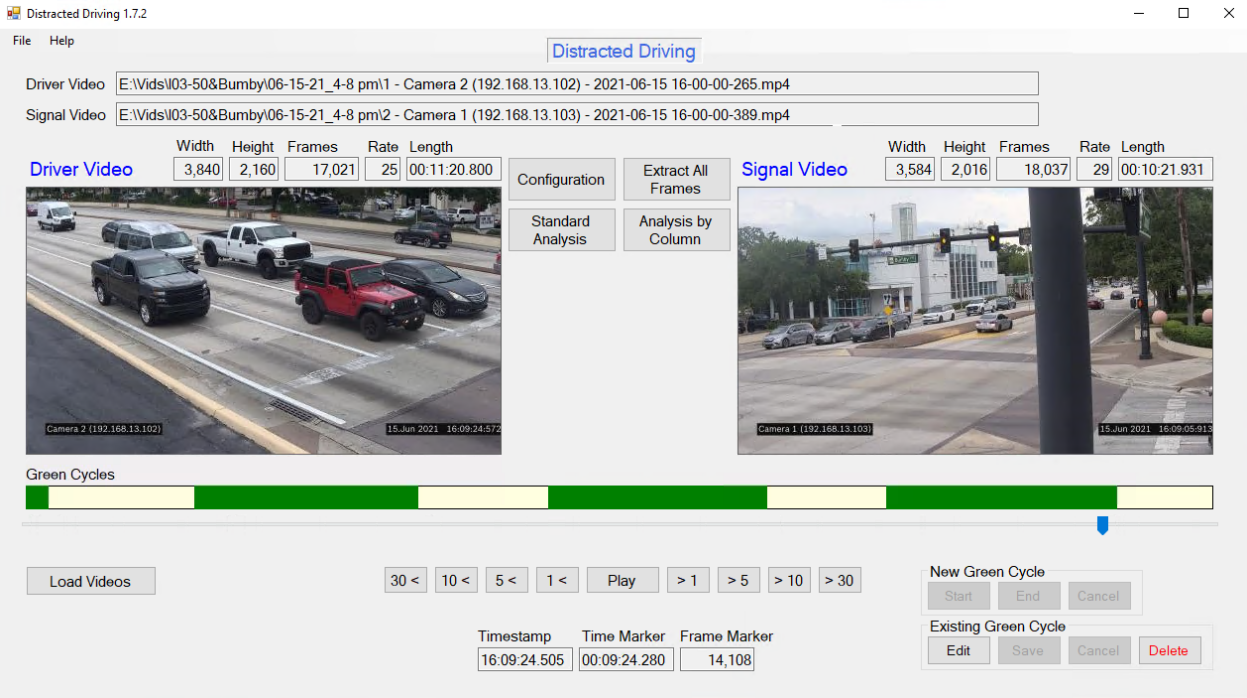


Figure 4-6: Distracted Driving Software

Figure 4-7 : Recording Timestamp

The User Interface

The user interface gives the researcher access to a number of features that facilitate the analysis operation.

Video Loading

The **Load Videos** button loads the two videos that correspond to the recording session under investigation (Figure 4-8).

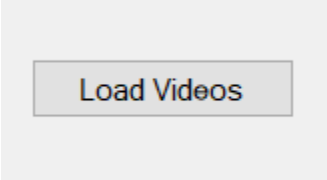


Figure 4-8: Video Loading Button

Configuration

Using a software configuration screen, the researcher specifies information pertinent to the intersection under investigation. Each intersection has a configuration file assigned to it containing such information as to location, the number of lanes, recording date and time, and video timestamp (Figure 4-9). Both videos are synchronized to a sub-frame accuracy using their timestamps. A zoomed and enlarged view of the date and time is provided to the researcher to facilitate the date and time entry of this recording.

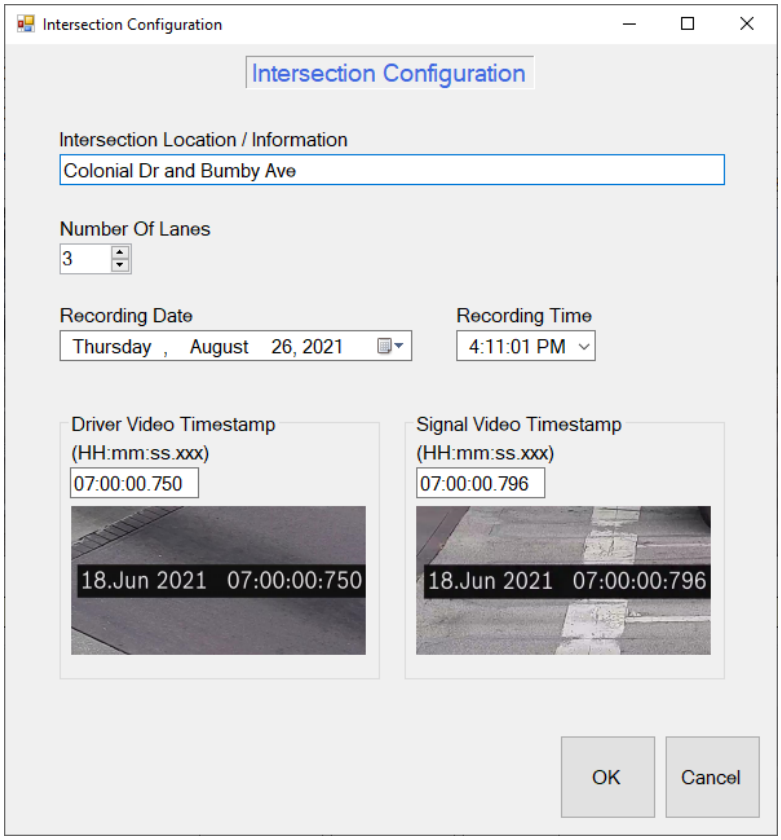


Figure 4-9: Intersection configuration and video synchronization

Frame Extraction

The video frames need to be extracted first before a distracted driver analysis can be performed (Figure 4-10). This will allow fast and responsive frame surfing and backward and forward video display. Figure 4-11 shows the frame extraction progress.

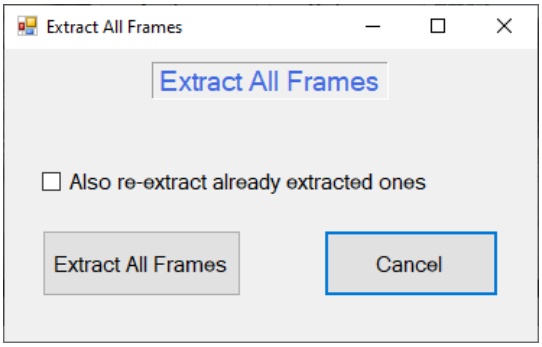


Figure 4-10: Frame extraction screen

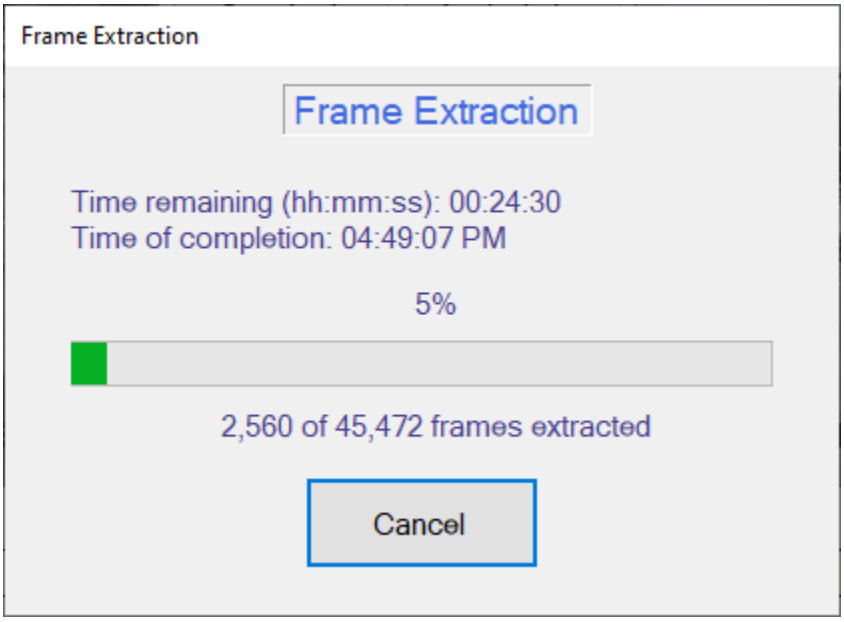


Figure 4-11: Frame extraction progress

Green Cycle Creation and Editing

The researcher can create new and edit existing green cycles based on traffic light status. To create a cycle, the Start button is pressed, and to end it, the End button is pressed. Similarly, an existing cycle can be edited or deleted (Figure 4-12).

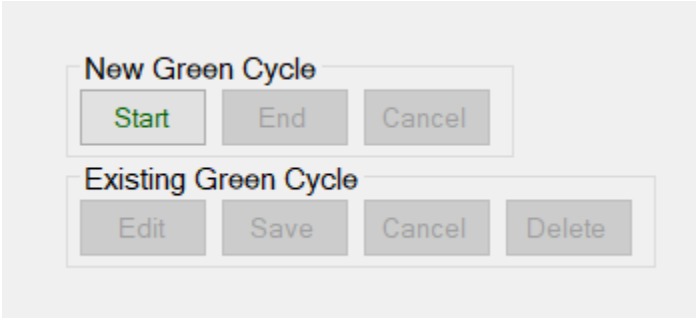


Figure 4-12: Green Cycle creation and editing

Video Surfing and Playing

The researcher can easily surf the videos and move forward and backward using directional arrow buttons and a slider (Figure 4-13). He/she can advance or regress by a specific number of frames down to a one-frame accuracy.

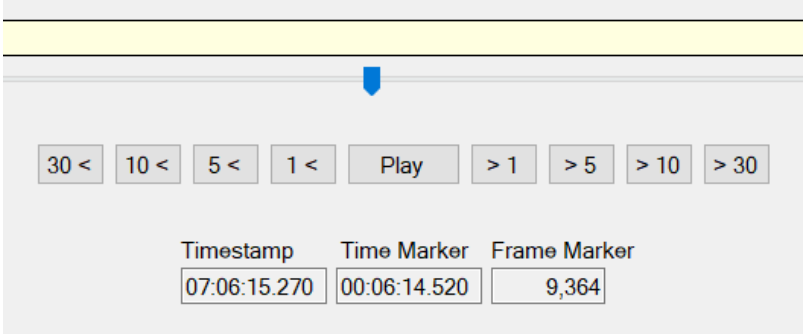


Figure 4-13: Video surfing and playing buttons

Driver Response Analysis

The software assists the researcher in precisely assessing the driver's response when the light turns green. Using the software's interactive user interface, the researcher specifies the moment the light turns green, which denotes the start of the green cycle. Then he/she specifies the moment each driver crosses the stop bar. The difference between the two times determines the driver's response. This calculation is conducted on each driver in each lane, both through and left. Figure 4-14 and Figure 4-15 show the moment the light turns green and the moment the driver in the outside lane crosses the stop bar, respectively. If a researcher finds a headway greater than two (2) seconds. In that case, they will try to identify whether there was a distraction associated with the increase in headway and, if so, determines the distraction type. If the researcher couldn't clearly determine the distraction type after analyzing the video two (2) times, the observation will be considered "Not Identified Distraction."

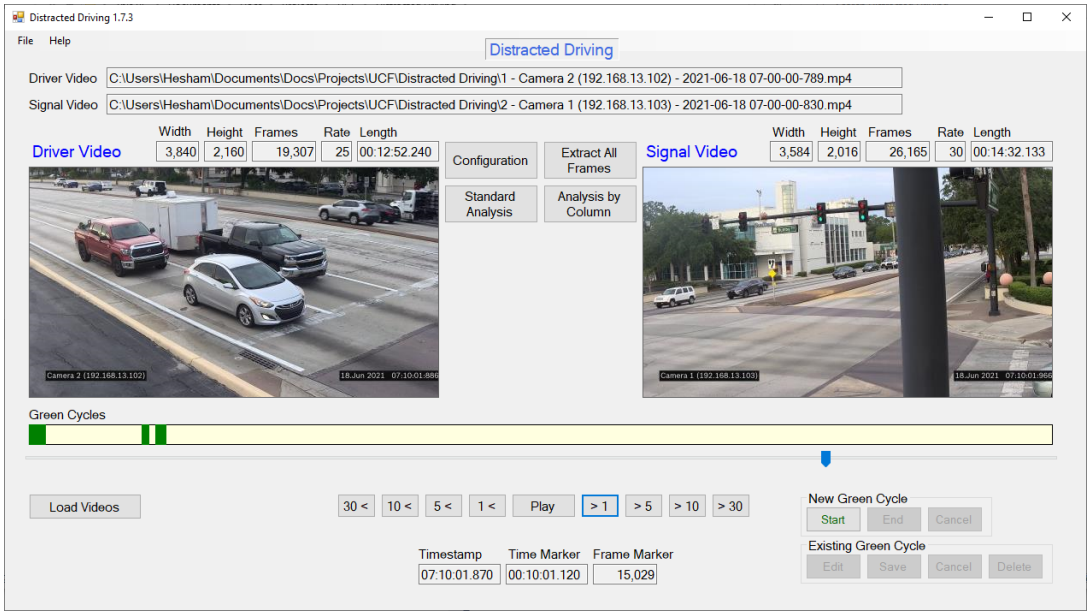


Figure 4-14: Driver response analysis, the light turns green

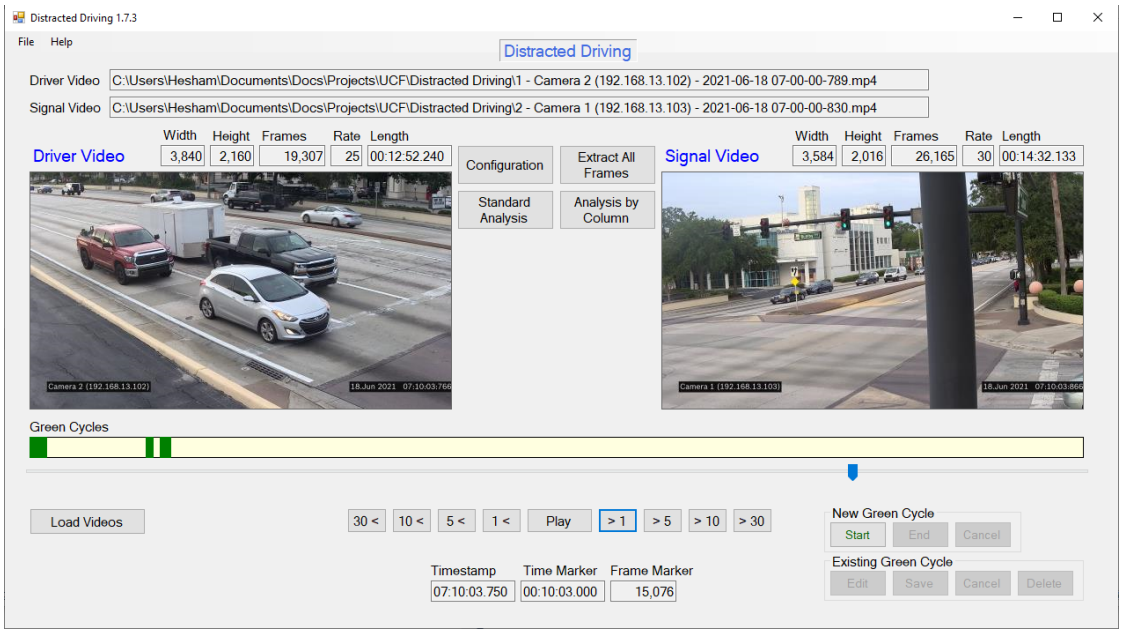


Figure 4-15: Driver Response Analysis

The driver in the outside lane crosses the stop bar

Output Data File

When the researcher completes the process of specifying the distracted driving timings, the software stores all the event information in a data file that can be easily ported to other software for further analysis. Figure 4-16 shows a sample of the output data file generated by the software.

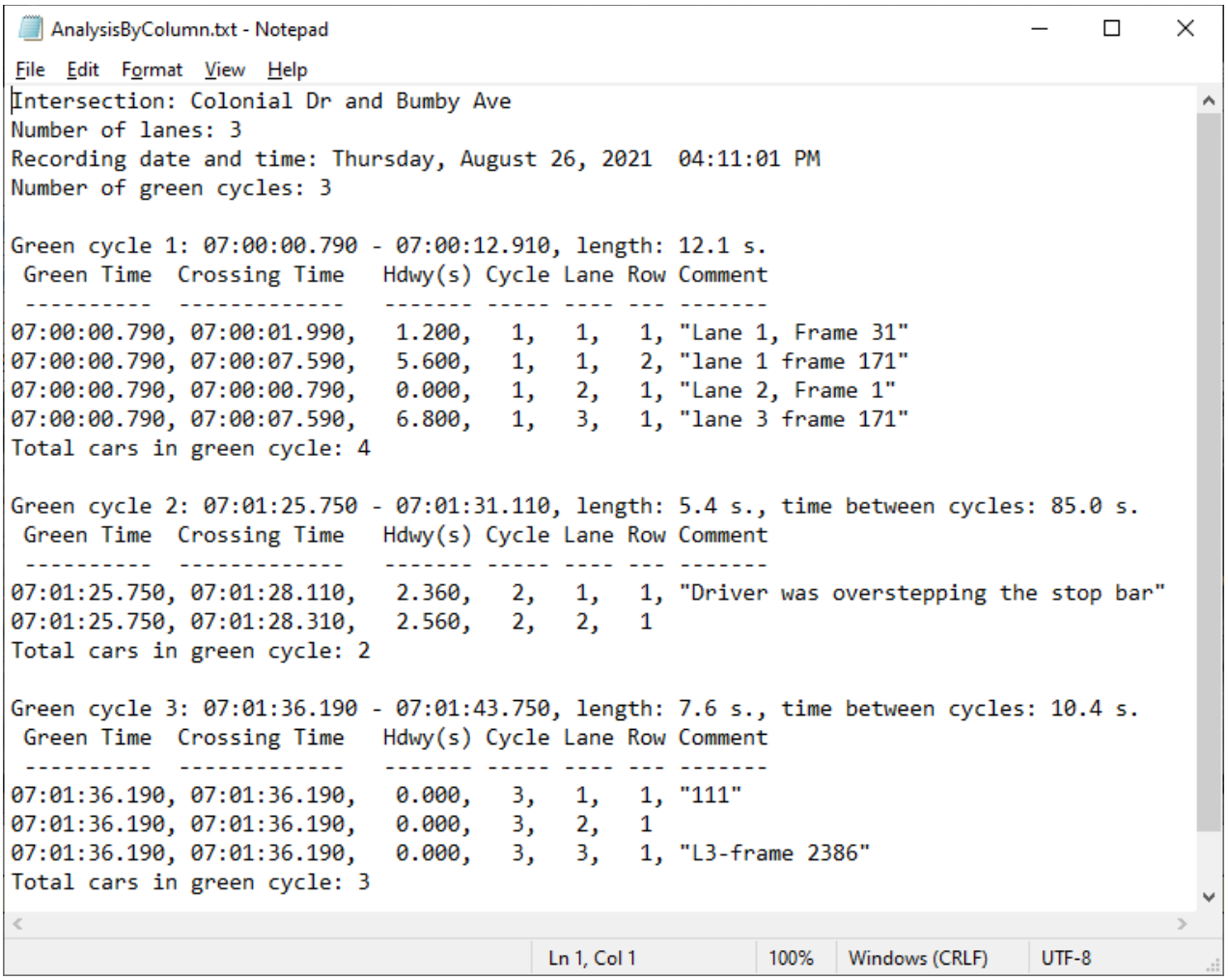


Figure 4-16: Sample of the output data file

Table 4-3 shows an excerpt of the data extracted by the research team for the distracted driving at the intersection of SR 50 and Bumby Avenue.

Table 4-3: Field Data Extracted from Video Files

	Weather	Intersection. ID.	Intersection. No.	Land-use	No. Lanes	Distraction Cause	Headway (sec)	Sat Headway (sec)	Lost-Time (sec)
1	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	4.162	1.615	2.547
2	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	3.6	1.615	1.985
3	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.88	1.615	1.265
4	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	4.84	2.994	1.846
5	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	4.24	1.469	2.771
6	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	2.68	1.469	1.211
7	Cloudy	I04-50&Bmby	I03	Offices	3	Cell phone	3.641	1.469	2.172
8	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	5.857	1.400	4.457
9	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.48	1.400	1.080
10	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	4.195	1.353	2.842
11	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	3.48	1.353	2.127
12	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.92	1.353	1.567
13	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.8	1.353	1.447
14	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.593	1.460	1.133
15	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	4.321	2.309	2.012
16	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	6.444	2.101	4.343
17	Cloudy	I04-50&Bmby	I03	Offices	3	Other(State)	4.16	2.343	1.817
18	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	6.42	2.343	4.077
19	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	4.764	2.400	2.364
20	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	3.56	2.400	1.160
21	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	6.89	2.387	4.503
22	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	3.44	2.387	1.053
23	Cloudy	I04-50&Bmby	I03	Offices	3	Cell phone	3.8	2.387	1.413
24	Cloudy	I04-50&Bmby	I03	Offices	3	Cell phone	3.48	2.387	1.093
25	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	3.447	1.326	2.121
26	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.647	1.326	1.321
27	Cloudy	I04-50&Bmby	I03	Offices	3	No Distraction	2.976	1.326	1.650
28	Cloudy	I04-50&Bmby	I03	Offices	3	Not Identified Dist.	3.88	2.385	1.495
29	Cloudy	I04-50&Bmby	I03	Offices	3	Cell phone	3.56	2.385	1.175
30	Cloudy	I04-50&Bmby	I03	Offices	3	Cell phone	3.68	2.385	1.295

The following Figure 4-17 shows a sample output from the distracted driving software, and Figure 38 shows the corresponding output from the data tables. The software output includes the intersections name, number of lanes, recording date and time, and the number of green cycles within the study period. Next, the software for each cycle provides the cycle number, the green start, and end, cycle length, total number of cars in each cycle. The software also provides for each vehicle inserted the crossing time, cycle/lane/row number, and finally calculates the headway. If the researcher finds that the headway is greater than two seconds, he or she will analyze the video recording at that specific time to identify the distraction type and then add it to the corresponding data table.

```
Intersection: SR436 & Wilshire
Number of lanes: 1
Recording date and time: Friday, December 24, 2021  04:00:00 PM
Number of green cycles: 30

Green cycle 1: 16:02:11.012 - 16:02:36.679, length: 25.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:02:11.012, 16:02:20.079,   9.067,   1,   1,   1
16:02:11.012, 16:02:23.679,   3.600,   1,   1,   2
Total cars in green cycle: 2

Green cycle 2: 16:06:01.446 - 16:06:27.212, length: 25.8 s., time between cycles: 230.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:06:01.446, 16:06:08.946,   7.500,   2,   1,   1
16:06:01.446, 16:06:11.946,   3.000,   2,   1,   2
16:06:01.446, 16:06:16.879,   4.933,   2,   1,   3
Total cars in green cycle: 3

Green cycle 3: 16:09:54.312 - 16:10:15.846, length: 21.5 s., time between cycles: 232.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:09:54.312, 16:09:59.146,   4.833,   3,   1,   1
16:09:54.312, 16:10:02.479,   3.333,   3,   1,   2
16:09:54.312, 16:10:04.846,   2.367,   3,   1,   3
16:09:54.312, 16:10:07.512,   2.667,   3,   1,   4
16:09:54.312, 16:10:09.346,   1.833,   3,   1,   5
16:09:54.312, 16:10:11.512,   2.167,   3,   1,   6
Total cars in green cycle: 6

Green cycle 4: 16:13:42.946 - 16:14:06.612, length: 23.7 s., time between cycles: 228.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:13:42.946, 16:13:48.779,   5.833,   4,   1,   1
16:13:42.946, 16:13:52.112,   3.333,   4,   1,   2
16:13:42.946, 16:14:03.946,  11.833,   4,   1,   3
Total cars in green cycle: 3

Green cycle 5: 16:17:36.479 - 16:17:56.779, length: 20.3 s., time between cycles: 233.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:17:36.479, 16:17:40.979,   4.500,   5,   1,   1
16:17:36.479, 16:17:54.446,  13.467,   5,   1,   2
Total cars in green cycle: 2
```

Figure 4-17: An Output from the software

The following Figure 4-18 illustrates how the software output was inserted into the main database for further analysis. The output contains the same parameters obtained from the software output, in addition to the distraction type/cause, peak period (AM/MD/PM), and the movement direction (Through, Left).

University of Central Florida
Distracted Driving Sheet

Collection Date	Weather	Int. No.	Distraction Cause	Green Time HH:MM:SS	Time Front/Back Wheels Crossed Ref. Pt. HH:MM:SS2	Hdwy. (sec)	Cycle No.	Lane No.	Row No.	Comments	AM/MD/PM	Direction
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:02:11.012	16:02:20.079	9.067	1	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:02:11.012	16:02:23.679	3.6	1	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:06:01.446	16:06:08.946	7.5	2	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:06:01.446	16:06:11.946	3	2	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:06:01.446	16:06:16.879	4.933	2	1	3		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:09:54.312	16:09:59.146	4.833	3	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:09:54.312	16:10:02.479	3.333	3	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:09:54.312	16:10:04.846	2.367	3	1	3		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:09:54.312	16:10:07.512	2.667	3	1	4		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:09:54.312	16:10:09.346	1.833	3	1	5		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:09:54.312	16:10:11.512	2.167	3	1	6		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:13:42.946	16:13:48.779	5.833	4	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:13:42.946	16:13:52.112	3.333	4	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:13:42.946	16:14:03.946	11.833	4	1	3		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:17:36.479	16:17:40.979	4.5	5	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:17:36.479	16:17:54.446	13.467	5	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:21:20.512	16:21:29.279	8.767	6	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:21:20.512	16:21:32.712	3.433	6	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:21:20.512	16:21:35.012	2.3	6	1	3		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Passengers	16:25:11.379	16:25:19.879	8.5	7	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:29:00.312	16:29:08.979	8.667	8	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:29:00.312	16:29:11.479	2.5	8	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:29:00.312	16:29:14.979	3.5	8	1	3		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:29:00.312	16:29:19.146	4.167	8	1	4		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:32:55.346	16:32:59.512	4.167	9	1	1	Pickup truck	PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:32:55.346	16:33:02.179	2.667	9	1	2		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:32:55.346	16:33:04.679	2.5	9	1	3		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:36:44.146	16:36:49.312	5.167	10	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:40:35.912	16:40:38.912	3	11	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:40:35.912	16:40:42.812	3.9	11	1	2	not in queue	PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.	Not Identified Dist.	16:44:30.112	16:44:33.579	3.467	12	1	1		PM	Left
12/24/2022	Sunny	8-SR436 & Wilshire Drv.		16:44:30.112	16:44:46.746	13.167	12	1	2		PM	Left

Figure 4-18: An output from the data tables

Sample Calculations

The following section will provide a sample calculation for the parameters used in the data analysis. As shown in Figure 4-18, the headway of the first vehicle was calculated by subtracting the cross-time from the green time:16:02:20:079-16:02:11:012=9.067 seconds. The following vehicles' headways are the time difference between consecutive vehicles that cross the stop-line. For instance, the second vehicle's headway can be calculated by subtracting 16:02:23:679 from 16:02:20:079 to get 3.6 seconds. The lost time can be calculated by subtracting the headway from the saturation headway. For example, as shown in Table 4-3, the lost time of the first vehicle was calculated from: 4.162-1.615 = 2.547 seconds.

4.2.3 Distracted Pedestrians Software

A software program has been developed to analyze distracted pedestrian behavior at intersections. The software assists the researcher in detecting, quantifying, and documenting the level of pedestrian distraction that may occur when a pedestrian signal switches to Walk. A video recorded by a camera at the intersection depicts both the pedestrians stopping at the crosswalk and the pedestrian signal. Figure 4-19 shows the main user interface.

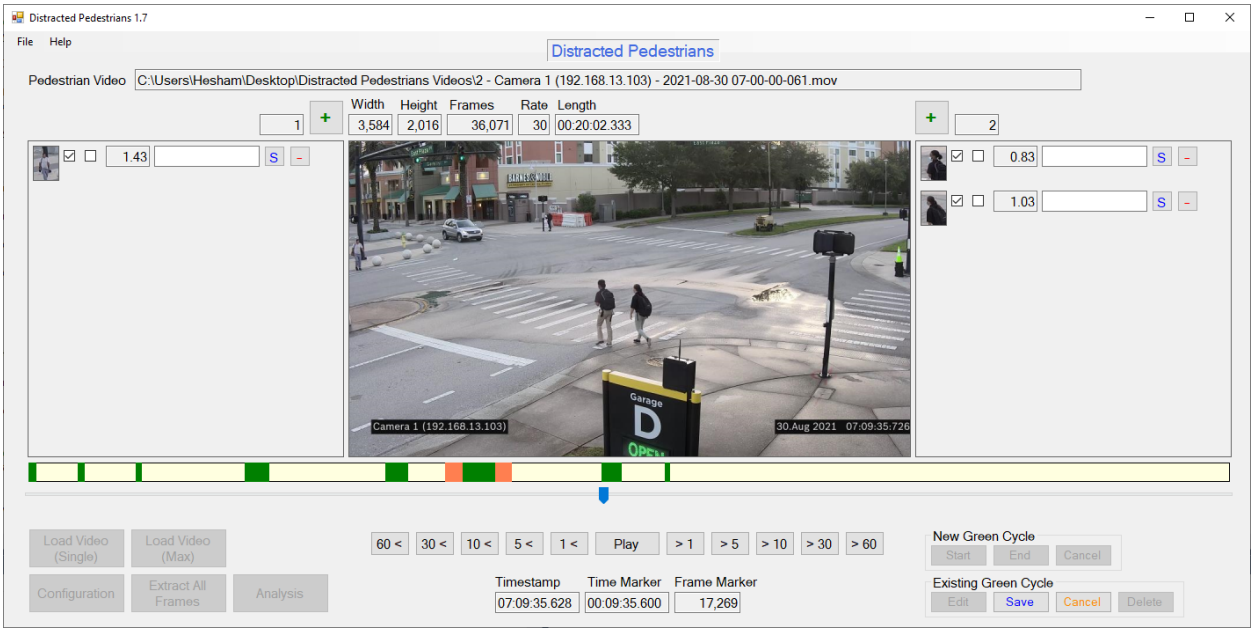


Figure 4-19: The Distracted Pedestrian software main user interface

The User Interface

The user interface gives the researcher access to several features that facilitate the analysis operation.

Video Loading

The Load Video (Single) and Load Video (Max) buttons are used to load pedestrian video files (Figure 4-20). Load Video (Single) loads a single video file, whereas Load Video (Max) loads a set of frames that were extracted using the Slicer software. Using an already extracted set of frames can save time by having a number of external machines extract the frames from many/large video files.

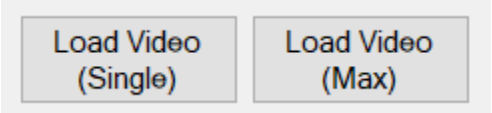


Figure 4-20: Video loading buttons

Configuration

Using a software configuration screen, the researcher specifies information pertinent to the intersection under investigation. Each intersection has a configuration file assigned to it containing such information as to location, crosswalk length, collection date, analysis date, the direction of crossing, video timestamp, and pedestrian demographic information (Figure 4-21).

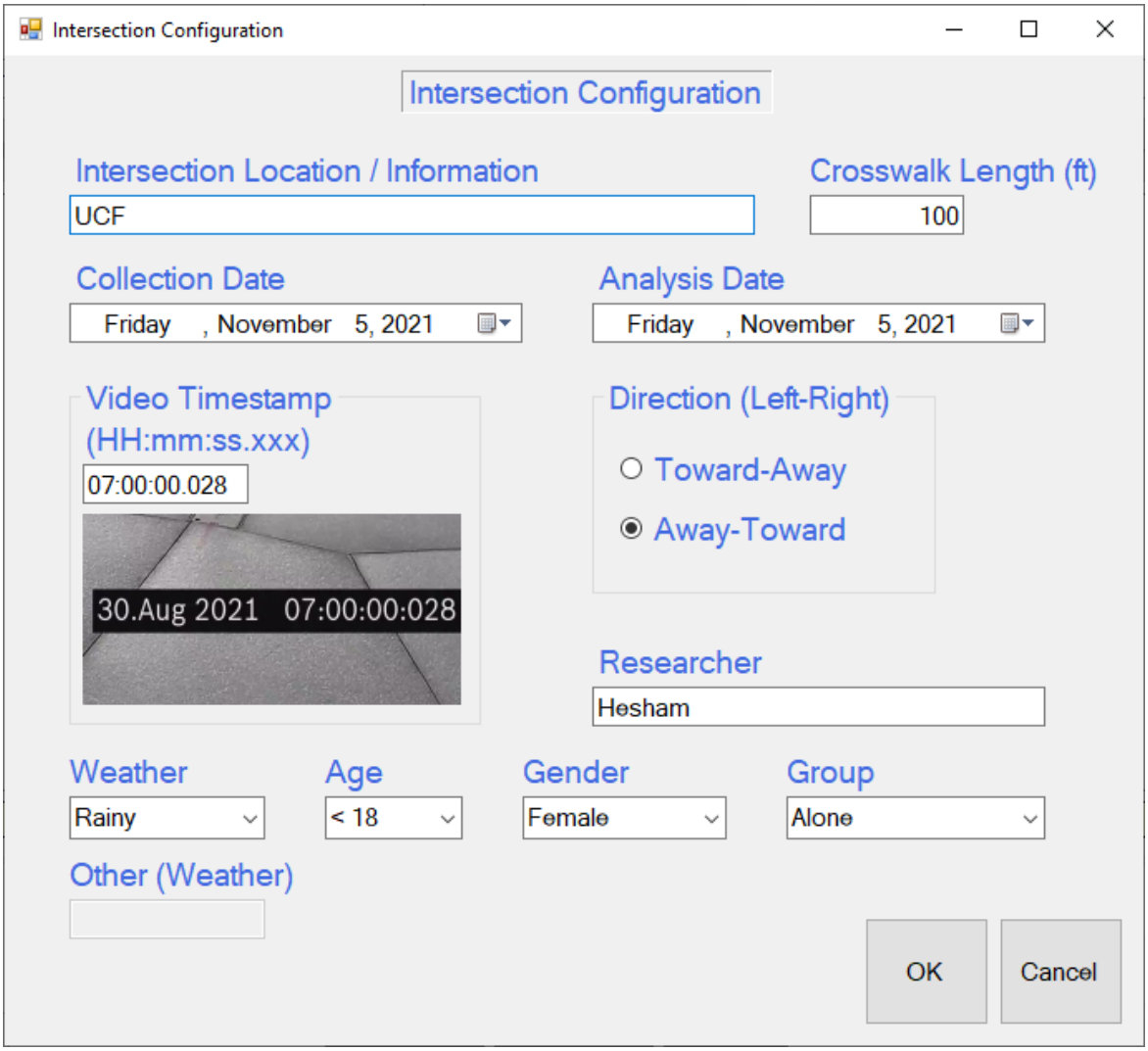


Figure 4-21: Intersection configuration

Frame Extraction

The video frames need to be extracted first before a distracted pedestrian analysis can be performed (Figure 4-22). This will allow fast and responsive frame surfing and backward and forward video display. Figure 4-23 shows the frame extraction progress.

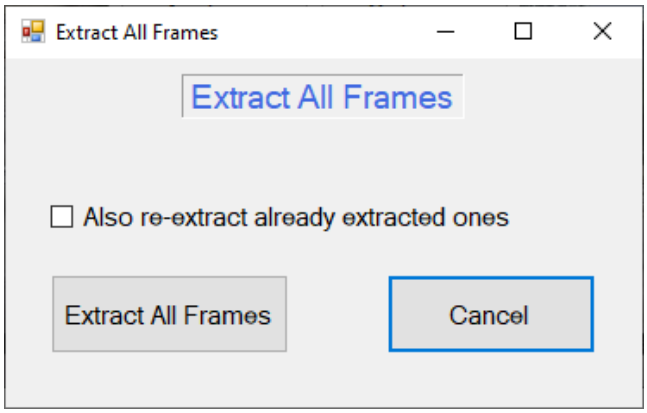


Figure 4-22: Frame extraction screen

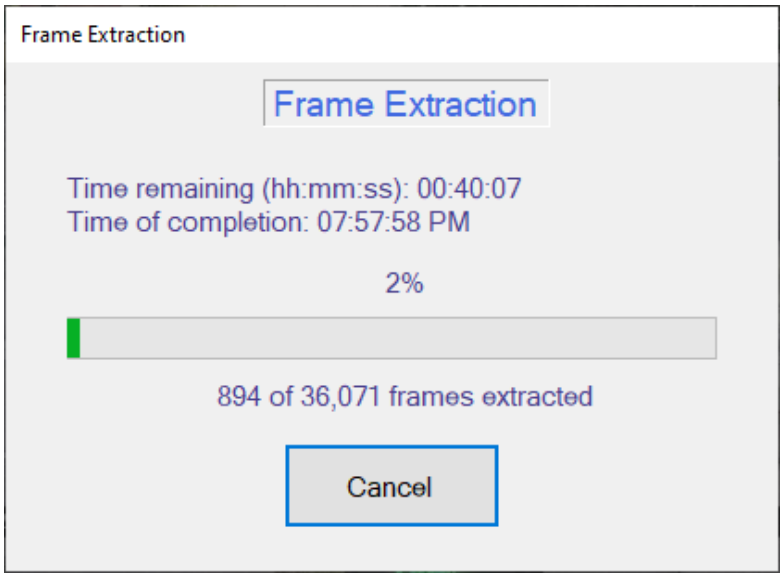


Figure 4-23: Frame extraction progress

Green Cycle Creation and Editing

The researcher can create new and edit existing green cycles based on traffic light status. To create a cycle, the Start button is pressed, and to end it, the End button is pressed. Similarly, an existing cycle can be edited or deleted (Figure 4-24).

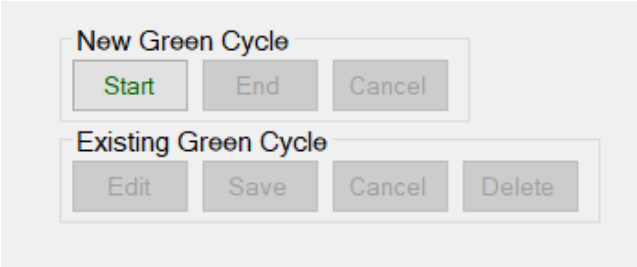


Figure 4-24: Green Cycle creation and editing

Video Surfing and Playing

The researcher can easily surf the video and move forward and backward using directional arrow buttons and a slider (Figure 4-25). He/she can advance or regress by a specific number of frames down to a one frame accuracy.

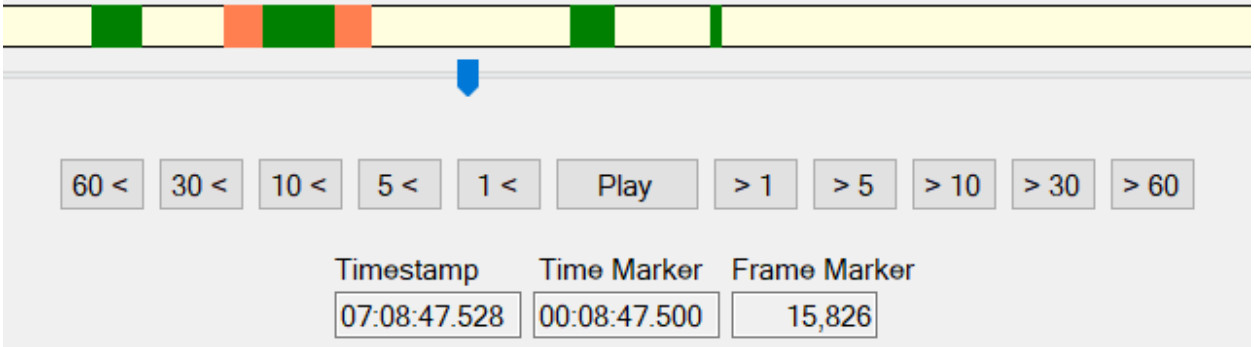
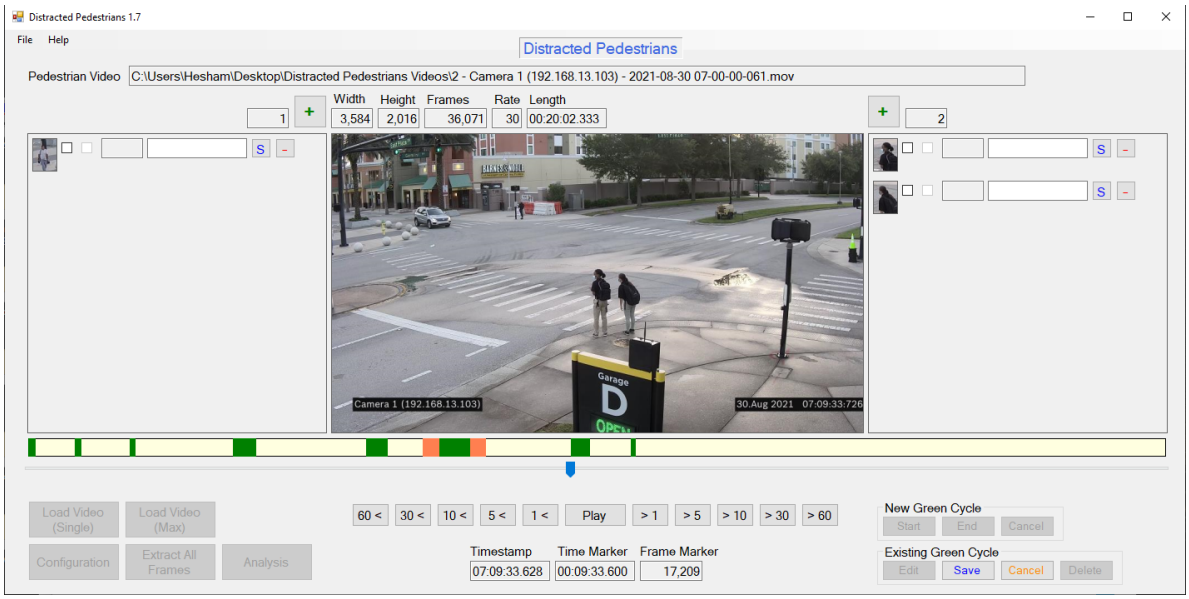


Figure 4-25: Video surfing and playing buttons

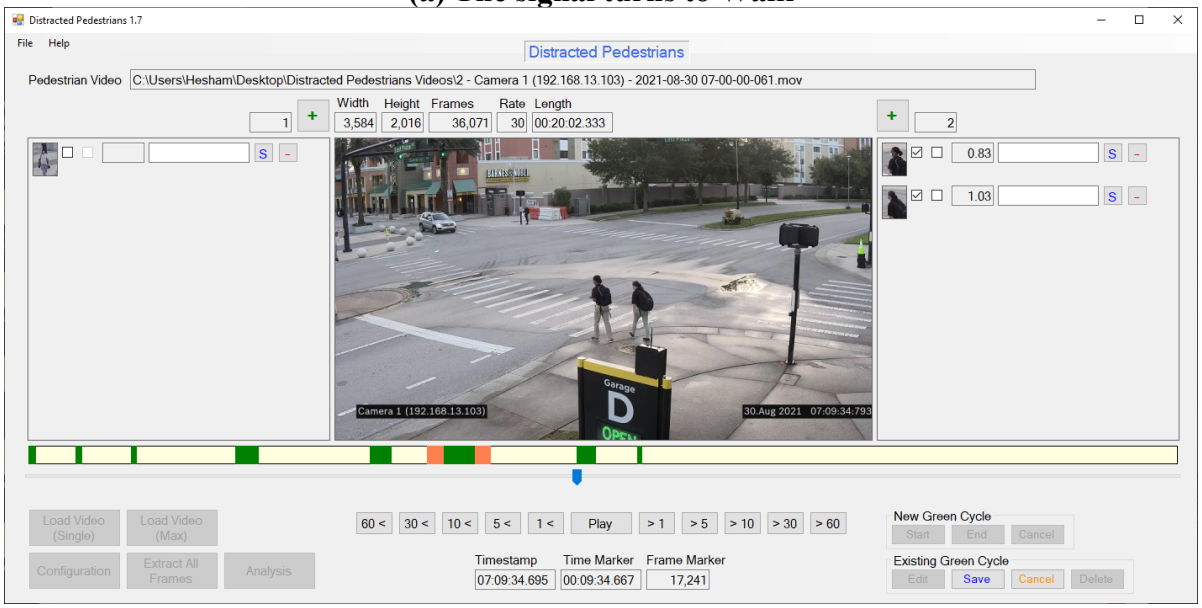
Pedestrian Response Analysis

The software assists the researcher in precisely assessing the pedestrian response at the time the pedestrian signal turns to Walk. Using the software's interactive user interface, the researcher specifies the moment the signal turns to Walk, which denotes the start of the cycle. Then he/she specifies the moment each pedestrian steps into the crosswalk. The difference between the two times determines the pedestrian response. This calculation is conducted individually on each pedestrian.

Figure 4-26 (a) and (b) show the moment the signal turns to Walk and the moment the pedestrian steps into the crosswalk, respectively.



(a) The signal turns to Walk



(b) The pedestrian steps into the crosswalk

Figure 4-26: Pedestrian Response Analysis

Pedestrian Statistics

The software assigns statistics record for each pedestrian. This record specifies such information as age, gender and distraction cause (Figure 4-27).

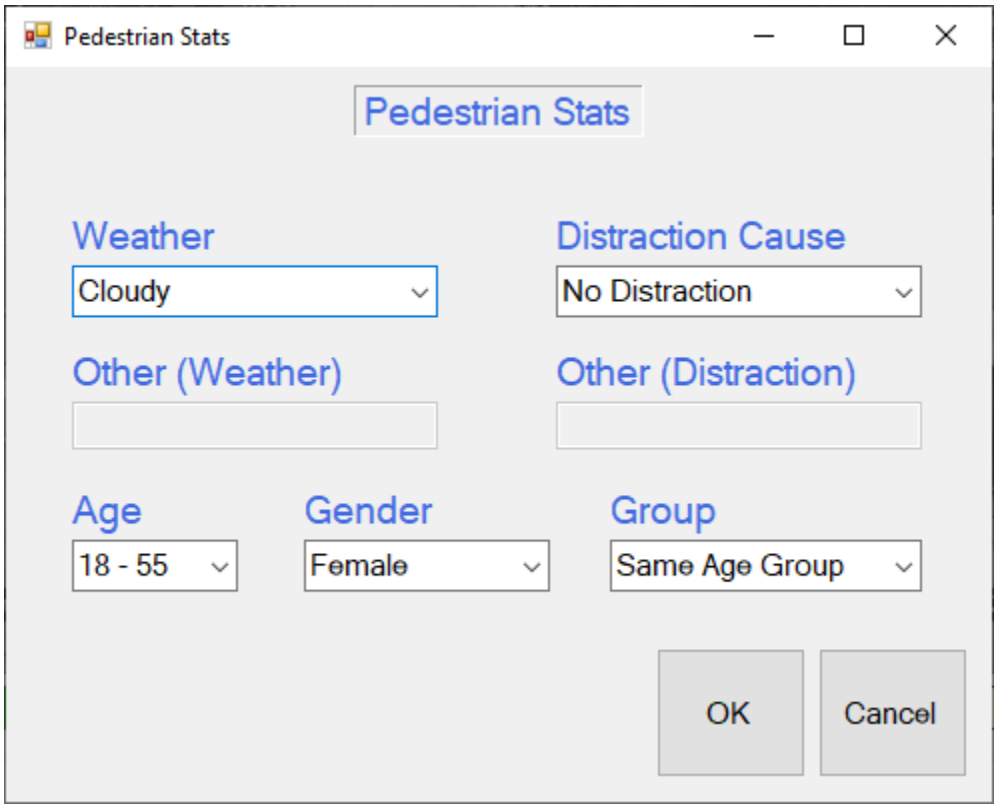
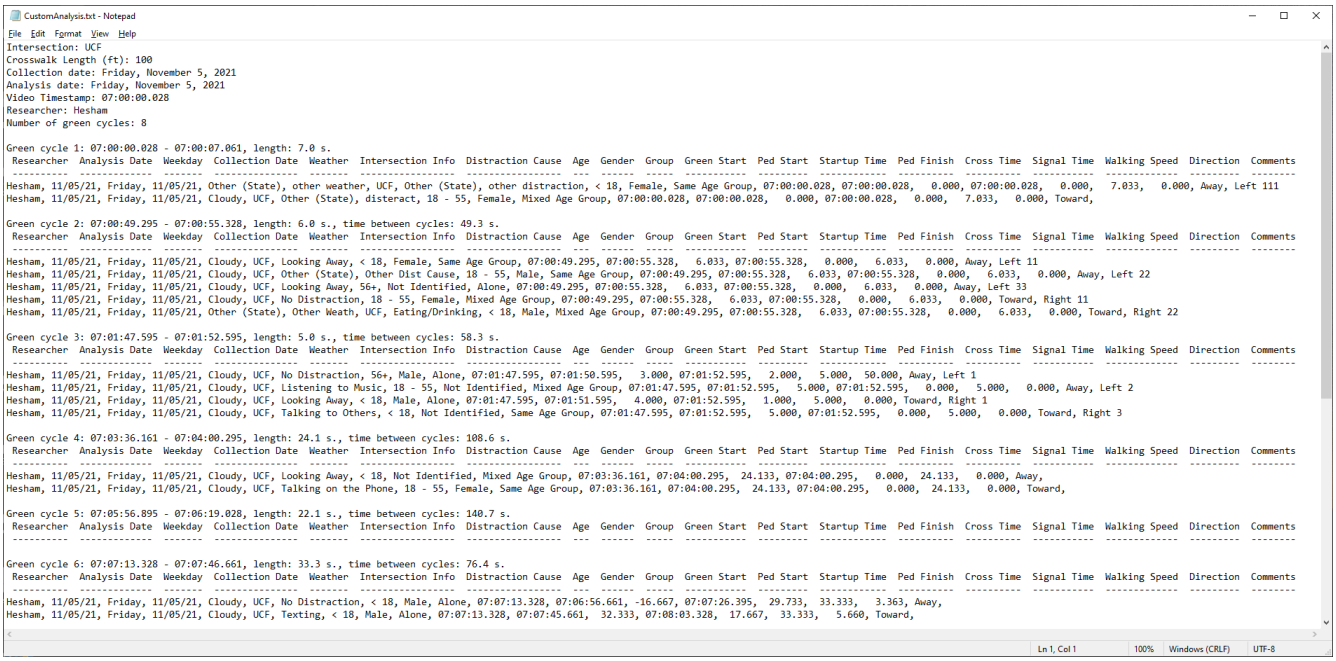


Figure 4-27: Pedestrian Statics Screen

Output Data File

When the researcher completes the process of specifying the distracted pedestrian timings, the software stores all the event information in a data file that can be easily ported to other software for further analysis. Figure 4-28 shows a sample of the output data file generated by the software.



CustomAnalysis.txt - Notepad

File Edit Format View Help

```
Intersection: UCF
Crosswalk Length (ft): 100
Collection date: Friday, November 5, 2021
Analysis date: Friday, November 5, 2021
Video Timestamp: 07:00:00.028
Researcher: Hesham
Number of green cycles: 8

Green cycle 1: 07:00:00.028 - 07:00:07.061, length: 7.0 s.
 Researcher  Analysis Date  Weekday  Collection Date  Weather  Intersection Info  Distraction Cause  Age  Gender  Group  Green Start  Ped Start  Startup Time  Ped Finish  Cross Time  Signal Time  Walking Speed  Direction  Comments
 ----------  -------------  -------  ---------------  -------  -----------------  -----------------  ---  ------  -----  -----------  ---------  ------------  ----------  ----------  -----------  -------------  ---------  --------
Hesham, 11/05/21, Friday, 11/05/21, Other (State), other weather, UCF, Other (State), other distraction, < 18, Female, Same Age Group, 07:00:00.028, 07:00:00.028,   0.000, 07:00:00.028,   0.000,   7.033,   0.000, Away, Left 111
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Other (State), disteract, 18 - 55, Female, Mixed Age Group, 07:00:00.028, 07:00:00.028,   0.000, 07:00:00.028,   0.000,   7.033,   0.000, Toward,

Green cycle 2: 07:00:49.295 - 07:00:55.328, length: 6.0 s., time between cycles: 49.3 s.
 Researcher  Analysis Date  Weekday  Collection Date  Weather  Intersection Info  Distraction Cause  Age  Gender  Group  Green Start  Ped Start  Startup Time  Ped Finish  Cross Time  Signal Time  Walking Speed  Direction  Comments
 ----------  -------------  -------  ---------------  -------  -----------------  -----------------  ---  ------  -----  -----------  ---------  ------------  ----------  ----------  -----------  -------------  ---------  --------
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Looking Away, < 18, Female, Same Age Group, 07:00:49.295, 07:00:55.328,   6.033, 07:00:55.328,   0.000,   6.033,   0.000, Away, Left 11
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Other (State), Other Dist Cause, 18 - 55, Male, Same Age Group, 07:00:49.295, 07:00:55.328,   6.033, 07:00:55.328,   0.000,   6.033,   0.000, Away, Left 22
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Looking Away, 56+, Not Identified, Alone, 07:00:49.295, 07:00:55.328,   6.033, 07:00:55.328,   0.000,   6.033,   0.000, Away, Left 33
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, No Distraction, 18 - 55, Female, Mixed Age Group, 07:00:49.295, 07:00:55.328,   6.033, 07:00:55.328,   0.000,   6.033,   0.000, Toward, Right 11
Hesham, 11/05/21, Friday, 11/05/21, Other (State), Other Weath, UCF, Eating/Drinking, < 18, Male, Mixed Age Group, 07:00:49.295, 07:00:55.328,   6.033, 07:00:55.328,   0.000,   6.033,   0.000, Toward, Right 22

Green cycle 3: 07:01:47.595 - 07:01:52.595, length: 5.0 s., time between cycles: 58.3 s.
 Researcher  Analysis Date  Weekday  Collection Date  Weather  Intersection Info  Distraction Cause  Age  Gender  Group  Green Start  Ped Start  Startup Time  Ped Finish  Cross Time  Signal Time  Walking Speed  Direction  Comments
 ----------  -------------  -------  ---------------  -------  -----------------  -----------------  ---  ------  -----  -----------  ---------  ------------  ----------  ----------  -----------  -------------  ---------  --------
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, No Distraction, 56+, Male, Alone, 07:01:47.595, 07:01:50.595,   3.000, 07:01:52.595,   2.000,   5.000,  50.000, Away, Left 1
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Listening to Music, 18 - 55, Not Identified, Mixed Age Group, 07:01:47.595, 07:01:52.595,   5.000, 07:01:52.595,   0.000,   5.000,   0.000, Away, Left 2
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Looking Away, < 18, Male, Alone, 07:01:47.595, 07:01:51.595,   4.000, 07:01:52.595,   1.000,   5.000,   0.000, Toward, Right 1
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Talking to Others, < 18, Not Identified, Same Age Group, 07:01:47.595, 07:01:52.595,   5.000, 07:01:52.595,   0.000,   5.000,   0.000, Toward, Right 3

Green cycle 4: 07:03:36.161 - 07:04:00.295, length: 24.1 s., time between cycles: 108.6 s.
 Researcher  Analysis Date  Weekday  Collection Date  Weather  Intersection Info  Distraction Cause  Age  Gender  Group  Green Start  Ped Start  Startup Time  Ped Finish  Cross Time  Signal Time  Walking Speed  Direction  Comments
 ----------  -------------  -------  ---------------  -------  -----------------  -----------------  ---  ------  -----  -----------  ---------  ------------  ----------  ----------  -----------  -------------  ---------  --------
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Looking Away, < 18, Not Identified, Mixed Age Group, 07:03:36.161, 07:04:00.295,  24.133, 07:04:00.295,   0.000,  24.133,   0.000, Away,
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Talking on the Phone, 18 - 55, Female, Same Age Group, 07:03:36.161, 07:04:00.295,  24.133, 07:04:00.295,   0.000,  24.133,   0.000, Toward,

Green cycle 5: 07:05:56.895 - 07:06:19.028, length: 22.1 s., time between cycles: 140.7 s.
 Researcher  Analysis Date  Weekday  Collection Date  Weather  Intersection Info  Distraction Cause  Age  Gender  Group  Green Start  Ped Start  Startup Time  Ped Finish  Cross Time  Signal Time  Walking Speed  Direction  Comments
 ----------  -------------  -------  ---------------  -------  -----------------  -----------------  ---  ------  -----  -----------  ---------  ------------  ----------  ----------  -----------  -------------  ---------  --------

Green cycle 6: 07:07:13.328 - 07:07:46.661, length: 33.3 s., time between cycles: 76.4 s.
 Researcher  Analysis Date  Weekday  Collection Date  Weather  Intersection Info  Distraction Cause  Age  Gender  Group  Green Start  Ped Start  Startup Time  Ped Finish  Cross Time  Signal Time  Walking Speed  Direction  Comments
 ----------  -------------  -------  ---------------  -------  -----------------  -----------------  ---  ------  -----  -----------  ---------  ------------  ----------  ----------  -----------  -------------  ---------  --------
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, No Distraction, < 18, Male, Alone, 07:07:13.328, 07:06:56.661, -16.667, 07:07:26.395,  29.733,  33.333,   3.363, Away,
Hesham, 11/05/21, Friday, 11/05/21, Cloudy, UCF, Texting, < 18, Male, Alone, 07:07:13.328, 07:07:45.661,  32.333, 07:08:03.328,  17.667,  33.333,   5.660, Toward,
```

Ln 1, Col 1 | 100% | Windows (CRLF) | UTF-8

Figure 4-28: Sample of the output data file

Sample Calculations

The following section will describe a sample from the parameter calculations for the analysis of distracted pedestrians. First, the pedestrian startup time was calculated by subtracting the time when the pedestrian started crossing from the green start. For instance, for the first record in Appendix L, the startup time: 7:18:47.284 – 7:18:46.483 = 0.801 seconds. The cross-time was the time difference between when the pedestrian finished crossing and when he/she started crossing. For example, the cross-time for the same record mentioned earlier: 7:19:3.72 – 7:18:47.284 = 16.436 seconds. For the same example, the walking speed is calculated by dividing the crossing distance by the crossing time. So in our example, the walking speed will be 72.2 feet (the crossing length) divided by 16.436 seconds (previously calculated) = 4.39 ft/sec.

4.3 Summary

Chapter 4 provided the framework and the required tools to analyze the collected data efficiently. First, a careful selection of the parameters and variables determined all potential effects related to distractions. Second, three software were developed to facilitate the data extraction process and eliminate any human error in the process.

V. STATISTICAL ANALYSIS AND MODELLING

This research focuses on the implications of distracted driving on the intersection's headway. The main idea is to measure the startup lost time at the onset of the green phase and the overall intersection's saturation headway. Startup lost time and saturation headway are the main microscopic parameters used in traffic operations studies to calculate the saturation flow rate at signalized intersections and determine its capacity. Startup lost time occurs due to the delayed response from the driver's reaction to the onset of the green phase and the vehicle's acceleration to leave the intersection. Headway is the time interval between two successive vehicles passing a point along the lane. The headway of the first vehicle in the queue is the difference between the time the vehicle crosses the stop-line and the time the signal turns green. The headway of the following vehicles is the time interval between successive vehicles crossing the stop-line or exiting the intersection. The first few vehicles in the queue tend to have a higher headway until the fourth or fifth vehicle, where it becomes nearly constant, which is known as the saturation headway (h). The difference between the first four to five vehicles' headway and the saturation headway is known as the startup lost time. According to the traffic signal timing manual, the standard start-up lost time is approximately 2.0 seconds which is attributed to the time taken by the driver to perceive and react, also known as Perception and Reaction Time (PRT). Several factors contribute to PRT, such as the physical condition, driver's age, situation complexity, emotional state, and stimuli strength for the action. However, distracted driving was not among the main factors affecting the startup's lost time, especially before the smartphone era. Thus, this research is investigating the implications of distracted driving on the vehicles' headway and its effect on the intersection's capacity.

This chapter of the research details the analysis of the processed data in response to the independent variables. A sequence of multivariate statistics and multiple regression analyses were performed to test the interactive effects of driver's distraction type on intersection performance using the JMP statistical software package. The large data sample that was collected and processed in the previous chapter determined the major factors, parameters, types, and measures of distraction. The following Table 5-1 and Table 5-2 summarize the main parameters used for the distracted drivers' and pedestrians' analysis, respectively. The following chapters will cover the statistical analysis of the distracted drivers (left and through movements) and pedestrians.

Table 5-1: Distracted Drivers' Parameters and Variables

Parameter	Variables
Weather	Sunny Rainy Cloudy
Distraction Types	No Distraction Cell phone Dashboard Eating/Drinking Passengers Smoking Not Identified Distraction Other
Land-use	Commercial Residential & School Mixed Use Tourist
Vehicle Queue Position	1, 2, 3, 4
Time Of Day (TOD)	AM, MD, PM
Distraction Status	Distracted or Not Distracted
Movement Type	Through, Left
Number of Lanes	1, 2, 3

Table 5-2: Distracted Pedestrians' Parameters and Variables

Parameter	Variables
Weather	Sunny Rainy Cloudy
Distraction Types	No Distraction Talking on a phone / Texting Eating/Drinking / Smoking Talking to others Other (Listening to music / Looking Away / Not Identified Distraction)
Age	Young - old
Gender	Male – Female – Not Identified
Group Status	Group – No Group (Alone)
Landuse	School/College – Mixed Use
Extra Pedestrian Time	The extra time taken by the pedestrian to clear the crosswalk after the end of the walk signal
Startup time	The time difference between the start of the walk signal and the pedestrian starts to cross
Walking Speed	The pedestrian walking speed
Cross Time	The time the pedestrian took to cross the intersection

5.1 Distracted Drivers (Through Movement)

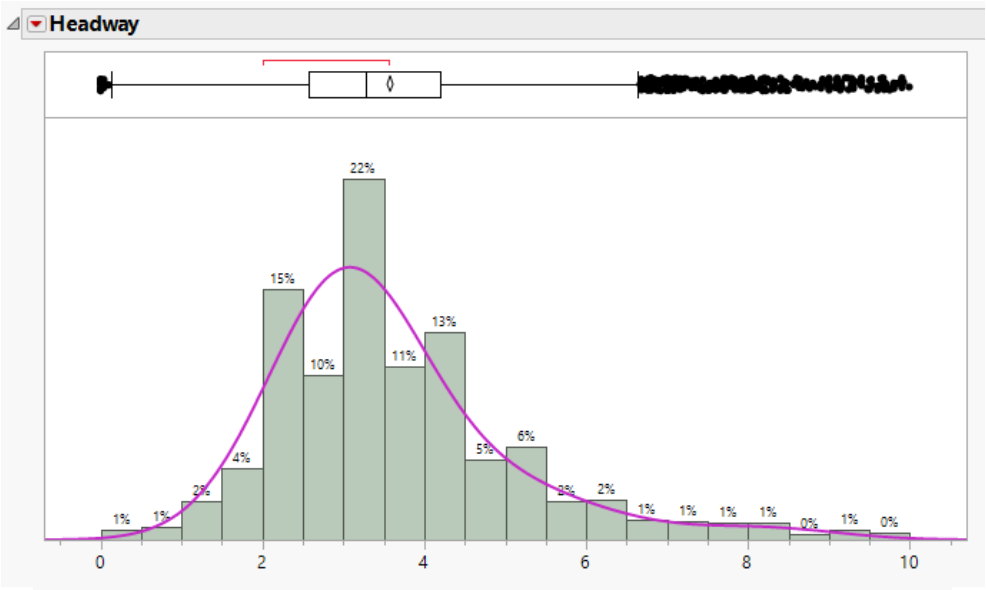
This section discusses the statistical analysis process applied to the dataset for the through movement. First, a discussion to determine the response variable and its potential effects. Second, comprehensive descriptive statistics were applied to each collected parameter from the extracted data. An initial model was conducted after completing the data extraction of the first four intersections to explore the results. Other models were investigated for the whole dataset that covers the ten intersections, along with a thorough explanation of the model results and their effects on the response variables.

A critical step in data analytics is preparing the data for modeling. First, the data extracted by each researcher were combined into a central database. Next, a data compilation process was applied, which is the collation and transformation of raw data into meaningful information that can be used in the model formulation. Finally, several quality measures were conducted to ensure the accuracy and efficiency of the data.

5.1.1 Response Variable - Headway

As mentioned earlier, the research goal is to quantify the effects of distracted driving on traffic operations and intersection capacity. Intersection capacity is measured by multiplying the saturation flow rate by the ratio of effective green to the cycle length. Since the saturation flow rate is the ratio of 3600 (seconds) to the headway (h in seconds), therefore the headway is considered an excellent indication of the intersection capacity and the optimal candidate to

measure the effects of distracted driving on traffic operations. So, for example, if we have a one hour of green time, a headway of two (2) seconds theoretically would allow 1800 vehicles/hour/lane to pass (3600/2=1800), while four (4) seconds headway will only allow 900 vehicles/hour/lane to pass. This increase in the headway caused the loss of half of the intersection's capacity. The headway (h) was used in the model as the response (or Y) variable and entered as a continuous variable. A test of normality was performed, as shown in Figure 5-1. The response variable is slightly skewed to the left but normally distributed. The test showed that the best normal distribution is the "Normal 3 Mixture" distribution, which provided the least AIC with a value of 23,802. The headway had a mean of 3.59 seconds and a standard deviation of 1.5 seconds, as shown in Figure 5-2.



Compare Distributions

Show	Distribution	AICc	AICc Weight	BIC	-2*LogLikelihood
☑	Normal 3 Mixture	23802.251	1	23856.977	23786.23
☐	Normal 2 Mixture	23858.247	0	23892.455	23848.238
☐	SHASH	23918.123	0	23945.491	23910.118
☐	Gamma	24033.013	0	24046.698	24029.012
☐	Lognormal	24065.732	0	24079.417	24061.73
☐	Johnson Su	24246.906	0	24274.274	24238.901
☐	Student's t	24650.34	0	24670.867	24644.337
☐	Weibull	24793.127	0	24806.812	24789.125
☐	Normal	25317.885	0	25331.57	25313.883
☐	Cauchy	26004.816	0	26018.501	26000.814
☐	Exponential	31568.672	0	31575.515	31566.672

Figure 5-1: Headway Distribution

Quantiles		
100.0%	maximum	10.32
99.5%		9.28
97.5%		7.720775
90.0%		5.48
75.0%	quartile	4.2
50.0%	median	3.3
25.0%	quartile	2.60575
10.0%		2
2.5%		1.4
0.5%		0.896805
0.0%	minimum	0.504

Summary Statistics	
Mean	3.5901542
Std Dev	1.5038964
Std Err Mean	0.0180682
Upper 95% Mean	3.6255733
Lower 95% Mean	3.554735
N	6928

Figure 5-2: Headway Statistic

5.1.2 Effect of Distraction Types on Headway – Preliminary Analysis

An initial model was developed after data were collected and extracted from the first four intersections. Overall, the results showed that the percentage of distracted and non-distracted drivers in all four intersections was 26% and 74%, respectively (Figure 5-3). The percentage of distracted drivers against different land uses; commercial, offices, and residential & School areas were 29%, 30%, and 14%, respectively (Figure 5-4). Results have also shown that distracted drivers represent about a quarter of all drivers. Commercial and office land use represented about 30%, while residential & school areas had nearly half of the distracted drivers from the first two areas (14%). This can be attributed to the fact that traffic is generally heavier in commercial and office land use areas compared to residential areas.

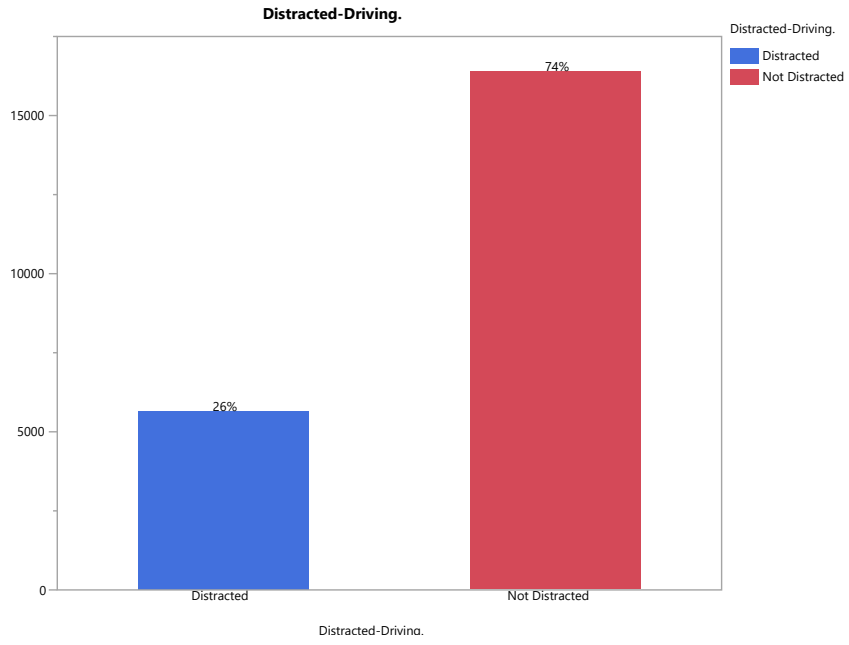


Figure 5-3: Overall Percentages of Distracted and Non-Distracted Drivers

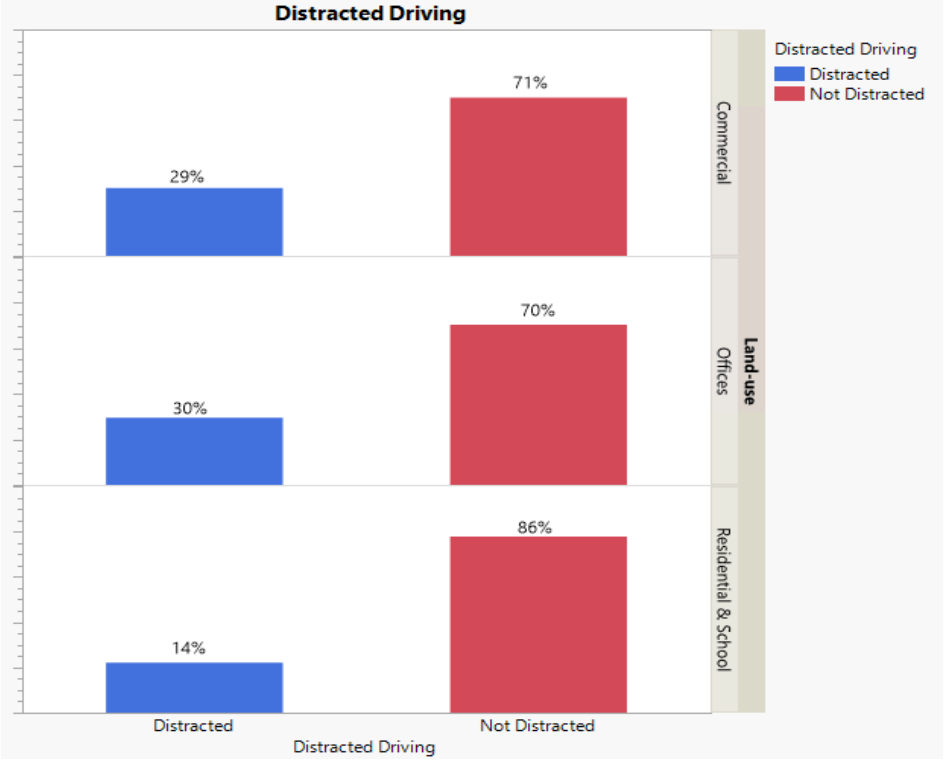


Figure 5-4: Percentage by Distraction Status among Different Land Uses

Distractions were classified by type (Figure 5-5), which showed that distractions caused by cell phones and not-identified-distraction were 20% and 5%, respectively. "Not Identified" are considered distractions that either were not identified by the observer, such as staring at something through the windshield or other types not included in the data extraction sheets, or considered uncommon such as putting on makeup or looking in the rear mirror. Passengers (talking to passengers) and other types of distractions formed 0.4% each. Eating and drinking and dashboard distraction represented 0.1%. Cell phone usage was the predominant distraction factor in the analysis.

The headway was also plotted against distracted/not distracted drivers. The results showed that the average headway for non-distracted drivers was around two (2) seconds, which is considered the standard used in traffic studies. However, this number is doubled to around four (4) seconds (Figure 5-6). Furthermore, different distraction types and their relationship with the headway are illustrated in Figure 5-7. Overall, "other" types of distraction have shown to be the highest and increased the headway to around five (5) seconds. The other types include looking around, reading, reaching the handbag, and fixing hair. Talking to passengers, dashboard, eating/drinking, and cell phone distractions recorded an average of nearly four (4) seconds. The no-distraction type scored the lowest headway with around two (2) seconds. The relationship between the headway and the distraction types showed that distraction significantly increases the overall average headway at the intersection and, consequently, worsens the intersection traffic operations.

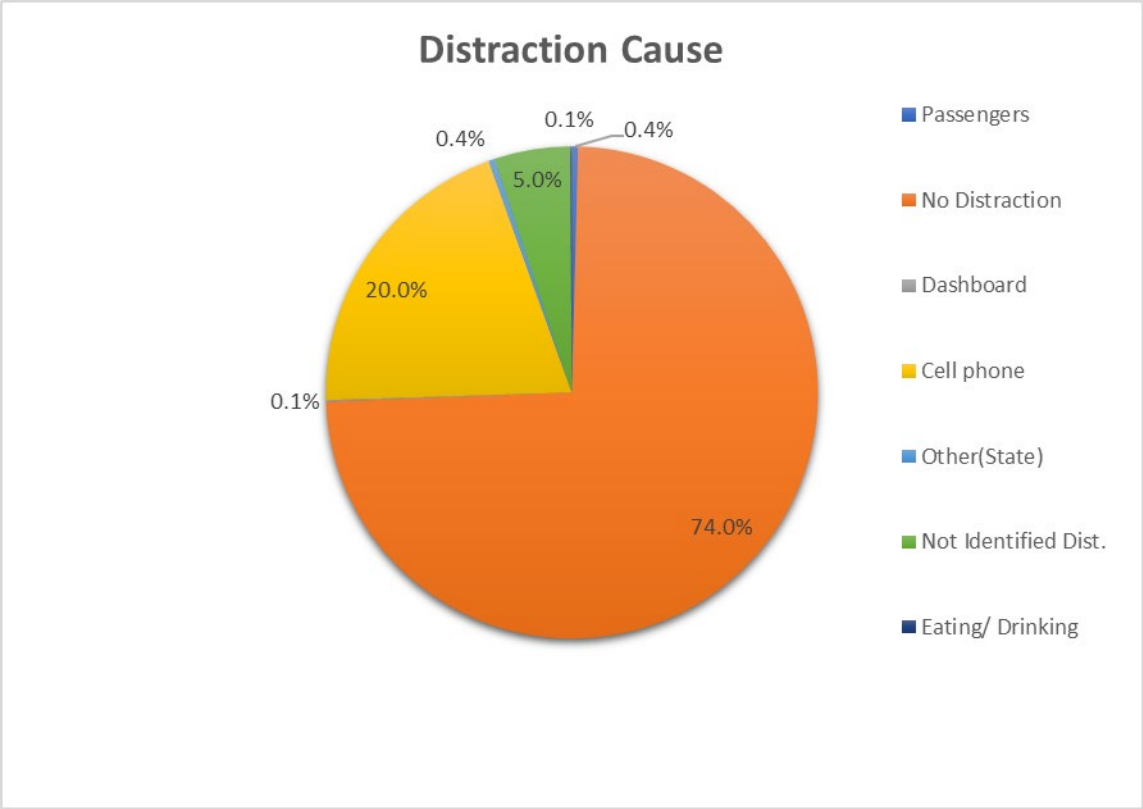


Figure 5-5: Percentages of Distraction Causes

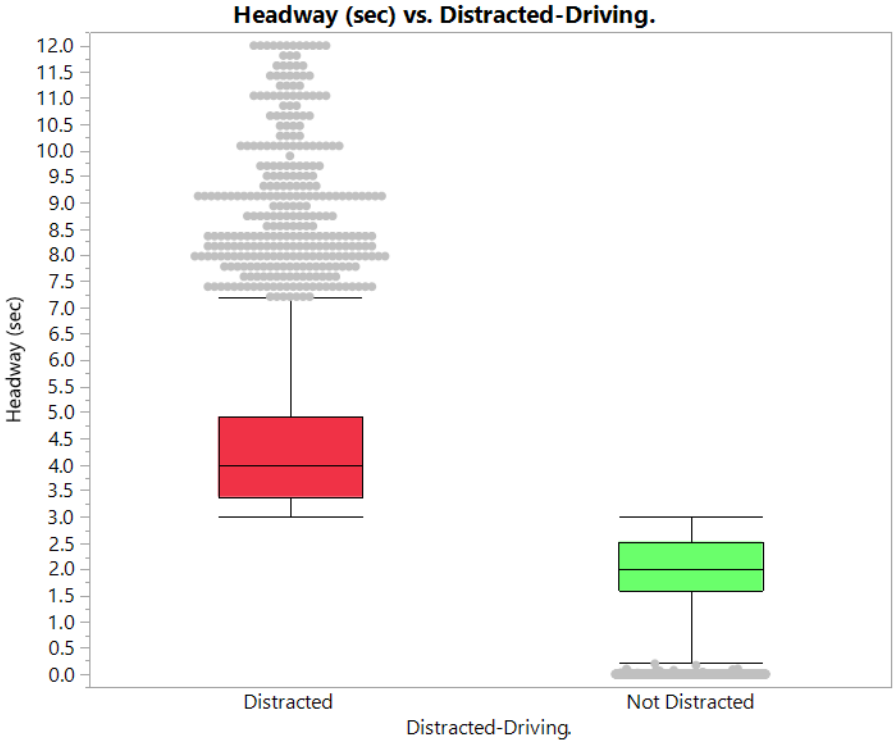


Figure 5-6: Average Headway between Distracted and Non-Distracted Driving

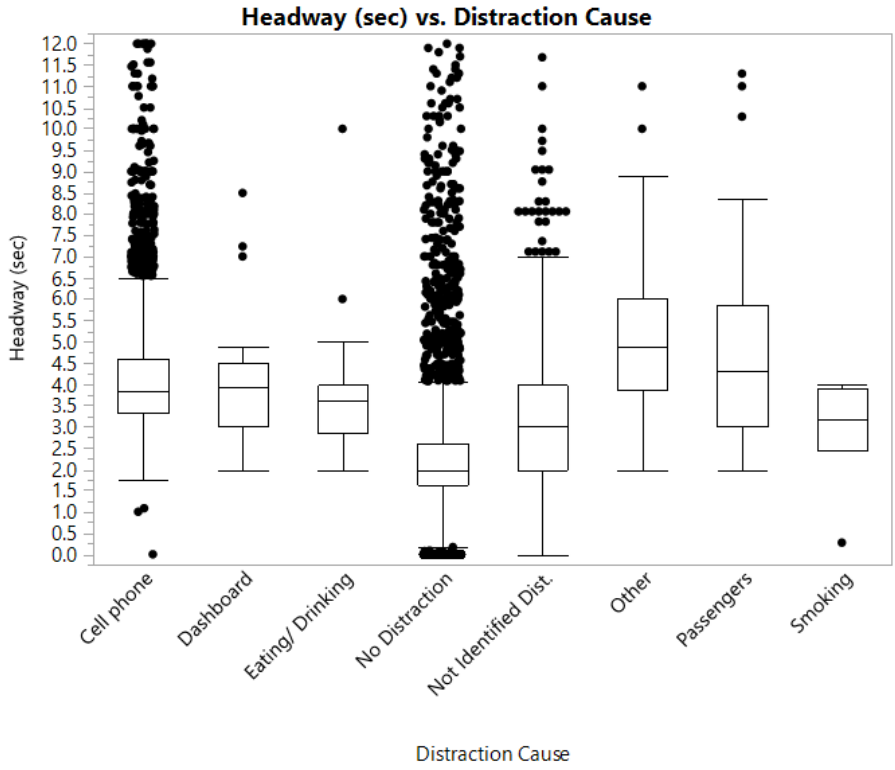


Figure 5-7: Average Headway between Different Types of Distracted Driving

Several statistical models, such as the generalized linear model, and mixed model, were initially examined to fit the data. The Akaike information criterion (AIC) estimator was used to compare the models. Lower AIC numbers mean a better fit for the data. The mixed model was selected as it provided the lowest AIC and the best fit for the data among all models. Additionally, the mixed model was selected for the following features: it can consider both fixed and random effects, handle correlation in data measurements, and flexibly accommodate different factors such as clustering effects containing repeated measurements. The data have different characteristics and consist of continuous variables (headway and lost time) and categorical variables (weather, distraction types, vehicle position in the queue, land use).

The statistical analysis was performed with all factors as main effects and categorized by distracted driving and non-distracted driving. The dependent variable or the response was the headway. The analysis developed two separate models, one for the distracted drivers and the other for the non-distracted drivers.

First, the non-distracted driving model showed very interesting results in terms of the base headway (Intercept), which is considered the headway without any effects, being significant with a value of **2.3** seconds. Weather, land use, lost time, and vehicle queue position significantly affected the headway (P-value<0.05). The clear weather condition didn't affect the headway when compared to the reference category of "Sunny," while cloudy weather decreased the headway by 0.4 seconds (negative sign). The rainy weather was significant and increased the headway by around 0.6 seconds. Commercial land use decreased the headway by 0.11 seconds, while offices' land use increased it by 0.37 seconds. These results showed that motorists waiting during the red light at intersections surrounded by commercial land use are more observant of the surrounding activities and more entertained by the commercial zones. This doesn't mean that they are not distracted but at least not consumed by their vehicles' interior, making them more attentive to the signal changes when compared to the residential/school zone land uses. Lost time and the first vehicle queue position were significant and increased the headway by 0.5 seconds. Distraction cause was not included in this model as it is for non-distracted drivers.

On the other hand, the distracted driving model showed similar results in terms of the base headway (Intercept) as significant with around **2.95** sec. In addition, the model showed that the weather, land use, distraction cause, lost time, and vehicle queue position had a significant effect on the headway (P-value<0.05). For weather effects, the results showed that clear and cloudy weather decreased the headway with an estimate of 0.57 and 0.34 (sec), respectively. Rainy weather was significant and increased the headway by 1.0 second. Offices and commercial zones were both significant, with values of around 0.2 and -0.3 seconds, respectively. For distraction causes: only cell phone usage was significant and increased the headway by 0.5 sec. Lost-time and vehicle queue position one affected headway by an increase of 0.6 sec. Another interesting result in the distracted model effects showed that vehicle queue position number 10 was significant with an increasing effect on headway by 0.49 seconds. The model also showed that vehicle positions 8 and 9 had an increasing effect on the headway but were insignificant. Although it might appear unusual that vehicles in the back rows have this significant effect on headway compared to the first rows that are often used in the lost time calculations. These results reveal the effect of distraction on intersection operations. It was observed that when the intersection is congested during the peak hour and drivers in the back rows (8, 9, or 10) are distracted and not paying

attention to the green phase even by a couple of seconds; the green phase gaps out due to the amount of time needed for this tenth vehicle to reach the stop-line which exceeds the standard 3-second gap out, thus decreasing the intersection hourly capacity dramatically. The following Figure 5-8 and Figure 5-9 show the statistical results for the non-distracted model, while Figure 5-10 and Figure 5-11 show the results for the distracted model.

A statistical expression was formed using the mixed model to predict the dependent variable headway between distracted and non-distracted drivers. The headway or h (sec) was considered as the dependent variable (Y), while Weather, Land-Use, Distraction Cause, Lost-Time, and Vehicle Queue position were the explanatory variables (X), as shown in the following equation:

$$\boldsymbol{Mean\,(h) = A + B_1 * Weather + B_2 * Land\ Use + B_3 * Distraction\ Cause + B_4 * Lost\ Time + B_5 * Vehicle\ Queue\ position}$$ **Equation 1**

Fit Mixed Distracted Driving=Not Distracted

Fit Statistics

-2 Residual Log Likelihood	47134.035
-2 Log Likelihood	47051.625
AICc	47091.684
BIC	47242.88

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	1.6018031	0.0190059	1.5651953	1.6397166

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	2.298161	0.1271896	14206	18.07	<.0001*	2.0488527	2.5474694
Weather[Clear]	-0.215035	0.1171167	14206	-1.84	0.0664	-0.444599	0.0145288
Weather[Cloudy]	-0.400014	0.0701007	14206	-5.71	<.0001*	-0.537421	-0.262608
Weather[Rainy]	0.5941014	0.1719713	14206	3.45	0.0006*	0.2570151	0.9311876
Land-use[Commercial]	-0.118752	0.0155497	14206	-7.64	<.0001*	-0.149231	-0.088272
Land-use[Offices]	0.3752465	0.01844	14206	20.35	<.0001*	0.3391017	0.4113914
Lost-Time (sec)	0.5902856	0.0082455	14206	71.59	<.0001*	0.5741235	0.6064478
Veh Queue Pos[1]	0.5479102	0.1141755	14206	4.80	<.0001*	0.3241112	0.7717092
Veh Queue Pos[2]	0.0917744	0.1139264	14206	0.81	0.4205	-0.131536	0.3150851
Veh Queue Pos[3]	-0.041117	0.1126406	14206	-0.37	0.7151	-0.261907	0.1796733
Veh Queue Pos[4]	-0.083377	0.1125459	14206	-0.74	0.4588	-0.303982	0.1372273
Veh Queue Pos[5]	-0.165939	0.1125591	14206	-1.47	0.1404	-0.386569	0.0546918
Veh Queue Pos[6]	-0.167217	0.112876	14206	-1.48	0.1385	-0.388468	0.0540353
Veh Queue Pos[7]	-0.160528	0.1134143	14206	-1.42	0.1570	-0.382835	0.0617787
Veh Queue Pos[8]	-0.145726	0.1142269	14206	-1.28	0.2021	-0.369625	0.0781739
Veh Queue Pos[9]	-0.167207	0.115062	14206	-1.45	0.1462	-0.392744	0.0583294
Veh Queue Pos[10]	-0.115263	0.1161728	14206	-0.99	0.3211	-0.342977	0.1124506
Veh Queue Pos[11]	-0.09505	0.5923322	14206	-0.16	0.8725	-1.256099	1.0659982
Veh Queue Pos[12]	0.1825311	0.8304825	14206	0.22	0.8260	-1.445323	1.8103855

Figure 5-8: Parameter Estimates for the Non-Distracted Mixed Model

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	3	3	14206	58.717796	<.0001*
Land-use	2	2	14206	210.97397	<.0001*
Distraction Cause	0	0	14206	.	.
Lost-Time (sec)	1	1	14206	5125.019	<.0001*
Veh Queue Pos	12	12	14206	28.490811	<.0001*

Marginal Model Profiler

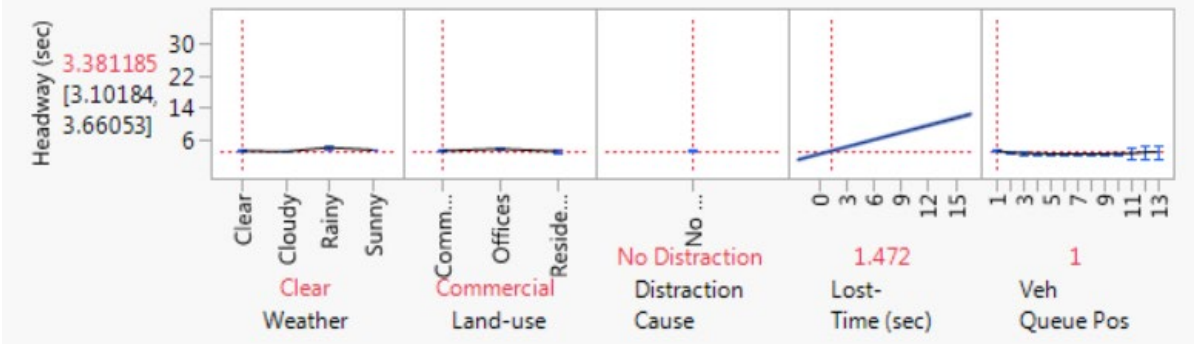


Figure 5-9: Marginal Model Profiler for the Non-Distracted Model

Fit Mixed Distracted Driving=Distracted

Fit Statistics

-2 Residual Log Likelihood	18891.514
-2 Log Likelihood	18820.491
AICc	18868.73
BIC	19025.114

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	2.454556	0.0489884	2.3613008	2.553474

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	2.9579578	0.2116887	5021.0	13.97	<.0001*	2.5429554	3.3729601
Weather[Clear]	-0.579001	0.2047546	5021.0	-2.83	0.0047*	-0.980409	-0.177592
Weather[Cloudy]	-0.348028	0.1107992	5021.0	-3.14	0.0017*	-0.565243	-0.130814
Weather[Rainy]	1.0178883	0.2547925	5021.0	3.99	<.0001*	0.5183838	1.5173929
Land-use[Commercial]	-0.369325	0.0310236	5021.0	-11.90	<.0001*	-0.430145	-0.308505
Land-use[Offices]	0.1967687	0.0372729	5021.0	5.28	<.0001*	0.1236976	0.2698397
Distraction Cause[Cell phone]	0.5315197	0.1209146	5021.0	4.40	<.0001*	0.2944743	0.768565
Distraction Cause[Dashboard]	0.09072	0.3615295	5021.0	0.25	0.8019	-0.618036	0.7994755
Distraction Cause[Eating/ Drinking]	-0.299931	0.3188866	5021.0	-0.94	0.3470	-0.925088	0.3252257
Distraction Cause[Not Identified Dist.]	-0.201556	0.1252168	5021.0	-1.61	0.1075	-0.447035	0.0439237
Distraction Cause[Other(State)]	0.2286122	0.1946406	5021.0	1.17	0.2402	-0.152968	0.6101927
Distraction Cause[Passengers]	0.1071565	0.1929695	5021.0	0.56	0.5787	-0.271148	0.485461
Lost-Time (sec)	0.6055502	0.0129425	5021.0	46.79	<.0001*	0.5801772	0.6309232
Veh Queue Pos[1]	0.6183154	0.1545838	5021.0	4.00	<.0001*	0.3152636	0.9213672
Veh Queue Pos[2]	0.0273434	0.1507059	5021.0	0.18	0.8560	-0.268106	0.3227928
Veh Queue Pos[3]	-0.1885	0.154786	5021.0	-1.22	0.2234	-0.491949	0.1149478
Veh Queue Pos[4]	-0.219706	0.1565741	5021.0	-1.40	0.1606	-0.52666	0.0872476
Veh Queue Pos[5]	-0.069891	0.1574797	5021.0	-0.44	0.6572	-0.37862	0.2388375
Veh Queue Pos[6]	-0.04364	0.1611208	5021.0	-0.27	0.7865	-0.359507	0.2722276
Veh Queue Pos[7]	-0.050062	0.1649554	5021.0	-0.30	0.7615	-0.373446	0.2733226
Veh Queue Pos[8]	0.0085848	0.1672248	5021.0	0.05	0.9591	-0.319249	0.3364184
Veh Queue Pos[9]	0.1280886	0.1715041	5021.0	0.75	0.4552	-0.208134	0.4643114
Veh Queue Pos[10]	0.4912376	0.1755243	5021.0	2.80	0.0052*	0.1471334	0.8353417

Figure 5-10: Parameters Estimates for the Distraction-Types Model

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	3	3	5021.0	11.649861	<.0001*
Land-use	2	2	5021.0	73.045356	<.0001*
Distraction Cause	6	6	5021.0	26.757338	<.0001*
Lost-Time (sec)	1	1	5021.0	2189.0818	<.0001*
Veh Queue Pos	10	10	5021.0	14.326205	<.0001*

Marginal Model Profiler

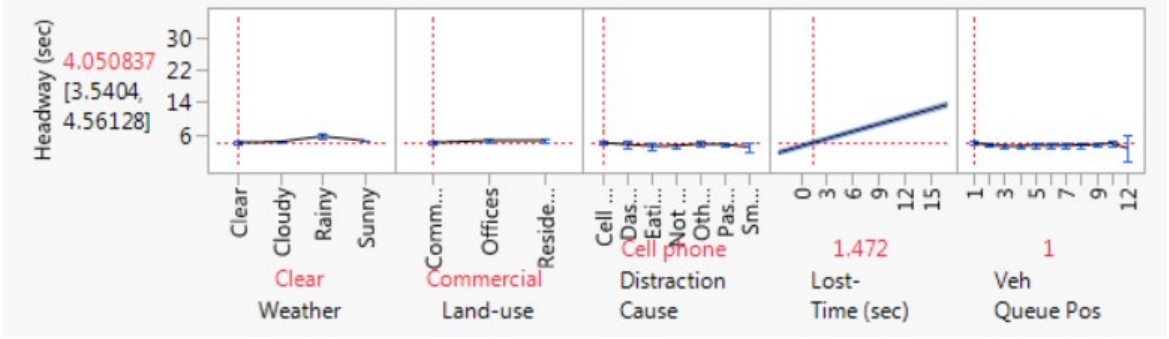


Figure 5-11: Marginal Model Profiler for the Distraction-Types Model

5.1.3 Descriptive Analysis of Main Parameters – Full Sample

Distraction Cause

After completing the data collection and extraction of all the ten (10) intersections (see Appendix A to O), the results showed that overall the percentages of distracted and non-distracted drivers were 53% and 47%, respectively (Figure 5-12). Distractions were classified by type (Figure 5-13), which showed that "Not Identified" and "Cell phone" types represented 41% and 31%, respectively. Drivers that were not distracted represented about 22%. Drivers distracted by talking to other passengers were 3.3%. "Other" and "Smoking" distractions formed 1.8% and 0.2%, respectively. Both "Eating/ Drinking" and "Dashboard" figures were also low, 0.7%. Cell phone usage was the prevalent distraction type in this study, with 31% after the uncommon types of distraction coded as "Not Identified."

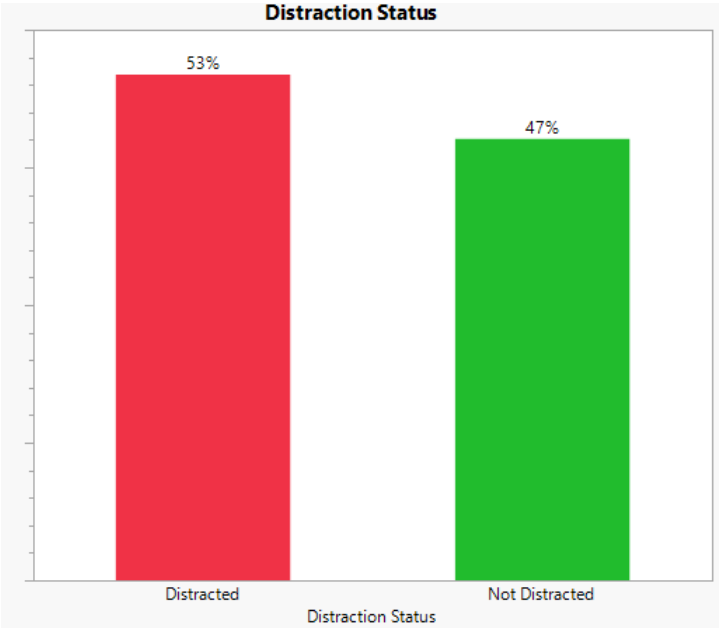


Figure 5-12: Percentages of Distracted and Non-Distracted Drivers

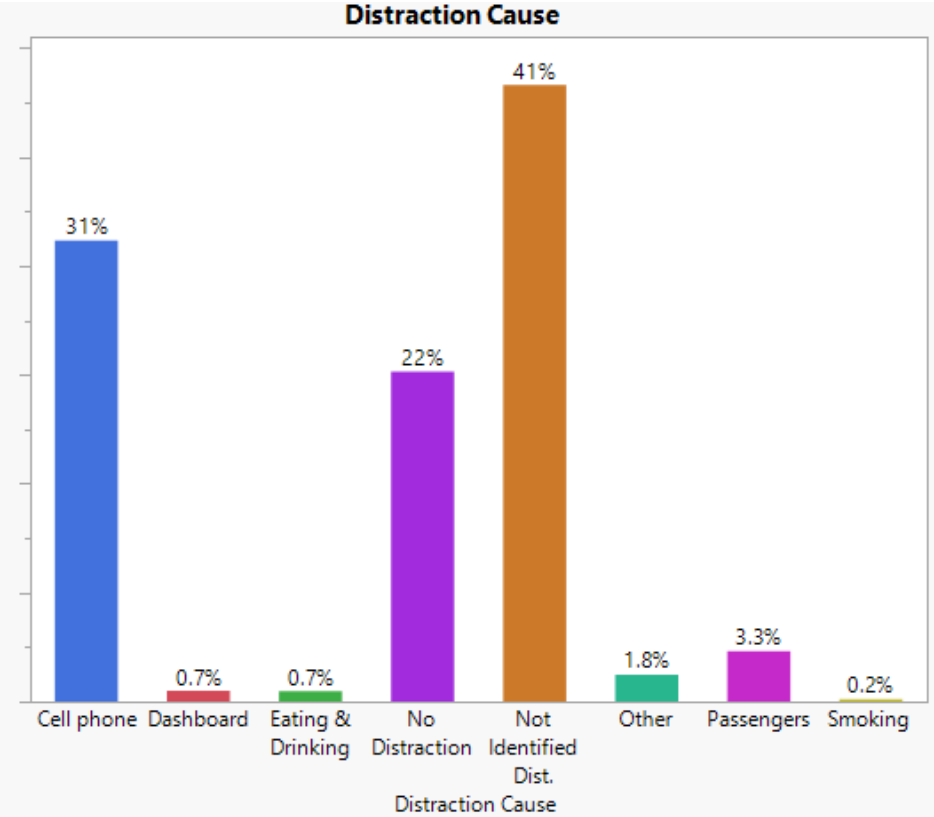


Figure 5-13: Distraction Cause Distribution

Headway and Saturation Headway

Figure 5-14 demonstrates the mean headway for distracted drivers compared to the mean of non-distracted drivers. The headway for distracted drivers (3.72 seconds) was significantly higher than the non-distracted drivers (2.0 seconds). The high difference between the two shows how distractions negatively affect the headway at signalized intersections. Figure 5-15 shows the headway variation within distraction cause categories. Non-distracted drivers scored the least headway, while "Not Identified" and "Smoking" categories were the highest. The saturation headway was also plotted for distracted and non-distracted drivers (Figure 5-16). The saturation headway for non-distracted drivers was 2.65 seconds, which is less than in the distracted drivers' case (2.83 seconds).

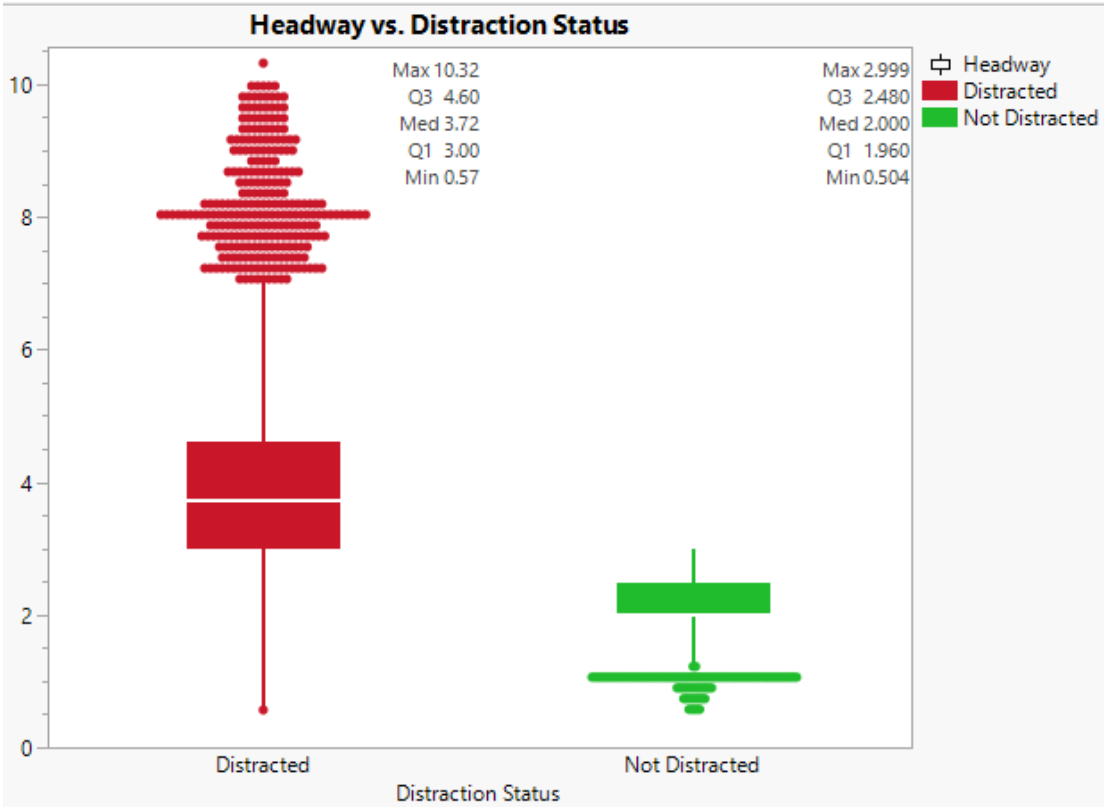


Figure 5-14: Headway vs. Distraction Status

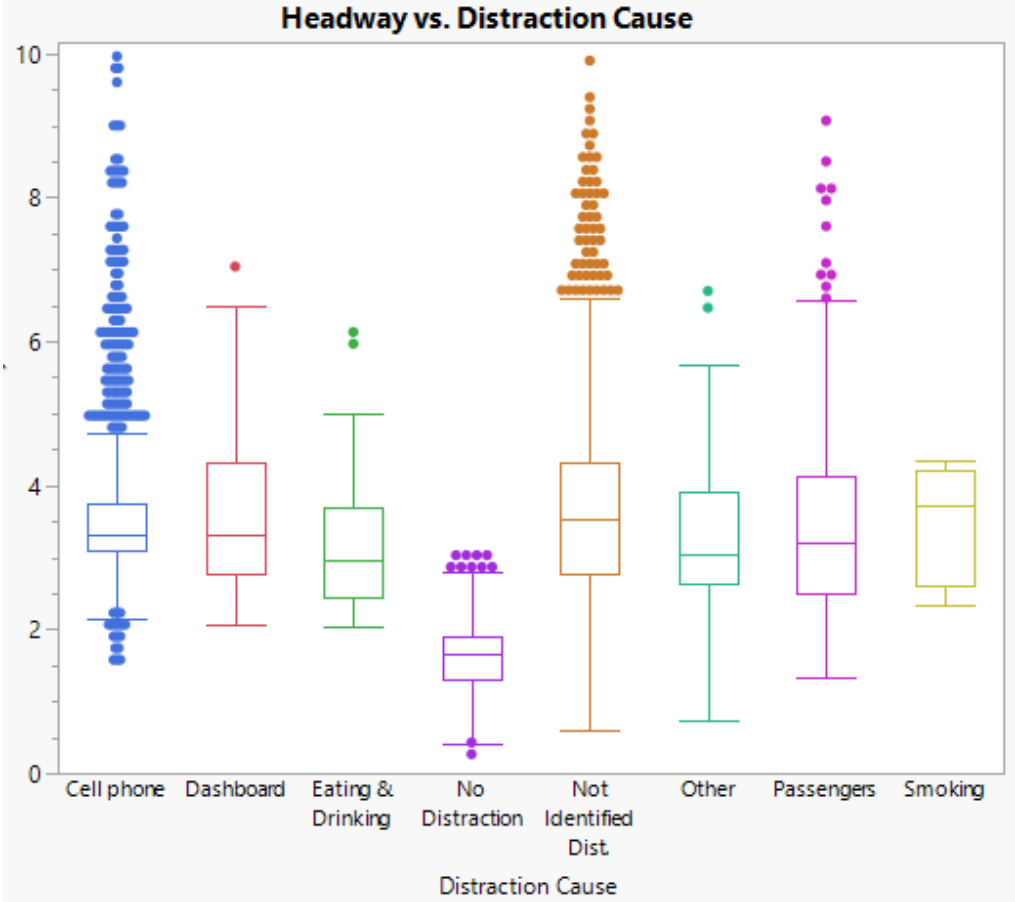


Figure 5-15: Headway vs. Distraction Cause

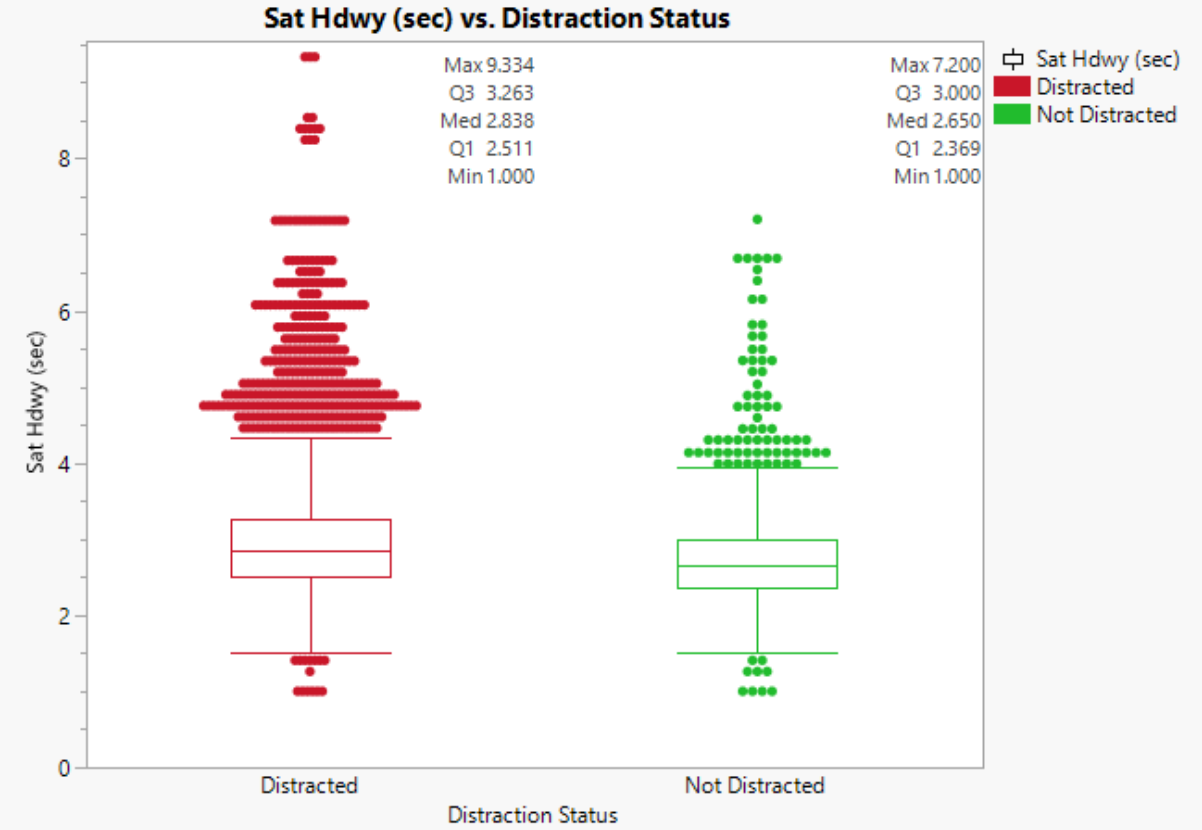


Figure 5-16: Saturation Headway vs. Distraction Status

Weather

Weather is also considered in the analysis as a potentially significant factor affecting drivers' behavior and was entered in the data in three (3) levels: Cloudy, Rainy, and Sunny. As was stated in previous sections, the high-quality cameras allowed the researchers to record clearly in rainy weather; therefore, data were collected during these times. As seen in Figure 5-17, most of the data were collected in sunny weather (61%). Only 29% of the data were recorded during cloudy weather. Rainy weather represented a low percentage in the study, only 9.3%. The majority of the data were collected during Sunny and Cloudy weather conditions (90%).

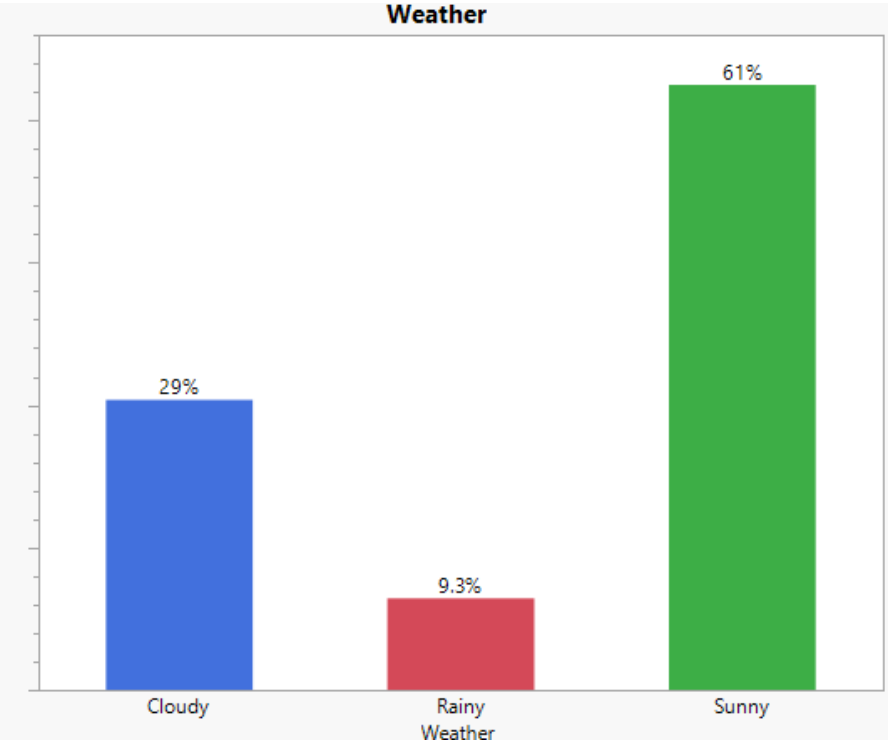


Figure 5-17: Weather Statistics

Land-Use

Land use plays a significant role in travel demand and, consequently, a significant factor in drivers' daily trips. Land-use data were collected in four (4) levels: Commercial, Mixed Use, Residential with School, and Tourist. As seen in Figure 5-18, motorists' numbers according to other land uses; Commercial, Mixed Use, Residential/School, and Tourist were observed to be 66%, 13%, 12%, and around 9%, respectively. Distracted drivers were found to be significantly higher than non-distracted drivers in all land use types (Figure 5-19).

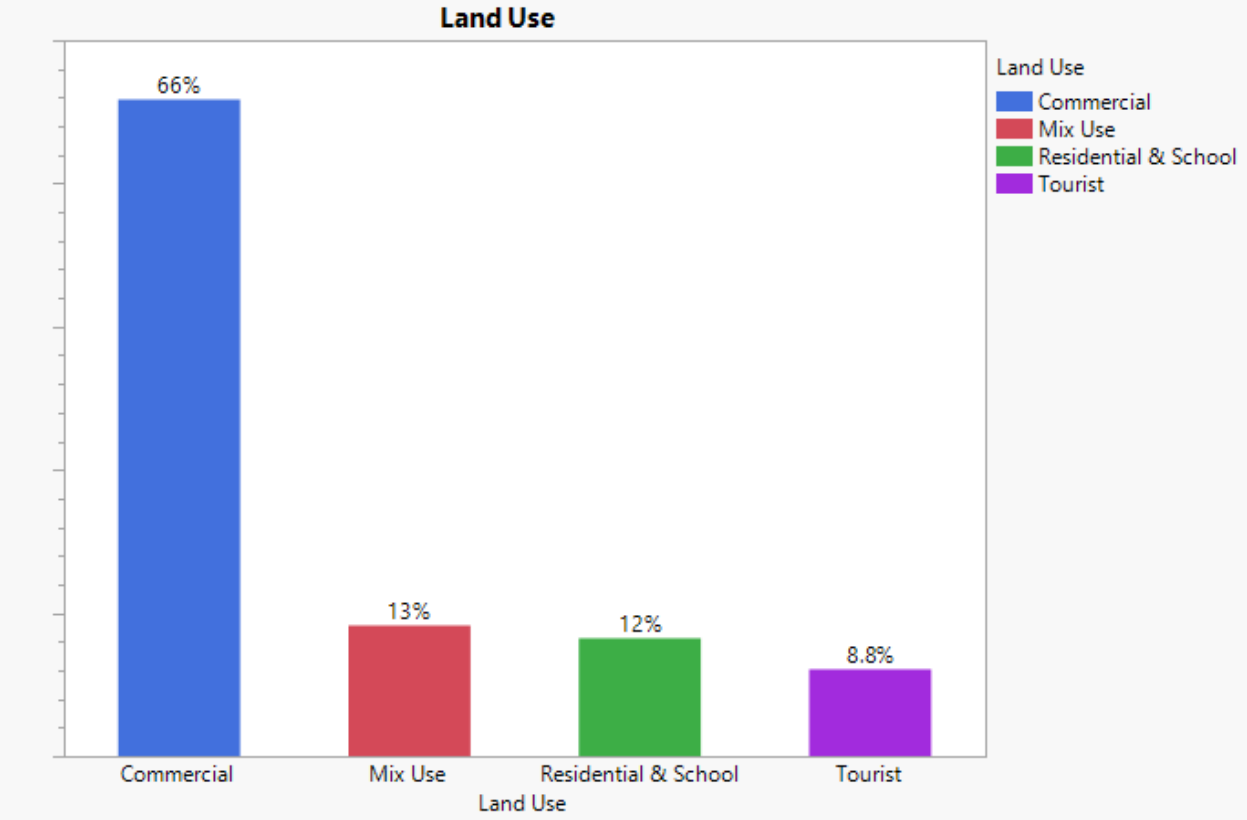


Figure 5-18: Land-use Statistics

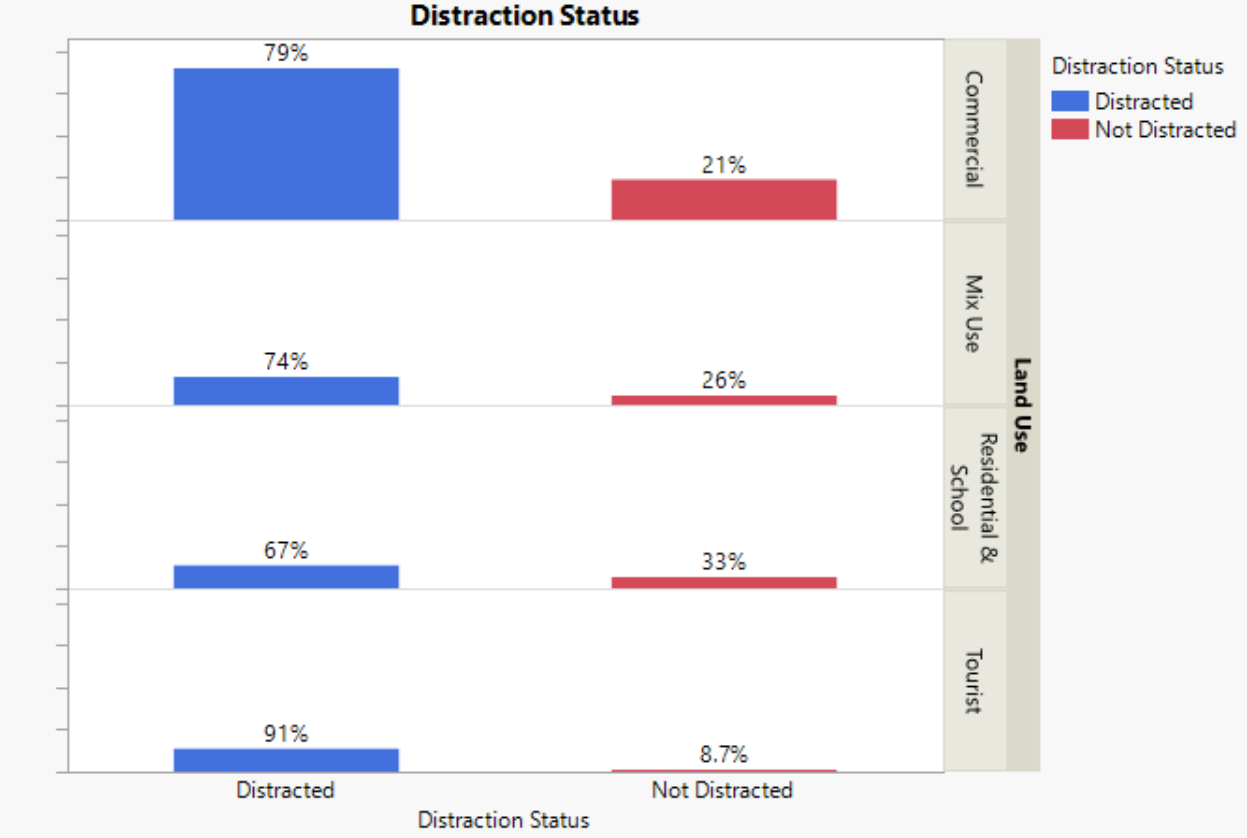


Figure 5-19: Distraction Status vs. Land Use

Number of Lanes

The number of lanes represents the total number of lanes studied for each movement. The through movement is composed of either two (2) or three (3) lanes. Most of the study locations covered three (3) lanes for the through movement (74%). Roads with two (2) lanes formed 26%, as seen in Figure 5-20.

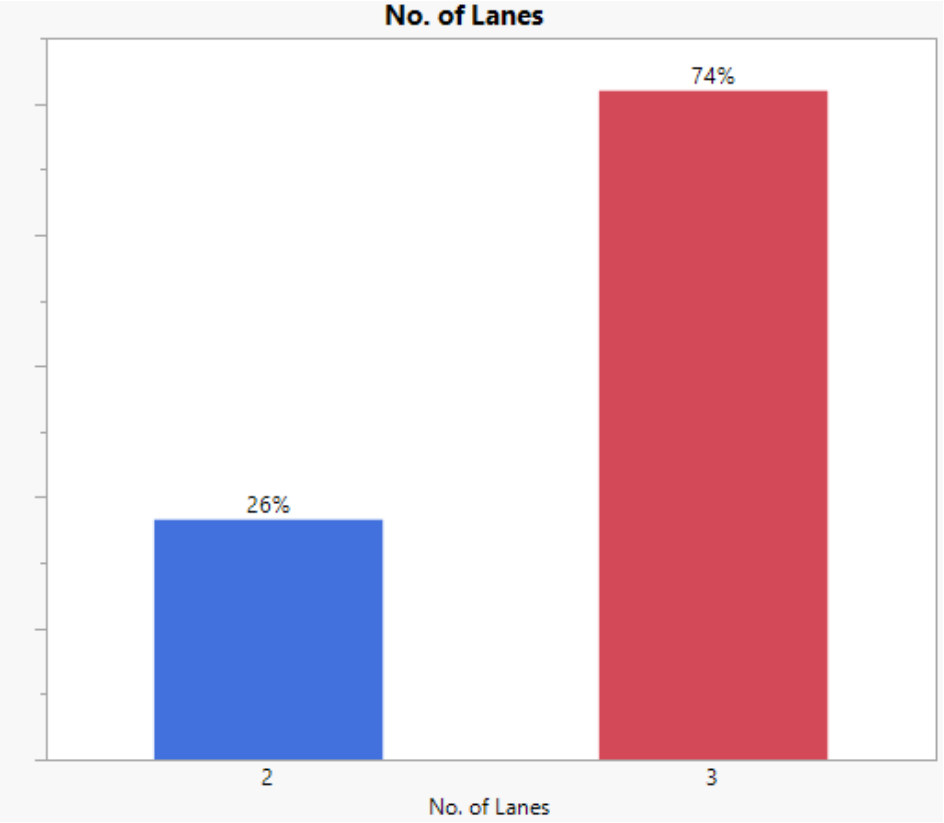


Figure 5-20: Total Number of Lanes

Vehicle Queue Position

As discussed earlier, the vehicle queue position is found to be a significant factor and represents the position of each vehicle in the queue in each lane. Usually, the first few vehicles in the queue cause the highest delay due to their reaction to the beginning of the green phase. Therefore, the first vehicle typically causes the highest delay. In this study, 41%, 32%, and 22% of all drivers were in the queue's first, second, and third positions (Figure 5-21). The fourth position formed around 5%.

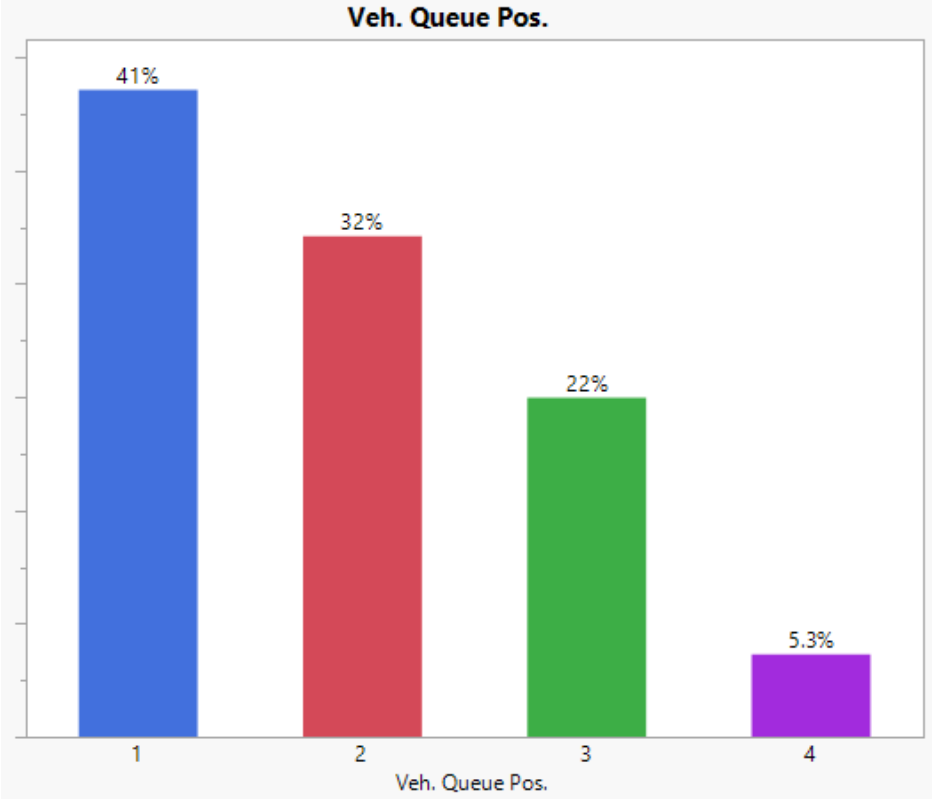


Figure 5-21: Vehicle Queue Position Distribution

Time Of Day (TOD)

The TOD identifies which peak hour is studied. AM, MD, and PM represent morning, mid-day, and afternoon peaks, respectively. Most of the records were collected during the PM peak (65%). The AM and MD peaks records were 28% and around 7%, respectively (Figure 5-22).

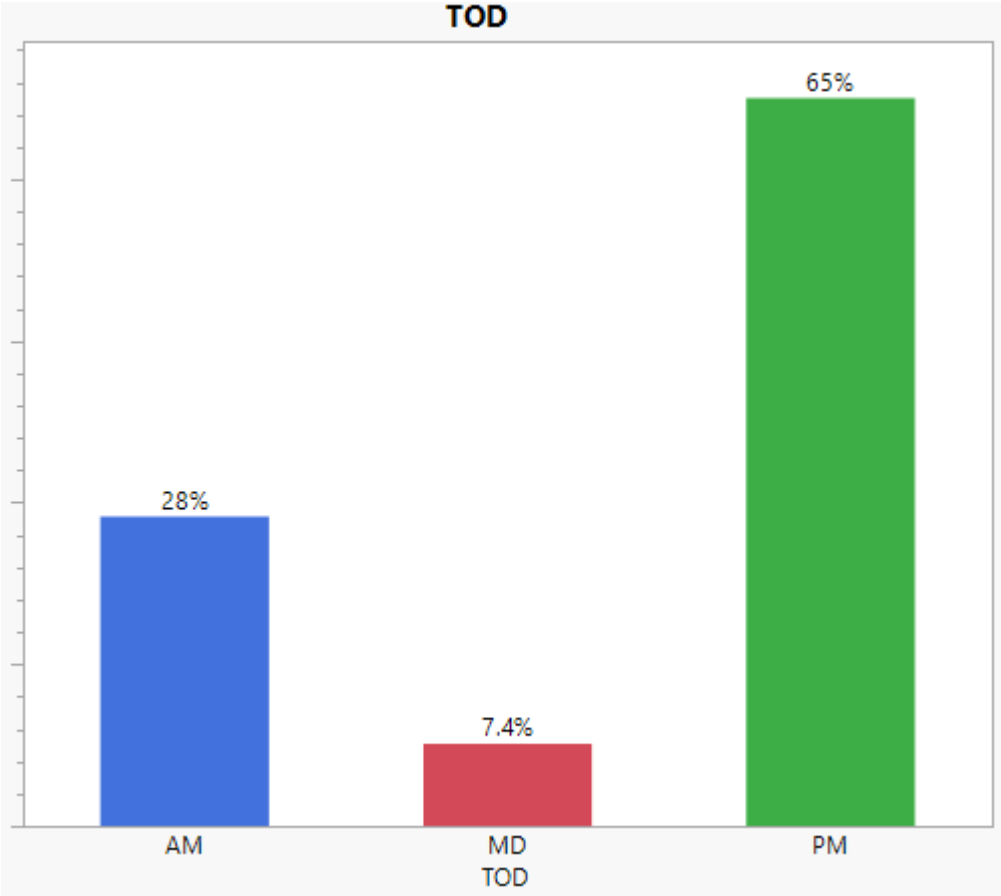


Figure 5-22: TOD Distribution

5.1.4 Effect of Distraction on Headway by TOD

AM Peak

The effect of distraction on headway during different times of the day was investigated using a Generalized Linear Model (GLM) Fit for the headway response. The TOD effect helped in understanding the model's variation during the different peak hours. The GLM model with Poisson distribution and an identity link was selected because it is ideal for rare events' counts and has a smaller total error than the normal distribution. The estimation method was Maximum Likelihood. The whole model test (Figure 5-23) was significant, with Prob>ChiSq of <.0001. The goodness of fit statistic showed a small overdispersion of less than one (0.32), which is a good indication that the model fits the data. The AIC was 19,820.

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	749.438334	1498.877	15	<.0001*
Full	9892.99159			
Reduced	10642.4299			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	611.2225	1899	1.0000	0.3219
Deviance	566.4203	1899	1.0000	

AICc
19820.306

Figure 5-23: GLM Model Test-AM Peak

Other variables were also included in the model, such as Distraction Cause, No. of Lanes, Land Use, Veh. Queue Position and Weather. All effects were significant during the AM peak hour, except for the Weather, as seen in Figure 5-24.

Effect Summary

Source	LogWorth	PValue
Distraction Cause	235.714	0.00000
No. of Lanes	7.756	0.00000
Land Use	4.766	0.00002
Veh. Queue Pos.	2.733	0.00185
Weather	1.180	0.06609

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	2	5.4334858	0.0661
No. of Lanes	1	31.750622	<.0001*
Distraction Cause	6	1109.3966	<.0001*
Veh. Queue Pos.	3	14.962758	0.0018*
Land Use	3	24.781877	<.0001*

Figure 5-24: Parameters Effects-AM Peak

The parameter estimates showed that the base headway (Intercept) was significant, with a value of 4 seconds. The weather parameter was significant, and the rainy condition had an increasing effect on the headway by 0.28 compared to the sunny conditions. In contrast, the cloudy weather had less effect on the headway than the sunny weather by 0.13 seconds. For the Land Use parameters, the effects were significant and showed that the office land use increases the headway when compared to the other land uses, which matches the drivers' destination during the AM peak hour. The two lanes had a lower effect on the headway (0.3 seconds) when compared to the base category of the 3-lane intersection. The analysis revealed that drivers were distracted by other types that are considered uncommon during the AM peak hour while going to work. "Other" types of distractions increased the headway by 0.68 seconds. The first vehicle in the queue increased the headway as expected by 0.12 seconds. Figure 5-25 illustrates the parameter estimates for the AM peak model.

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.0068834	0.1300331	949.52318	<.0001*	3.7518607	4.261906
Weather[Cloudy]	-0.138861	0.0681798	4.1480806	0.0417*	-0.272576	-0.005146
Weather[Rainy]	0.2826842	0.1258926	5.0419988	0.0247*	0.035782	0.5295865
No. of Lanes[2]	-0.303623	0.0510437	35.382327	<.0001*	-0.403731	-0.203516
Distraction Cause[Cell phone]	0.0242713	0.1057197	0.0527078	0.8184	-0.183068	0.2316101
Distraction Cause[Dashboard]	0.7109609	0.426476	2.7790874	0.0955	-0.12545	1.5473712
Distraction Cause[Eating & Drinking]	-0.24601	0.3066847	0.6434577	0.4225	-0.847484	0.3554645
Distraction Cause[No Distraction]	-1.733777	0.101918	289.39089	<.0001*	-1.93366	-1.533894
Distraction Cause[Not Identified Dist.]	-0.046064	0.1024168	0.2022886	0.6529	-0.246925	0.1547977
Distraction Cause[Other]	0.6895535	0.2027285	11.569276	0.0007*	0.2919596	1.0871474
Veh. Queue Pos.[1]	0.1207854	0.0408033	8.7627142	0.0031*	0.0407615	0.2008094
Veh. Queue Pos.[2]	0.0476525	0.041102	1.3441432	0.2463	-0.032957	0.1282622
Veh. Queue Pos.[3]	-0.111734	0.0419049	7.1095674	0.0077*	-0.193919	-0.02955
Land Use[Commercial]	-0.27143	0.0779139	12.13627	0.0005*	-0.424236	-0.118624
Land Use[Mix Use]	-0.206309	0.1068041	3.7313045	0.0534	-0.415775	0.0031566
Land Use[Residential & School]	-0.294681	0.0955995	9.501507	0.0021*	-0.482172	-0.10719

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-25: Parameter Estimates-AM Peak

MD Peak

The MD peak whole model was significant, with an overdispersion of 0.6, as shown in Figure 5-26. The model AIC was 3232, which is significantly lower than the AM peak. Only the distraction cause parameter was significant (Figure 5-27). For the parameter estimates, the base headway (Intercept) was significant with a value of 4 seconds. “Cell phone” and “Other” distractions increased the headway by 0.7 seconds and 1.75 seconds. Not distracted drivers, as expected, showed a decreasing effect on the headway by 2.1 seconds when compared to the base category of being distracted by smoking (Figure 5-28). This also reveals that drivers talk more on the cell phone during lunch time (MD peak) compared to the AM peak.

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	84.8381404	169.6763	9	<.0001*
Full	1605.1464			
Reduced	1689.98454			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	302.2623	500	1.0000	0.6045
Deviance	282.6153	500	1.0000	

AICc
3232.8229

Figure 5-26: Whole Model Test-MD Peak

Effect Summary

Source	LogWorth	PValue
Distraction Cause	30.131	0.00000
Veh. Queue Pos.	0.118	0.76248
No. of Lanes	.	.
Land Use	.	.
Weather	.	.

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	0	.	.
Land Use	0	.	.
No. of Lanes	0	.	.
Distraction Cause	7	158.2774	<.0001*
Veh. Queue Pos.	2	0.5423576	0.7625

Figure 5-27: Whole Model Test-MD Peak

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.0103748	0.21475	348.74139	<.0001*	3.5884532	4.4322964
Distraction Cause[Cell phone]	0.711963	0.2320163	9.4162466	0.0022*	0.2561182	1.1678079
Distraction Cause[Dashboard]	0.5309193	0.5557294	0.9127048	0.3394	-0.560928	1.6227665
Distraction Cause[Eating & Drinking]	0.520336	0.6285557	0.6852992	0.4078	-0.714594	1.7552658
Distraction Cause[No Distraction]	-2.116415	0.2585453	67.008275	<.0001*	-2.624382	-1.608449
Distraction Cause[Not Identified Dist.]	0.4304953	0.2346297	3.3664413	0.0665	-0.030484	0.8914746
Distraction Cause[Other]	1.7556411	0.6945069	6.3902586	0.0115*	0.3911364	3.1201459
Distraction Cause[Passengers]	-0.009886	0.3072256	0.0010355	0.9743	-0.613495	0.5937232
Veh. Queue Pos.[1]	0.0664559	0.1025408	0.4200234	0.5169	-0.135007	0.2679189
Veh. Queue Pos.[2]	-0.054321	0.1019944	0.2836517	0.5943	-0.254711	0.1460683

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-28: Parameter Estimates-MD Peak

PM Peak

The PM peak model was significant (Prob>ChiSq <.0001) and provided a small overdispersion of 0.38. The AIC was 40240.062 (Figure 5-29). The Weather, Land Use, No. of Lanes, Distraction Cause, and Veh. Queue Position parameters were included in this model. The effects tests showed that all parameters were significant (Figure 5-30).

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	1208.49717	2416.994	16	<.0001*
Full	20101.9548			
Reduced	21310.452			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	1733.767	4486	1.0000	0.3865
Deviance	1610.142	4486	1.0000	

AICc
40240.062

Figure 5-29: Whole Model Test-PM Peak

Effect Summary

Source	LogWorth	PValue
Distraction Cause	354.671	0.00000
Land Use	37.193	0.00000
Veh. Queue Pos.	22.504	0.00000
No. of Lanes	12.726	0.00000
Weather	4.029	0.00009

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	2	18.55381	<.0001*
Land Use	3	176.00955	<.0001*
No. of Lanes	1	54.124902	<.0001*
Distraction Cause	7	1664.5432	<.0001*
Veh. Queue Pos.	3	107.88418	<.0001*

Figure 5-30: Effect Summary-PM Peak

The parameter estimates (Figure 5-31) showed that the base headway (Intercept) was significant by 3.55 seconds. The cloudy weather had an increasing effect on the headway by 0.12 seconds, while the rainy weather had a lower effect compared to the sunny conditions, which dominated the data. Commercial and Mixed land uses had an increasing effect on the headway by 0.43 and 0.55 seconds, respectively, compared to the office land use, which matches the typical destinations of the drivers in the PM peak on their way back from work. The two (2) highest distraction causes were "Dashboard" and "cell phone" which increased the headway by 0.65 and 0.4, respectively, and described drivers' behavior while going home. The first and third positions in the queue were significant. The first position increased the headway by 0.27 seconds, while the third position had a lower effect on the headway (0.18 seconds) when compared to the fourth vehicle in the queue.

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	3.5568001	0.0785574	2049.9549	<.0001*	3.4027888	3.7108114
Weather[Cloudy]	0.1233221	0.0287729	18.370254	<.0001*	0.0669131	0.1797312
Weather[Rainy]	-0.090223	0.0349906	6.6485945	0.0099*	-0.158822	-0.021624
No. of Lanes[2]	0.2778928	0.0390355	50.679763	<.0001*	0.2013639	0.3544216
Distraction Cause[Cell phone]	0.3287065	0.07188	20.912216	<.0001*	0.1877862	0.4696268
Distraction Cause[Dashboard]	0.6561068	0.2034161	10.403472	0.0013*	0.2573109	1.0549026
Distraction Cause[Eating & Drinking]	-0.235778	0.1940109	1.4769092	0.2243	-0.616135	0.1445791
Distraction Cause[No Distraction]	-1.533355	0.0719782	453.8198	<.0001*	-1.674467	-1.392242
Distraction Cause[Not Identified Dist.]	0.0413886	0.0708478	0.3412785	0.5591	-0.097508	0.1802851
Distraction Cause[Other]	0.4098339	0.1370325	8.944753	0.0028*	0.1411826	0.6784852
Distraction Cause[Passengers]	0.1848626	0.1081385	2.9223837	0.0874	-0.027142	0.3968674
Veh. Queue Pos.[1]	0.2710569	0.0301999	80.55814	<.0001*	0.2118502	0.3302636
Veh. Queue Pos.[2]	0.0011112	0.0306509	0.0013143	0.9711	-0.05898	0.061202
Veh. Queue Pos.[3]	-0.183046	0.0327851	31.17207	<.0001*	-0.247321	-0.118771
Land Use[Commercial]	0.4367454	0.0529087	68.140081	<.0001*	0.3330183	0.5404725
Land Use[Mix Use]	0.5514963	0.0636647	75.039197	<.0001*	0.4266822	0.6763104
Land Use[Residential & School]	-0.584541	0.0598694	95.32792	<.0001*	-0.701915	-0.467167

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-31: Parameter Estimates-PM Peak

Conclusion

All three models were significant (p-value<.0001), and the goodness of fit statistic provided a small overdispersion. The AM peak model revealed that drivers are not inclined toward using their cell phones in the morning. However, they get distracted by other types, such as staring through the windshield and not paying attention to the road. Intersections surrounded by office land use increased the headway, which matches the drivers' destination in the morning going to work with the first vehicle in the queue, causing an increase in the headway.

In the MD peak model, only the "Distraction Cause" effect was significant. Cell phone usage had a positive effect on headway which revealed that drivers talk more on the cell phone during lunch time (MD peak) compared to the AM peak.

The PM peak model showed a good fit for the data, which had all the effects significant. Commercial and Mixed land uses had an increasing effect on the headway compared to the office land use, which matches the typical destinations of the drivers in the PM peak on their way back from work. The two (2) highest effects on headway were "Dashboard" and "cell phone" which describes drivers' behavior while going home. Also, this showed that drivers pay more attention near residential land uses and around school areas. Startup lost time is also represented by the first vehicle position in the queue, which increased the headway.

Overall, the GLM model fits the data well by TOD. However, other models were explored to explain the parameters and effects and also provide a better AIC and effectively address the goal of studying the effects of the distraction on the headway.

5.1.5 Statistical Comparison - Mixed Model Analysis

The third model was the mixed model, which provided less AIC than the previous two models. The first mixed model was categorized by Distracted or Not Distracted, which provided an AIC of 18868 and 47091, respectively. The 2nd and 3rd models provided less AIC, but the 3rd mixed model offered the least AIC, as seen in Table 5-3. The 3rd model analysis produced three models (AM, MD, and PM), which will be discussed in the following sections.

Table 5-3: GLM and Mixed Models Comparison

TOD	GLM	Mixed Model
AM Peak	19820	5794
MD Peak	3232	1966
PM Peak	40240	14598

AM Peak

The AM peak model provided an AIC of 5794 (Figure 5-32). All effects included in the model were significant (Figure 5-33). The base headway (Intercept) was 4 seconds (Figure 5-34). Rainy weather increased the headway by 0.31 compared to Sunny conditions. Land-use effects decreased the headway by an average of 0.25 seconds compared to the office land use. Two (2) lane intersection approaches had lower effect than the three-lane approaches. All distraction types showed no significant effect on the headway, except for the "Other" category, which increased the headway by 0.7 seconds. Not distracted drivers showed lower effect on the headway by 1.77 seconds compared to the distraction category. Vehicle position one (1) increased the headway by 0.12 seconds, while the third position had lower effect than the fourth vehicle in the queue.

Fit Statistics

-2 Residual Log Likelihood	5813.9027
-2 Log Likelihood	5759.8008
AICc	5794.1234
BIC	5888.2778

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	1.1950726	0.0387835	1.1225576	1.2748842

Figure 5-32: Fit Statistics-AM Peak

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	2	2	1899.0	3.4757424	0.0311*
Land Use	3	3	1899.0	9.0882882	<.0001*
No. of Lanes	1	1	1899.0	30.217645	<.0001*
Distraction Cause	6	6	1899.0	153.80968	<.0001*
Veh. Queue Pos.	3	3	1899.0	4.7029512	0.0028*

Figure 5-33: Fixed Effects Tests-AM Peak

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	4.0128714	0.1238606	1899.0	32.40	<.0001*	3.7699543	4.2557886
Weather[Cloudy]	-0.172375	0.0668956	1899.0	-2.58	0.0100*	-0.303572	-0.041179
Weather[Rainy]	0.3122582	0.1215084	1899.0	2.57	0.0102*	0.0739543	0.5505621
No. of Lanes[2]	-0.352773	0.0641748	1899.0	-5.50	<.0001*	-0.478633	-0.226912
Distraction Cause[Cell phone]	-0.008979	0.1000359	1899.0	-0.09	0.9285	-0.205171	0.1872128
Distraction Cause[Dashboard]	0.7291776	0.3887491	1899.0	1.88	0.0608	-0.033243	1.4915978
Distraction Cause[Eating & Drinking]	-0.214685	0.3072468	1899.0	-0.70	0.4848	-0.817262	0.3878916
Distraction Cause[No Distraction]	-1.775041	0.1003167	1899.0	-17.69	<.0001*	-1.971783	-1.578298
Distraction Cause[Not Identified Dist.]	-0.076133	0.0969972	1899.0	-0.78	0.4326	-0.266365	0.1140992
Distraction Cause[Other]	0.7021684	0.1853501	1899.0	3.79	0.0002*	0.3386572	1.0656797
Veh. Queue Pos.[1]	0.1285764	0.0451114	1899.0	2.85	0.0044*	0.0401034	0.2170495
Veh. Queue Pos.[2]	0.0286029	0.0464433	1899.0	0.62	0.5381	-0.062482	0.1196881
Veh. Queue Pos.[3]	-0.124334	0.0491745	1899.0	-2.53	0.0115*	-0.220776	-0.027892
Land Use[Commercial]	-0.258695	0.0857524	1899.0	-3.02	0.0026*	-0.426874	-0.090516
Land Use[Mix Use]	-0.242747	0.1173655	1899.0	-2.07	0.0387*	-0.472925	-0.012568
Land Use[Residential & School]	-0.325158	0.1094067	1899.0	-2.97	0.0030*	-0.539728	-0.110588

Figure 5-34: Fixed Effects Parameter Estimates-AM Peak

MD Peak

The MD peak model scored an AIC of 1966 and had only the distraction cause parameter significant (P<.0001). The base headway was 4 seconds, with a significant effect. Both "Cell phone" and "Other" categories increased the headway by 0.7 seconds and 1.77 seconds, respectively. All other parameters were not significant (Figure 5-35).

Fit Statistics

-2 Residual Log Likelihood	1954.3832
-2 Log Likelihood	1943.8289
AICc	1966.359
BIC	2012.4074

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	2.6997521	0.1707473	2.3940275	3.0683465

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	4.0352215	0.2578867	500.0	15.65	<.0001*	3.5285464	4.5418966
Distraction Cause[Cell phone]	0.7008003	0.2705583	500.0	2.59	0.0099*	0.1692291	1.2323715
Distraction Cause[Dashboard]	0.5315457	0.5667355	500.0	0.94	0.3487	-0.581931	1.6450221
Distraction Cause[Eating & Drinking]	0.5209624	0.6368331	500.0	0.82	0.4137	-0.730236	1.7721609
Distraction Cause[No Distraction]	-2.161595	0.3346427	500.0	-6.46	<.0001*	-2.819074	-1.504115
Distraction Cause[Not Identified Dist.]	0.4287256	0.2744406	500.0	1.56	0.1189	-0.110473	0.9679244
Distraction Cause[Other]	1.7721382	0.6339078	500.0	2.80	0.0054*	0.526687	3.0175895
Distraction Cause[Passengers]	9.8969e-5	0.3459276	500.0	0.00	0.9998	-0.679552	0.6797497
Veh. Queue Pos.[1]	0.0409828	0.1054709	500.0	0.39	0.6978	-0.166238	0.2482035
Veh. Queue Pos.[2]	-0.109545	0.1116589	500.0	-0.98	0.3270	-0.328923	0.1098336

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	0	0	500.0	.	.
Land Use	0	0	500.0	.	.
No. of Lanes	0	0	500.0	.	.
Distraction Cause	7	7	500.0	17.741262	<.0001*
Veh. Queue Pos.	2	2	500.0	0.4951482	0.6098

Figure 5-35: MD Model Fixed Effects

PM Peak

The PM peak model scored an AIC of 14598. The base headway was significant, with a value of 3.55 seconds. Cloudy weather increases the headway by 0.13 seconds, while rainy weather decreases the headway by 0.1 seconds compared to sunny conditions. Commercial and Mixed land uses increased the headway by 0.46 and 0.58 seconds when compared to the Tourist land use. Two lanes had higher effect than the 3 lane approach intersections by around 0.3 seconds. Regarding distraction causes, Cell phones, Dashboard, and Other distractions increased the headway by 0.3, 0.7, and 0.4 seconds, respectively. The first position in the queue increased the headway by nearly 0.3 seconds, while the third position had lower effect on the response by 0.2 seconds when compared to the fourth vehicle in the queue (Figure 5-36).

Fit Statistics

-2 Residual Log Likelihood	14632.18
-2 Log Likelihood	14562.638
AICc	14598.79
BIC	14714.063

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	1.4916515	0.0314958	1.4317957	1.5553594

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	3.5547732	0.079521	4486.0	44.70	<.0001*	3.398873	3.7106735
Weather[Cloudy]	0.1338957	0.0307044	4486.0	4.36	<.0001*	0.0736999	0.1940915
Weather[Rainy]	-0.104843	0.0379206	4486.0	-2.76	0.0057*	-0.179186	-0.0305
No. of Lanes[2]	0.2929943	0.0382471	4486.0	7.66	<.0001*	0.2180111	0.3679775
Distraction Cause[Cell phone]	0.3195216	0.0708395	4486.0	4.51	<.0001*	0.1806413	0.4584019
Distraction Cause[Dashboard]	0.7005543	0.1903447	4486.0	3.68	0.0002*	0.3273849	1.0737237
Distraction Cause[Eating & Drinking]	-0.247423	0.2008859	4486.0	-1.23	0.2181	-0.641259	0.1464119
Distraction Cause[No Distraction]	-1.557782	0.0750334	4486.0	-20.76	<.0001*	-1.704885	-1.41068
Distraction Cause[Not Identified Dist.]	0.0488226	0.0703799	4486.0	0.69	0.4879	-0.089157	0.1868018
Distraction Cause[Other]	0.435339	0.1320566	4486.0	3.30	0.0010*	0.1764429	0.694235
Distraction Cause[Passengers]	0.1727951	0.1062329	4486.0	1.63	0.1039	-0.035474	0.381064
Veh. Queue Pos.[1]	0.2911008	0.0325333	4486.0	8.95	<.0001*	0.2273196	0.3548821
Veh. Queue Pos.[2]	-0.036584	0.0337946	4486.0	-1.08	0.2791	-0.102838	0.0296701
Veh. Queue Pos.[3]	-0.209316	0.0377847	4486.0	-5.54	<.0001*	-0.283392	-0.135239
Land Use[Commercial]	0.4687923	0.0540002	4486.0	8.68	<.0001*	0.3629253	0.5746594
Land Use[Mix Use]	0.5873803	0.0654523	4486.0	8.97	<.0001*	0.4590614	0.7156992
Land Use[Residential & School]	-0.643293	0.0636346	4486.0	-10.11	<.0001*	-0.768048	-0.518538

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	2	2	4486.0	9.5272175	<.0001*
No. of Lanes	1	1	4486.0	58.684204	<.0001*
Distraction Cause	7	7	4486.0	198.36311	<.0001*
Veh. Queue Pos.	3	3	4486.0	38.729433	<.0001*
Land Use	3	3	4486.0	59.740601	<.0001*

Figure 5-36: PM Peak Model Statistics and Fixed Effects

Conclusion

Although the Mixed Model provided a lower AIC than the GLM, both provided similar results. The base headway (Intercept) for the AM and MD peaks were around 4 seconds and 3.55 seconds in the PM peak. The average basic headway in all models was around 4 seconds. For the weather parameter, while the rainy weather in the AM peak showed a positive effect on the headway and a negative effect in the cloudy weather, the opposite was true in the PM peak. All parameters, except the distraction cause, didn't affect the headway in the MD peak model. All land use categories in the AM peak model had a lower effect on the headway compared to the tourist land use. Three-lane intersection approaches increase the headway during both the AM and the PM peak models. Drivers are distracted by their cell phones, especially during lunchtime and on their way back from work. The "Other" distraction category increased the headway in the AM. Dashboard distraction was only found in the PM peak model and increased the headway by 0.7 seconds. In both the AM and PM peak models, the first position in the queue increased the headway. These results supported that the number of lanes and weather parameters did not consistently affect the headway. The motorists driving in residential and school land use are less distracted because of the existence of school zones and residents crossing. Drivers surrounded by Mixed land use (commercial and/or Offices) are more attentive in the AM peak and more distracted in the PM peak. Though cell phone distractions increased the response in the MD and PM peaks, they didn't affect the AM peak; Drivers in the AM peak are distracted by other uncommon things such as staring though the windshield.

5.1.6 Overall Distraction Effect on Headway

The above analysis showed that different distraction types significantly affect the intersection headway based on several separate models (distracted or not-distracted, or TOD). However, such formulations did not provide clear statistical inference on whether overall distracted driving has really increased the headway since the control variables of the two models included mutually exclusive samples and used different coefficients. Therefore, it was crucial to develop a single model with all the control variables to investigate the overall distraction status, which would be coded as a binary indicator (dummy variable). Therefore, another mixed model was developed, which included the main control variables; weather, land use, and vehicle queue position, and excluded the lost time, and consolidated all distraction types to avoid any correlation, as shown in Figure 5-37 and Figure 5-38. The model results show that the effect of distraction is significant, with an increasing effect of 0.93 seconds on the headway.

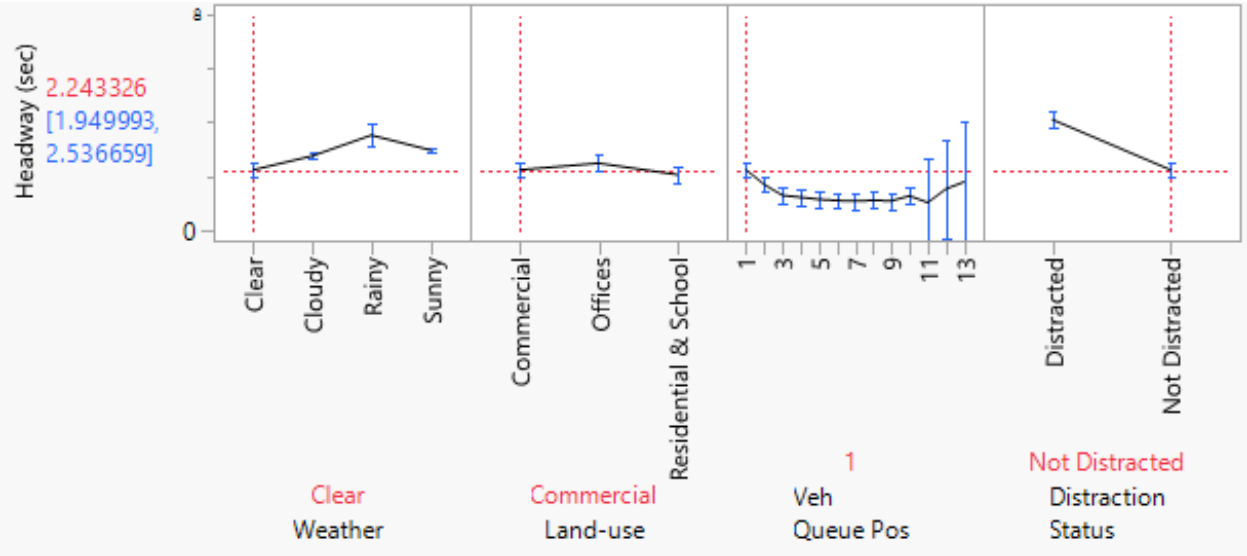
Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	2.9549353	0.1451634	19250	20.36	<.0001	2.6704024	3.2394682
Weather [Clear]	-0.635736	0.1212658	19250	-5.24	<.0001	-0.873428	-0.398045
Weather [Cloudy]	-0.113045	0.0699187	19250	-1.62	0.1059	-0.250092	0.0240016
Weather [Rainy]	0.6516018	0.1681518	19250	3.88	0.0001	0.3220096	0.9811941
Land-use [Commercial]	-0.02569	0.0164838	19250	-1.56	0.1191	-0.058	0.0066199
Land-use [Offices]	0.2238187	0.0193544	19250	11.56	<.0001	0.1858824	0.261755
Veh Queue Pos [1]	0.8819599	0.1340814	19250	6.58	<.0001	0.6191487	1.144771
Veh Queue Pos [2]	0.341962	0.1334315	19250	2.56	0.0104	0.0804246	0.6034995
Veh Queue Pos [3]	-0.060499	0.133293	19250	-0.45	0.6499	-0.321765	0.2007666
Veh Queue Pos [4]	-0.131982	0.1333558	19250	-0.99	0.3223	-0.393371	0.129407
Veh Queue Pos [5]	-0.207863	0.133423	19250	-1.56	0.1193	-0.469384	0.0536575
Veh Queue Pos [6]	-0.250161	0.1338944	19250	-1.87	0.0617	-0.512606	0.0122834
Veh Queue Pos [7]	-0.274763	0.1345572	19250	-2.04	0.0412	-0.538507	-0.011019
Veh Queue Pos [8]	-0.246107	0.1353988	19250	-1.82	0.0691	-0.5115	0.0192865
Veh Queue Pos [9]	-0.264787	0.1363508	19250	-1.94	0.0522	-0.532047	0.0024722
Veh Queue Pos [10]	-0.078533	0.1375691	19250	-0.57	0.5681	-0.34818	0.1911148
Veh Queue Pos [11]	-0.325204	0.7549438	19250	-0.43	0.6666	-1.80496	1.1545515
Veh Queue Pos [12]	0.1728208	0.8684684	19250	0.20	0.8423	-1.529453	1.8750945
Distraction Status [Distracted]	0.9321431	0.0136417	19250	68.33	<.0001	0.9054041	0.9588821

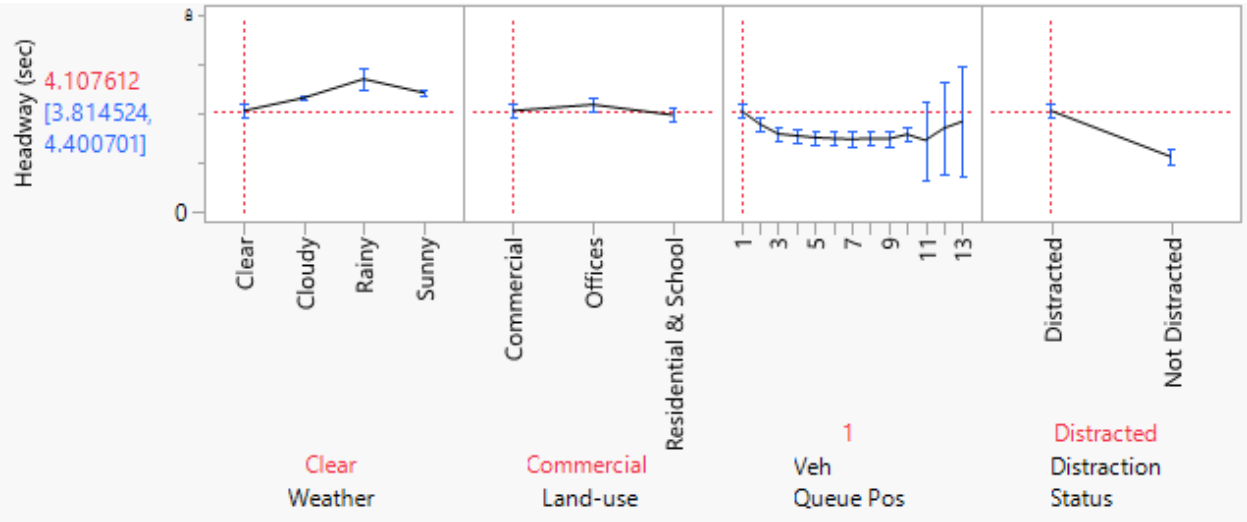
Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	3	3	19250	23.867004	<.0001*
Land-use	2	2	19250	73.83035	<.0001*
Veh Queue Pos	12	12	19250	75.061349	<.0001*
Distraction Status	1	1	19250	4669.0199	<.0001*

Figure 5-37: Mixed Model for the Overall Distraction Effects



(a) Distraction Status – Not Distracted



(b) Distraction Status – Distracted

Figure 5-38: Marginal model profiler for distraction effects

5.2 Distracted Drivers (Left Movement)

5.2.1 Descriptive Analysis of Main Parameters

Headway and Saturation Headway

Similar to the through movement, the effect of distraction was studied for the left-turn movement. However, the analysis was considered for single and dual lefts operating in a protected-only mode due to the fact that permissive mode will have a confounding effect with increased headway yielding to oncoming traffic. The response variable for the left movement was also the headway. The headway distribution for the left movement is shown in Figure 5-39 and follows a normal distribution (Normal 3 Mixture) though it is slightly skewed to the left. The headway AIC was 13564 (Figure 5-40). Figure 5-41 compares the saturation headway for distracted and non-distracted drivers. The saturation headway for non-distracted drivers was 2.2 seconds, which is slightly less than the distracted drivers' case (2.3 seconds).

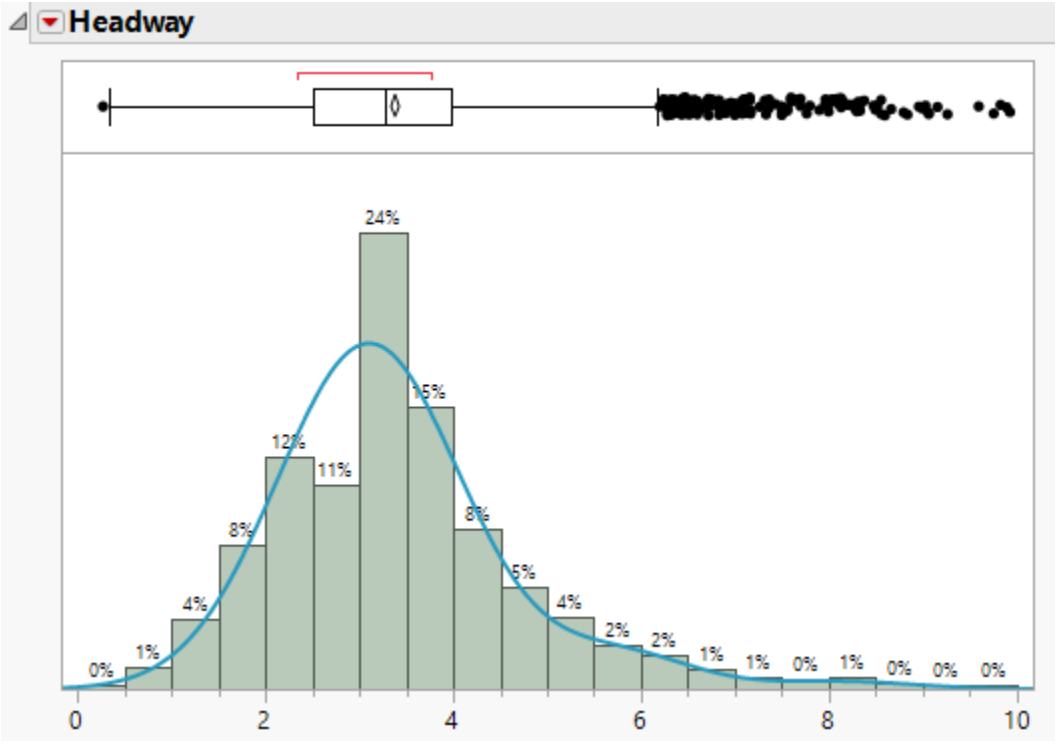


Figure 5-39: Headway Histogram-Left Movement

Compare Distributions

Show	Distribution	AICc	AICc Weight	BIC	-2*LogLikelihood
☑	Normal 3 Mixture	13564.955	0.9858	13615.575	13548.92
☐	Normal 2 Mixture	13573.434	0.0142	13605.079	13563.42
☐	SHASH	13650.262	0	13675.58	13642.252
☐	Gamma	13730.311	0	13742.972	13726.308
☐	Johnson Su	13752.291	0	13777.609	13744.282
☐	Student's t	13829.081	0	13848.071	13823.075
☐	Lognormal	13938.142	0	13950.803	13934.14
☐	Weibull	14022.606	0	14035.267	14018.603
☐	Normal	14191.879	0	14204.54	14187.876
☐	Cauchy	14615.982	0	14628.643	14611.979
☐	Exponential	18425.577	0	18431.908	18423.576

Figure 5-40: Headway Distribution-Left Movement

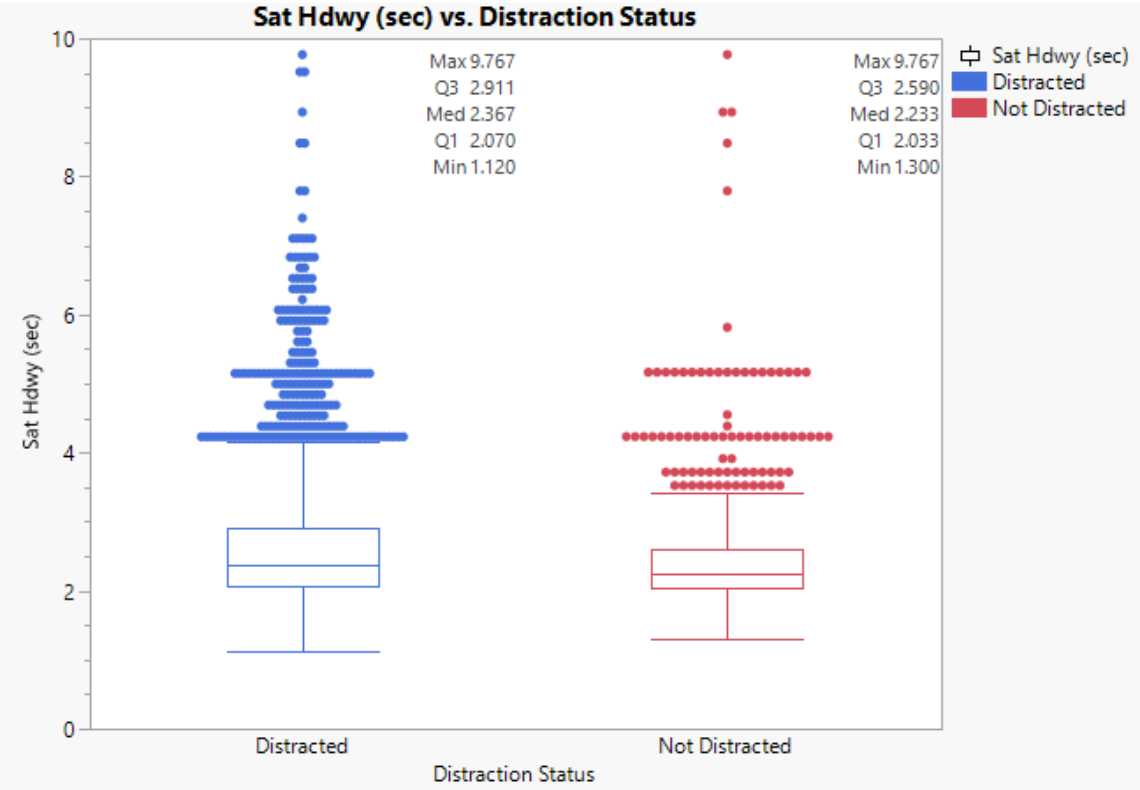


Figure 5-41: Saturation Headway vs. Distraction Status.

Weather

The weather parameter contained three levels: Cloudy, Rainy, and Sunny. Most records were collected in sunny weather (94%). Cloudy and rainy weather percentages were negligible, 4% and 2%, respectively, as shown in Figure 5-42.

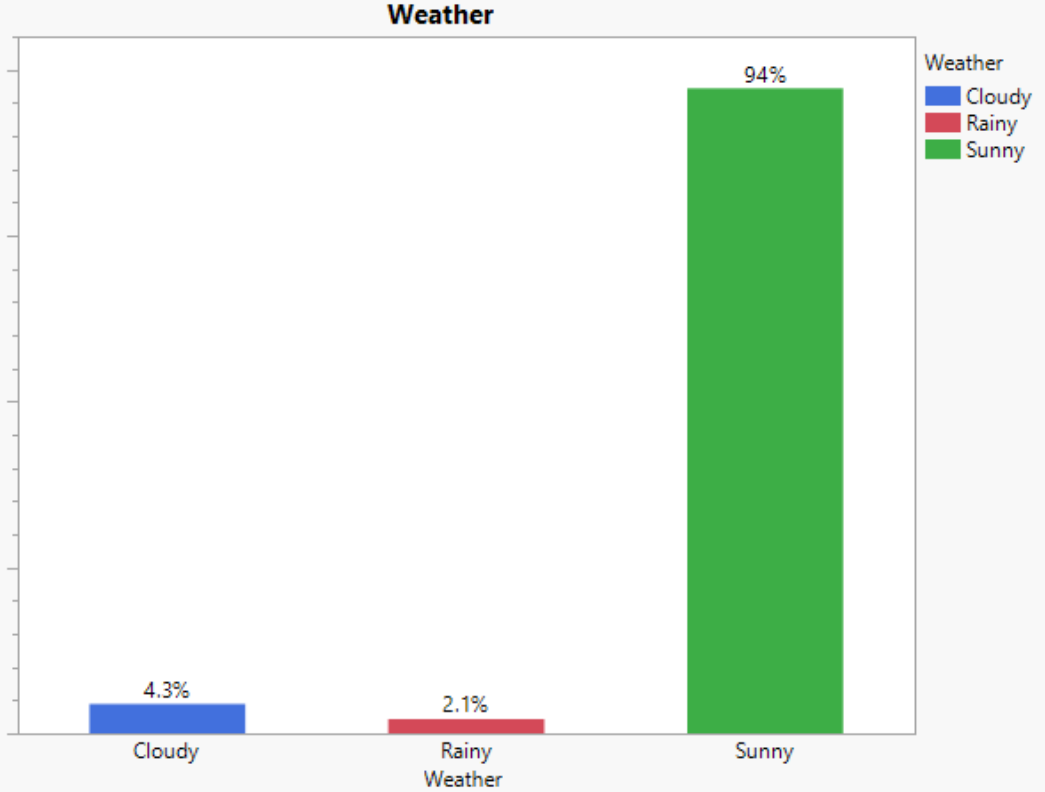


Figure 5-42: Weather Histogram-Left Movement

Land Use

Land use data were collected in four levels: Commercial, Residential with School, Mixed-Use, and Tourist. Most records were collected from Residential & School areas (43%). Commercial and Tourist land uses represented 30% and 23%, respectively (Figure 5-43). Mixed land use represented around 4%.

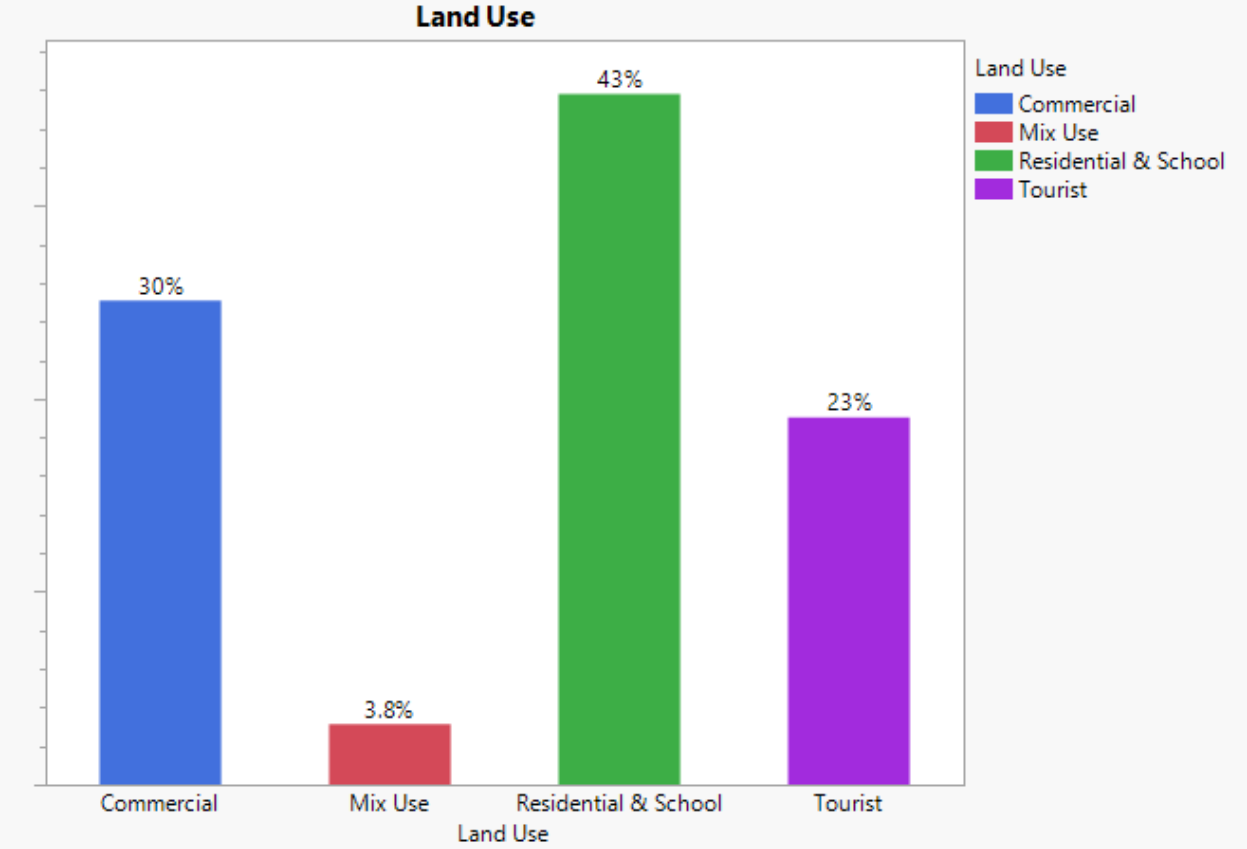


Figure 5-43: Land Use Histogram-Left Movement

Number of Lanes

The number of lanes denotes the total number of lanes analyzed for each movement. The left movement is composed of either one or two lanes. 58% of records were collected from two-lane approaches, while 42% were from one-lane approach intersections, as shown in Figure 5-44.

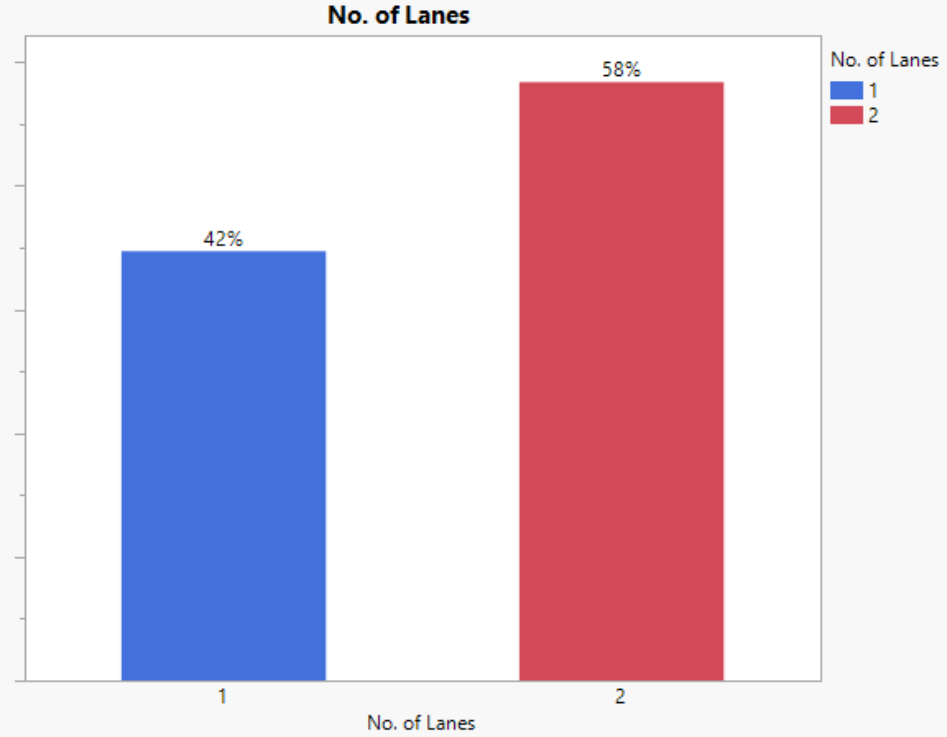


Figure 5-44: Number of Lanes Histogram-Left Movement

Distraction Cause

The percentage of distracted and not distracted drivers was 87% and 13% (Figure 5-45). The majority of the left turn drivers, almost two-thirds, were distracted. Distractions were studied by types (Figure 5-46). Almost half (48%) of the distractions were not identified. The predominant distraction was cell phone usage by almost a third (28%), followed by 13% for not distracted drivers, and around 8% for passenger distractions. The remaining types had negligible proportions.

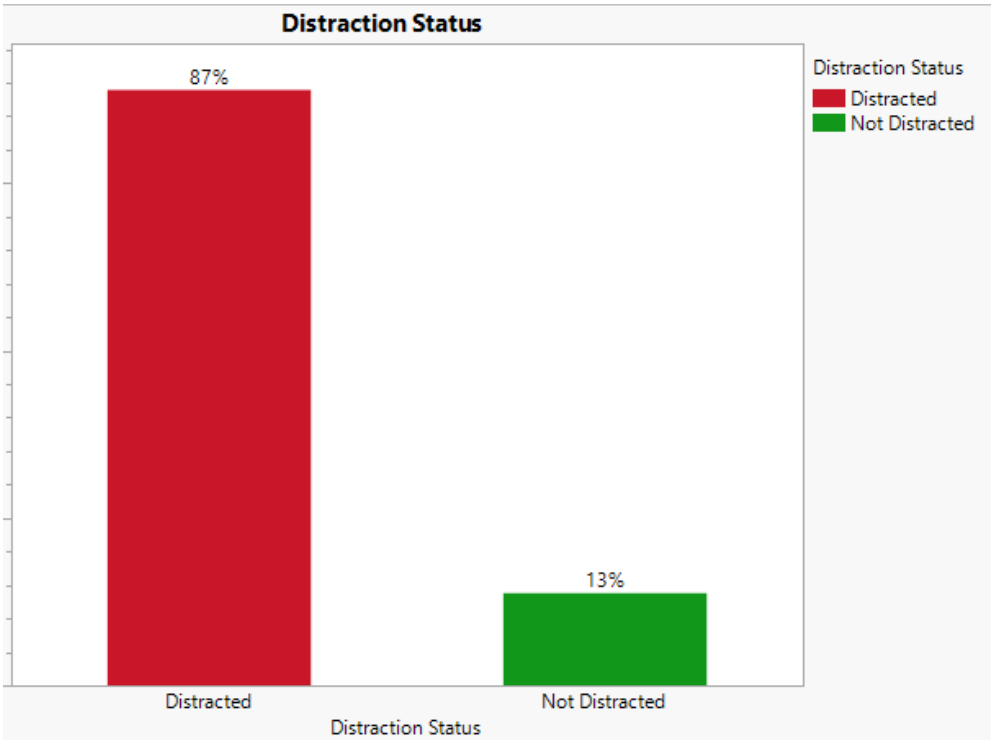


Figure 5-45: Distraction Status for Left Movement

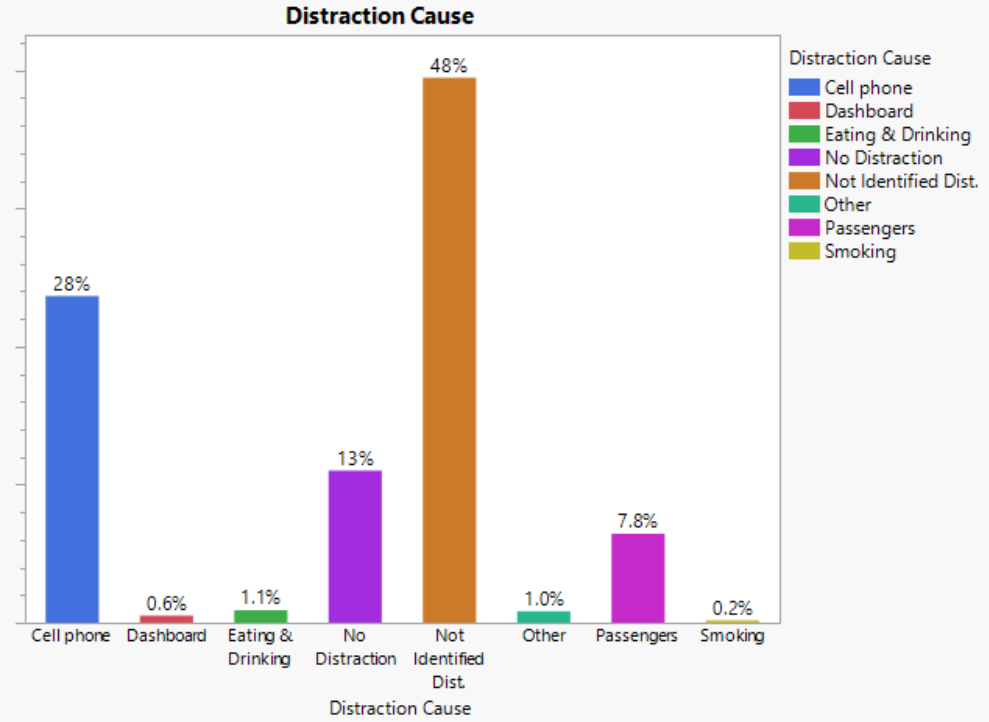


Figure 5-46: Distraction Types for Left Movement

Vehicle Queue Position

The vehicle queue position percentages for the left-turn movement are shown in Figure 5-47. Almost half of the records (47%) were from position one. Positions two and three in the queue represented 31% and 21%. The remaining positions were not significant (around 1%).

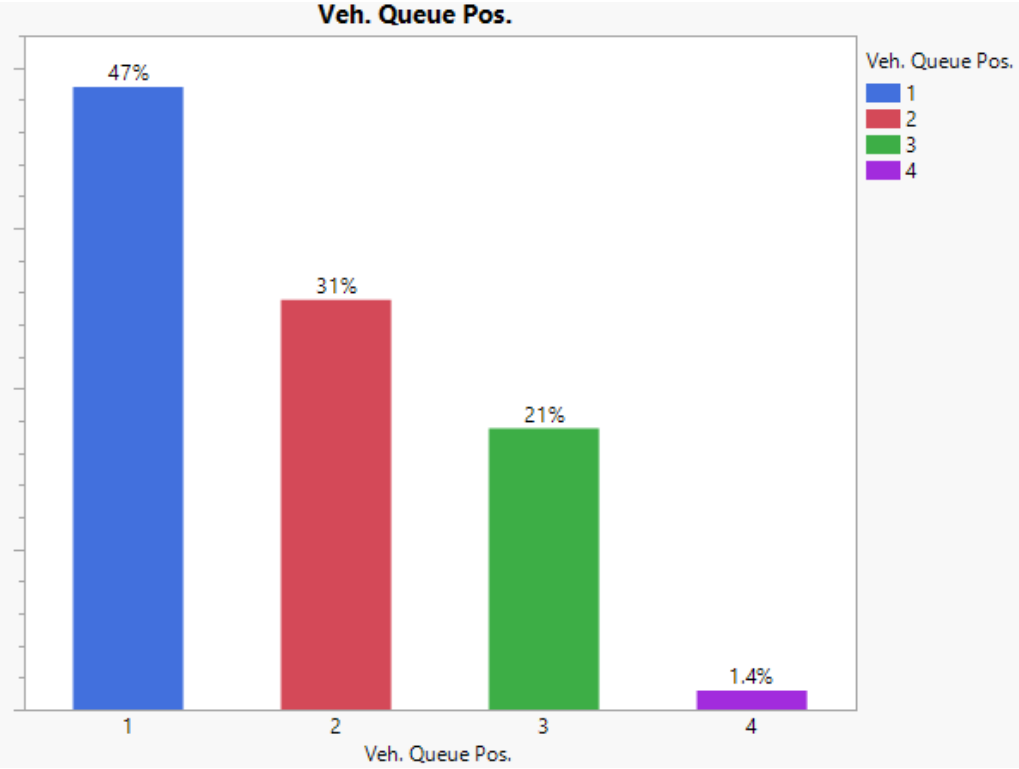


Figure 5-47: Vehicle Queue Position Histogram-Left Movement

5.2.2 Effect of Distraction on Headway for Left Movement by TOD

A Standard Least Squares model was investigated, and though most effect tests were significant through the peak hours, the model had a low R-Squared (40%) and a significant lack of fit for all peak hours. Figure 5-48 shows the lack of fit results for the AM peak.

Lack Of Fit

Source	DF	Sum of Squares	Mean Square	F Ratio
Lack Of Fit	30	77.84215	2.59474	2.8515
Pure Error	699	636.04869	0.90994	Prob > F
Total Error	729	713.89084		<.0001*
				Max RSq
				0.4719

Summary of Fit

RSquare	0.407243
RSquare Adj	0.397486
Root Mean Square Error	0.989583
Mean of Response	3.413082
Observations (or Sum Wgts)	742

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	12	490.4659	40.8722	41.7372
Error	729	713.8908	0.9793	Prob > F
C. Total	741	1204.3567		<.0001*

Figure 5-48: Lack of Fit-Left Movement (AM Peak)

5.2.3 Statistical Comparison – Generalized Linear Regression Analysis

AM Peak

A Generalized Linear Model was formulated by TOD, with a Poisson distribution and Identity link. The estimation method is Maximum Likelihood. The whole model test was significant (P<.0001) and provided a low overdispersion (0.39), as shown in Figure 5-49.

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	163.294631	326.5893	13	<.0001*
Full	2386.45935			
Reduced	2549.75398			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	206.0176	527	1.0000	0.3909
Deviance	187.9339	527	1.0000	

AICc
4803.8330

Figure 5-49: GLM-Left Movement

The parameters entered in the model were: Weather, Land Use, Distraction Cause, and Veh. Queue Position. All parameters were significant (Figure 5-50). The base headway was significant by a value of 4.28 seconds. Cloudy weather increased the headway by 0.3 seconds when compared to the sunny conditions. Also, residential with school land-use showed lower effect on headway than mixed land use. For distraction causes, cell phone usage and not identified categories increased the headway by 0.4. Also, the first three vehicle positions in the queue were significant and reduced the headway by an average of 0.45 seconds compared to the fourth vehicle, which shows that drivers are more alert than the vehicles in the back of the queue.

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	2	25.640521	<.0001*
Land Use	2	31.317109	<.0001*
Distraction Cause	6	137.14446	<.0001*
Veh. Queue Pos.	3	15.052822	0.0018*

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.2841435	0.2611217	269.17966	<.0001*	3.7711786	4.7971084
Weather[Cloudy]	0.335338	0.1259067	7.093622	0.0077*	0.0879985	0.5826776
Weather[Rainy]	0.1022554	0.1636835	0.3902674	0.5322	-0.219296	0.4238062
Land Use[Commercial]	0.0129601	0.1592053	0.0066267	0.9351	-0.299794	0.3257137
Land Use[Residential & School]	-0.627571	0.1633501	14.76004	0.0001*	-0.948467	-0.306675
Distraction Cause[Cell phone]	0.4066515	0.1412155	8.2924014	0.0040*	0.1292384	0.6840647
Distraction Cause[Dashboard]	-0.325559	0.5022929	0.4200921	0.5169	-1.312297	0.6611792
Distraction Cause[Eating & Drinking]	0.1350733	0.2932056	0.212224	0.6450	-0.440919	0.711066
Distraction Cause[No Distraction]	-1.443624	0.1595307	81.887849	<.0001*	-1.757017	-1.130231
Distraction Cause[Not Identified Dist.]	0.4356542	0.1349598	10.420171	0.0012*	0.1705301	0.7007784
Distraction Cause[Other]	0.2676482	0.3194511	0.7019724	0.4021	-0.359903	0.8951993
Veh. Queue Pos.[1]	-0.419516	0.1571564	7.1257769	0.0076*	-0.728244	-0.110787
Veh. Queue Pos.[2]	-0.538436	0.1652095	10.621799	0.0011*	-0.862985	-0.213887
Veh. Queue Pos.[3]	-0.494494	0.1691884	8.5424341	0.0035*	-0.82686	-0.162129

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-50: GLM Parameter Estimates-Left Movement

MD Peak

The MD peak whole model test was significant and provided a small acceptable overdispersion of 0.27. The model AIC was 8783 (Figure 5-51). All parameters entered in the model were significant, except for the weather (Figure 5-52). The intercept (base headway) was significant (3.29 seconds). Commercial land use had an increasing effect on the headway by 0.25 seconds, while residential & school zones had a decreasing effect by 0.44 seconds when compared to the base category of Mixed-Land use. In the distraction causes parameter, not identified distractions were significant and increased the headway by 0.4 seconds. Not distracted drivers had a decreasing effect on the headway by 1.35 seconds. Figure 5-53 demonstrates the parameter estimates.

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	285.644493	571.2890	12	<.0001*
Full	4377.30275			
Reduced	4662.94724			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	203.5699	729	1.0000	0.2792
Deviance	180.7599	729	1.0000	

AICc
8783.1832

Figure 5-51: Final Model-Whole Model Test-MD Peak

Effect Summary

Source	LogWorth	PValue
Distraction Cause	65.835	0.00000
Land Use	13.325	0.00000
Veh. Queue Pos.	1.327	0.04714
Weather	0.348	0.44863

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	1	0.5741226	0.4486
Land Use	2	61.363783	<.0001*
Distraction Cause	6	322.14957	<.0001*
Veh. Queue Pos.	3	7.9460198	0.0471*

Figure 5-52: Final Model-Effects Summary -MD Peak

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	3.2940873	0.2542746	167.82792	<.0001*	2.7948905	3.793284
Weather[Rainy]	-0.162673	0.2089829	0.6059106	0.4363	-0.572952	0.2476063
Land Use[Commercial]	0.2520628	0.0791454	10.142992	0.0014*	0.096683	0.4074426
Land Use[Residential & School]	-0.447868	0.0587478	58.11875	<.0001*	-0.563203	-0.332533
Distraction Cause[Cell phone]	0.1990783	0.1141305	3.0425958	0.0811	-0.024985	0.4231415
Distraction Cause[Dashboard]	0.318915	0.3145155	1.0281719	0.3106	-0.298548	0.9363779
Distraction Cause[Eating & Drinking]	0.0017265	0.310844	3.0849e-5	0.9956	-0.608528	0.6119813
Distraction Cause[No Distraction]	-1.358892	0.1148098	140.0915	<.0001*	-1.584288	-1.133495
Distraction Cause[Not Identified Dist.]	0.4023138	0.1069922	14.139233	0.0002*	0.1922648	0.6123629
Distraction Cause[Other]	0.2508212	0.3602675	0.4847059	0.4863	-0.456463	0.9581052
Veh. Queue Pos.[1]	0.148241	0.1159083	1.6357139	0.2009	-0.079312	0.3757945
Veh. Queue Pos.[2]	-0.075489	0.1211015	0.3885647	0.5331	-0.313237	0.1622602
Veh. Queue Pos.[3]	0.0309828	0.1272095	0.05932	0.8076	-0.218757	0.2807228

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-53: Model Parameter Estimates -MD Peak

PM Peak

The PM peak whole model was significant and presented a low overdispersion (0.29). The model AIC was 32501. Figure 5-54 shows the whole model test. All model parameters, shown in Figure 5-55, were significant (P<.0001). The base intercept was significant (3.97 seconds). Cloudy weather increased the headway by 0.25 seconds. Mixed land use increased the response by 0.75 seconds, while drivers were more attentive in residential and school land uses. Dashboard, not identified, passengers categories increased the headway by 0.52, 0.17, and 0.18 seconds. Not distracted drivers significantly reduced the headway by 1.28 seconds. Only the first queue position was significant and increased the headway by 0.09 seconds (Figure 5-56).

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	1169.30024	2338.600	15	<.0001*
Full	16233.5324			
Reduced	17402.8326			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	828.3003	2855	1.0000	0.2901
Deviance	757.9241	2855	1.0000	

AICc
32501.279

Figure 5-54: Final Model-Whole Model Test-PM Peak

Effect Summary

Source	LogWorth	PValue
Distraction Cause	170.795	0.00000
Land Use	118.194	0.00000
Weather	6.419	0.00000
Veh. Queue Pos.	2.490	0.00324

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	2	29.560956	<.0001*
Land Use	3	550.1638	<.0001*
Distraction Cause	7	814.19543	<.0001*
Veh. Queue Pos.	3	13.768516	0.0032*

Figure 5-55: Final Model-Effect Summary & Tests-PM Peak

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	3.9710457	0.1033684	1475.8232	<.0001*	3.7683615	4.1737299
Weather[Cloudy]	0.2580356	0.0953127	7.3292247	0.0068*	0.071147	0.4449242
Weather[Rainy]	0.0727137	0.1113284	0.4266004	0.5137	-0.145578	0.2910058
Distraction Cause[Cell phone]	-0.010706	0.0725971	0.0217486	0.8828	-0.153054	0.1316418
Distraction Cause[Dashboard]	0.5231877	0.2449019	4.5638422	0.0327*	0.0429852	1.0033902
Distraction Cause[Eating & Drinking]	-0.29285	0.1757064	2.7778882	0.0956	-0.637374	0.0516744
Distraction Cause[No Distraction]	-1.287768	0.0732534	309.0435	<.0001*	-1.431403	-1.144133
Distraction Cause[Not Identified Dist.]	0.1783125	0.0696134	6.5611176	0.0104*	0.0418149	0.3148101
Distraction Cause[Other]	0.1008644	0.1803519	0.3127768	0.5760	-0.252769	0.4544974
Distraction Cause[Passengers]	0.1823222	0.0834373	4.7748385	0.0289*	0.0187188	0.3459257
Veh. Queue Pos.[1]	0.0918736	0.0454988	4.0773796	0.0435*	0.0026597	0.1810874
Veh. Queue Pos.[2]	-0.016941	0.0472924	0.1283189	0.7202	-0.109672	0.0757898
Veh. Queue Pos.[3]	-0.066625	0.0485991	1.8793724	0.1704	-0.161918	0.0286683
Land Use[Commercial]	-0.012873	0.0401569	0.102757	0.7485	-0.091612	0.0658669
Land Use[Mix Use]	0.7541891	0.0721473	109.2748	<.0001*	0.612723	0.8956553
Land Use[Residential & School]	-0.832016	0.0366352	515.78244	<.0001*	-0.90385	-0.760182

Figure 5-56: Final Model-Parameter Estimates-PM Peak

Conclusion

The three peak models were significant with a p-value (<.0001), and the goodness of fit statistic was acceptable by a small overdispersion. The AM peak model: Cloudy weather, cell phone, and not identified categories positively affected the response. Drivers were more attentive near residential with school land uses. The first three vehicle positions in the queue did not affect the headway. The MD peak model: Commercial land use and not identified categories increased the headway. Similarly, drivers were more attentive near residential, and school land uses. The PM peak model: All parameters were significant. Cloudy weather and Mix land use positively impacted the headway. Again, drivers being more careful in residential and school land use. The distraction causes: Dashboard, not identified, and passengers categories positively increased the headway. The only position in the queue that significantly affected the model positively was the first position.

Overall, the model was significant for the three peaks and passed the goodness of fit test. The base headway (Intercept) for the AM, MD, and PM peaks was 4.28, 3.29, and 3.97 seconds. The cloudy weather had a positive effect on the AM and PM peaks and no effect on the MD peak. Residential and school land uses had a reducing effect on the headway as anticipated. Commercial and mixed land uses positively impacted the response. Cell phone distractions had an increasing effect only on the AM peak. Dashboard and passenger categories were positively significant only during the PM peak. Drivers who were not distracted significantly decreased the headway in the three peaks. Not identified category positively affected the headway in all peaks. Vehicle queue position one decreased the headway in the AM peak and increased it during the PM peak.

This model demonstrated that driving during cloudy weather in mixed land use would increase the headway in the PM peak. Drivers in residential and school land use drive slower due to the presence of students or residents crossing. Left turn motorists tend to be distracted by their phones during the AM peak and the dashboard during the PM peak. Drivers in the first queue position during the AM peak had a negative impact on the headway compared to the PM peak. As expected, motorists who were not distracted significantly decreased the headway. Not identified distractions increased the response in all peaks. Most of those unidentified distractions are probably related to drivers not paying attention and staring through the windshield. Left turners seem distracted more in the PM than in the AM peak.

5.3 Effect of Distracted Driving on Intersection Capacity

At signalized intersections, the capacity for a particular movement is defined by two elements: the maximum rate at which vehicles can pass through a given point in an hour under prevailing conditions (known as saturation flow rate), and the ratio of the green time during which vehicles may enter the intersection as shown in equations 2 and 3. Saturation flow rate is simply the headway in seconds between vehicles moving from a queued condition, divided into 3600 seconds per hour.

$$c_i = s_i \frac{g_i}{C} \qquad \textbf{(Equation 2)}$$

$$s_i = \frac{3600}{h} \qquad \textbf{(Equation 3)}$$

Where, i is the intersection approach lane group,

c is the capacity of the intersection in vehicles per hour per lane (vphpl),

s is the saturation flow rate in vehicles per hour of green per lane (vphgpl),

g is the effective green time interval for the movement in seconds (sec),

C is the intersection cycle length in seconds (sec),

h is the average discharge headway in seconds per vehicle (sec/veh).

To determine the effect of one of the distraction types such as cell phone use, Figure 5-9 and Figure 5-11 show the profile of the marginal model parameters for the non-distracted model versus the distraction-Types model at the same center points which included clear weather, commercial land use, startup lost time of 1.472 sec, first vehicle in the queue in addition to one of the distraction types which is cell phone use. The average intersection's headway in the non-distracted model was **3.38** seconds, while in the distraction-types model was **4.05** seconds. Comparing the headway between the two models show that the effect of cell phone use in a commercial area on the first vehicle in the queue resulted in an increase in the headway of approximately 0.67 seconds or **20%** increase. Therefore, translating these values into the intersection's capacity using the above equations, it is concluded that cell phone use reduced the intersection capacity from 1,065 vphgpl to 889 vphgpl (16.5%) which can then be multiplied by the proportion of green time of the cycle length for this specific movement to determine the capacity per cycle.

$s_{non\text{-}distracted}$ = 3600/3.38 = 1,065 vphgpl

$s_{cellphone\text{-}distraction}$ = 3600/4.05 = 889 vphgpl

Reduction in capacity = (1065-889)/1065*100 = 16.5%

On the other hand, Figure 38(a) shows the parameter estimates for the overall distraction status model as "non-distracted" with the standard discharge headway of 2.24 seconds and excluding the start-up lost time, while Figure 38(b) shows the status as "distracted" including all distraction types with discharge headway of 4.11 sec. Using the above equations, it is concluded that distracted driving at signalized intersections reduces the intersection capacity from 1,607 vphgpl to 876 vphgpl which is approximately 45.5%.

$s_{non\text{-}distracted}$ = 3600/2.24 = 1,607 vphgpl

$s_{distracted}$ = 3600/4.11 = 876 vphgpl

Reduction in capacity = (1607-876)/1607*100 = 45.5%

5.4 Distracted Pedestrians

Site selection was a very crucial step to ensure that measurements were taken at a variety of land use areas with moderate to heavy pedestrian activity. This would allow the analysis of pedestrian behavior in relation to land use categories adjacent to the university, school zones, tourist, residential, commercial, or mixed-use areas. The majority of the data were collected near the university and mixed land use. Around 5000+ pedestrians were monitored during the data collection stage at different locations (see Appendix L to O & V), including different land use, group status, and age group. Several statistical models were formed to understand these factors better and quantify their effects on the proposed responses. The following sections detail the modeling process and its evaluation.

After the pedestrian's raw data compilation, a set of models were formed to address the study goal of determining distracted pedestrians' effect on signalized intersections. This section will discuss the statistical analysis of distracted pedestrians. First, determining the response variable. Second, descriptive statistics for the parameters and effects. Finally, modeling formulation with an evaluation of the performance of each model.

Different potential response factors were investigated, such as startup time, crossing time, or walking speed were inserted into the model to explore which models best explain the response and the predictors' relationship.

5.4.1 Descriptive Analysis of Main Parameters

Distraction Status

The results showed that the overall percentage of distracted and not distracted pedestrians were 44% and 56%, respectively (Figure 5-57). The distraction causes distribution showed that most pedestrians were not distracted (56%). The percentage of records collected from school/college and mixed land use was 63% and 37%, respectively (Figure 5-58). In mixed land use, the percentage of distracted pedestrians was almost half (51%). The figures were different in School/College land use, as the percentage of Distracted vs. Not Distracted was 41% and 59%, respectively.

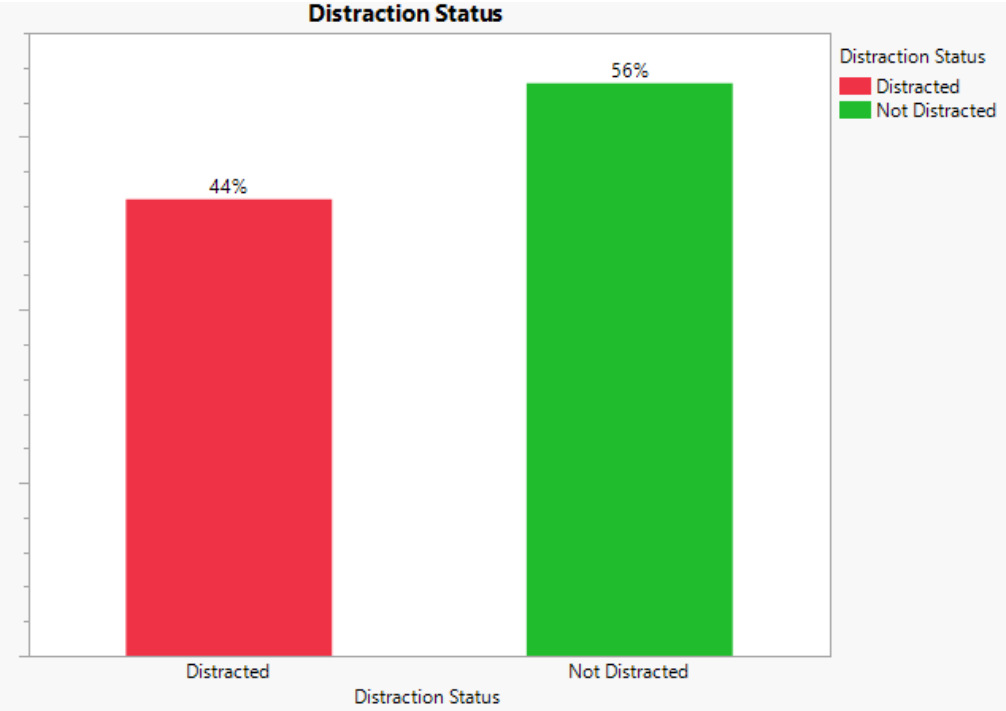


Figure 5-57: Percentage of Distracted Pedestrians

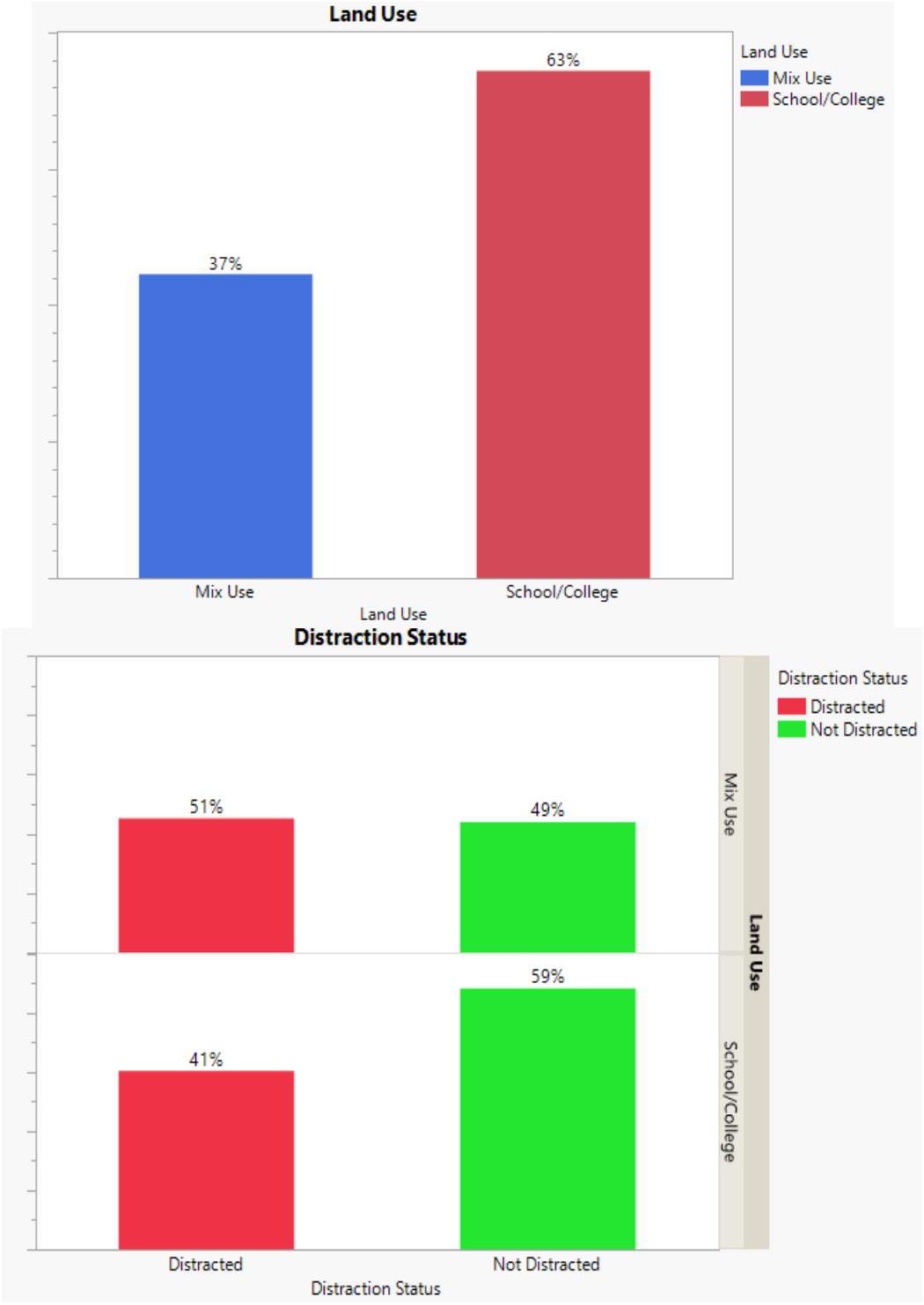


Figure 5-58: Distraction Status vs. Land Use

Distraction Cause

"Texting/Talking" on a phone and "Other" categories represented nearly similar distribution (15%) as shown in Figure 5-59. "Talking to others" were slightly lower (11%). The "Eating/Drinking/Smoking" category was significantly low (around 2%). The young age group was predominant in the study (98%), compared to only 2% of the old age group (Figure 5-60).

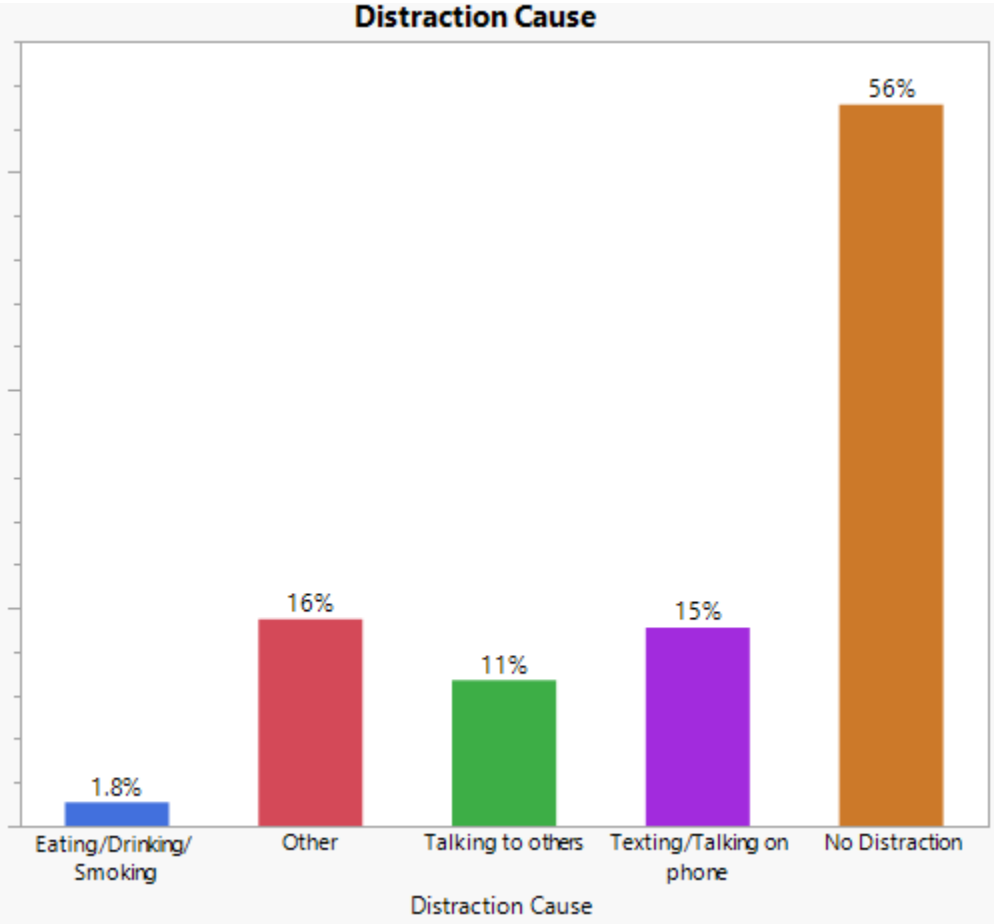


Figure 5-59: Distraction Causes Percentage

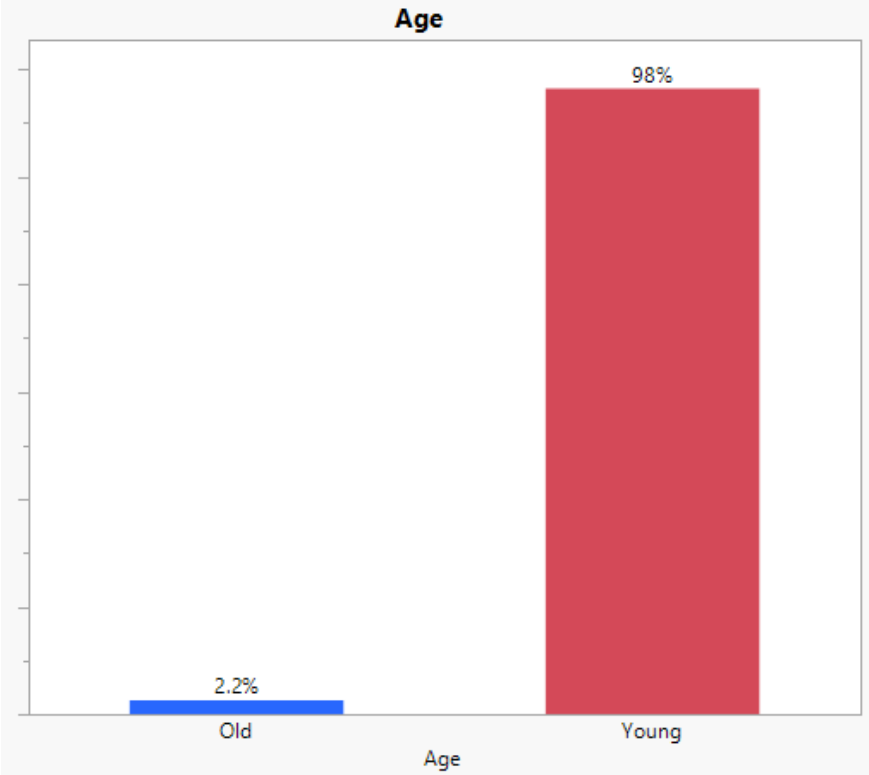


Figure 5-60: Age Distribution

Weather

Weather is an essential factor affecting human behavior, especially for pedestrians. Therefore, the data were collected during "Sunny" weather (88%) as well as "Rainy" and "Cloudy" conditions, as shown in Figure 5-61.

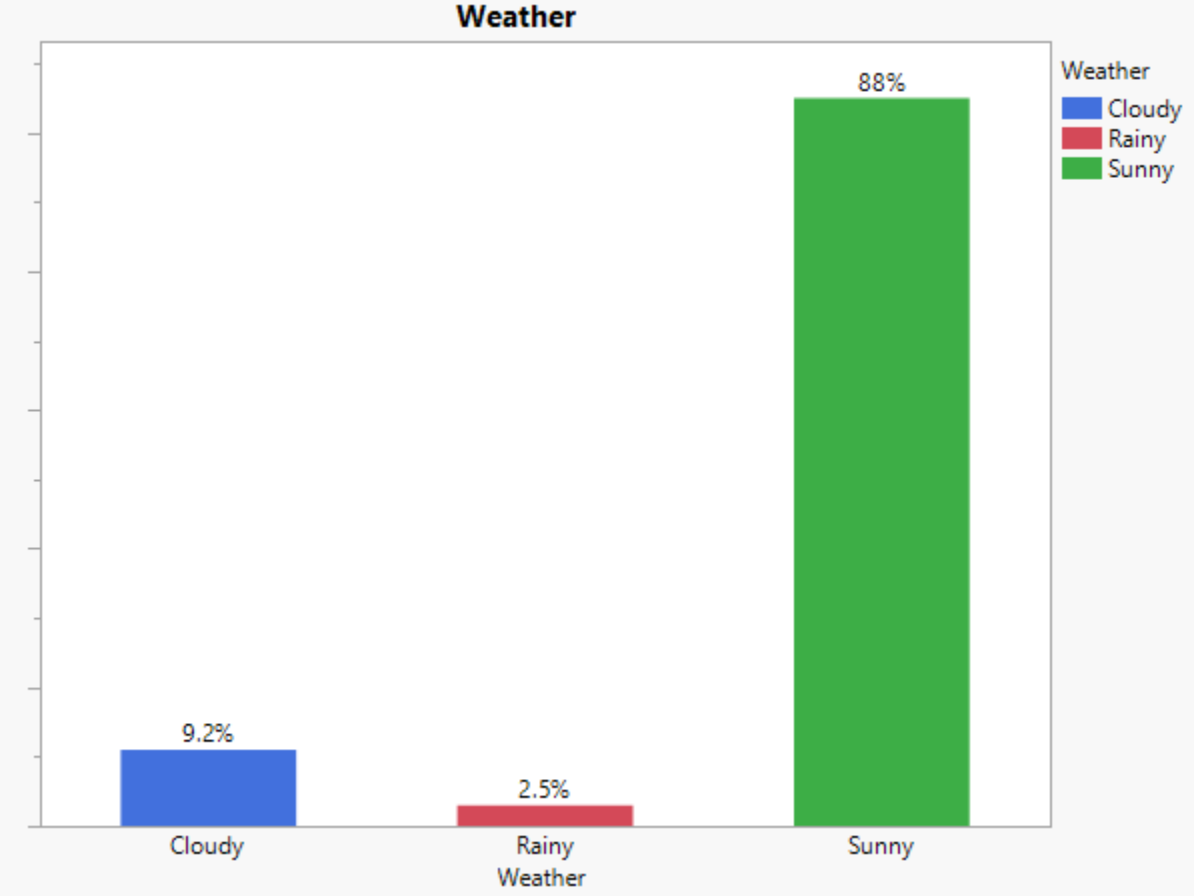


Figure 5-61: Weather Histogram

Gender

Gender was another factor studied to explore if there is a significant difference between males and females in their responses. 53% were males in this study, and 47% were females (Figure 5-62).

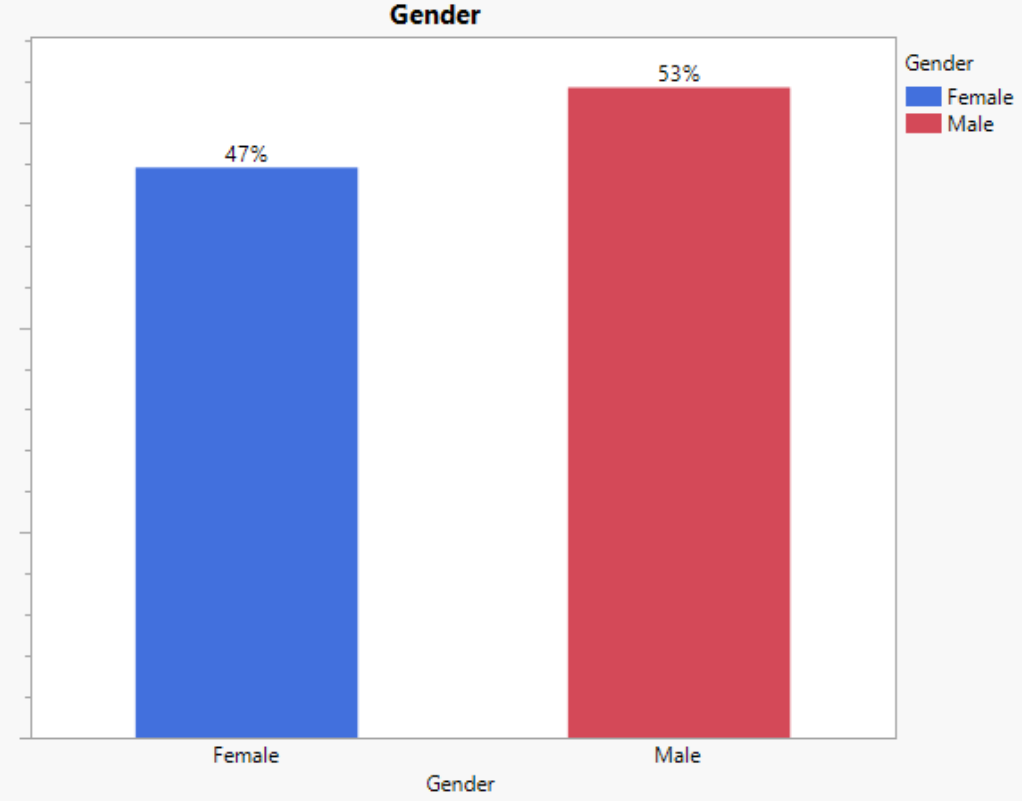


Figure 5-62: Gender Percentages

Group Status

Group status indicates if the pedestrian was walking alone (no group) or with others in a group. From the literature review (Gillete et al., 2016), group status is a potential factor in pedestrians' behavior and therefore was studied to show its effects. The results showed that 75% of the pedestrians walked alone (no group) and 25% in groups (Figure 5-63).

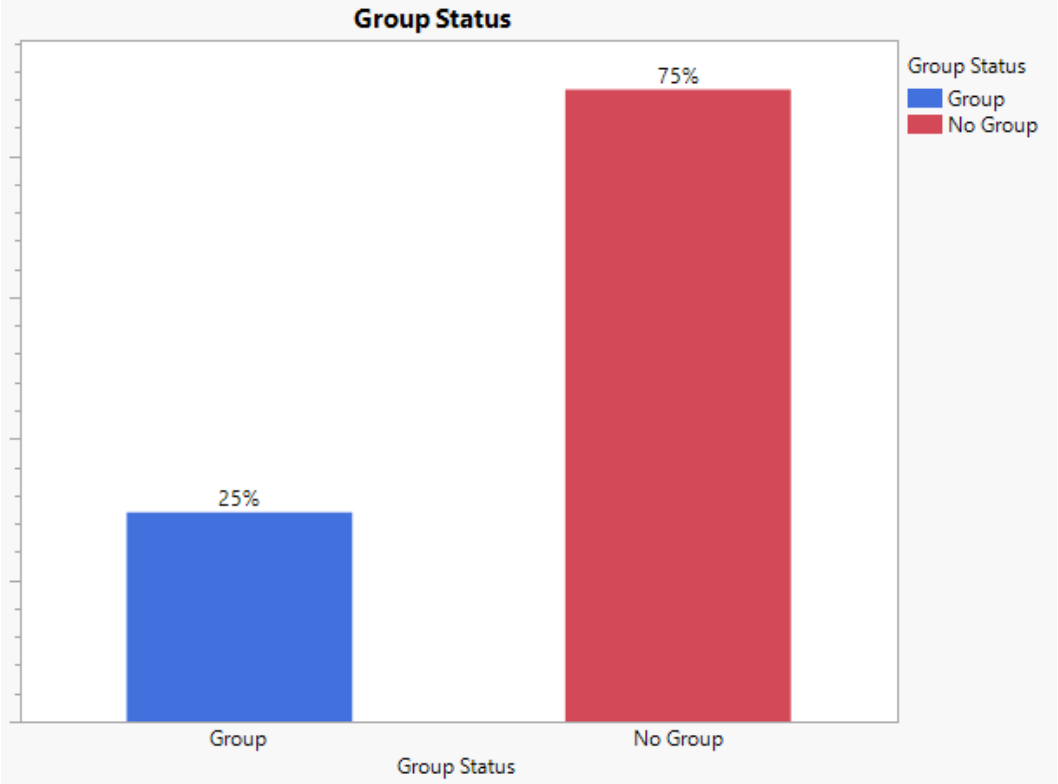


Figure 5-63: Group Status Histogram

5.4.2 Effect of Distracted Pedestrians on Startup Time

The start-up lost time was selected as a response variable to understand the effect of distracted pedestrians on the pedestrian's signal duration and whether extra time is needed for the pedestrian to complete the intersection crossing distance. A Generalized Linear Regression analysis is selected with the response as the startup time with exponential distribution. The model used the Maximum Likelihood estimation method. The model scored an AIC of 6859. The goodness of fit statistic was acceptable, with 0.27 overdispersion (Figure 5-64). The main parameters included in the model were: Distraction Cause, Extra Peds. Time, Land Use, Gender, Group Status, and Weather. The effects summary showed that only land use, Distraction Cause, and Extra Peds Time were significant (Figure 5-65).

The results showed that the base startup time was 2.46 seconds, and distraction caused by texting/talking on the phone had the highest effect of an additional one sec (0.99) with an extra pedestrian time needed of 1.39 seconds. Land use had a minor effect compared to the school/college land use, but other types of distractions had a significant effect of an additional 0.44 seconds, as shown in Figure 5-66.

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	300.012913	600.0258	10	<.0001*
Full	3417.70732			
Reduced	3717.72024			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	162.7566	584	1.0000	0.2787
Deviance	135.7768	584	1.0000	

AICc
6859.9507

Figure 5-64: Whole Model Test

Effect Summary

Source	LogWorth	PValue
Distraction Cause	89.793	0.00000
Extra Peds. Time (sec)	7.291	0.00000
Land Use	2.234	0.00584
Gender	0.433	0.36915
Group Status	0.405	0.39360
Weather	0.242	0.57340

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	2	1.1123456	0.5734
Land Use	1	7.5990015	0.0058*
Distraction Cause	4	424.23619	<.0001*
Gender	1	0.8065231	0.3692
Group Status	1	0.7277793	0.3936
Extra Peds. Time (sec)	1	29.670515	<.0001*

Figure 5-65: Effect Summary & Tests

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	2.4596649	0.1169115	442.62689	<.0001*	2.2300476	2.6892822
Weather[Cloudy]	-0.008795	0.1057311	0.0069186	0.9337	-0.216453	0.1988643
Weather[Rainy]	-0.079334	0.1417658	0.3131675	0.5757	-0.357766	0.1990978
Distraction Cause[Eating/Drinking/Smoking]	-0.276304	0.2954433	0.8746332	0.3497	-0.856563	0.3039547
Distraction Cause[Other]	0.4413031	0.1569563	7.9052698	0.0049*	0.1330367	0.7495695
Distraction Cause[Talking to others]	0.1277968	0.1765721	0.5238371	0.4692	-0.218996	0.4745892
Distraction Cause[Texting/Talking on phone]	0.994286	0.1796302	30.638254	<.0001*	0.6414874	1.3470847
Gender[Female]	-0.029299	0.0323305	0.8212306	0.3648	-0.092797	0.0341996
Group Status[Group]	0.0401631	0.050286	0.6379089	0.4245	-0.0586	0.1389262
Extra Peds. Time (sec)	1.391498	0.3992966	12.144341	0.0005*	0.6072685	2.1757275
Land Use[Mix Use]	0.1045943	0.0389332	7.2173084	0.0072*	0.0281284	0.1810601

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-66: Parameter Estimates

5.4.3 Effect on Startup Time By Distraction Status

Another model was investigated similar to the first one but was categorized by distraction status (distracted or not distracted). The whole model test, for the distracted part, was significant (P<.0001) with an acceptable overdispersion value (0.31). The model scored an AIC of 3621 (Figure 5-67). The effects summary and test results demonstrated that only land use and extra pedestrian time were significant (Figure 5-68). The not distracted part of the model was not significant, as seen in Figure 5-69, and therefore the second model was not considered.

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	43.4680233	86.9360	9	<.0001*
Full	1799.20276			
Reduced	1842.67078			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	79.2564	254	1.0000	0.3120
Deviance	64.2020	254	1.0000	

AICc
3621.4531

Figure 5-67: Whole model Test-Distracted

Effect Summary

Source	LogWorth	PValue
Extra Peds. Time (sec)	11.300	0.00000
Land Use	3.359	0.00044
Distraction Cause	0.857	0.13899
Weather	0.777	0.16698
Group Status	0.586	0.25919
Gender	0.361	0.43528

Remove Add Edit ☐ FDR

Effect Tests

Source	DF	L-R ChiSquare	Prob>ChiSq
Weather	2	3.5797852	0.1670
Land Use	1	12.362868	0.0004*
Distraction Cause	3	5.4940599	0.1390
Gender	1	0.6086856	0.4353
Group Status	1	1.2730881	0.2592
Extra Peds. Time (sec)	1	47.683873	<.0001*

Figure 5-68: Effect Summary & Tests-Distracted Part

Whole Model Test

Model	-LogLikelihood	L-R ChiSquare	DF	Prob>ChiSq
Difference	4.70694938	9.4139	6	0.1516
Full	1674.86875			
Reduced	1679.5757			

Goodness Of Fit Statistic	ChiSquare	DF	Prob>ChiSq	Overdispersion
Pearson	74.5514	324	1.0000	0.2301
Deviance	60.1797	324	1.0000	

AICc
3366.1847

Figure 5-69: Whole model Test-Not Distracted

5.4.4 Startup Time-Mixed Model

Another model for the start-up time was also investigated using mixed modeling, which is recommended when different types of parameters are considered. The model provided an AIC of 2323 (Figure 5-70). The mixed model provided very close results as the GLM but without the extra ped time parameter. The base startup time was significant, with a value of **2.4** seconds. Texting/talking on the phone and other categories increased the startup time by 1.3 and 0.43 seconds. The mixed land use increased the startup time by around 0.3 seconds. The remaining parameters were not significant (Figure 5-71)

Fit Statistics

-2 Residual Log Likelihood	2323.9703
-2 Log Likelihood	2301.1516
AICc	2323.6045
BIC	2371.4258

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	2.8474145	0.1664899	2.547331	3.2041248

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Weather	2	2	585.0	1.5545399	0.2122
Land Use	1	1	585.0	14.158481	0.0002*
Distraction Cause	4	4	585.0	60.421927	<.0001*
Gender	1	1	585.0	0.0273765	0.8686
Group Status	1	1	585.0	1.8284995	0.1768

Figure 5-70: Fit Statistics

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	2.4004383	0.1960623	585.0	12.24	<.0001*	2.0153667	2.78551
Weather[Cloudy]	-0.08836	0.2153741	585.0	-0.41	0.6818	-0.511361	0.3346408
Weather[Rainy]	-0.192433	0.3086417	585.0	-0.62	0.5332	-0.798614	0.4137476
Distraction Cause[Eating/Drinking/Smoking]	-0.456041	0.4165154	585.0	-1.09	0.2740	-1.274089	0.3620069
Distraction Cause[Other]	0.4354137	0.1829882	585.0	2.38	0.0177*	0.0760198	0.7948076
Distraction Cause[Talking to others]	0.1706174	0.2349809	585.0	0.73	0.4681	-0.290891	0.6321263
Distraction Cause[Texting/Talking on phone]	1.3070664	0.1878528	585.0	6.96	<.0001*	0.9381182	1.6760145
Gender[Female]	0.0115686	0.0699181	585.0	0.17	0.8686	-0.125753	0.1488897
Group Status[Group]	-0.135426	0.100151	585.0	-1.35	0.1768	-0.332125	0.0612731
Land Use[Mix Use]	0.2929239	0.0778478	585.0	3.76	0.0002*	0.1400287	0.4458192

Figure 5-71: Fixed Effects

5.4.5 Walking Speed by Gender

Another response variable was studied, which is the pedestrian walking speed. A GLM model was used with an exponential distribution, and the estimation method was Maximum Likelihood. This model was categorized by gender and therefore developed into two separate models: One for males and another for females. Both models were significant and showed interesting results, as shown in Figure 5-72 and Figure 5-73. The base walking speed for both Females (4.14 ft/sec) and Males (4.12 ft/sec) were comparable with the Females speed slightly higher. The Females were found to be distracted by talking to others which reduced their walking speed compared to the No Distraction case but were more alert in mixed use areas compared to the school/college land use with faster speed. On the other hand, the Males were found to be distracted by Other causes such as looking and staring away from the intersection but with being more alert which increased their walking speed especially in mixed use areas than in school/college area. They were also found to be predominantly crossing Alone than in groups which also reflected higher speed.

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.1434992	0.1000953	1713.592	<.0001*	3.9464327	4.3405656
Weather[Cloudy]	0.1333877	0.1050174	1.6132765	0.2040	-0.073369	0.3401448
Weather[Rainy]	-0.06801	0.1578414	0.1856528	0.6666	-0.378766	0.2427466
Distraction Cause[Eating/Drinking/Smoking]	-0.078636	0.2240608	0.1231712	0.7256	-0.519764	0.3624925
Distraction Cause[Other]	0.1113634	0.0919306	1.4674539	0.2257	-0.069629	0.2923554
Distraction Cause[Talking to others]	-0.340844	0.1144415	8.8704354	0.0029*	-0.566155	-0.115533
Distraction Cause[Texting/Talking on phone]	0.1056738	0.1000369	1.1158725	0.2908	-0.091278	0.3026253
Group Status[Alone]	0.0219492	0.0500265	0.192504	0.6608	-0.076542	0.1204408
Land Use[Mixed Use]	0.1313939	0.0391997	11.235328	0.0008*	0.054218	0.2085697

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-72: Parameter Estimates – Female

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.1237385	0.0942612	1913.8873	<.0001*	3.9382635	4.3092135
Weather[Cloudy]	0.0043188	0.1125011	0.0014737	0.9694	-0.217046	0.225684
Weather[Rainy]	0.0301951	0.1548762	0.0380104	0.8454	-0.27455	0.3349404
Distraction Cause[Eating/Drinking/Smoking]	-0.29842	0.1683174	3.1433966	0.0762	-0.629614	0.0327728
Distraction Cause[Other]	0.2874007	0.0885926	10.523995	0.0012*	0.1130796	0.4617218
Distraction Cause[Talking to others]	-0.119958	0.1054378	1.2943812	0.2552	-0.327424	0.0875094
Distraction Cause[Texting/Talking on phone]	-0.0573	0.0804871	0.5068217	0.4765	-0.215672	0.1010723
Group Status[Alone]	0.1288117	0.0487082	6.9936758	0.0082*	0.0329699	0.2246534
Land Use[Mixed Use]	0.1331327	0.0377082	12.465141	0.0004*	0.0589353	0.2073302

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-73: Parameter Estimates – Male

5.4.6 Walking Speed by Age

We also investigated the walking speed by age group (Old and Young) in a GLM model. It should be noted that the age groups were compiled into two main groups; "Young" which reflected college age students, and "Middle/Old" which reflected all other categories. The model distribution was exponential and used the Maximum Likelihood estimation method. Both models were significant and passed the goodness of fit statistic test with a lower overdispersion (0.007). Both models were significant and showed interesting results, as shown in Figure 5-74 and Figure 5-75. The base walking speed was very comparable for the Middle/Old ages (4.31 ft/sec) and Young ages (4.2 ft/sec). It was found that rainy conditions increased the walking speed for the middle/old age, especially when being distracted. However, their speed was lower when walking alone and in mixed use areas compared to when being in groups and in a school/college setting. On the other hand, the young age was found to be walking with slower speed especially when distracted by talking in others and in groups in a school/college setting compared to when being alone and in a mixed use area.

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.3166661	0.2400072	278.36356	<.0001*	3.8656163	4.80397
Weather[Rainy]	0.4535571	0.1694902	7.7767841	0.0053*	.	.
Distraction Cause[Other]	0.4710512	0.23163	4.2555546	0.0391*	.	0.9518188
Distraction Cause[Talking to others]	0.2452603	0.2463317	1.0019195	0.3168	.	.
Distraction Cause[Texting/Talking on phone]	-0.307686	0.2916486	1.0739258	0.3001	.	.
Group Status[Alone]	-0.562291	0.1717775	10.599683	0.0011*	.	.
Land Use[Mixed Use]	-0.511212	0.201076	6.642953	0.0100*	.	.

Figure 5-74: Parameter Estimates – Middle/Old Age

Parameter Estimates

Term	Estimate	Std Error	L-R ChiSquare	Prob>ChiSq	Lower CL	Upper CL
Intercept	4.207551	0.0725625	3362.2836	<.0001*	4.0650306	4.3500714
Weather[Cloudy]	0.005491	0.08032	0.0046737	0.9455	-0.152266	0.1632481
Weather[Rainy]	0.1140469	0.1241965	0.8432349	0.3585	-0.129888	0.3579819
Distraction Cause[Eating/Drinking/Smoking]	-0.215214	0.1318527	2.6641882	0.1026	-0.474187	0.0437581
Distraction Cause[Other]	0.2210933	0.0621845	12.641174	0.0004*	0.0989565	0.3432302
Distraction Cause[Talking to others]	-0.227084	0.076258	8.8675624	0.0029*	-0.376863	-0.077306
Distraction Cause[Texting/Talking on phone]	0.0206281	0.0614584	0.1126565	0.7371	-0.100083	0.141339
Group Status[Alone]	0.0867447	0.034598	6.2861433	0.0122*	0.0187906	0.1546989
Land Use[Mixed Use]	0.1447605	0.0268643	29.036716	<.0001*	0.0919961	0.1975249

The confidence intervals and tests are Wald-based because the data has more than 1,000 rows.

Figure 5-75: Parameter Estimates – Young Age

5.4.7 Crossing Time by Distraction Status

The crossing time by distraction status was also investigated in a mixed model. Two models were produced, one for the distracted pedestrians and another for the non-distracted pedestrians. The AIC for the distracted and not distracted models were 1635 and 1960, respectively (Figure 5-76 and Figure 5-77). This model provided the least AIC compared to the previous models and therefore was considered the best model.

Fit Statistics

-2 Residual Log Likelihood	1609.4105
-2 Log Likelihood	1612.1993
AICc	1635.2469
BIC	1673.5347

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	27.298104	2.422315	23.109459	32.745087

Figure 5-76: Fit Statistics-Distracted Model

Fit Statistics

-2 Residual Log Likelihood	1943.5316
-2 Log Likelihood	1943.5198
AICc	1959.967
BIC	1989.9368

Repeated Effects Covariance Parameter Estimates

Covariance Parameter	Estimate	Std Error	95% Lower	95% Upper
Residual	21.219743	1.6671805	18.296825	24.907614

Figure 5-77: Fit Statistics-Not Distracted Model

For the distracted model, the parameters: Startup time, Weather, Land Use, Distraction Cause, Gender, and Group Status were included as the main effects. The parameters that affected the model were Distraction Cause, Land Use, Weather, and Group Status (Figure 5-78). The parameter estimates showed that the mixed land use was highly significant and increased the crossing time by 3.41 sec. Cloudy weather was another highly significant effect that increased the response by 5.38 seconds. In sharp contrast, the rainy weather effect significantly decreased the crossing time by 5.72 seconds. The negative impact on the crossing time when it is raining was observed in the recordings, as pedestrians walked faster in that weather. Talking to others category increased the response by 2.8 seconds, while the other category decreased it by 1.53 seconds. The results have shown that walking in a group significantly decreases the crossing time by 2.57 seconds. This was also observed in the data collection, as one person in the group is usually less distracted than the others and alerts them about the walk signal when it turns on. The following Figure 5-79 shows the parameter estimates. Figure 5-80 shows the marginal model profiler and the effects of the parameter's variation on the response (Crossing time).

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Start up time	1	1	254.0	2.7895416	0.0961
Weather	2	2	254.0	17.646548	<.0001*
Land Use	1	1	254.0	86.650976	<.0001*
Distraction Cause	3	3	254.0	6.6509196	0.0002*
Gender	1	1	254.0	1.0563006	0.3050
Group Status	1	1	254.0	27.956277	<.0001*

Figure 5-78: Fixed Effects Tests-Distracted Model

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	19.444846	0.9929309	254.0	19.58	<.0001*	17.48942	21.400272
Start up time	0.2244366	0.1343777	254.0	1.67	0.0961	-0.0402	0.4890731
Weather[Cloudy]	5.3886483	0.9981248	254.0	5.40	<.0001*	3.4229936	7.354303
Weather[Rainy]	-5.727283	1.6223151	254.0	-3.53	0.0005*	-8.922185	-2.532381
Distraction Cause[Eating/Drinking/Smoking]	0.3535397	1.2526213	254.0	0.28	0.7780	-2.113307	2.8203864
Distraction Cause[Other]	-1.532464	0.6162329	254.0	-2.49	0.0135*	-2.74604	-0.318887
Distraction Cause[Talking to others]	2.8075862	0.8571814	254.0	3.28	0.0012*	1.1194982	4.4956742
Gender[Female]	0.3420686	0.3328277	254.0	1.03	0.3050	-0.313385	0.9975221
Group Status[Group]	-2.574916	0.4869937	254.0	-5.29	<.0001*	-3.533975	-1.615856
Land Use[Mix Use]	3.4140975	0.3667661	254.0	9.31	<.0001*	2.6918076	4.1363874

Figure 5-79: Parameter Estimates- Distracted Model

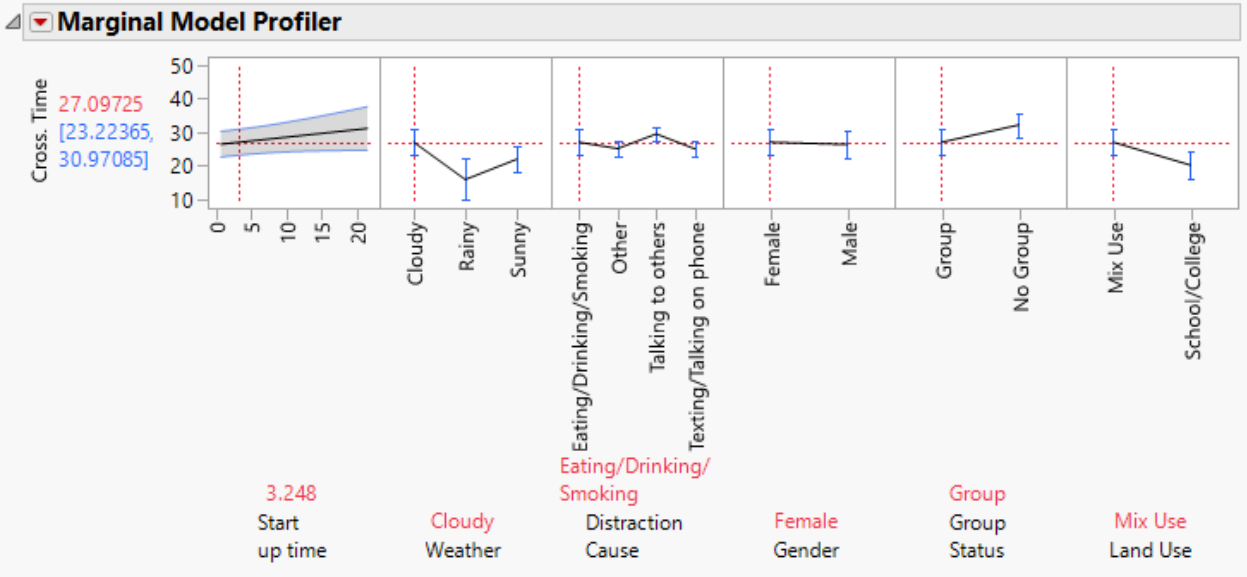


Figure 5-80: Model Profiler- Distracted Model

For the non-distracted model, the Startup time, Land use, and Group status significantly affected the response (Figure 5-81). The base response (Crossing time) was 18.75 seconds which reflects faster crossing than when being distracted (19.44 sec). The startup time effect was significant, increasing the crossing time by 0.87 seconds as well as the rainy weather by 2.35 seconds. The mixed land use (residential/commercial) showed a significant effect and increased the crossing time (3.48 seconds) compared to the school land use. Walking in a group also showed that people increase their walking speed, which is reflected in a faster crossing time with -2.76 seconds (Figure 5-82), as they are not distracted. As seen in Figure 5-83, the marginal model profiler demonstrates the various effects of the parameter on the response (the cross-time).

Fixed Effects Tests

Source	Nparm	DFNum	DFDen	F Ratio	Prob > F
Start up time	1	1	324.0	3.9410718	0.0480*
Weather	2	2	324.0	2.415032	0.0910
Land Use	1	1	324.0	145.92684	<.0001*
Distraction Cause	0	0	324.0	.	.
Gender	1	1	324.0	0.2267282	0.6343
Group Status	1	1	324.0	55.624069	<.0001*

Figure 5-81: Fixed Effects-Not-Distracted Model

Fixed Effects Parameter Estimates

Term	Estimate	Std Error	DFDen	t Ratio	Prob>|t|	95% Lower	95% Upper
Intercept	18.758515	0.8311707	324.0	22.57	<.0001*	17.123343	20.393688
Start up time	0.8735388	0.4400226	324.0	1.99	0.0480*	0.0078766	1.739201
Weather[Cloudy]	-1.323557	0.8996866	324.0	-1.47	0.1422	-3.093522	0.4464081
Weather[Rainy]	2.3585742	1.094565	324.0	2.15	0.0319*	0.2052224	4.5119259
Gender[Female]	0.1209497	0.2540107	324.0	0.48	0.6343	-0.378769	0.6206682
Group Status[Group]	-2.766598	0.3709493	324.0	-7.46	<.0001*	-3.496371	-2.036824
Land Use[Mix Use]	3.4894874	0.2888644	324.0	12.08	<.0001*	2.9212007	4.057774

Figure 5-82: Parameter Estimates-Not-Distracted Model

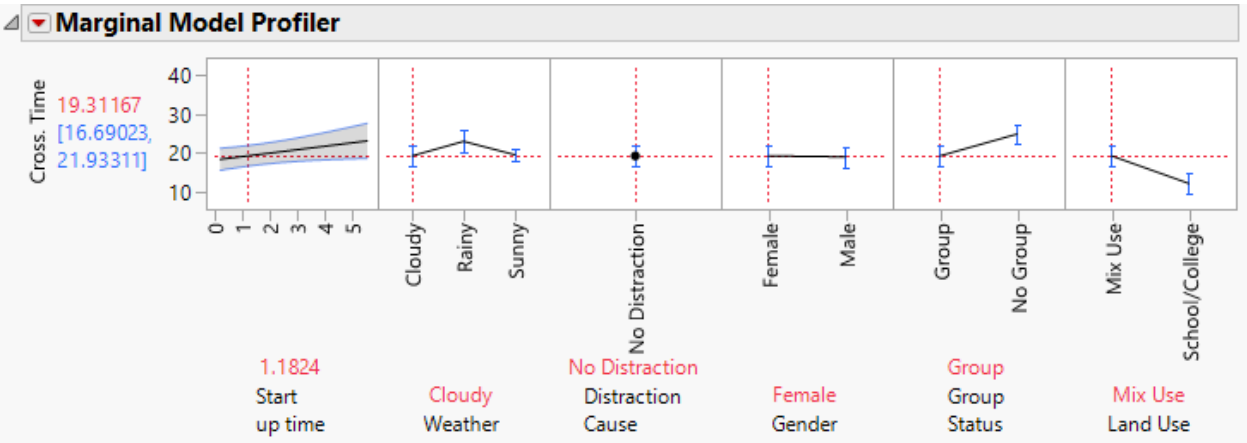


Figure 5-83: Marginal Model Profiler-Not-Distracted Model

5.5 Effect of Distracted Pedestrians on Intersection Capacity

Overall, the analysis revealed that distracted pedestrians did not significantly impact the intersections' traffic operations. Two main parameters were investigated to determine the amount of time needed for the pedestrians to finish crossing the intersection and whether extra time is needed in addition to the given pedestrian signal, namely "Startup Time" and "Extra Ped Time". The base "Startup" time was **2.46** seconds in addition to different distraction types which added up to **1.90** seconds for a total of **4.36** seconds, which is within the given Signal Walk Time of **7.0** seconds. The other parameter is the "Extra Ped Time" after the signal time ends which was **1.39** seconds. Also, all field and video observations did not record vehicles waiting for pedestrians to finish crossing after the ped signal ended. Although distractions among pedestrians increased their crossing time by nearly 4%, the extra time caused by their distractions was almost equal to or less than the drivers' startup lost time (2 seconds).

5.6 Summary

Distracted driving activities pose one of the most difficult challenges to ensuring a safe and efficient transportation system. The impacts of distracted driving on traffic operations have received less research attention than the safety aspect. However, the impact on traffic efficiency is one aspect that has been overlooked or has not been explored much in the literature. It is clear that distracted driving can have impacts that negatively affect smooth traffic flow and operations aside from increased accident rates, such as poor speed control, excessive lane variability, lowered reaction times, and increased delays. Furthermore, new Florida laws prohibit cellphone usage while driving; however, use is allowed when the vehicle is stationary, which is more likely to be during the red phase. Often times this results in the driver being unprepared when the signal turns green, causing further delay on top of the initial reaction time. This can be quantified in intersection analysis as part of lost time, which is the difference between the average headway and the headway for the first few cars, which is larger due to perception time, reaction time, and now, distraction time. As such, distracted driving can seriously affect intersection throughput, thereby affecting operations and capacity. This study aims to determine the impacts of distraction types for both motorists and pedestrians on traffic operations. The study also measures the effects of different distraction types on headway for motorists and crossing time for pedestrians at signalized intersections and consequently its operational capacity by testing the statistical significance between distracted and non-distracted drivers. Data collection was conducted at numerous locations to cover different land use, intersection configuration, and periods of high demand.

First, the analysis for the through movement showed that nearly half of the drivers were distracted at these locations. The number of distracted drivers was significantly high in all land-use types. Several uncommon distraction types coded as “Not identified” distractions were found to have the primary effect on headway (41%), followed by Cell phone usage (31%). The mean headway for distracted drivers was almost doubled when compared to non-distracted drivers. The statistical models demonstrated that motorists driving in residential and school land use are less distracted than those in commercial and office areas. Drivers in mixed land uses (commercial and offices) are more attentive in the AM peak than those in the MD and PM peak hours. Motorists are more likely to be distracted by their phones in the MD and PM peak hours than in the AM peak. The first vehicle in the queue causes a significant increase in the headway. The analysis also highlighted an interesting fact that the distraction caused by the tenth vehicle in the queue had a detrimental effect on the intersection capacity due to the fact that the green phase gaps out before reaching the stop bar.

Second, the left-turn movement analysis showed that 87% were distracted. Cell phone distractions represented 28% of all distractions and were significant only during the AM peak. Dashboard and talking to passengers’ distractions were dominant only during the PM peak. Not identified distractions were dominant in all peak periods (48%). Motorists in the first row in the queue were more distracted in the PM peak than those in the AM peak. Similar to the through movement, residential & School land use did not increase the headway, as drivers are cautious when driving in these areas. In contrast, mixed land use increased the headway, especially in commercial areas, as motorists are usually distracted by the various stores around and searching for their destination, especially in tourist areas.

Almost third of the drivers were distracted by their cell phone for the through and left movements which had the primary effect on headway among distraction types with a **20%** increase, which resulted in reducing the intersection capacity by **16.5%.** Overall, the effect of distraction on the discharge headway at signalized intersections is significant. The base headway increased by **0.93 sec**, which resulted in reducing the intersections' capacity by **45.5%**

Third, the pedestrians' analysis demonstrated that nearly half the pedestrians were distracted. This percentage is consistent with the literature review, as pedestrians generally pay less attention to their surroundings. Pedestrians are less distracted in rainy weather than in cloudy or sunny weather, as they tend to cross faster to avoid the rain. Walking in mixed land use (residential and commercial) increases the crossing time than in school, and college land uses. This increase in crossing time is because pedestrians get distracted by commercial land uses with retail stores. It was found that rainy conditions increased the walking speed for the middle/old age, especially when being distracted. However, their speed was lower when walking alone and in mixed-use areas compared to when being in groups and in a school/college setting. The leading cause of distractions, especially among young age groups, was talking to each other, which caused a significant increase in the crossing time. The young age was found to be walking with slower speed, especially when distracted by talking to others and in groups in a school/college setting compared to when being alone and in a mixed-use area. The Females were found to be distracted by talking to others which reduced their walking speed compared to the No Distraction case but were more alert in mixed-use areas compared to the school/college land use with a faster speed. On the other hand, the Males were found to be distracted by other causes such as looking and staring away from the intersection but with being more alert which increased their walking speed especially in mixed use areas than in school/college area. They were also found to be predominantly crossing Alone than in groups which also reflected higher speed. Texting/Talking on a phone distraction and other types of distractions contributed to a third of the distraction causes. Most pedestrians in this study were young (98%).

Overall, the analysis revealed that distracted pedestrians did not significantly impact the intersections' traffic operations. Two main parameters were investigated to determine the amount of time needed for the pedestrians to finish crossing the intersection and whether extra time is needed in addition to the given pedestrian signal, namely "Startup Time" and "Extra Ped Time". The base "Startup" time was **2.46** seconds in addition to different distraction types, which added up to **1.90** seconds for a total of **4.36** seconds, which is within the given Signal Walk Time of **7.0** seconds. The other parameter is the "Extra Ped Time" after the signal time ends, which was **1.39** seconds. Also, all field and video observations did not record vehicles waiting for pedestrians to finish crossing after the ped signal ended.

Distracted driving demonstrated to have a negative effect on the headway at signalized intersections and consequently decreased the intersection capacity. Due to distractions, the headway surged from 2 seconds to 4 seconds. This significant rise resulted in nearly half the intersection's capacity loss. In contrast, distracted pedestrians did not significantly impact the intersections' traffic operations. Although distractions among pedestrians increased their crossing time by nearly 4%, the extra time caused by their distractions was almost equal to or less than the drivers' startup lost time of 2 seconds.

5.7 Implications

Several policy implications can be recommended and utilized from this research. As mentioned in the introduction, Florida laws prohibit the use of cell phones while the vehicle is moving but allows it while the vehicle is stationary, which was expected to be at intersections during the red phase. Therefore, one policy implication is to update Florida laws to prevent drivers from using their cell phones while the vehicle is at the traffic light due to its effect on reducing the intersection capacity. Another implication can be related to the traffic engineering field, where the effect of distraction is taken into account and added to the startup lost time and in designing intersection signal timing, increasing it to 3.5 seconds instead of 2 seconds. Also, distracted driving can be added as a new parameter to microscopic traffic simulation models with different distributions to be modeled at signalized intersections.

VI. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Distracted driving activities pose one of the most difficult challenges to ensuring a safe and efficient transportation system. The impacts of distracted driving on traffic operations have received less research attention than the safety aspect. However, the impact on traffic efficiency is one aspect that has been overlooked or has not been explored much in the literature. It is clear that distracted driving can have impacts that negatively affect smooth traffic flow and operations aside from increased accident rates, such as poor speed control, excessive lane variability, lowered reaction times, and increased delays. Furthermore, new Florida laws prohibit cellphone usage while driving; however, use is allowed when the vehicle is stationary, which is more likely to be during the red phase. Often times this results in the driver being unprepared when the signal turns green, causing further delay on top of the initial reaction time. This can be quantified in intersection analysis as part of lost time, which is the difference between the average headway and the headway for the first few cars, which is larger due to perception time, reaction time, and now, distraction time. As such, distracted driving can be a serious detriment to intersection capacity, thereby affecting both operations and capacity. This study aims to determine the impacts of distraction types for both motorists and pedestrians on traffic operations. The study also measures the effects of different distraction types on headway for motorists and crossing time for pedestrians at signalized intersections and consequently its operational capacity by testing the statistical significance between distracted and non-distracted drivers. Data collection was conducted at specific locations to cover different land uses, intersection configuration, and periods of high demand. A total of ten (10) intersections covering thirteen (13) approaches for distracted driving and five (5) intersections covering eight (8) approaches for distracted pedestrians were selected for data collection. Three (3) softwares customized to the project needs were developed to facilitate the data extraction process and ensure quality and consistency among the different parameters.

First, the data analysis for the through movement showed that nearly half of the drivers are distracted at those locations. The numbers of distracted drivers were significantly high in all land-use types. Not identified distractions are the primary effect on headway (41%), followed by Cell phone usage (31%). The mean headway for distracted drivers was almost double compared to non-distracted drivers. The statistical model demonstrated that the overall effect of distraction on the discharge headway at signalized intersections is significant. The base headway increased by 0.93 sec which resulted in reducing the intersections capacity by 45.5%. Motorists driving in residential and school land use are less distracted than those in commercial and offices areas. Drivers in mixed land use (commercial and offices) are more attentive in the AM peak than those in the PM peak. The first vehicle in the queue causes a significant increase in the headway. The analysis highlighted an interesting fact that the distraction caused by the tenth vehicle in the queue had a detrimental effect on the intersection capacity because the green phase gaps out before reaching the stop bar.

Second, the left-turn movement analysis showed that 87% were distracted. Cell phone distractions represented 28% of all distractions and were significant only during the AM peak. Dashboard and passengers' distractions were positively effective only during the PM peak. Not identified distractions were significant in all peaks (48%). Motorists driving in the first position in the queue were more distracted in the PM peak than those in the AM peak. Similar to the through movement, residential & School land use always decreased the response, as drivers are cautious when driving

in those areas. In contrast, mixed land use increased the headway, especially in commercial areas, as motorists are usually distracted by the various stores around and searching for their destination.

Third, the pedestrians' analysis demonstrated that nearly half the pedestrians were distracted. This percentage is consistent with the literature review, as pedestrians, in general, pay less attention to their surroundings. Pedestrians are less distracted in rainy weather than in cloudy or sunny weather, as they tend to cross faster to avoid the rain. Walking in mixed land use (residential and commercial) significantly increases the cross-time than in school and college land use; This rise in cross time is because pedestrians are distracted by retail stores in their surroundings. The leading cause of distractions among groups was talking to each other, which caused a significant increase in the crossing time. Walking in a group significantly decreases the crossing time than walking alone. Texting/Talking on a phone distraction and other types of distractions contributed to a third of the distraction causes. Most pedestrians in this study were young (98%).

Thus, distracted driving proved to have a detrimental effect on the headway at signalized intersections and consequently decreased the intersection capacity. Due to distractions, the headway soared from 2 seconds to 4 seconds. This significant rise resulted in the loss of nearly half the intersection's capacity. In contrast, distracted pedestrians did not significantly impact the intersections' traffic operations. Although distractions among pedestrians increased their crossing time by nearly 4%, the extra time caused by their distractions was almost equal to or less than the drivers' startup lost time of 2 seconds. However, this can be attributed to the fact that pedestrian activity in Central Florida is still considered low and didn't reach the level of affecting vehicular operations especially when compared to heavily walked cities such as New York or Washington DC.

6.2 Recommendations

Several policy implications can be recommended and utilized from this research. As mentioned in the introduction, Florida laws prohibit the use of cell phones while the vehicle is moving but allows it while the vehicle is stationary, which was expected to be at intersections during the red phase. Therefore, one policy implication is to update Florida laws to prevent drivers from using their cell phones while the vehicle is at the traffic light due to its effect on reducing the intersection capacity. Another implication can be related to the traffic engineering field, where the effect of distraction is taken into account and added to the startup lost time and in designing intersection signal timing, increasing it to 3.5 seconds instead of the standard 2.0 seconds. Also, distracted driving can be added as a new parameter to microscopic traffic simulation models with different distributions to be modeled at signalized intersections.

On the other hand, the research results and the different distraction types extracted from several footages have shown that distracted pedestrians can be regarded as blind when crossing while distracted. Although some intersection locations were equipped with audible pedestrian signals (APS), it was not concluded whether it had an effect on their start up time or crossing speed which can be explored in future research.

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APPENDIX A: SAMPLE DATA AT SR436 & WILSHIRE DRV (LEFT MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.567	2.000	3.567	1	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.000	2.000	1.000	1	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.600	2.100	0.500	2	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.467	2.100	0.367	2	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.366	2.100	0.266	2	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.300	2.100	0.200	2	1	5	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.500	2.100	0.400	2	1	7	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.600	2.100	0.500	2	1	9	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.235	2.100	3.135	3	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.300	1.933	0.367	4	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.167	1.933	1.234	4	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.167	1.933	0.234	4	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.200	1.933	0.267	4	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.100	1.933	0.167	4	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.334	3.000	0.334	5	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.633	2.333	1.300	6	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.567	2.333	1.234	6	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.633	2.333	0.300	6	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.666	2.333	1.333	7	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.667	2.333	1.334	7	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.833	2.333	3.500	7	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	3.567	2.867	0.700	8	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.333	2.867	2.466	8	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	6.133	2.367	3.766	9	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.900	2.367	0.533	9	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	6.666	2.367	4.299	10	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.934	2.367	0.567	10	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4.166	2.367	1.799	10	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.700	2.367	0.333	10	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Passengers	4.666	2.367	2.299	11	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.734	2.367	1.367	11	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.000	2.367	2.633	12	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4.500	3.434	1.067	13	1	1	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	3.334	1.950	1.384	18	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Cell phone	4.833	2.600	2.233	19	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.000	2.600	0.400	19	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.667	2.600	0.067	19	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.667	2.600	0.067	19	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.734	2.600	0.134	19	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Passengers	4.667	3.333	1.334	20	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4.666	3.166	1.500	21	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Passengers	6.833	2.500	4.333	22	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.000	2.500	0.500	22	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.667	2.500	0.167	22	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.000	2.500	0.500	22	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.000	2.534	2.467	23	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.500	2.534	0.967	23	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.333	2.534	0.800	23	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.833	2.389	0.444	24	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.567	2.389	3.178	24	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.333	2.389	0.944	24	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.666	2.389	1.277	25	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.500	2.389	0.111	25	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.500	2.467	0.034	26	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.933	2.467	0.467	26	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.667	2.467	0.201	26	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		3.167	2.467	0.701	26	1	5	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.100	2.467	0.634	27	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.600	2.467	0.134	27	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.567	2.333	0.234	28	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.133	2.333	0.800	28	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.133	1.884	1.250	29	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	3.167	1.884	1.284	29	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.266	1.884	0.383	29	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.400	1.884	0.517	29	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.100	1.884	0.217	29	1	5	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.766	2.334	0.432	31	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4.833	2.334	2.499	32	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.433	2.334	0.099	32	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.8	2.334	0.466	32	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	8.2	1.889	6.311	33	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.633	1.889	0.744	33	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4	1.889	2.111	33	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.5	1.889	0.611	33	1	5	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		1.9	1.889	0.011	33	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.433	1.889	3.544	34	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	6.7	1.889	4.811	34	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.567	1.889	0.678	34	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		7.567	5.200	2.367	35	1	6	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Cell phone	5.333	5.200	0.133	36	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		9.433	6.833	2.600	40	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	5.234	1.833	3.401	41	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.433	1.833	0.600	41	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.067	1.833	0.234	41	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		1.9	1.833	0.067	41	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	6.134	1.833	4.301	42	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.933	1.833	1.100	42	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	No Distraction	6.1	1.833	4.267	43	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4.567	1.833	2.734	43	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.466	1.833	0.633	43	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	6.067	1.834	4.234	44	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.767	1.834	0.934	44	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2.333	1.834	0.500	44	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		2	1.834	0.167	44	1	4	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		1.933	1.834	0.100	44	1	5	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	6.5	1.834	4.667	45	1	1	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.	Not Identified Dist.	4.333	1.834	2.500	45	1	2	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		8	1.834	6.167	45	1	3	Left
12/23/2021	Sunny	SR436 & Wilshire Drv.		1.9	1.834	0.067	45	1	4	Left

APPENDIX B: SAMPLE DATA
AT NARCOOSSEE RD. & LEE VISTA BLVD. (LEFT MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.667	2.000	0.667	121	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.1	2.000	0.100	121	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	No Distraction	3.066	2.000	1.066	121	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.567	2.000	0.567	121	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.067	2.000	0.067	121	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.366	2.000	0.366	121	1	6	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.133	2.000	0.133	121	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.733	2.007	0.726	122	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.967	2.007	0.960	122	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.3	2.007	0.293	122	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.633	2.007	0.626	122	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.9	2.007	0.893	122	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.366	2.007	0.359	122	1	13	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Cell phone	4.666	2.118	2.548	123	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	No Distraction	3.3	2.118	1.182	123	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.5	2.118	0.382	123	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.966	2.118	1.848	123	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.7	2.118	0.582	123	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.567	2.118	0.449	123	1	10	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.133	2.118	0.015	123	1	11	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	No Distraction	3.167	1.783	1.384	124	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.233	1.783	0.450	124	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.967	1.783	0.184	124	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.033	1.783	1.250	124	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.6	1.783	0.817	124	1	6	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.267	1.783	0.484	124	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2	1.783	0.217	124	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	3.833	1.783	2.050	125	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.2	1.783	0.417	125	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Cell phone	3.8	1.783	2.017	125	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.434	1.783	0.651	125	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.6	1.917	0.683	126	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.567	1.917	0.650	126	1	2	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	3.766	2.813	0.953	135	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.813	0.187	135	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.967	2.813	0.154	135	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		5.6	2.813	2.787	135	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	1.833	1.667	0.166	136	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.333	1.667	0.666	136	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		4.067	1.667	2.400	136	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.5	1.667	0.833	136	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.167	1.667	0.500	136	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.766	1.667	0.099	136	1	6	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.667	1.667	0.000	136	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.667	1.667	0.000	136	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Passengers	4.833	2.200	2.633	137	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.934	2.200	0.734	137	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.433	2.200	0.233	137	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Cell phone	7.1	2.157	4.943	138	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.434	2.157	0.277	138	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.233	2.157	0.076	138	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.167	2.157	1.010	138	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.966	2.157	0.809	138	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.157	0.843	138	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.293	0.707	139	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.293	0.707	139	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.667	2.293	0.374	139	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.3	2.293	1.007	139	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		5.2	3.507	1.693	140	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.767	3.507	0.260	140	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	3.967	2.879	1.088	141	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.067	2.879	0.188	141	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		6.633	2.879	3.754	141	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.879	0.121	141	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.366	2.879	0.487	141	1	11	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.9	2.511	0.389	142	1	1	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	3.766	2.813	0.953	135	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.813	0.187	135	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.967	2.813	0.154	135	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		5.6	2.813	2.787	135	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	1.833	1.667	0.166	136	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.333	1.667	0.666	136	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		4.067	1.667	2.400	136	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.5	1.667	0.833	136	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.167	1.667	0.500	136	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.766	1.667	0.099	136	1	6	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.667	1.667	0.000	136	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		1.667	1.667	0.000	136	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Passengers	4.833	2.200	2.633	137	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.934	2.200	0.734	137	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.433	2.200	0.233	137	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Cell phone	7.1	2.157	4.943	138	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.434	2.157	0.277	138	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.233	2.157	0.076	138	1	3	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.167	2.157	1.010	138	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.966	2.157	0.809	138	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.157	0.843	138	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.293	0.707	139	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.293	0.707	139	1	2	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.667	2.293	0.374	139	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.3	2.293	1.007	139	1	7	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		5.2	3.507	1.693	140	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.767	3.507	0.260	140	1	9	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.	Not Identified Dist.	3.967	2.879	1.088	141	1	1	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.067	2.879	0.188	141	1	4	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		6.633	2.879	3.754	141	1	5	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3	2.879	0.121	141	1	8	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		3.366	2.879	0.487	141	1	11	Left
1/7/2022	Sunny	Narcoossee Rd. & Lee Vista Blvd.		2.9	2.511	0.389	142	1	1	Left

APPENDIX C: SAMPLE DATA AT LAKE UNDERHILL RD. & DEAN RD. (THROUGH MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	5	1.800	3.200	483	1	1	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3	1.800	1.200	483	1	2	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3	1.800	1.200	483	1	3	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	2	1.800	0.200	483	1	4	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3	1.800	1.200	483	1	5	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	2	1.800	0.200	483	1	8	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	2	1.800	0.200	483	1	9	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3	2.500	0.500	484	1	1	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3	2.500	0.500	484	1	2	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	4	2.500	1.500	484	1	6	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	4	2.500	1.500	484	1	8	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	4	2.167	1.833	485	1	1	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	4	2.167	1.833	485	1	3	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	4	2.167	1.833	485	1	6	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3	1.333	1.667	486	1	1	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3	1.333	1.667	486	1	2	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3	1.333	1.667	486	1	3	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	4	1.333	2.667	486	1	4	Through
5/25/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3	1.333	1.667	486	1	6	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	4.376	2.421	1.955	487	1	1	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.26	2.421	0.839	487	1	2	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.62	2.421	0.199	487	1	3	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.6	2.421	0.179	487	1	4	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.84	2.421	1.419	487	1	6	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	6.256	2.421	3.835	487	2	1	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.02	2.421	0.599	487	2	2	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.57	2.421	1.149	487	2	8	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3.435	2.361	1.074	488	1	1	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	7.36	2.361	4.999	488	1	2	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.29	2.361	0.929	488	1	4	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.75	2.361	0.389	488	1	7	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.74	2.361	0.379	488	1	8	Through
6/1/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	4.905	2.361	2.544	488	2	1	Through

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.88	1.993	0.887	573	2	3	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.38	1.993	0.387	573	2	4	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.12	1.993	1.127	573	2	6	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.16	1.993	1.167	573	2	10	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3.961	2.239	1.722	574	1	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3.91	2.239	1.671	574	1	2	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.77	2.239	0.531	574	1	3	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		4.1	2.239	1.861	574	1	7	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3	2.239	0.761	574	1	10	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	9.481	2.239	7.242	574	2	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.36	2.239	0.121	574	2	2	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.16	2.239	0.921	574	2	7	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	6.281	1.985	4.296	575	1	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.12	1.985	1.135	575	1	2	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.019	1.985	0.034	575	1	3	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.142	1.985	0.157	575	1	4	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.28	1.985	0.295	575	1	5	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.41	1.985	0.425	575	1	9	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.31	1.985	0.325	575	1	10	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	5.361	1.985	3.376	575	2	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		5.48	1.985	3.495	575	2	2	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.486	1.985	0.501	575	2	3	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.815	1.985	0.830	575	2	4	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.06	1.985	1.075	575	2	6	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.2	1.985	1.215	575	2	9	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Cell phone	3.924	2.283	1.641	576	1	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3	2.283	0.717	576	1	2	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Cell phone	5.844	2.283	3.561	576	2	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	2.66	2.283	0.377	576	2	2	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.678	2.283	0.395	576	2	5	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.09	2.283	0.807	576	2	7	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Other(State)	5.878	2.150	3.728	577	1	1	Through
6/2/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3.342	2.150	1.192	577	1	2	Through

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
6/3/2021	Sunny	Lake Underhill Rd. & Dean Rd.		9.669	2.762	6.908	761	1	3	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.3	2.040	0.260	762	1	2	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.1	2.040	0.060	762	1	3	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.1	2.040	1.060	762	1	6	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.4	1.983	0.417	763	1	2	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.1	1.983	0.117	763	1	3	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.2	1.983	0.217	763	1	6	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.1	1.983	0.117	763	1	8	Through
6/9/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.7	1.983	0.717	763	1	10	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.	No Distraction	3.068	2.133	0.935	764	1	4	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.967	2.133	0.834	764	1	7	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.4	2.278	0.122	765	1	3	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.535	2.278	0.257	765	1	4	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.266	2.278	0.988	765	1	5	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.868	2.626	1.243	766	1	3	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.767	2.626	1.142	766	1	5	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.667	2.626	0.042	766	1	6	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.234	2.701	0.534	767	1	3	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.434	2.701	0.734	767	1	6	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.567	2.084	0.484	768	1	2	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.3	2.084	0.217	768	1	3	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.967	2.084	0.884	768	1	5	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.534	2.467	0.067	769	1	2	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		1.801	1.701	0.100	770	1	3	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.433	1.701	0.732	770	1	4	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.367	2.123	0.245	771	1	6	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.134	2.123	0.011	771	1	9	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.733	2.123	0.611	771	1	10	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.	Not Identified Dist.	3.867	2.445	1.423	772	1	3	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.267	2.445	0.823	772	1	6	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.935	2.445	0.491	772	1	8	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		3.101	2.445	0.657	772	1	10	Through
6/10/2021	Sunny	Lake Underhill Rd. & Dean Rd.		2.802	2.309	0.493	773	1	4	Through

APPENDIX D: SAMPLE DATA AT LK. UNDERHILL RD. AND WOODBURY RD. (LEFT MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.234	2.309	0.925	776	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.433	2.309	0.124	777	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.466	2.309	1.157	779	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Dashboard	2.833	2.309	0.524	780	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.867	2.309	0.558	780	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.533	2.309	0.224	780	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.367	2.309	1.058	781	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.4	2.309	0.091	781	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.7	2.309	0.391	782	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3.967	2.309	1.658	782	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	4.134	2.309	1.825	783	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.733	2.309	0.424	784	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.633	2.309	1.324	785	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.9	2.309	0.591	785	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.6	2.309	0.291	785	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.367	2.309	0.058	785	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		4.966	2.309	2.657	785	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.667	2.309	0.358	787	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.933	2.309	1.624	787	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3.234	2.309	0.925	787	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.433	2.309	0.124	787	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.309	0.691	787	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4.6	2.309	2.291	788	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.966	2.309	0.657	788	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.2	2.309	0.891	788	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.434	2.309	1.125	789	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	4.567	2.309	2.258	789	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.367	2.309	0.058	789	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	5.366	2.309	3.057	789	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.309	0.691	790	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.5	2.309	0.191	790	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.433	2.309	0.124	790	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Other(State)	2.967	2.309	0.658	791	1	1	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4.067	2.067	2.000	871	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.5	2.067	0.433	871	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.666	2.067	0.599	873	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.3	2.067	0.233	873	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4.9	2.067	2.833	874	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	6.833	2.067	4.766	875	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.1	2.067	0.033	875	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.566	2.067	0.499	875	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.833	2.067	0.766	876	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.3	2.067	0.233	876	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.667	2.067	0.600	876	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3.433	2.067	1.366	877	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3.067	2.067	1.000	878	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3.666	2.067	1.599	878	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.1	2.067	0.033	878	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3.3	2.067	1.233	878	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.3	2.067	0.233	878	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.333	2.067	0.266	879	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	9	2.067	6.933	879	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.467	2.067	1.400	879	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.3	2.067	0.233	879	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.067	0.933	880	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.667	2.067	0.600	880	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.3	2.067	0.233	880	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3.133	2.067	1.066	880	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.367	2.067	0.300	880	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.333	2.067	0.266	880	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Eating/ Drinking	5.967	2.067	3.900	881	1	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3.8	2.067	1.733	881	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.667	2.067	0.600	881	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.8	2.067	0.733	882	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.4	2.067	0.333	882	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Dashboard	2.9	2.067	0.833	882	2	1	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.633	2.000	0.633	984	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	4.367	2.000	2.367	984	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	4.034	1.967	2.067	985	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.666	1.967	0.699	985	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		3.467	1.967	1.500	985	1	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.134	1.967	0.167	985	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	2.533	1.967	0.566	985	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3.333	1.967	1.366	985	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		3.4	1.967	1.433	985	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.3	2.250	0.050	986	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.967	2.250	0.717	986	1	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.867	2.250	0.617	986	1	6	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.6	2.250	0.350	986	1	7	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3.034	2.250	0.784	986	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	2.6	2.250	0.350	986	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.733	2.250	0.483	986	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.250	0.750	986	2	5	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2.833	2.250	0.583	987	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4.967	2.250	2.717	987	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	2.4	2.250	0.150	988	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.934	2.250	0.684	988	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.4	1.833	0.567	989	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	1.933	1.833	0.100	989	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		3.067	1.833	1.234	989	1	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2.434	1.833	0.601	989	2	1	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	3.2	1.833	1.367	989	2	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	2.6	1.833	0.767	989	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.666	1.833	0.833	989	2	4	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	2.9	2.140	0.760	990	1	2	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	2.233	2.140	0.093	990	1	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.633	2.140	0.493	990	1	6	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2.6	2.140	0.460	990	2	3	Left
1/31/2022	Sunny	Lk Underhill Rd. and Woodbury Rd.		2.6	2.140	0.460	990	2	4	Left

APPENDIX E: SAMPLE DATA AT I-DRIVE & JAMAICAN CT. (LEFT MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.433	2.266	1.167	1016	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.367	2.266	1.101	1016	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.666	2.266	0.400	1016	1	3	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.667	2.266	2.401	1017	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.533	2.266	0.267	1017	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.9	2.266	0.634	1017	1	3	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Cell phone	5.367	2.266	3.101	1018	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Passengers	3.6	2.033	1.567	1019	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.7	2.033	0.667	1019	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.033	2.033	2.000	1019	1	3	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.234	2.033	0.201	1019	1	4	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.434	2.033	0.401	1020	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct		2.2	2.033	0.167	1020	1	3	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.867	3.300	0.567	1021	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	4.266	3.300	0.966	1021	1	5	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.5	3.300	0.200	1022	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Passengers	5.733	3.300	2.433	1023	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.2	3.300	0.900	1024	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	5.067	3.300	1.767	1025	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.6	3.300	0.300	1026	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.434	3.300	0.134	1029	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.633	3.300	0.333	1029	1	3	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.466	3.300	0.166	1030	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.533	3.300	1.233	1031	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Passengers	3.933	3.300	0.633	1034	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	5.367	3.233	2.134	1035	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.433	3.233	0.200	1036	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.5	3.233	0.267	1036	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.967	3.233	0.734	1036	1	3	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.733	3.233	0.500	1037	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.334	3.233	0.101	1039	1	2	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.366	3.233	0.133	1040	1	1	Left
9/28/2021	Sunny	Idrive & Jamaican Ct	Passengers	3.367	3.233	0.134	1042	1	2	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
10/1/2021	Sunny	Idrive & Jamaican Ct		2.8	2.100	0.700	1241	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.334	2.100	0.234	1241	1	5	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.266	3.000	0.266	1242	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.667	3.000	0.667	1242	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.833	2.880	0.953	1243	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.9	2.880	0.020	1243	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3.5	2.880	0.620	1243	1	6	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3.133	2.880	0.253	1243	1	7	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3.033	2.880	0.153	1243	1	9	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.5	2.880	0.620	1244	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.267	2.880	0.387	1244	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.933	2.417	2.517	1245	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.933	2.417	0.517	1245	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.834	2.417	0.418	1245	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.7	2.417	0.284	1245	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.933	2.417	0.517	1245	1	5	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.6	2.417	2.184	1246	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3	2.417	0.584	1246	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.133	2.417	0.717	1246	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.8	2.933	1.867	1248	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3	2.933	0.067	1248	1	5	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3.133	2.933	0.200	1248	1	6	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Cell phone	3.5	2.933	0.567	1249	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.766	2.933	0.833	1249	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.234	2.933	0.301	1249	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.366	2.933	0.433	1249	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.933	2.817	0.116	1250	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.933	2.817	1.116	1250	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3.467	2.817	0.650	1250	1	6	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.134	2.817	1.317	1251	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.233	2.817	0.416	1251	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.967	2.817	1.150	1251	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.4	2.700	0.700	1252	1	1	Left

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
10/1/2021	Sunny	Idrive & Jamaican Ct		2.9	1.767	1.133	1255	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.2	1.767	0.433	1255	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		4.166	1.767	2.399	1255	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.9	2.333	0.567	1256	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.767	2.333	0.434	1256	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	5.033	2.333	2.700	1256	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.434	2.333	0.101	1256	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.933	2.150	0.783	1257	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.2	2.150	1.050	1257	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.334	2.150	0.184	1257	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.2	2.150	0.050	1257	1	6	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.067	2.150	0.917	1258	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.867	2.150	0.717	1258	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.733	2.150	1.583	1258	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.866	2.750	0.116	1259	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.167	2.750	0.417	1259	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.5	2.750	0.750	1259	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.767	2.750	0.017	1259	1	5	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.933	2.750	0.183	1260	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.334	2.750	0.584	1260	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.966	2.750	0.216	1260	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.8	2.750	0.050	1261	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.366	2.750	0.616	1261	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.3	2.750	0.550	1261	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.933	2.750	1.183	1262	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.267	2.750	0.517	1262	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3	2.600	0.400	1263	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.267	2.600	0.667	1263	1	2	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		2.8	2.600	0.200	1263	1	3	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.733	2.600	1.133	1263	1	4	Left
10/1/2021	Sunny	Idrive & Jamaican Ct		3.133	2.600	0.533	1263	1	6	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.334	2.600	1.734	1264	1	1	Left
10/1/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	3.633	2.600	1.033	1264	1	2	Left

APPENDIX F: SAMPLE OF DATA COLLECTED AT I-DRIVE & JAMAICAN CT. (THROUGH MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.653	3.758	0.895	1265	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.067	3.758	0.309	1265	2	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.667	3.758	0.909	1265	2	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.7	3.758	0.942	1265	2	9	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.9	4.864	2.036	1266	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.167	4.864	0.303	1266	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.2	4.864	4.336	1266	2	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.267	4.864	4.403	1266	2	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.3	4.864	2.436	1266	2	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5	4.864	0.136	1266	2	9	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.9	4.864	5.036	1266	2	10	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	5.167	4.864	0.303	1266	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.7	4.864	2.836	1266	2	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.267	4.864	4.403	1266	2	7	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.3	4.864	2.436	1266	2	9	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5	4.864	0.136	1266	2	10	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.9	4.864	5.036	1266	2	11	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.733	4.864	4.869	1267	1	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.867	4.864	3.003	1267	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.967	4.864	1.103	1267	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.166	4.864	0.302	1267	2	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.4	4.864	1.536	1267	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	9.72	4.864	4.856	1267	1	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.834	4.864	2.970	1267	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	5.954	4.864	1.090	1267	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	5.166	4.864	0.302	1267	2	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	6.4	4.864	1.536	1267	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.933	3.473	6.460	1268	1	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.233	3.473	1.760	1268	1	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.167	3.473	1.694	1268	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.9	3.473	4.427	1268	1	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.167	3.473	0.694	1268	1	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.466	3.473	4.993	1268	2	1	Through

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
10/4/2021	Sunny	Idrive & Jamaican Ct		6.967	4.765	2.202	1272	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.133	4.765	1.368	1272	1	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.6	4.765	1.835	1272	1	11	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.834	4.765	2.069	1272	1	12	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	7.934	4.765	3.169	1272	2	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.4	4.765	2.635	1272	2	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.033	4.997	4.036	1273	2	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.6	4.997	4.603	1273	2	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.033	4.997	4.036	1273	2	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.633	4.997	4.636	1273	2	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.667	4.997	2.670	1273	2	9	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.133	4.997	1.136	1273	2	10	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	5.434	2.800	2.634	1274	1	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.4	2.800	5.600	1274	1	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.933	2.800	2.133	1274	1	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		2.9	2.800	0.100	1274	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		3.567	2.800	0.767	1274	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.534	2.800	1.734	1274	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.934	2.800	5.134	1274	2	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	3.89	2.800	1.090	1275	1	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	4.934	2.800	2.134	1275	1	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		2.9	2.800	0.100	1275	1	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		3.566	2.800	0.766	1275	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	5.69	2.800	2.890	1275	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	7.9	2.800	5.100	1275	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Other(State)	5.234	2.800	2.434	1276	1	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.233	7.167	0.067	1277	2	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	9.233	6.083	3.150	1278	1	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.1	6.083	2.017	1278	2	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.267	6.083	1.184	1278	2	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.3	6.083	0.217	1280	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.867	6.083	3.784	1280	2	2	Through

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	9.667	4.661	5.006	1378	1	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.767	4.661	5.106	1378	2	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.233	6.389	2.844	1379	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.034	6.389	1.645	1379	1	7	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.633	6.389	0.244	1379	1	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8	6.389	1.611	1379	1	9	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.767	6.389	1.378	1379	2	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.234	6.395	2.840	1380	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.033	6.395	1.639	1380	1	7	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.634	6.395	0.240	1380	1	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.033	6.395	1.639	1380	1	9	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	7.833	6.395	1.439	1380	2	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.767	4.789	3.978	1381	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.767	4.789	4.978	1381	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	6.6	4.789	1.811	1381	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.4	4.789	4.611	1381	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.734	4.789	3.945	1382	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.766	4.789	4.977	1382	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	6.372	4.789	1.583	1382	2	1	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	9.4	4.789	4.611	1382	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.266	4.842	0.424	1383	1	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.234	4.842	2.392	1383	1	7	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		6.266	4.842	1.424	1383	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		5.266	4.834	0.433	1385	1	6	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		7.234	4.834	2.401	1385	1	7	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	No Distraction	6.266	4.834	1.433	1385	2	3	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.933	4.209	0.724	1387	1	2	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.733	4.209	0.524	1387	1	4	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		4.834	4.209	0.625	1387	1	5	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		9.066	4.209	4.857	1387	1	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.066	4.209	3.857	1387	2	8	Through
10/4/2021	Sunny	Idrive & Jamaican Ct		8.7	4.209	4.491	1387	2	11	Through
10/4/2021	Sunny	Idrive & Jamaican Ct	Not Identified Dist.	4.9	4.200	0.700	1388	1	2	Through

APPENDIX G: SAMPLE OF DATA COLLECTED AT LK. UNDERHILL & WOODBURY RD. (THROUGH MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.667	0.333	2015	1	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	1.667	1.333	2015	2	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	2	1.667	0.333	2015	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	1.667	2.333	2015	2	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Passengers	5	2.000	3.000	2016	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.000	1.000	2016	1	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.000	1.000	2016	1	5	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	2.000	2.000	2016	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3	2.000	1.000	2017	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	2.000	1.000	2017	1	4	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	2.000	2.000	2018	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	2.000	2.000	2018	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.700	1.300	2019	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	5	1.700	3.300	2019	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	1	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.700	1.300	2019	1	4	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	1	5	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	1	7	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	1	8	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	1	9	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	7	1.700	5.300	2019	2	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	2	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.700	1.300	2019	2	4	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	2	6	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	2	7	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2019	2	8	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	1.700	2.300	2020	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3	1.700	1.300	2020	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.700	1.300	2020	1	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.700	1.300	2020	2	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2020	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.700	0.300	2020	2	3	Through

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2	1.857	0.143	2040	2	6	Through
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	2	1.857	0.143	2040	2	7	Through
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.250	0.750	2041	1	2	Through
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.250	0.750	2041	1	4	Through
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.250	0.750	2041	1	6	Through
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	3.000	1.000	2042	1	1	Through
3/23/2021	Cloudy	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	3.000	1.000	2042	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	3.000	1.000	2043	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Other(State)	4	3.000	1.000	2043	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Other(State)	4	3.000	1.000	2046	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	3.000	1.000	2049	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	6	3.000	3.000	2049	2	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	3	1.000	2.000	2050	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	1.000	3.000	2050	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.000	1.000	2050	1	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	1.000	2.000	2050	1	4	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	1.000	3.000	2050	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	1.000	2.000	2050	2	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	1.000	2.000	2050	2	4	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Cell phone	5	1.000	4.000	2051	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Eating/ Drinking	4	1.000	3.000	2051	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.000	1.000	2051	1	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	1.000	3.000	2051	2	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.000	2.000	2051	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.000	1.000	2051	2	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.000	1.000	2051	2	4	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	5	2.000	3.000	2052	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.000	1.000	2052	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	2.000	2.000	2052	2	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.000	1.000	2052	2	3	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.833	0.167	2053	1	1	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.833	0.167	2053	1	2	Through
3/23/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.833	1.167	2053	1	3	Through

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.545	0.455	2329	2	3	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.545	0.455	2329	2	4	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.545	0.455	2329	2	5	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.545	0.455	2329	2	8	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.250	0.750	2330	1	1	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	2.250	0.750	2330	1	2	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.250	0.750	2330	1	3	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.250	0.750	2330	1	7	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	4	2.250	1.750	2330	2	2	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		4	2.250	1.750	2330	2	5	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		4	2.250	1.750	2330	2	8	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	2.417	1.583	2331	1	1	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	3	2.417	0.583	2331	1	2	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.417	0.583	2331	1	3	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.417	0.583	2331	1	7	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		4	2.417	1.583	2331	1	8	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	2.417	0.583	2331	2	1	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.417	0.583	2331	2	3	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.417	0.583	2331	2	4	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.417	0.583	2331	2	6	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	2.417	0.583	2331	2	7	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.889	0.111	2332	1	1	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	3	1.889	1.111	2332	1	2	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	1.889	1.111	2332	1	3	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	1.889	1.111	2332	1	4	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.889	0.111	2332	1	5	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.889	0.111	2332	1	6	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.889	0.111	2332	1	7	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		3	1.889	1.111	2332	1	8	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.889	0.111	2332	1	9	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	No Distraction	2	1.889	0.111	2332	2	1	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.	Not Identified Dist.	4	1.889	2.111	2332	2	2	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.889	0.111	2332	2	3	Through
5/25/2021	Sunny	Lk Underhill Rd. and Woodbury Rd.		2	1.889	0.111	2332	2	4	Through

APPENDIX H: SAMPLE OF DATA COLLECTED AT SR482 & OBT (THROUGH MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
7/29/2021	Rainy	SR482 & OBT		4	3.112	0.888	2515	2	16	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	4.36	3.112	1.248	2515	3	1	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.12	3.112	0.008	2515	3	3	Through
7/29/2021	Rainy	SR482 & OBT		5.16	3.112	2.048	2515	3	5	Through
7/29/2021	Rainy	SR482 & OBT		3.6	3.112	0.488	2515	3	6	Through
7/29/2021	Rainy	SR482 & OBT		7.56	3.112	4.448	2515	3	9	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.92	2.902	1.018	2516	1	1	Through
7/29/2021	Rainy	SR482 & OBT		4.28	2.902	1.378	2516	1	6	Through
7/29/2021	Rainy	SR482 & OBT		6.16	2.902	3.258	2516	1	7	Through
7/29/2021	Rainy	SR482 & OBT		4.44	2.902	1.538	2516	1	9	Through
7/29/2021	Rainy	SR482 & OBT		3.04	2.902	0.138	2516	1	10	Through
7/29/2021	Rainy	SR482 & OBT		5.48	2.902	2.578	2516	1	17	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	5.12	2.902	2.218	2516	2	1	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.48	2.902	0.578	2516	2	2	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.32	2.902	0.418	2516	2	3	Through
7/29/2021	Rainy	SR482 & OBT		5	2.902	2.098	2516	2	5	Through
7/29/2021	Rainy	SR482 & OBT		4.6	2.902	1.698	2516	2	13	Through
7/29/2021	Rainy	SR482 & OBT		4.04	2.902	1.138	2516	2	14	Through
7/29/2021	Rainy	SR482 & OBT		4.16	2.902	1.258	2516	2	15	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.92	2.902	1.018	2516	3	1	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.2	2.902	0.298	2516	3	2	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.04	2.902	0.138	2516	3	3	Through
7/29/2021	Rainy	SR482 & OBT		7	2.902	4.098	2516	3	8	Through
7/29/2021	Rainy	SR482 & OBT		7.64	2.902	4.738	2516	3	12	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3	2.822	0.178	2517	1	2	Through
7/29/2021	Rainy	SR482 & OBT		9.8	2.822	6.978	2517	1	4	Through
7/29/2021	Rainy	SR482 & OBT		4.64	2.822	1.818	2517	1	5	Through
7/29/2021	Rainy	SR482 & OBT		6.48	2.822	3.658	2517	1	6	Through
7/29/2021	Rainy	SR482 & OBT		6.64	2.822	3.818	2517	1	9	Through
7/29/2021	Rainy	SR482 & OBT		2.96	2.822	0.138	2517	1	12	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	5.12	2.822	2.298	2517	2	1	Through
7/29/2021	Rainy	SR482 & OBT	Not Identified Dist.	3.56	2.822	0.738	2517	2	2	Through
7/29/2021	Rainy	SR482 & OBT		8.84	2.822	6.018	2517	2	4	Through

APPENDIX I: SAMPLE OF DATA COLLECTED AT SR482 & OBT (LEFT MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
8/3/2021	Sunny	SR482 & OBT	Not Identified Dist.	3.96	3.096	0.864	2824	1	1	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	3.12	3.096	0.024	2824	1	2	Left
8/3/2021	Sunny	SR482 & OBT		3.12	3.096	0.024	2824	1	4	Left
8/3/2021	Sunny	SR482 & OBT	Not Identified Dist.	3.52	3.096	0.424	2824	2	3	Left
8/3/2021	Sunny	SR482 & OBT		4.36	3.096	1.264	2824	2	9	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	3.28	2.483	0.797	2825	1	1	Left
8/3/2021	Sunny	SR482 & OBT		2.68	2.483	0.197	2825	1	2	Left
8/3/2021	Sunny	SR482 & OBT	Not Identified Dist.	4.12	2.483	1.637	2825	1	3	Left
8/3/2021	Sunny	SR482 & OBT		2.6	2.483	0.117	2825	1	6	Left
8/3/2021	Sunny	SR482 & OBT		4.4	2.483	1.917	2825	1	9	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	3.04	2.483	0.557	2825	2	1	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	3.04	2.483	0.557	2825	2	2	Left
8/3/2021	Sunny	SR482 & OBT		2.64	2.483	0.157	2825	2	3	Left
8/3/2021	Sunny	SR482 & OBT		2.52	2.483	0.037	2825	2	5	Left
8/3/2021	Sunny	SR482 & OBT		2.68	2.483	0.197	2825	2	7	Left
8/3/2021	Sunny	SR482 & OBT		3.08	2.483	0.597	2825	2	10	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	3.52	2.115	1.405	2826	1	1	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	3.12	2.115	1.005	2826	1	2	Left
8/3/2021	Sunny	SR482 & OBT		2.64	2.115	0.525	2826	1	3	Left
8/3/2021	Sunny	SR482 & OBT	No Distraction	4.6	2.115	2.485	2826	1	4	Left
8/3/2021	Sunny	SR482 & OBT		2.4	2.115	0.285	2826	1	5	Left
8/3/2021	Sunny	SR482 & OBT		2.92	2.115	0.805	2826	1	6	Left
8/3/2021	Sunny	SR482 & OBT	Not Identified Dist.	5.08	2.115	2.965	2826	2	1	Left
8/3/2021	Sunny	SR482 & OBT		2.12	2.115	0.005	2826	2	2	Left
8/3/2021	Sunny	SR482 & OBT		2.12	2.115	0.005	2826	2	3	Left
8/3/2021	Sunny	SR482 & OBT		2.6	2.115	0.485	2826	2	4	Left
8/3/2021	Sunny	SR482 & OBT		4.28	2.115	2.165	2826	2	5	Left
8/3/2021	Sunny	SR482 & OBT		2.4	2.115	0.285	2826	2	6	Left
8/3/2021	Sunny	SR482 & OBT		2.8	2.115	0.685	2826	2	8	Left
8/3/2021	Sunny	SR482 & OBT		2.24	2.115	0.125	2826	2	9	Left
8/3/2021	Sunny	SR482 & OBT		2.2	2.115	0.085	2826	2	11	Left

APPENDIX J: SAMPLE OF DATA COLLECTED AT SR50 & BUMBY AVE. (THROUGH MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
6/17/2021	Sunny	SR50 & Bumby Ave		3.243	2.392	0.851	3640	2	7	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.56	2.392	0.168	3640	3	2	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.04	2.392	0.648	3640	3	3	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.8	2.392	0.408	3640	3	4	Through
6/17/2021	Sunny	SR50 & Bumby Ave		4	2.392	1.608	3640	3	6	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.849	2.874	0.975	3641	1	1	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.12	2.874	0.246	3641	1	2	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.32	2.874	0.446	3641	1	3	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.12	2.874	0.246	3641	1	5	Through
6/17/2021	Sunny	SR50 & Bumby Ave		5.36	2.874	2.486	3641	2	2	Through
6/17/2021	Sunny	SR50 & Bumby Ave		4.32	2.874	1.446	3641	2	5	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.129	2.874	0.255	3641	3	1	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.08	2.874	0.206	3641	3	2	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.92	2.874	0.046	3641	3	3	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.2	2.965	0.235	3642	1	5	Through
6/17/2021	Sunny	SR50 & Bumby Ave		4.439	2.965	1.474	3642	2	1	Through
6/17/2021	Sunny	SR50 & Bumby Ave	Other(State)	8.76	2.965	5.795	3642	2	4	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.88	2.965	0.915	3642	2	5	Through
6/17/2021	Sunny	SR50 & Bumby Ave		4.72	2.965	1.755	3642	3	4	Through
6/17/2021	Sunny	SR50 & Bumby Ave		5.16	2.965	2.195	3642	3	7	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.636	2.116	0.520	3643	1	1	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.24	2.116	0.124	3643	1	3	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.68	2.116	0.564	3643	1	4	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.72	2.116	0.604	3643	1	5	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.48	2.116	0.364	3643	1	6	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.876	2.116	0.760	3643	2	1	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.12	2.116	0.004	3643	2	2	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.16	2.116	1.044	3643	2	5	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.12	2.116	0.004	3643	2	6	Through
6/17/2021	Sunny	SR50 & Bumby Ave		3.48	2.116	1.364	3643	3	2	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.16	2.116	0.044	3643	3	7	Through
6/17/2021	Sunny	SR50 & Bumby Ave		2.6	2.116	0.484	3643	3	8	Through
6/17/2021	Sunny	SR50 & Bumby Ave	Other(State)	3.858	2.610	1.248	3644	1	1	Through

APPENDIX K: SAMPLE OF DATA COLLECTED AT SR50 & JYP (THROUGH MOVEMENT)

Collection Date	Weather	Intersection ID.	Distraction Cause	Headway (sec)	Avg. Hdwy (sec)	Lost-Tim	Group.	Lane No.	Row No.	Direction
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.8	2.720	0.080	3972	3	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	5.3	2.720	2.580	3972	3	5	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	Not Identified Dist.	4.7	2.963	1.738	3973	1	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	5	2.963	2.038	3973	1	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.3	2.963	0.338	3973	1	3	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	9.5	2.963	6.538	3973	2	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.3	2.963	0.338	3973	2	5	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.4	2.260	0.140	3974	3	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.3	2.260	1.040	3974	3	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.6	2.535	0.065	3975	1	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.7	2.535	0.165	3975	1	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.7	2.535	0.165	3975	1	4	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.8	2.535	0.265	3975	1	5	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	Cell phone	4.1	2.535	1.565	3975	2	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.1	2.535	0.565	3975	2	3	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	4	2.535	1.465	3975	2	4	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.6	2.535	0.065	3975	2	6	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3	2.535	0.465	3975	3	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	Eating/ Drinking	2.6	2.535	0.065	3975	3	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.9	2.535	0.365	3975	3	3	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	4.4	2.406	1.994	3976	2	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	Cell phone	3.1	2.406	0.694	3976	2	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.6	2.406	0.194	3976	2	5	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.5	2.406	0.094	3976	2	9	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.2	2.406	0.794	3976	3	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	Passengers	4.2	2.406	1.794	3976	3	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.5	2.406	0.094	3976	3	3	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.7	2.406	0.294	3976	3	5	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.5	2.637	0.863	3977	1	1	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.9	2.637	0.263	3977	1	2	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	3.1	2.637	0.463	3977	1	3	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.8	2.637	0.163	3977	1	5	Through
6/25/2021	Cloudy	SR50 & John Young Pkwy	No Distraction	2.9	2.637	0.263	3977	1	6	Through

APPENDIX L: SAMPLE OF PEDESTIANS' DATA COLLECTED AT GEMIN &E PLAZA- (WEST APPROACH)

					Green Start			Time Peds. Started Crossing				Time Peds. Finished Crossing											
Int. No.	Distraction Cause	Age	Gender	Group	Hrs	Min	Sec	Hrs.	Min.	Sec.	Start up tim	Hrs2 ?	Min2 ?	Sec22	Cross. Time	Signal Time	Walking Speed	Direction	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End	Comments
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	7	18	46.483	7	18	47.284	0.801	7	19	3.720	16.436	27	4.3928	Toward	7:18:46.483	7:18:47.284	7:19:3.72		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	7	33	9.449	7	33	10.515	1.066	7	33	28.286	17.771	27	4.0628	Toward	7:33:9.449	7:33:10.515	7:33:28.286		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	7	36	23.683	7	36	25.483	1.8				34.517	27	2.09172	Toward	7:36:23.683	7:36:25.483	::		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	7	40	32.632	7	40	33.132	0.5	7	40	51.268	18.136	27	3.98103	Toward	7:40:32.632	7:40:33.132	7:40:51.268		
I09-Gemini&E Plaza-PED W	Talking on a phone	Young	Male	Alone	7	45	34.884	7	45	36.217	1.333	7	45	52.653	16.436	27	4.3928	Toward	7:45:34.884	7:45:36.217	7:45:52.653		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	7	56	10.431	7	56	10.998	0.567	7	56	31.501	20.503	27	3.52144	Toward	7:56:10.431	7:56:10.998	7:56:31.501		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	9	6.074	8	9	7.108	1.034	8	9	24.177	17.069	27	4.22989	Toward	8:9:6.074	8:9:7.108	8:9:24.177		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	13	49.989	8	13	50.99	1.001	8	14	11.726	20.736	27	3.48187	Toward	8:13:49.989	8:13:50.99	8:14:11.726		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	18	30.938	8	18	31.671	0.733	8	18	48.874	17.203	27	4.19694	Toward	8:18:30.938	8:18:31.671	8:18:48.874		
I09-Gemini&E Plaza-PED W	Looking away	Young	Male	Alone	8	19	36.982	8	19	39.949	2.967	8	19	58.836	18.887	27	3.82274	Toward	8:19:36.982	8:19:39.949	8:19:58.836		checking around
I09-Gemini&E Plaza-PED W	Looking away	Young	Male	Alone	8	19	36.982	8	19	40.649	3.667	8	19	56.018	15.369	27	4.69777	Away	8:19:36.982	8:19:40.649	8:19:56.018		checking around
I09-Gemini&E Plaza-PED W	Looking away	Young	Female	Alone	8	21	57.924	8	22	0.124	2.2	8	22	16.128	16.004	27	4.51137	Toward	8:21:57.924	8:22:0.124	8:22:16.128		checking around
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	24	19.615	8	24	20.415	0.8	8	24	38.284	17.869	27	4.04052	Toward	8:24:19.615	8:24:20.415	8:24:38.284		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	26	1.532	8	26	2.799	1.267	8	26	21.836	19.037	27	3.79261	Toward	8:26:1.532	8:26:2.799	8:26:21.836		
I09-Gemini&E Plaza-PED W	Looking away	Young	Female	Alone	8	28	20.032	8	28	22.765	2.733	8	28	40.268	17.503	27	4.12501	Toward	8:28:20.032	8:28:22.765	8:28:40.268		
I09-Gemini&E Plaza-PED W	Texting	Young	Female	Alone	8	29	26.077	8	29	31.11	5.033	8	29	45.847	14.737	27	4.89923	Toward	8:29:26.077	8:29:31.11	8:29:45.847		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	32	59.38	8	33	0.113	0.733	8	33	14.582	14.469	27	4.98998	Toward	8:32:59.38	8:33:0.113	8:33:14.582		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	32	59.38	8	33	1.313	1.933	8	33	17.916	16.603	27	4.34861	Toward	8:32:59.38	8:33:1.313	8:33:17.916		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	35	1.034	8	35	2.067	1.033	8	35	19.470	17.403	27	4.14871	Toward	8:35:1.034	8:35:2.067	8:35:19.47		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	35	1.034	8	35	2.067	1.033	8	35	21.137	19.070	27	3.78605	Toward	8:35:1.034	8:35:2.067	8:35:21.137		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	35	2.034	8	35	3.701	1.667	8	35	22.371	18.670	27	3.86717	Toward	8:35:2.034	8:35:3.701	8:35:22.371		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	35	59.744	8	36	1.411	1.667	8	36	18.847	17.436	27	4.14086	Toward	8:35:59.744	8:36:1.411	8:36:18.847		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Same-age group	8	35	59.744	8	36	1.21	1.466	8	36	19.248	18.038	27	4.00266	Toward	8:35:59.744	8:36:1.21	8:36:19.248		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Same-age group	8	35	59.744	8	36	1.21	1.466	8	36	19.248	18.038	27	4.00266	Toward	8:35:59.744	8:36:1.21	8:36:19.248		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	40	54.294	8	44	55.161	0.867	8	41	7.396	12.235	27	5.9011	Toward	8:40:54.294	8:44:55.161	8:41:7.396		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	40	54.294	8	40	55.494	1.2	8	41	14.132	18.638	27	3.87381	Toward	8:40:54.294	8:40:55.494	8:41:14.132		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	40	54.294	8	40	55.494	1.2	8	41	14.964	19.470	27	3.70827	Toward	8:40:54.294	8:40:55.494	8:41:14.964		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	40	54.294	8	40	55.494	1.2	8	41	15.498	20.004	27	3.60928	Toward	8:40:54.294	8:40:55.494	8:41:15.498		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	40	54.294	8	40	55.694	1.4	8	41	12.330	16.636	27	4.33999	Toward	8:40:54.294	8:40:55.694	8:41:12.33		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	40	54.294	8	40	55.694	1.4	8	41	17.199	21.505	27	3.35736	Toward	8:40:54.294	8:40:55.694	8:41:17.199		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Male	Alone	8	40	54.294	8	40	55.694	1.4	8	41	17.698	22.004	27	3.28122	Toward	8:40:54.294	8:40:55.694	8:41:17.698		
I09-Gemini&E Plaza-PED W	Texting	Young	Male	Alone	8	42	4.373	8	42	7.24	2.867	8	42	21.609	14.369	27	5.02471	Toward	8:42:4.373	8:42:7.24	8:42:21.609		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	42	4.373	8	42	5.94	1.567	8	42	24.243	18.303	27	3.94471	Toward	8:42:4.373	8:42:5.94	8:42:24.243		
I09-Gemini&E Plaza-PED W	Texting	Young	Male	Alone	8	42	59.716	8	43	4.17	4.454	8	43	23.174	19.004	27	3.7992	Toward	8:42:59.716	8:43:4.17	8:43:23.174		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	42	59.616	8	43	0.949	1.333	8	43	17.339	16.390	27	4.40513	Toward	8:42:59.616	8:43:0.949	8:43:17.339		
I09-Gemini&E Plaza-PED W	No Distraction	Young	Female	Alone	8	44	1.548	8	44	2.814	1.266	8	44	17.917	15.103	27	4.78051	Toward	8:44:1.548	8:44:2.814	8:44:17.917		

APPENDIX M: SAMPLE OF PEDESTIANS' DATA COLLECTED AT LK UNDERHILL RD. & WOODBURY RD.- (SOUTH APPROACH)

									Green Start			Time Peds. Started Crossing				Time Peds. Finished Crossing										
Analysis Date	Collection Date	Day	Weather	Int. No.	Distraction Cause	Age	Gender	Group	Hrs	Min	Sec	Hrs.	Min.	Sec.	Start up time	Hrs22	Min22	Sec22	Cross. Time	Signal Time	Walking Speed	Direction	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing
11/30/2021	4/14/2021	Wednesday	Sunny	I02-LkUndrhl&Wodbry-PED S	Smoking	Young	Male	Alone	13	34	23	13	34	26	3	13	34	39.000	13.000	27	4.71154		13:34:23	13:34:26	13:34:39
11/30/2021	4/14/2021	Wednesday	Sunny	I02-LkUndrhl&Wodbry-PED S	Looking away	Young	Male	Alone	16	38	29	16	38	34	5	16	38	40.000	6.000	27	10.2083		16:38:29	16:38:34	16:38:40
11/30/2021	4/14/2021	Wednesday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Female	Alone	17	31	34	17	31	36	2	17	31	49.000	13.000	27	4.71154		17:31:34	17:31:36	17:31:49
11/30/2021	4/14/2021	Wednesday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Female	Alone	18	19	15	18	19	17	2	18	19	30.000	13.000	27	4.71154		18:19:15	18:19:17	18:19:30
11/30/2021	4/14/2021	Wednesday	Sunny	I02-LkUndrhl&Wodbry-PED S	Texting	Young	Female	Alone	19	12	33	19	12	42	9	19	12	57.000	15.000	27	4.08333		19:12:33	19:12:42	19:12:57
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Female	Alone	12	40	39	12	40	40	1	12	40	57.000	17.000	27	3.60294		12:40:39	12:40:40	12:40:57
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Female	Alone	13	26	6	13	26	7	1	13	26	22.000	15.000	27	4.08333		13:26:6	13:26:7	13:26:22
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Female	Alone	16	2	59	16	3	1	2	16	3	9.000	8.000	27	7.65625		16:2:59	16:3:1	16:3:9
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	Other	Young	Male	Alone	17	31	39	17	31	48	9	17	31	54.000	6.000	27	10.2083		17:31:39	17:31:48	17:31:54
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Male	Alone	18	5	22	18	5	23	1	18	5	37.000	14.000	27	4.375		18:5:22	18:5:23	18:5:37
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Male	Alone	18	5	22	18	5	23	1	18	5	37.000	14.000	27	4.375		18:5:22	18:5:23	18:5:37
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Male	Alone	18	41	30	18	41	31	1	18	41	47.000	16.000	27	3.82813		18:41:30	18:41:31	18:41:47
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	No Distraction	Young	Male	Alone	18	41	30	18	41	31	1	18	41	47.000	16.000	27	3.82813		18:41:30	18:41:31	18:41:47
11/30/2021	4/15/2021	Thursday	Sunny	I02-LkUndrhl&Wodbry-PED S	Texting	Young	Male	Alone	18	52	36	18	52	39	3	18	52	54.000	15.000	27	4.08333		18:52:36	18:52:39	18:52:54

APPENDIX N: SAMPLE OF PEDESTIANS' DATA COLLECTED AT SR482 & OBT- (NORTH & WEST APPROACH)

					Green Start			Time Peds. Started Crossing				Time Peds. Finished Crossing											
Int. No.	Distraction Cause	Age	Gender	Group	Hrs	Min	Sec	Hrs.	Min.	Sec.	Start up tim	Hrs2 ?	Min2 ?	Sec22	Cross. Time	Signal Time	Walking Speed	Direction	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End	Comments
I08-SR482&OBT-PED W	Not Identified Dist.	Young	Female	Alone	11	24	6.201	11	24	9.701	3.5	11	24	39.106	29.405	45	4.56453		11:24:6.201	11:24:9.701	11:24:39.106		
I08-SR482&OBT-PED W	Not Identified Dist.	Young	Male	Alone	11	59	13.884	11	59	16.718	2.834	11	59	43.223	26.505	45	5.06395		11:59:13.884	11:59:16.718	11:59:43.223		
I08-SR482&OBT-PED W	Talking on a phone	Young	Male	Alone	13	15	30.521				45					45			13:15:30.521	::	::		missed the cycle bc talking
I08-SR482&OBT-PED W	No Distraction	Young	Male	Alone	13	33	6.744	13	33	8.278	1.534	13	33	35.116	26.838	45	5.00112		13:33:6.744	13:33:8.278	13:33:35.116		
I08-SR482&OBT-PED W	No Distraction	Young	Female	Alone	13	33	6.744	13	33	8.278	1.534	13	33	35.116	26.838	45	5.00112		13:33:6.744	13:33:8.278	13:33:35.116		
I08-SR482&OBT-PED W	Looking away	Young	Male	Alone	13	38	58.487	13	39	1.454	2.967	13	39	27.326	25.872	45	5.18785		13:38:58.487	13:39:1.454	13:39:27.326		
I08-SR482&OBT-PED W	No Distraction	Young	Female	Alone	13	41	54.418	13	41	55.985	1.567	13	42	22.023	26.038	45	5.15477		13:41:54.418	13:41:55.985	13:42:22.023		
I08-SR482&OBT-PED W	No Distraction	Young	Male	Alone	13	41	54.418	13	41	55.985	1.567	13	42	22.023	26.038	45	5.15477		13:41:54.418	13:41:55.985	13:42:22.023		
I07-SR482&OBT-PED N	Looking away	Young	Female	Mixed-age group	8	40	48.47	8	40	50.95	2.48	8	41	24.072	33.122	48	3.73287		8:40:48.47	8:40:50.95	8:41:24.072		
I07-SR482&OBT-PED N	Looking away	Young	Female	Mixed-age group	8	40	48.47	8	40	50.95	2.48	8	41	24.072	33.122	48	3.73287		8:40:48.47	8:40:50.95	8:41:24.072		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	10	14	9.003	10	14	9.803	0.8	10	14	39.964	30.161	48	4.09933		10:14:9.003	10:14:9.803	10:14:39.964		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	10	35	38.987	10	35	39.907	0.92	10	36	9.707	29.800	48	4.14899		10:35:38.987	10:35:39.907	10:36:9.707		
I07-SR482&OBT-PED N	Talking to others	Young	Male	Same-age group	10	40	49.052	10	40	51.972	2.92	10	41	21.054	29.082	48	4.25143		10:40:49.052	10:40:51.972	10:41:21.054		
I07-SR482&OBT-PED N	Talking to others	Young	Male	Same-age group	10	40	49.052	10	40	51.972	2.92	10	41	21.054	29.082	48	4.25143		10:40:49.052	10:40:51.972	10:41:21.054		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	10	43	38.858	10	43	40.298	1.44	10	44	7.538	27.240	48	4.53891		10:43:38.858	10:43:40.298	10:44:7.538		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	10	43	38.858	10	43	40.298	1.44	10	44	7.538	27.240	48	4.53891		10:43:38.858	10:43:40.298	10:44:7.538		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	11	42	19.086	11	42	20.487	1.401	11	43	2.047	41.560	48	2.97498		11:42:19.086	11:42:20.487	11:43:2.047		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	12	6	19.019	12	6	21.069	2.05	12	6	40.954	19.885	48	6.21775		12:6:19.019	12:6:21.069	12:6:40.954		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	12	16	59.201	12	17	0.401	1.2	12	17	18.961	18.560	48	6.66164		12:16:59.201	12:17:0.401	12:17:18.961		running
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	14	14	19.405	14	14	20.165	0.76	14	14	43.927	23.762	48	5.20327		14:14:19.405	14:14:20.165	14:14:43.927		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	14	22	47.86	14	22	48.86	1	14	23	16.140	27.280	48	4.53226		14:22:47.86	14:22:48.86	14:23:16.14		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	14	22	47.86	14	22	48.86	1	14	23	16.140	27.280	48	4.53226		14:22:47.86	14:22:48.86	14:23:16.14		
I07-SR482&OBT-PED N	Smoking	Young	Male	Alone	14	27	39.308	14	27	43.668	4.36	14	28	16.908	33.240	48	3.71961		14:27:39.308	14:27:43.668	14:28:16.908		
I07-SR482&OBT-PED N	Smoking	Young	Male	Alone	15	20	59.558	15	21	1.078	1.52	15	21	50.239	49.161	48	2.515		15:20:59.558	15:21:1.078	15:21:50.239		
I07-SR482&OBT-PED N	Looking away	Young	Male	Alone	15	52	59.512	15	53	1.632	2.12	15	53	27.832	26.200	48	4.71908		15:52:59.512	15:53:1.632	15:53:27.832		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	16	14	19.597	16	14	20.917	1.32	16	14	57.119	36.202	48	3.41528		16:14:19.597	16:14:20.917	16:14:57.119		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	16	30	19.801	16	30	20.481	0.68	16	30	53.442	32.961	48	3.7511		16:30:19.801	16:30:20.481	16:30:53.442		
I07-SR482&OBT-PED N	No Distraction	Young	Male	Alone	16	38	20.91	16	38	21.91	1	16	38	57.111	35.201	48	3.5124		16:38:20.91	16:38:21.91	16:38:57.111		
I07-SR482&OBT-PED N	Looking away	Young	Female	Alone	17	26	19.92	17	26	23.48	3.56	17	26	50.201	26.721	48	4.62707		17:26:19.92	17:26:23.48	17:26:50.201		
I07-SR482&OBT-PED N	Texting	Young	Female	Alone	17	26	19.92	17	26	23.76	3.84	17	26	58.801	35.041	48	3.52844		17:26:19.92	17:26:23.76	17:26:58.801		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	8	25	2.34	8	25	3.78	1.44	8	25	36.260	32.480	48	3.80665		8:25:2.34	8:25:3.78	8:25:36.26		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	8	43	42.778	8	43	43.378	0.6	8	44	9.898	26.520	48	4.66214		8:43:42.778	8:43:43.378	8:44:9.898		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	8	57	2.8	8	57	4.601	1.801	8	57	33.521	28.920	48	4.27524		8:57:2.8	8:57:4.601	8:57:33.521		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	9	16	34.468	9	16	35.428	0.96	9	17	4.188	28.760	48	4.29903		9:16:34.468	9:16:35.428	9:17:4.188		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	10	9	20.532	10	9	21.452	0.92	10	9	45.014	23.562	48	5.24743		10:9:20.532	10:9:21.452	10:9:45.014		
I07-SR482&OBT-PED N	No Distraction	Young	Female	Alone	11	37	12.216	11	37	13.296	1.08	11	37	44.973	31.677	48	3.90315		11:37:12.216	11:37:13.296	11:37:44.973		

APPENDIX O: SAMPLE OF PEDESTIANS' DATA COLLECTED AT I-DRIVE & JAMAICAN CT.- (NORTH & SOUTH APPROACH)

							Green Start			Time Peds. Started Crossing				Time Peds. Finished Crossing									
Collection Date	Weather	Int. No.	Distraction Cause	Age	Gender	Group	Hrs	Min	Sec	Hrs	Min	Sec.	Start up tii	Hrs2	Min	Sec22	Cross. Tim	Signal Ti	Walking Spee	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Comments
9/22/2021	Sunny	I12-iDrive&Jamaican Ct. PED S	No Distraction	Young	Female	Alone	16	28	45.36	16	28	46.42	1.07	16	28	58.157	11.735	43	5.221133	16:28:45.355	16:28:46.422	16:28:58.157	signal time same as North
9/22/2021	Sunny	I12-iDrive&Jamaican Ct. PED S	No Distraction	Young	Male	Alone	18	31	3.682	18	31	4.883	1.2	18	31	19.352	14.469	43	4.23457	18:31:3.682	18:31:4.883	18:31:19.352	
9/22/2021	Sunny	I12-iDrive&Jamaican Ct. PED S	No Distraction	Young	Male	Same-age group	19	6	3.575	19	6	4.509	0.93	19	6	18.044	13.535	43	4.526782	19:6:3.575	19:6:4.509	19:6:18.044	
9/22/2021	Sunny	I12-iDrive&Jamaican Ct. PED S	No Distraction	Young	Male	Same-age group	19	6	3.575	19	6	4.509	0.93	19	6	18.044	13.535	43	4.526782	19:6:3.575	19:6:4.509	19:6:18.044	
9/22/2021	Rainy	I12-iDrive&Jamaican Ct. PED S	Looking away	Young	Male	Same-age group	19	8	26.43	19	8	40.7	14.3	19	8	50.502	9.800	43	6.252041	19:8:26.433	19:8:40.702	19:8:50.502	run
9/22/2021	Rainy	I12-iDrive&Jamaican Ct. PED S	Looking away	Young	Male	Same-age group	19	8	26.43	19	8	40.7	14.3	19	8	50.502	9.800	43	6.252041	19:8:26.433	19:8:40.702	19:8:50.502	run
9/22/2021	Rainy	I11-iDrive&Jamaican Ct. PED W	Looking away	Young	Male	Alone	19	51	29.74	19	51	31.48	1.73	19	51	48.812	17.336	32	4.933087	19:51:29.742	19:51:31.476	19:51:48.812	
9/22/2021	Rainy	I11-iDrive&Jamaican Ct. PED W	Looking away	Old	Male	Alone	19	54	0.235	19	54	1.568	1.33	19	54	20.238	18.670	32	4.580611	19:54:0.235	19:54:1.568	19:54:20.238	
9/22/2021	Rainy	I12-iDrive&Jamaican Ct. PED S	Talking to others	Young	Male	Same-age group	20	11	26.28	20	11	28.35	2.07	20	11	39.616	11.268	43	5.437522	20:11:26.281	20:11:28.348	20:11:39.616	
9/22/2021	Rainy	I12-iDrive&Jamaican Ct. PED S	Talking to others	Young	Female	Same-age group	20	11	26.28	20	11	28.35	2.07	20	11	39.616	11.268	43	5.437522	20:11:26.281	20:11:28.348	20:11:39.616	video isn't clear due to rain
9/22/2021	Clear	I12-iDrive&Jamaican Ct. PED S	No Distraction	Young	Male	Same-age group	21	40	35.73	21	40	36.6	0.87	21	41	2.737	26.138	43	2.344097	21:40:35.732	21:40:36.599	21:41:2.737	
9/22/2021	Clear	I12-iDrive&Jamaican Ct. PED S	Talking to others	Young	Female	Same-age group	21	40	35.73	21	40	39.53	3.8	21	41	2.737	23.204	43	2.640493	21:40:35.732	21:40:39.533	21:41:2.737	
9/22/2021	Clear	I12-iDrive&Jamaican Ct. PED S	Talking to others	Young	Female	Same-age group	21	40	35.73	21	40	39.53	3.8	21	41	2.737	23.204	43	2.640493	21:40:35.732	21:40:39.533	21:41:2.737	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Mixed-age group	16	22	58.02	16	22	58.69	0.67	16	23	9.958	11.268	43	4.602414	16:22:58.023	16:22:58.69	16:23:9.958	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Mixed-age group	16	22	58.02	16	22	58.69	0.67	16	23	9.958	11.268	43	4.602414	16:22:58.023	16:22:58.69	16:23:9.958	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Toward	No Distraction	Young	Female	Same-age group	16	58	57.79	16	58	57.99	0.2	16	59	11.263	13.269	43	3.496872	16:58:57.793	16:58:57.994	16:59:11.263	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Toward	Looking away	Young	Male	Same-age group	16	58	57.79	16	58	59.86	2.07	16	59	11.263	11.401	43	4.069818	16:58:57.793	16:58:59.862	16:59:11.263	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Old	Female	Alone	17	7	58.02	17	7	59.15	1.13	17	8	14.111	14.958	43	3.467041	17:7:58.021	17:7:59.153	17:8:14.111	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Talking on a phone	Young	Male	Alone	17	59	0.248	17	59	3.116	2.87	17	59	15.518	12.402	43	4.181584	17:59:0.248	17:59:3.116	17:59:15.518	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Talking to others	Young	Male	Same-age group	18	23	0.295	18	23	1.629	1.33	18	23	17.432	15.803	43	3.281655	18:23:0.295	18:23:1.629	18:23:17.432	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Talking to others	Young	Male	Same-age group	18	23	0.295	18	23	1.629	1.33	18	23	17.432	15.803	43	3.281655	18:23:0.295	18:23:1.629	18:23:17.432	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Toward	Texting	Young	Male	Alone	18	52	19.26	18	52	26.73	7.47	18	52	38.601	11.869	43	3.909344	18:52:19.264	18:52:26.732	18:52:38.601	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Same-age group	18	59	18.87	18	59	19.34	0.47	18	59	30.005	10.668	43	4.861267	18:59:18.87	18:59:19.337	18:59:30.005	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Same-age group	18	59	18.87	18	59	19.34	0.47	18	59	30.005	10.668	43	4.861267	18:59:18.87	18:59:19.337	18:59:30.005	
9/22/2021	Rainy	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Same-age group	19	27	19.09	19	27	20.03	0.93	19	27	32.027	12.002	43	4.320947	19:27:19.092	19:27:20.025	19:27:32.027	
9/22/2021	Rainy	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Same-age group	19	27	19.09	19	27	20.03	0.93	19	27	32.027	12.002	43	4.320947	19:27:19.092	19:27:20.025	19:27:32.027	
9/22/2021	Rainy	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Same-age group	19	41	19.1	19	41	19.77	0.67	19	41	32.705	12.936	43	4.008967	19:41:19.103	19:41:19.769	19:41:32.705	
9/22/2021	Rainy	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Same-age group	19	41	19.1	19	41	19.77	0.67	19	41	32.705	12.936	43	4.008967	19:41:19.103	19:41:19.769	19:41:32.705	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Old	Female	Mixed-age group	19	45	59.15	19	46	1.951	2.8	19	46	15.153	13.202	43	3.928193	19:45:59.151	19:46:1.951	19:46:15.153	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Male	Mixed-age group	19	45	59.15	19	46	1.951	2.8	19	46	15.153	13.202	43	3.928193	19:45:59.151	19:46:1.951	19:46:15.153	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Old	Female	Same-age group	20	16	17.21	20	16	18.01	0.8	20	16	32.212	14.202	43	3.651598	20:16:17.209	20:16:18.01	20:16:32.212	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Old	Male	Same-age group	20	16	17.21	20	16	18.01	0.8	20	16	32.212	14.202	43	3.651598	20:16:17.209	20:16:18.01	20:16:32.212	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Same-age group	20	16	17.21	20	16	18.81	1.6	20	16	33.812	15.002	43	3.456872	20:16:17.209	20:16:18.81	20:16:33.812	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Same-age group	20	16	17.21	20	16	18.81	1.6	20	16	35.212	16.402	43	3.16181	20:16:17.209	20:16:18.81	20:16:35.212	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Alone	20	23	16.62	20	23	17.62	1	20	23	29.284	11.669	43	4.444254	20:23:16.615	20:23:17.615	20:23:29.284	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Male	Mixed-age group	20	30	8.286	20	30	11.42	3.13	20	30	22.555	11.136	43	4.656968	20:30:8.286	20:30:11.419	20:30:22.555	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Female	Mixed-age group	20	30	8.286	20	30	10.42	2.13	20	30	22.555	12.136	43	4.273237	20:30:8.286	20:30:10.419	20:30:22.555	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Male	Mixed-age group	20	30	8.286	20	30	10.42	2.13	20	30	22.555	12.136	43	4.273237	20:30:8.286	20:30:10.419	20:30:22.555	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Female	Mixed-age group	20	30	8.286	20	30	10.42	2.13	20	30	22.555	12.136	43	4.273237	20:30:8.286	20:30:10.419	20:30:22.555	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Mixed-age group	20	47	41	20	47	42.87	1.87	20	47	55.002	12.135	43	4.273589	20:47:41	20:47:42.867	20:47:55.002	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Mixed-age group	20	47	41	20	47	42.87	1.87	20	47	52.335	9.468	43	5.477398	20:47:41	20:47:42.867	20:47:52.335	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Male	Mixed-age group	20	47	41	20	47	42.87	1.87	20	47	55.002	12.135	43	4.273589	20:47:41	20:47:42.867	20:47:55.002	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	No Distraction	Young	Female	Mixed-age group	20	47	41	20	47	42.87	1.87	20	47	53.335	10.468	43	4.954146	20:47:41	20:47:42.867	20:47:53.335	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Female	Mixed-age group	20	57	53.31	20	57	57.11	3.8	20	57	8.307	11.201	43	4.629944	20:57:53.305	20:57:57.106	20:57:8.307	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Looking away	Young	Female	Mixed-age group	20	57	53.31	20	57	57.11	3.8	20	57	8.307	11.201	43	4.629944	20:57:53.305	20:57:57.106	20:57:8.307	
9/22/2021	Clear	I10-iDrive&Jamaican Ct. PED N-Away	Talking to others	Young	Female	Same-age group	21	3	50.9	21	3	54.1	3.2	21	3	10.437	16.336	43	3.174584	21:3:50.899	21:3:54.101	21:3:10.437	

APPENDIX P: SAMPLE OF DRIVER'S DATA EXTRACTED AT NARCOOSSEE RD. & LEE VISTA BLVD. (LEFT MOVEMENT)

```
Intersection: Lee Vista
Number of lanes: 1
Recording date and time: Tuesday, January 11, 2022  07:00:00 AM
Number of green cycles: 23

Green cycle 1: 07:01:45.910 - 07:02:21.844, length: 35.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:01:45.910, 07:01:47.744,   1.833,   1,   1,   1
07:01:45.910, 07:01:51.077,   3.333,   1,   1,   2
07:01:45.910, 07:01:52.744,   1.667,   1,   1,   3
07:01:45.910, 07:02:18.677,  25.933,   1,   1,   4
Total cars in green cycle: 4

Green cycle 2: 07:04:25.977 - 07:05:01.877, length: 35.9 s., time between cycles: 160.1 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:04:25.977, 07:04:29.377,   3.400,   2,   1,   1
07:04:25.977, 07:04:32.977,   3.600,   2,   1,   2
07:04:25.977, 07:04:34.944,   1.967,   2,   1,   3
07:04:25.977, 07:04:36.777,   1.833,   2,   1,   4
07:04:25.977, 07:04:38.477,   1.700,   2,   1,   5
07:04:25.977, 07:04:41.544,   3.067,   2,   1,   6
07:04:25.977, 07:04:44.544,   3.000,   2,   1,   7
07:04:25.977, 07:04:45.877,   1.333,   2,   1,   8
07:04:25.977, 07:04:47.610,   1.733,   2,   1,   9
07:04:25.977, 07:04:48.944,   1.333,   2,   1,  10
Total cars in green cycle: 10

Green cycle 3: 07:07:06.010 - 07:07:41.877, length: 35.9 s., time between cycles: 160.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:07:06.010, 07:07:10.977,   4.967,   3,   1,   1
07:07:06.010, 07:07:14.277,   3.300,   3,   1,   2
07:07:06.010, 07:07:16.510,   2.233,   3,   1,   3
07:07:06.010, 07:07:19.110,   2.600,   3,   1,   4
07:07:06.010, 07:07:21.277,   2.167,   3,   1,   5
07:07:06.010, 07:07:23.744,   2.467,   3,   1,   6
07:07:06.010, 07:07:26.344,   2.600,   3,   1,   7
07:07:06.010, 07:07:27.877,   1.533,   3,   1,   8
07:07:06.010, 07:07:29.310,   1.433,   3,   1,   9
Total cars in green cycle: 9
```

```
Green cycle 4: 07:09:48.477 - 07:10:24.377, length: 35.9 s., time between cycles: 162.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:09:48.477, 07:09:50.744,   2.267,   4,   1,   1
07:09:48.477, 07:09:53.510,   2.767,   4,   1,   2
07:09:48.477, 07:09:56.210,   2.700,   4,   1,   3
07:09:48.477, 07:09:58.644,   2.433,   4,   1,   4
07:09:48.477, 07:10:01.710,   3.067,   4,   1,   5
07:09:48.477, 07:10:02.944,   1.233,   4,   1,   6
07:09:48.477, 07:10:05.344,   2.400,   4,   1,   7
07:09:48.477, 07:10:06.610,   1.267,   4,   1,   8
07:09:48.477, 07:10:09.610,   3.000,   4,   1,   9
Total cars in green cycle: 9

Green cycle 5: 07:12:45.644 - 07:13:21.577, length: 35.9 s., time between cycles: 177.2 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:12:45.644, 07:12:48.510,   2.867,   5,   1,   1
07:12:45.644, 07:12:54.577,   6.067,   5,   1,   2
07:12:45.644, 07:12:56.410,   1.833,   5,   1,   3
07:12:45.644, 07:12:58.644,   2.233,   5,   1,   4
07:12:45.644, 07:13:00.844,   2.200,   5,   1,   5
Total cars in green cycle: 5

Green cycle 6: 07:15:16.110 - 07:15:52.010, length: 35.9 s., time between cycles: 150.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:15:16.110, 07:15:19.877,   3.767,   6,   1,   1
07:15:16.110, 07:15:22.177,   2.300,   6,   1,   2
07:15:16.110, 07:15:24.977,   2.800,   6,   1,   3
07:15:16.110, 07:15:28.077,   3.100,   6,   1,   4
07:15:16.110, 07:15:30.910,   2.833,   6,   1,   5
07:15:16.110, 07:15:32.677,   1.767,   6,   1,   6
07:15:16.110, 07:15:33.844,   1.167,   6,   1,   7
Total cars in green cycle: 7

Green cycle 7: 07:17:46.544 - 07:18:22.377, length: 35.8 s., time between cycles: 150.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
07:17:46.544, 07:17:49.610,   3.067,   7,   1,   1
07:17:46.544, 07:17:52.710,   3.100,   7,   1,   2
07:17:46.544, 07:17:54.710,   2.000,   7,   1,   3
07:17:46.544, 07:17:57.177,   2.467,   7,   1,   4
07:17:46.544, 07:18:16.944,  19.767,   7,   1,   5
Total cars in green cycle: 5
```

APPENDIX Q: SAMPLE OF DRIVER'S DATA EXTRACTED AT SR436 & WILSHIRE DRV. (LEFT MOVEMENT)

```
Intersection: SR436 & Wilshire
Number of lanes: 1
Recording date and time: Friday, December 24, 2021  04:00:00 PM
Number of green cycles: 30

Green cycle 1: 16:02:11.012 - 16:02:36.679, length: 25.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:02:11.012, 16:02:20.079,   9.067,   1,   1,   1
16:02:11.012, 16:02:23.679,   3.600,   1,   1,   2
Total cars in green cycle: 2

Green cycle 2: 16:06:01.446 - 16:06:27.212, length: 25.8 s., time between cycles: 230.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:06:01.446, 16:06:08.946,   7.500,   2,   1,   1
16:06:01.446, 16:06:11.946,   3.000,   2,   1,   2
16:06:01.446, 16:06:16.879,   4.933,   2,   1,   3
Total cars in green cycle: 3

Green cycle 3: 16:09:54.312 - 16:10:15.846, length: 21.5 s., time between cycles: 232.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:09:54.312, 16:09:59.146,   4.833,   3,   1,   1
16:09:54.312, 16:10:02.479,   3.333,   3,   1,   2
16:09:54.312, 16:10:04.846,   2.367,   3,   1,   3
16:09:54.312, 16:10:07.512,   2.667,   3,   1,   4
16:09:54.312, 16:10:09.346,   1.833,   3,   1,   5
16:09:54.312, 16:10:11.512,   2.167,   3,   1,   6
Total cars in green cycle: 6

Green cycle 4: 16:13:42.946 - 16:14:06.612, length: 23.7 s., time between cycles: 228.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:13:42.946, 16:13:48.779,   5.833,   4,   1,   1
16:13:42.946, 16:13:52.112,   3.333,   4,   1,   2
16:13:42.946, 16:14:03.946,  11.833,   4,   1,   3
Total cars in green cycle: 3

Green cycle 5: 16:17:36.479 - 16:17:56.779, length: 20.3 s., time between cycles: 233.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:17:36.479, 16:17:40.979,   4.500,   5,   1,   1
16:17:36.479, 16:17:54.446,  13.467,   5,   1,   2
Total cars in green cycle: 2
```

```
Green cycle 6: 16:21:20.512 - 16:21:47.012, length: 26.5 s., time between cycles: 224.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:21:20.512, 16:21:29.279,   8.767,   6,   1,   1
16:21:20.512, 16:21:32.712,   3.433,   6,   1,   2
16:21:20.512, 16:21:35.012,   2.300,   6,   1,   3
Total cars in green cycle: 3

Green cycle 7: 16:25:11.379 - 16:25:36.212, length: 24.8 s., time between cycles: 230.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:25:11.379, 16:25:19.879,   8.500,   7,   1,   1
Total cars in green cycle: 1

Green cycle 8: 16:29:00.312 - 16:29:25.479, length: 25.2 s., time between cycles: 228.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:29:00.312, 16:29:08.979,   8.667,   8,   1,   1
16:29:00.312, 16:29:11.479,   2.500,   8,   1,   2
16:29:00.312, 16:29:14.979,   3.500,   8,   1,   3
16:29:00.312, 16:29:19.146,   4.167,   8,   1,   4
Total cars in green cycle: 4

Green cycle 9: 16:32:55.346 - 16:33:15.679, length: 20.3 s., time between cycles: 235.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:32:55.346, 16:32:59.512,   4.167,   9,   1,   1
16:32:55.346, 16:33:02.179,   2.667,   9,   1,   2
16:32:55.346, 16:33:04.679,   2.500,   9,   1,   3
Total cars in green cycle: 3

Green cycle 10: 16:36:44.146 - 16:37:06.312, length: 22.2 s., time between cycles: 228.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:36:44.146, 16:36:49.312,   5.167,  10,   1,   1
Total cars in green cycle: 1

Green cycle 11: 16:40:35.912 - 16:40:55.479, length: 19.6 s., time between cycles: 231.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:40:35.912, 16:40:38.912,   3.000,  11,   1,   1
16:40:35.912, 16:40:42.812,   3.900,  11,   1,   2
Total cars in green cycle: 2
```

```
Green cycle 12: 16:44:30.112 - 16:44:48.746, length: 18.6 s., time between cycles: 234.2 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:44:30.112, 16:44:33.579,   3.467,  12,   1,   1
16:44:30.112, 16:44:46.746,  13.167,  12,   1,   2
Total cars in green cycle: 2

Green cycle 13: 16:48:15.746 - 16:48:36.246, length: 20.5 s., time between cycles: 225.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:48:15.746, 16:48:21.246,   5.500,  13,   1,   1
Total cars in green cycle: 1

Green cycle 14: 16:52:06.379 - 16:52:25.212, length: 18.8 s., time between cycles: 230.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:52:06.379, 16:52:09.879,   3.500,  14,   1,   1
16:52:06.379, 16:52:12.212,   2.333,  14,   1,   2
Total cars in green cycle: 2

Green cycle 15: 16:55:53.779 - 16:56:16.646, length: 22.9 s., time between cycles: 227.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:55:53.779, 16:55:57.612,   3.833,  15,   1,   1
16:55:53.779, 16:56:00.079,   2.467,  15,   1,   2
16:55:53.779, 16:56:03.646,   3.567,  15,   1,   3
Total cars in green cycle: 3

Green cycle 16: 16:59:43.346 - 17:00:06.179, length: 22.8 s., time between cycles: 229.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:59:43.346, 16:59:48.979,   5.633,  16,   1,   1
16:59:43.346, 16:59:53.046,   4.067,  16,   1,   2
16:59:43.346, 16:59:55.246,   2.200,  16,   1,   3
16:59:43.346, 16:59:57.179,   1.933,  16,   1,   4
Total cars in green cycle: 4

Green cycle 17: 17:03:34.346 - 17:03:55.846, length: 21.5 s., time between cycles: 231.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:03:34.346, 17:03:39.346,   5.000,  17,   1,   1
17:03:34.346, 17:03:42.846,   3.500,  17,   1,   2
Total cars in green cycle: 2
```

```
Green cycle 18: 17:07:23.379 - 17:07:45.812, length: 22.4 s., time between cycles: 229.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:07:23.379, 17:07:28.546,   5.167,  18,   1,   1
17:07:23.379, 17:07:33.812,   5.267,  18,   1,   2
Total cars in green cycle: 2

Green cycle 19: 17:11:15.412 - 17:11:34.979, length: 19.6 s., time between cycles: 232.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:11:15.412, 17:11:19.312,   3.900,  19,   1,   1
17:11:15.412, 17:11:21.746,   2.433,  19,   1,   2
17:11:15.412, 17:11:23.579,   1.833,  19,   1,   3
17:11:15.412, 17:11:27.979,   4.400,  19,   1,   4
Total cars in green cycle: 4

Green cycle 20: 17:15:01.446 - 17:15:24.712, length: 23.3 s., time between cycles: 226.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:15:01.446, 17:15:08.446,   7.000,  20,   1,   1
17:15:01.446, 17:15:11.312,   2.867,  20,   1,   2
17:15:01.446, 17:15:15.712,   4.400,  20,   1,   3
Total cars in green cycle: 3

Green cycle 21: 17:18:54.979 - 17:19:16.212, length: 21.2 s., time between cycles: 233.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:18:54.979, 17:18:59.479,   4.500,  21,   1,   1
17:18:54.979, 17:19:02.112,   2.633,  21,   1,   2
17:18:54.979, 17:19:05.646,   3.533,  21,   1,   3
17:18:54.979, 17:19:07.879,   2.233,  21,   1,   4
Total cars in green cycle: 4

Green cycle 22: 17:22:43.779 - 17:23:05.312, length: 21.5 s., time between cycles: 228.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:22:43.779, 17:22:48.479,   4.700,  22,   1,   1
17:22:43.779, 17:22:51.312,   2.833,  22,   1,   2
Total cars in green cycle: 2

Green cycle 23: 17:26:34.212 - 17:26:56.546, length: 22.3 s., time between cycles: 230.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:26:34.212, 17:26:38.579,   4.367,  23,   1,   1
17:26:34.212, 17:26:41.579,   3.000,  23,   1,   2
17:26:34.212, 17:26:44.212,   2.633,  23,   1,   3
Total cars in green cycle: 3
```

APPENDIX R: SAMPLE OF DRIVER'S DATA EXTRACTED AT I-DRIVE & JAMAICAN CT. (LEFT MOVEMENT)

```
Intersection: Idrive & Jamaican ct
Number of lanes: 1
Recording date and time: Friday, October 1, 2021  04:00:00 PM
Number of green cycles: 36

Green cycle 1: 16:02:56.482 - 16:03:14.249, length: 17.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:02:56.482, 16:03:01.615,   5.133,   1,   1,   1
16:02:56.482, 16:03:04.282,   2.667,   1,   1,   2
16:02:56.482, 16:03:07.249,   2.967,   1,   1,   3
Total cars in green cycle: 3

Green cycle 2: 16:08:57.649 - 16:09:13.115, length: 15.5 s., time between cycles: 361.2 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:08:57.649, 16:09:02.382,   4.733,   2,   1,   1
16:08:57.649, 16:09:05.115,   2.733,   2,   1,   2
Total cars in green cycle: 2

Green cycle 3: 16:11:32.482 - 16:11:48.815, length: 16.3 s., time between cycles: 154.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:11:32.482, 16:11:35.315,   2.833,   3,   1,   1
16:11:32.482, 16:11:38.482,   3.167,   3,   1,   2
16:11:32.482, 16:11:41.149,   2.667,   3,   1,   3
Total cars in green cycle: 3

Green cycle 4: 16:14:57.482 - 16:15:21.549, length: 24.1 s., time between cycles: 205.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:14:57.482, 16:15:01.549,   4.067,   4,   1,   1
16:14:57.482, 16:15:04.682,   3.133,   4,   1,   2
16:14:57.482, 16:15:08.549,   3.867,   4,   1,   3
16:14:57.482, 16:15:11.649,   3.100,   4,   1,   4
16:14:57.482, 16:15:13.882,   2.233,   4,   1,   5
Total cars in green cycle: 5

Green cycle 5: 16:20:39.882 - 16:21:04.115, length: 24.2 s., time between cycles: 342.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:20:39.882, 16:20:42.449,   2.567,   5,   1,   1
16:20:39.882, 16:20:47.782,   5.333,   5,   1,   2
16:20:39.882, 16:20:50.149,   2.367,   5,   1,   3
16:20:39.882, 16:20:52.682,   2.533,   5,   1,   4
16:20:39.882, 16:20:55.515,   2.833,   5,   1,   5
16:20:39.882, 16:21:01.115,   5.600,   5,   1,   6
Total cars in green cycle: 6
```

```
Green cycle 6: 16:23:29.615 - 16:23:41.449, length: 11.8 s., time between cycles: 169.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:23:29.615, 16:23:32.449,   2.833,   6,   1,   1
Total cars in green cycle: 1

Green cycle 7: 16:26:56.649 - 16:27:07.982, length: 11.3 s., time between cycles: 207.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:26:56.649, 16:26:59.649,   3.000,   7,   1,   1
Total cars in green cycle: 1

Green cycle 8: 16:29:30.849 - 16:29:47.349, length: 16.5 s., time between cycles: 154.2 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:29:30.849, 16:29:33.849,   3.000,   8,   1,   1
16:29:30.849, 16:29:36.682,   2.833,   8,   1,   2
16:29:30.849, 16:29:40.015,   3.333,   8,   1,   3
Total cars in green cycle: 3

Green cycle 9: 16:32:56.282 - 16:33:11.615, length: 15.3 s., time between cycles: 205.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:32:56.282, 16:32:59.015,   2.733,   9,   1,   1
16:32:56.282, 16:33:01.482,   2.467,   9,   1,   2
16:32:56.282, 16:33:04.282,   2.800,   9,   1,   3
Total cars in green cycle: 3

Green cycle 10: 16:38:56.082 - 16:39:13.082, length: 17.0 s., time between cycles: 359.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:38:56.082, 16:38:59.082,   3.000,  10,   1,   1
16:38:56.082, 16:39:01.882,   2.800,  10,   1,   2
16:38:56.082, 16:39:05.415,   3.533,  10,   1,   3
Total cars in green cycle: 3

Green cycle 11: 16:41:24.382 - 16:41:47.515, length: 23.1 s., time between cycles: 148.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:41:24.382, 16:41:27.249,   2.867,  11,   1,   1
16:41:24.382, 16:41:30.249,   3.000,  11,   1,   2
16:41:24.382, 16:41:33.215,   2.967,  11,   1,   3
16:41:24.382, 16:41:35.682,   2.467,  11,   1,   4
16:41:24.382, 16:41:40.515,   4.833,  11,   1,   5
Total cars in green cycle: 5
```

```
Green cycle 12: 16:44:57.682 - 16:45:18.949, length: 21.3 s., time between cycles: 213.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:44:57.682, 16:44:59.849,   2.167,  12,   1,   1
16:44:57.682, 16:45:02.082,   2.233,  12,   1,   2
16:44:57.682, 16:45:04.582,   2.500,  12,   1,   3
16:44:57.682, 16:45:07.349,   2.767,  12,   1,   4
16:44:57.682, 16:45:08.849,   1.500,  12,   1,   5
16:44:57.682, 16:45:11.182,   2.333,  12,   1,   6
16:44:57.682, 16:45:12.949,   1.767,  12,   1,   7
Total cars in green cycle: 7

Green cycle 13: 16:50:56.915 - 16:51:14.215, length: 17.3 s., time between cycles: 359.2 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:50:56.915, 16:50:59.249,   2.333,  13,   1,   1
16:50:56.915, 16:51:02.415,   3.167,  13,   1,   2
16:50:56.915, 16:51:05.449,   3.033,  13,   1,   3
16:50:56.915, 16:51:08.315,   2.867,  13,   1,   4
16:50:56.915, 16:51:11.215,   2.900,  13,   1,   5
Total cars in green cycle: 5

Green cycle 14: 16:53:55.915 - 16:54:11.449, length: 15.5 s., time between cycles: 179.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:53:55.915, 16:53:59.482,   3.567,  14,   1,   1
16:53:55.915, 16:54:02.782,   3.300,  14,   1,   2
Total cars in green cycle: 2

Green cycle 15: 16:59:56.049 - 17:00:16.382, length: 20.3 s., time between cycles: 360.1 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
16:59:56.049, 16:59:59.582,   3.533,  15,   1,   1
16:59:56.049, 17:00:02.949,   3.367,  15,   1,   2
16:59:56.049, 17:00:05.882,   2.933,  15,   1,   3
16:59:56.049, 17:00:07.749,   1.867,  15,   1,   4
16:59:56.049, 17:00:10.882,   3.133,  15,   1,   5
16:59:56.049, 17:00:12.715,   1.833,  15,   1,   6
Total cars in green cycle: 6

Green cycle 16: 17:02:22.382 - 17:02:48.482, length: 26.1 s., time between cycles: 146.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:02:22.382, 17:02:26.715,   4.333,  16,   1,   1
17:02:22.382, 17:02:28.949,   2.233,  16,   1,   2
17:02:22.382, 17:02:31.215,   2.267,  16,   1,   3
17:02:22.382, 17:02:35.149,   3.933,  16,   1,   4
17:02:22.382, 17:02:37.815,   2.667,  16,   1,   5
17:02:22.382, 17:02:40.815,   3.000,  16,   1,   6
Total cars in green cycle: 6
```

```
Green cycle 17: 17:05:41.982 - 17:05:58.715, length: 16.7 s., time between cycles: 199.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:05:41.982, 17:05:45.215,   3.233,  17,   1,   1
17:05:41.982, 17:05:47.882,   2.667,  17,   1,   2
17:05:41.982, 17:05:51.049,   3.167,  17,   1,   3
Total cars in green cycle: 3

Green cycle 18: 17:08:33.649 - 17:08:49.015, length: 15.4 s., time between cycles: 171.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:08:33.649, 17:08:36.982,   3.333,  18,   1,   1
17:08:33.649, 17:08:41.015,   4.033,  18,   1,   2
Total cars in green cycle: 2

Green cycle 19: 17:11:36.049 - 17:11:50.449, length: 14.4 s., time between cycles: 182.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:11:36.049, 17:11:39.082,   3.033,  19,   1,   1
17:11:36.049, 17:11:42.449,   3.367,  19,   1,   2
Total cars in green cycle: 2

Green cycle 20: 17:14:55.649 - 17:15:05.915, length: 10.3 s., time between cycles: 199.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:14:55.649, 17:14:57.915,   2.267,  20,   1,   1
Total cars in green cycle: 1

Green cycle 21: 17:17:55.415 - 17:18:12.882, length: 17.5 s., time between cycles: 179.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:17:55.415, 17:17:57.915,   2.500,  21,   1,   1
17:17:55.415, 17:18:02.249,   4.333,  21,   1,   2
17:17:55.415, 17:18:04.882,   2.633,  21,   1,   3
Total cars in green cycle: 3

Green cycle 22: 17:20:59.915 - 17:21:18.815, length: 18.9 s., time between cycles: 184.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:20:59.915, 17:21:02.749,   2.833,  22,   1,   1
17:20:59.915, 17:21:05.749,   3.000,  22,   1,   2
17:20:59.915, 17:21:08.482,   2.733,  22,   1,   3
Total cars in green cycle: 3

Green cycle 23: 17:23:57.715 - 17:24:11.049, length: 13.3 s., time between cycles: 177.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:23:57.715, 17:23:59.715,   2.000,  23,   1,   1
17:23:57.715, 17:24:03.049,   3.333,  23,   1,   2
Total cars in green cycle: 2
```

APPENDIX S: SAMPLE OF DRIVER'S DATA EXTRACTED AT SR482 & OBT (LEFT MOVEMENT)

```
Intersection: OBT & SR482
Number of lanes: 2
Recording date and time: Monday, January 24, 2022  06:00:00 PM
Number of green cycles: 20

Green cycle 1: 17:57:34.165 - 17:58:01.685, length: 27.5 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
17:57:34.165, 17:57:36.925,   2.760,   1,   1,   1
17:57:34.165, 17:57:39.845,   2.920,   1,   1,   2
17:57:34.165, 17:57:42.445,   2.600,   1,   1,   3
17:57:34.165, 17:57:46.885,   4.440,   1,   1,   4
17:57:34.165, 17:57:50.085,   3.200,   1,   1,   5
17:57:34.165, 17:57:51.765,   1.680,   1,   1,   6
17:57:34.165, 17:57:53.285,   1.520,   1,   1,   7
17:57:34.165, 17:57:55.365,   2.080,   1,   1,   8
17:57:34.165, 17:57:57.085,   1.720,   1,   1,   9
17:57:34.165, 17:57:36.285,   2.120,   1,   2,   1
17:57:34.165, 17:57:38.525,   2.240,   1,   2,   2
17:57:34.165, 17:57:42.565,   4.040,   1,   2,   3
17:57:34.165, 17:57:44.685,   2.120,   1,   2,   4
17:57:34.165, 17:57:46.205,   1.520,   1,   2,   5
17:57:34.165, 17:57:48.285,   2.080,   1,   2,   6
17:57:34.165, 17:57:50.565,   2.280,   1,   2,   7
17:57:34.165, 17:57:52.765,   2.200,   1,   2,   8
17:57:34.165, 17:57:54.685,   1.920,   1,   2,   9
17:57:34.165, 17:57:56.485,   1.800,   1,   2,  10
Total cars in green cycle: 19
```

```
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
18:03:23.125, 18:03:26.925,   3.800,   2,   1,   1
18:03:23.125, 18:03:30.005,   3.080,   2,   1,   2
18:03:23.125, 18:03:34.725,   4.720,   2,   1,   3
18:03:23.125, 18:03:36.845,   2.120,   2,   1,   4
18:03:23.125, 18:03:38.725,   1.880,   2,   1,   5
18:03:23.125, 18:03:40.125,   1.400,   2,   1,   6
18:03:23.125, 18:03:42.405,   2.280,   2,   1,   7
18:03:23.125, 18:03:45.605,   3.200,   2,   1,   8
18:03:23.125, 18:03:48.165,   2.560,   2,   1,   9
18:03:23.125, 18:03:26.605,   3.480,   2,   2,   1
18:03:23.125, 18:03:29.605,   3.000,   2,   2,   2
18:03:23.125, 18:03:32.325,   2.720,   2,   2,   3
18:03:23.125, 18:03:33.725,   1.400,   2,   2,   4
18:03:23.125, 18:03:35.645,   1.920,   2,   2,   5
18:03:23.125, 18:03:37.445,   1.800,   2,   2,   6
18:03:23.125, 18:03:39.125,   1.680,   2,   2,   7
18:03:23.125, 18:03:40.925,   1.800,   2,   2,   8
18:03:23.125, 18:03:42.685,   1.760,   2,   2,   9
18:03:23.125, 18:03:45.805,   3.120,   2,   2,  10
18:03:23.125, 18:03:47.405,   1.600,   2,   2,  11
18:03:23.125, 18:03:49.045,   1.640,   2,   2,  12
18:03:23.125, 18:03:50.365,   1.320,   2,   2,  13
18:03:23.125, 18:03:52.765,   2.400,   2,   2,  14
Total cars in green cycle: 23

Green cycle 3: 18:09:27.685 - 18:09:43.605, length: 15.9 s., time between cycles: 364.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
18:09:27.685, 18:09:31.525,   3.840,   3,   1,   1
18:09:27.685, 18:09:33.245,   1.720,   3,   1,   2
18:09:27.685, 18:09:35.685,   2.440,   3,   1,   3
18:09:27.685, 18:09:37.805,   2.120,   3,   1,   4
18:09:27.685, 18:09:39.365,   1.560,   3,   1,   5
18:09:27.685, 18:09:42.085,   2.720,   3,   1,   6
18:09:27.685, 18:09:43.005,   0.920,   3,   1,   7
18:09:27.685, 18:09:32.645,   4.960,   3,   2,   1
18:09:27.685, 18:09:35.285,   2.640,   3,   2,   2
18:09:27.685, 18:09:37.085,   1.800,   3,   2,   3
18:09:27.685, 18:09:38.845,   1.760,   3,   2,   4
18:09:27.685, 18:09:40.525,   1.680,   3,   2,   5
18:09:27.685, 18:09:42.445,   1.920,   3,   2,   6
Total cars in green cycle: 13
```

```
Green cycle 4: 18:15:07.045 - 18:15:35.085, length: 28.0 s., time between cycles: 339.4 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
18:15:07.045, 18:15:14.645,   7.600,   4,   1,   1
18:15:07.045, 18:15:20.365,   5.720,   4,   1,   2
18:15:07.045, 18:15:23.005,   2.640,   4,   1,   3
18:15:07.045, 18:15:25.085,   2.080,   4,   1,   4
18:15:07.045, 18:15:11.845,   4.800,   4,   2,   1
18:15:07.045, 18:15:14.245,   2.400,   4,   2,   2
18:15:07.045, 18:15:16.765,   2.520,   4,   2,   3
18:15:07.045, 18:15:20.885,   4.120,   4,   2,   4
18:15:07.045, 18:15:23.205,   2.320,   4,   2,   5
Total cars in green cycle: 9

Green cycle 5: 18:18:02.725 - 18:18:31.525, length: 28.8 s., time between cycles: 175.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
18:18:02.725, 18:18:05.965,   3.240,   5,   1,   1
18:18:02.725, 18:18:08.325,   2.360,   5,   1,   2
18:18:02.725, 18:18:12.205,   3.880,   5,   1,   3
18:18:02.725, 18:18:14.205,   2.000,   5,   1,   4
18:18:02.725, 18:18:15.965,   1.760,   5,   1,   5
18:18:02.725, 18:18:18.285,   2.320,   5,   1,   6
18:18:02.725, 18:18:20.285,   2.000,   5,   1,   7
18:18:02.725, 18:18:22.605,   2.320,   5,   1,   8
18:18:02.725, 18:18:24.685,   2.080,   5,   1,   9
18:18:02.725, 18:18:26.165,   1.480,   5,   1,  10
18:18:02.725, 18:18:05.165,   2.440,   5,   2,   1
18:18:02.725, 18:18:07.605,   2.440,   5,   2,   2
18:18:02.725, 18:18:12.125,   4.520,   5,   2,   3
18:18:02.725, 18:18:14.525,   2.400,   5,   2,   4
18:18:02.725, 18:18:16.365,   1.840,   5,   2,   5
18:18:02.725, 18:18:18.045,   1.680,   5,   2,   6
18:18:02.725, 18:18:21.485,   3.440,   5,   2,   7
18:18:02.725, 18:18:23.285,   1.800,   5,   2,   8
18:18:02.725, 18:18:24.765,   1.480,   5,   2,   9
18:18:02.725, 18:18:27.965,   3.200,   5,   2,  10
18:18:02.725, 18:18:29.525,   1.560,   5,   2,  11
Total cars in green cycle: 21
```

```
Green cycle 6: 18:21:03.605 - 18:21:27.365, length: 23.8 s., time between cycles: 180.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
18:21:03.605, 18:21:09.245,   5.640,   6,   1,   1
18:21:03.605, 18:21:12.965,   3.720,   6,   1,   2
18:21:03.605, 18:21:16.205,   3.240,   6,   1,   3
18:21:03.605, 18:21:18.205,   2.000,   6,   1,   4
18:21:03.605, 18:21:20.765,   2.560,   6,   1,   5
18:21:03.605, 18:21:22.685,   1.920,   6,   1,   6
18:21:03.605, 18:21:24.405,   1.720,   6,   1,   7
18:21:03.605, 18:21:26.965,   2.560,   6,   1,   8
18:21:03.605, 18:21:08.845,   5.240,   6,   2,   1
18:21:03.605, 18:21:12.045,   3.200,   6,   2,   2
18:21:03.605, 18:21:14.805,   2.760,   6,   2,   3
18:21:03.605, 18:21:17.805,   3.000,   6,   2,   4
18:21:03.605, 18:21:20.445,   2.640,   6,   2,   5
18:21:03.605, 18:21:21.845,   1.400,   6,   2,   6
18:21:03.605, 18:21:23.925,   2.080,   6,   2,   7
18:21:03.605, 18:21:25.205,   1.280,   6,   2,   8
Total cars in green cycle: 16

Green cycle 7: 18:23:54.885 - 18:24:24.925, length: 30.0 s., time between cycles: 171.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
18:23:54.885, 18:23:57.725,   2.840,   7,   1,   1
18:23:54.885, 18:23:59.845,   2.120,   7,   1,   2
18:23:54.885, 18:24:02.525,   2.680,   7,   1,   3
18:23:54.885, 18:24:05.165,   2.640,   7,   1,   4
18:23:54.885, 18:24:07.685,   2.520,   7,   1,   5
18:23:54.885, 18:24:11.005,   3.320,   7,   1,   6
18:23:54.885, 18:24:12.805,   1.800,   7,   1,   7
18:23:54.885, 18:24:14.125,   1.320,   7,   1,   8
18:23:54.885, 18:24:16.005,   1.880,   7,   1,   9
18:23:54.885, 18:24:20.125,   4.120,   7,   1,  10
18:23:54.885, 18:23:57.285,   2.400,   7,   2,   1
18:23:54.885, 18:23:59.245,   1.960,   7,   2,   2
18:23:54.885, 18:24:02.325,   3.080,   7,   2,   3
18:23:54.885, 18:24:05.405,   3.080,   7,   2,   4
18:23:54.885, 18:24:07.565,   2.160,   7,   2,   5
18:23:54.885, 18:24:09.005,   1.440,   7,   2,   6
18:23:54.885, 18:24:18.645,   9.640,   7,   2,   7
18:23:54.885, 18:24:20.525,   1.880,   7,   2,   8
Total cars in green cycle: 18
```

APPENDIX T: SAMPLE OF DRIVER'S DATA EXTRACTED AT I-DRIVE & JAMAICAN CT. (THROUGH MOVEMENT)

```
Intersection: I13-Idrive & Jamaican  Ct
Number of lanes: 2
Recording date and time: Friday, October 1, 2021  12:00:00 PM
Number of green cycles: 51

Green cycle 1: 12:02:07.479 - 12:04:03.045, length: 115.6 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:02:07.479, 12:02:11.379,   3.900,   1,   1,   1
12:02:07.479, 12:02:14.345,   2.967,   1,   1,   2
12:02:07.479, 12:02:16.645,   2.300,   1,   1,   3
12:02:07.479, 12:02:44.879,  28.233,   1,   1,   4
12:02:07.479, 12:03:58.312,  73.433,   1,   1,   5
12:02:07.479, 12:02:13.279,   5.800,   1,   2,   1
12:02:07.479, 12:02:16.445,   3.167,   1,   2,   2
12:02:07.479, 12:03:58.979, 102.533,   1,   2,   3
12:02:07.479, 12:04:01.245,   2.267,   1,   2,   4
Total cars in green cycle: 9

Green cycle 2: 12:04:41.612 - 12:06:23.012, length: 101.4 s., time between cycles: 154.1 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:04:41.612, 12:04:45.212,   3.600,   2,   1,   1
12:04:41.612, 12:04:48.845,   3.633,   2,   1,   2
12:04:41.612, 12:04:52.379,   3.533,   2,   1,   3
12:04:41.612, 12:05:18.545,  26.167,   2,   1,   4
12:04:41.612, 12:05:28.012,   9.467,   2,   1,   5
12:04:41.612, 12:05:31.079,   3.067,   2,   1,   6
12:04:41.612, 12:06:21.079,  50.000,   2,   1,   7
12:04:41.612, 12:04:49.179,   7.567,   2,   2,   1
12:04:41.612, 12:04:51.045,   1.867,   2,   2,   2
12:04:41.612, 12:05:15.345,  24.300,   2,   2,   3
12:04:41.612, 12:05:19.579,   4.233,   2,   2,   4
12:04:41.612, 12:05:27.045,   7.467,   2,   2,   5
12:04:41.612, 12:05:58.212,  31.167,   2,   2,   6
Total cars in green cycle: 13
```

```
Green cycle 3: 12:07:15.279 - 12:09:13.879, length: 118.6 s., time between cycles: 153.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:07:15.279, 12:07:20.512,   5.233,   3,   1,   1
12:07:15.279, 12:07:23.545,   3.033,   3,   1,   2
12:07:15.279, 12:07:25.379,   1.833,   3,   1,   3
12:07:15.279, 12:07:29.079,   3.700,   3,   1,   4
12:07:15.279, 12:07:43.612,  14.533,   3,   1,   5
12:07:15.279, 12:08:30.645,  47.033,   3,   1,   6
12:07:15.279, 12:08:56.145,  25.500,   3,   1,   7
12:07:15.279, 12:07:21.812,   6.533,   3,   2,   1
12:07:15.279, 12:07:24.712,   2.900,   3,   2,   2
12:07:15.279, 12:07:27.479,   2.767,   3,   2,   3
12:07:15.279, 12:07:29.212,   1.733,   3,   2,   4
12:07:15.279, 12:07:30.845,   1.633,   3,   2,   5
12:07:15.279, 12:07:50.845,  20.000,   3,   2,   6
12:07:15.279, 12:08:27.145,  36.300,   3,   2,   7
12:07:15.279, 12:08:29.345,   2.200,   3,   2,   8
12:07:15.279, 12:08:48.679,  19.333,   3,   2,   9
Total cars in green cycle: 16

Green cycle 4: 12:09:58.945 - 12:11:02.979, length: 64.0 s., time between cycles: 163.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:09:58.945, 12:10:02.812,   3.867,   4,   1,   1
12:09:58.945, 12:10:05.579,   2.767,   4,   1,   2
12:09:58.945, 12:10:08.512,   2.933,   4,   1,   3
12:09:58.945, 12:10:10.679,   2.167,   4,   1,   4
12:09:58.945, 12:10:14.145,   3.467,   4,   1,   5
12:09:58.945, 12:10:23.245,   9.100,   4,   1,   6
12:09:58.945, 12:10:01.812,   2.867,   4,   2,   1
12:09:58.945, 12:10:04.645,   2.833,   4,   2,   2
12:09:58.945, 12:10:09.579,   4.933,   4,   2,   3
12:09:58.945, 12:10:40.379,  30.800,   4,   2,   4
12:09:58.945, 12:10:54.912,  14.533,   4,   2,   5
Total cars in green cycle: 11
```

```
Green cycle 5: 12:11:20.845 - 12:13:22.912, length: 122.1 s., time between cycles: 81.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:11:20.845, 12:11:30.212,   9.367,   5,   1,   1
12:11:20.845, 12:12:04.812,  34.600,   5,   1,   2
12:11:20.845, 12:12:52.612,  47.800,   5,   1,   3
12:11:20.845, 12:12:06.845,  46.000,   5,   2,   1
12:11:20.845, 12:12:08.145,   1.300,   5,   2,   2
12:11:20.845, 12:12:11.545,   3.400,   5,   2,   3
12:11:20.845, 12:12:13.845,   2.300,   5,   2,   4
12:11:20.845, 12:12:15.412,   1.567,   5,   2,   5
12:11:20.845, 12:12:34.812,  19.400,   5,   2,   6
12:11:20.845, 12:12:36.412,   1.600,   5,   2,   7
12:11:20.845, 12:13:04.912,  28.500,   5,   2,   8
12:11:20.845, 12:13:13.712,   8.800,   5,   2,   9
Total cars in green cycle: 12

Green cycle 6: 12:13:48.112 - 12:15:42.879, length: 114.8 s., time between cycles: 147.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:13:48.112, 12:14:46.912,  58.800,   6,   1,   1
12:13:48.112, 12:14:59.845,  12.933,   6,   1,   2
12:13:48.112, 12:15:28.779,  28.933,   6,   1,   3
12:13:48.112, 12:13:51.779,   3.667,   6,   2,   1
12:13:48.112, 12:14:09.112,  17.333,   6,   2,   2
12:13:48.112, 12:14:45.345,  36.233,   6,   2,   3
12:13:48.112, 12:15:33.445,  48.100,   6,   2,   4
12:13:48.112, 12:15:41.112,   7.667,   6,   2,   5
12:13:48.112, 12:15:42.679,   1.567,   6,   2,   6
Total cars in green cycle: 9
```

```
Green cycle 7: 12:16:18.179 - 12:18:02.845, length: 104.7 s., time between cycles: 150.1 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:16:18.179, 12:16:21.545,   3.367,   7,   1,   1
12:16:18.179, 12:16:23.779,   2.233,   7,   1,   2
12:16:18.179, 12:16:25.512,   1.733,   7,   1,   3
12:16:18.179, 12:16:42.912,  17.400,   7,   1,   4
12:16:18.179, 12:17:14.245,  31.333,   7,   1,   5
12:16:18.179, 12:17:25.445,  11.200,   7,   1,   6
12:16:18.179, 12:17:34.579,   9.133,   7,   1,   7
12:16:18.179, 12:17:42.879,   8.300,   7,   1,   8
12:16:18.179, 12:17:46.912,   4.033,   7,   1,   9
12:16:18.179, 12:16:22.045,   3.867,   7,   2,   1
12:16:18.179, 12:16:24.679,   2.633,   7,   2,   2
12:16:18.179, 12:16:27.612,   2.933,   7,   2,   3
12:16:18.179, 12:17:15.512,  47.900,   7,   2,   4
12:16:18.179, 12:17:16.879,   1.367,   7,   2,   5
12:16:18.179, 12:17:19.979,   3.100,   7,   2,   6
12:16:18.179, 12:17:23.112,   3.133,   7,   2,   7
12:16:18.179, 12:17:35.412,  12.300,   7,   2,   8
12:16:18.179, 12:17:37.945,   2.533,   7,   2,   9
Total cars in green cycle: 18

Green cycle 8: 12:18:29.912 - 12:20:22.845, length: 112.9 s., time between cycles: 131.7 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:18:29.912, 12:18:33.312,   3.400,   8,   1,   1
12:18:29.912, 12:18:37.979,   4.667,   8,   1,   2
12:18:29.912, 12:18:42.679,   4.700,   8,   1,   3
12:18:29.912, 12:19:00.479,  17.800,   8,   1,   4
12:18:29.912, 12:19:08.945,   8.467,   8,   1,   5
12:18:29.912, 12:19:12.679,   3.733,   8,   1,   6
12:18:29.912, 12:19:39.845,  27.167,   8,   1,   7
12:18:29.912, 12:20:06.979,  27.133,   8,   1,   8
12:18:29.912, 12:18:34.079,   4.167,   8,   2,   1
12:18:29.912, 12:18:40.345,   6.267,   8,   2,   2
12:18:29.912, 12:18:45.012,   4.667,   8,   2,   3
12:18:29.912, 12:19:10.912,  25.900,   8,   2,   4
12:18:29.912, 12:19:50.245,  39.333,   8,   2,   5
Total cars in green cycle: 13
```

```
Green cycle 9: 12:20:56.779 - 12:22:42.745, length: 106.0 s., time between cycles: 146.9 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:20:56.779, 12:21:37.179,  40.400,   9,   1,   1
12:20:56.779, 12:21:44.179,   7.000,   9,   1,   2
12:20:56.779, 12:21:58.279,  14.100,   9,   1,   3
12:20:56.779, 12:22:10.579,  12.300,   9,   1,   4
12:20:56.779, 12:22:13.345,   2.767,   9,   1,   5
12:20:56.779, 12:22:27.245,  13.900,   9,   1,   6
12:20:56.779, 12:22:30.779,   3.533,   9,   1,   7
12:20:56.779, 12:21:02.012,   5.233,   9,   2,   1
12:20:56.779, 12:21:07.479,   5.467,   9,   2,   2
12:20:56.779, 12:21:11.412,   3.933,   9,   2,   3
12:20:56.779, 12:21:40.112,  28.700,   9,   2,   4
12:20:56.779, 12:21:50.312,  10.200,   9,   2,   5
12:20:56.779, 12:21:53.512,   3.200,   9,   2,   6
12:20:56.779, 12:22:02.379,   8.867,   9,   2,   7
12:20:56.779, 12:22:04.379,   2.000,   9,   2,   8
12:20:56.779, 12:22:08.412,   4.033,   9,   2,   9
12:20:56.779, 12:22:11.212,   2.800,   9,   2,  10
12:20:56.779, 12:22:26.579,  15.367,   9,   2,  11
Total cars in green cycle: 18

Green cycle 10: 12:23:51.045 - 12:25:02.779, length: 71.7 s., time between cycles: 174.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:23:51.045, 12:23:54.679,   3.633,  10,   1,   1
12:23:51.045, 12:24:09.112,  14.433,  10,   1,   2
12:23:51.045, 12:24:11.379,   2.267,  10,   1,   3
12:23:51.045, 12:24:31.145,  19.767,  10,   1,   4
12:23:51.045, 12:24:33.679,   2.533,  10,   1,   5
12:23:51.045, 12:24:38.445,   4.767,  10,   1,   6
12:23:51.045, 12:24:55.779,  17.333,  10,   1,   7
12:23:51.045, 12:23:56.912,   5.867,  10,   2,   1
12:23:51.045, 12:24:10.945,  14.033,  10,   2,   2
12:23:51.045, 12:24:13.679,   2.733,  10,   2,   3
12:23:51.045, 12:24:26.379,  12.700,  10,   2,   4
12:23:51.045, 12:24:28.879,   2.500,  10,   2,   5
12:23:51.045, 12:24:32.645,   3.767,  10,   2,   6
12:23:51.045, 12:24:36.012,   3.367,  10,   2,   7
Total cars in green cycle: 14
```

```
Green cycle 11: 12:25:38.812 - 12:27:22.745, length: 103.9 s., time between cycles: 107.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:25:38.812, 12:25:43.745,   4.933,  11,   1,   1
12:25:38.812, 12:26:29.212,  45.467,  11,   1,   2
12:25:38.812, 12:26:31.879,   2.667,  11,   1,   3
12:25:38.812, 12:26:33.979,   2.100,  11,   1,   4
12:25:38.812, 12:25:44.879,   6.067,  11,   2,   1
12:25:38.812, 12:26:33.612,  48.733,  11,   2,   2
12:25:38.812, 12:26:36.845,   3.233,  11,   2,   3
12:25:38.812, 12:26:38.445,   1.600,  11,   2,   4
12:25:38.812, 12:27:16.779,  38.333,  11,   2,   5
Total cars in green cycle: 9

Green cycle 12: 12:27:48.112 - 12:29:42.812, length: 114.7 s., time between cycles: 129.3 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:27:48.112, 12:27:51.712,   3.600,  12,   1,   1
12:27:48.112, 12:27:57.479,   5.767,  12,   1,   2
12:27:48.112, 12:28:01.145,   3.667,  12,   1,   3
12:27:48.112, 12:28:51.679,  50.533,  12,   1,   4
12:27:48.112, 12:29:11.345,  19.667,  12,   1,   5
12:27:48.112, 12:29:21.945,  10.600,  12,   1,   6
12:27:48.112, 12:29:27.645,   5.700,  12,   1,   7
12:27:48.112, 12:29:35.812,   8.167,  12,   1,   8
12:27:48.112, 12:27:51.979,   3.867,  12,   2,   1
12:27:48.112, 12:27:55.445,   3.467,  12,   2,   2
12:27:48.112, 12:27:57.912,   2.467,  12,   2,   3
12:27:48.112, 12:29:32.979,  95.067,  12,   2,   4
Total cars in green cycle: 12

Green cycle 13: 12:30:43.145 - 12:32:02.645, length: 79.5 s., time between cycles: 175.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
12:30:43.145, 12:30:47.212,   4.067,  13,   1,   1
12:30:43.145, 12:31:06.212,  19.000,  13,   1,   2
12:30:43.145, 12:31:19.579,  13.367,  13,   1,   3
12:30:43.145, 12:31:21.445,   1.867,  13,   1,   4
12:30:43.145, 12:31:09.879,  26.733,  13,   2,   1
12:30:43.145, 12:31:10.945,   1.067,  13,   2,   2
12:30:43.145, 12:31:15.545,   4.600,  13,   2,   3
12:30:43.145, 12:31:17.645,   2.100,  13,   2,   4
12:30:43.145, 12:31:37.979,  20.333,  13,   2,   5
12:30:43.145, 12:31:53.712,  15.733,  13,   2,   6
Total cars in green cycle: 10
```

APPENDIX U: SAMPLE OF DRIVER'S DATA EXTRACTED AT SR482 & OBT (THROUGH MOVEMENT)

```
Intersection: I6-SR 482 & OBT
Number of lanes: 3
Recording date and time: Tuesday, August 3, 2021  01:09:26 PM
Number of green cycles: 2

Green cycle 1: 13:09:31.479 - 13:10:31.279, length: 59.8 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
13:09:31.479, 13:09:34.959,   3.480,   1,   1,   1
13:09:31.479, 13:09:37.519,   2.560,   1,   1,   2
13:09:31.479, 13:09:45.079,   7.560,   1,   1,   3
13:09:31.479, 13:09:48.559,   3.480,   1,   1,   4
13:09:31.479, 13:09:51.159,   2.600,   1,   1,   5
13:09:31.479, 13:09:55.319,   4.160,   1,   1,   6
13:09:31.479, 13:10:03.839,   8.520,   1,   1,   7
13:09:31.479, 13:10:07.479,   3.640,   1,   1,   8
13:09:31.479, 13:10:27.199,  19.720,   1,   1,   9
13:09:31.479, 13:10:29.479,   2.280,   1,   1,  10
13:09:31.479, 13:09:36.519,   5.040,   1,   2,   1
13:09:31.479, 13:09:39.919,   3.400,   1,   2,   2
13:09:31.479, 13:09:43.919,   4.000,   1,   2,   3
13:09:31.479, 13:09:46.839,   2.920,   1,   2,   4
13:09:31.479, 13:09:50.879,   4.040,   1,   2,   5
13:09:31.479, 13:09:55.399,   4.520,   1,   2,   6
13:09:31.479, 13:10:02.239,   6.840,   1,   2,   7
13:09:31.479, 13:10:06.759,   4.520,   1,   2,   8
13:09:31.479, 13:10:08.519,   1.760,   1,   2,   9
13:09:31.479, 13:10:12.119,   3.600,   1,   2,  10
13:09:31.479, 13:10:14.159,   2.040,   1,   2,  11
13:09:31.479, 13:10:18.959,   4.800,   1,   2,  12
13:09:31.479, 13:10:22.439,   3.480,   1,   2,  13
13:09:31.479, 13:10:23.719,   1.280,   1,   2,  14
13:09:31.479, 13:10:25.799,   2.080,   1,   2,  15
13:09:31.479, 13:10:30.719,   4.920,   1,   2,  16
13:09:31.479, 13:09:35.799,   4.320,   1,   3,   1
13:09:31.479, 13:09:53.799,  18.000,   1,   3,   2
13:09:31.479, 13:10:26.799,  33.000,   1,   3,   3
Total cars in green cycle: 29
```

```
Green cycle 2: 13:12:27.439 - 13:13:27.119, length: 59.7 s., time between cycles: 176.0 s.
 Green Time  Crossing Time   Hdwy(s) Cycle Lane Row Comment
 ----------  -------------   ------- ----- ---- --- -------
13:12:27.439, 13:12:30.159,   2.720,   2,   1,   1
13:12:27.439, 13:12:32.999,   2.840,   2,   1,   2
13:12:27.439, 13:12:36.319,   3.320,   2,   1,   3
13:12:27.439, 13:12:38.079,   1.760,   2,   1,   4
13:12:27.439, 13:12:39.839,   1.760,   2,   1,   5
13:12:27.439, 13:12:42.039,   2.200,   2,   1,   6
13:12:27.439, 13:12:44.919,   2.880,   2,   1,   7
13:12:27.439, 13:12:46.639,   1.720,   2,   1,   8
13:12:27.439, 13:12:48.119,   1.480,   2,   1,   9
13:12:27.439, 13:12:50.919,   2.800,   2,   1,  10
13:12:27.439, 13:12:53.399,   2.480,   2,   1,  11
13:12:27.439, 13:12:55.559,   2.160,   2,   1,  12
13:12:27.439, 13:12:58.679,   3.120,   2,   1,  13
13:12:27.439, 13:13:01.039,   2.360,   2,   1,  14
13:12:27.439, 13:13:02.279,   1.240,   2,   1,  15
13:12:27.439, 13:13:11.079,   8.800,   2,   1,  16
13:12:27.439, 13:13:16.559,   5.480,   2,   1,  17
13:12:27.439, 13:13:20.239,   3.680,   2,   1,  18
13:12:27.439, 13:13:24.399,   4.160,   2,   1,  19
13:12:27.439, 13:13:25.679,   1.280,   2,   1,  20
13:12:27.439, 13:12:32.919,   5.480,   2,   2,   1
13:12:27.439, 13:12:35.399,   2.480,   2,   2,   2
13:12:27.439, 13:12:36.839,   1.440,   2,   2,   3
13:12:27.439, 13:12:39.039,   2.200,   2,   2,   4
13:12:27.439, 13:12:40.559,   1.520,   2,   2,   5
13:12:27.439, 13:12:41.999,   1.440,   2,   2,   6
13:12:27.439, 13:12:46.959,   4.960,   2,   2,   7
13:12:27.439, 13:12:48.559,   1.600,   2,   2,   8
13:12:27.439, 13:12:50.439,   1.880,   2,   2,   9
13:12:27.439, 13:12:52.719,   2.280,   2,   2,  10
13:12:27.439, 13:12:55.079,   2.360,   2,   2,  11
13:12:27.439, 13:12:56.959,   1.880,   2,   2,  12
13:12:27.439, 13:12:58.159,   1.200,   2,   2,  13
13:12:27.439, 13:12:59.519,   1.360,   2,   2,  14
13:12:27.439, 13:13:01.679,   2.160,   2,   2,  15
13:12:27.439, 13:13:03.359,   1.680,   2,   2,  16
13:12:27.439, 13:13:09.319,   5.960,   2,   2,  17
13:12:27.439, 13:13:11.199,   1.880,   2,   2,  18
13:12:27.439, 13:13:13.639,   2.440,   2,   2,  19
13:12:27.439, 13:13:15.399,   1.760,   2,   2,  20
13:12:27.439, 13:13:16.679,   1.280,   2,   2,  21
13:12:27.439, 13:13:17.679,   1.000,   2,   2,  22
13:12:27.439, 13:13:20.359,   2.680,   2,   2,  23
13:12:27.439, 13:13:23.279,   2.920,   2,   2,  24
13:12:27.439, 13:13:26.839,   3.560,   2,   2,  25
13:12:27.439, 13:12:36.119,   8.680,   2,   3,   1, "Large truck"
13:12:27.439, 13:12:39.479,   3.360,   2,   3,   2
13:12:27.439, 13:12:41.679,   2.200,   2,   3,   3
13:12:27.439, 13:12:46.519,   4.840,   2,   3,   4
13:12:27.439, 13:12:48.239,   1.720,   2,   3,   5
13:12:27.439, 13:12:50.119,   1.880,   2,   3,   6
13:12:27.439, 13:12:53.879,   3.760,   2,   3,   7
13:12:27.439, 13:12:58.639,   4.760,   2,   3,   8
13:12:27.439, 13:13:00.559,   1.920,   2,   3,   9
13:12:27.439, 13:13:02.759,   2.200,   2,   3,  10
13:12:27.439, 13:13:05.839,   3.080,   2,   3,  11
13:12:27.439, 13:13:08.519,   2.680,   2,   3,  12
13:12:27.439, 13:13:10.759,   2.240,   2,   3,  13
13:12:27.439, 13:13:12.839,   2.080,   2,   3,  14
13:12:27.439, 13:13:14.439,   1.600,   2,   3,  15
13:12:27.439, 13:13:17.159,   2.720,   2,   3,  16
13:12:27.439, 13:13:18.599,   1.440,   2,   3,  17
13:12:27.439, 13:13:24.239,   5.640,   2,   3,  18
Total cars in green cycle: 63
```

Green cycle 1: 13:15:23.519 - 13:16:23.279 length: 59.8 s.

Green Time	Crossing Time	Hdwy(s)	Cycle	Lane	Row	Comment
13:15:23.519	13:15:33.959	10.44	1	1	1	
13:15:23.519	13:15:36.399	2.44	1	1	2	
13:15:23.519	13:15:40.479	4.08	1	1	3	
13:15:23.519	13:15:42.439	1.96	1	1	4	
13:15:23.519	13:15:44.439	2	1	1	5	
13:15:23.519	13:15:46.199	1.76	1	1	6	
13:15:23.519	13:15:49.359	3.16	1	1	7	
13:15:23.519	13:15:52.199	2.84	1	1	8	
13:15:23.519	13:15:57.559	5.36	1	1	9	
13:15:23.519	13:16:01.919	4.36	1	1	10	
13:15:23.519	13:16:03.719	1.8	1	1	11	
13:15:23.519	13:16:08.399	4.68	1	1	12	
13:15:23.519	13:16:13.519	5.12	1	1	13	
13:15:23.519	13:16:16.359	2.84	1	1	14	
13:15:23.519	13:16:18.799	2.44	1	1	15	
13:15:23.519	13:15:26.679	3.16	1	2	1	
13:15:23.519	13:15:30.199	3.52	1	2	2	
13:15:23.519	13:15:37.319	7.12	1	2	3	" ""Large truck"""
13:15:23.519	13:15:39.879	2.56	1	2	4	
13:15:23.519	13:15:41.279	1.4	1	2	5	
13:15:23.519	13:15:43.559	2.28	1	2	6	
13:15:23.519	13:15:45.079	1.52	1	2	7	
13:15:23.519	13:15:49.519	4.44	1	2	8	
13:15:23.519	13:15:51.319	1.8	1	2	9	
13:15:23.519	13:15:54.839	3.52	1	2	10	
13:15:23.519	13:15:56.519	1.68	1	2	11	
13:15:23.519	13:16:01.319	4.8	1	2	12	
13:15:23.519	13:16:03.319	2	1	2	13	
13:15:23.519	13:16:09.639	6.32	1	2	14	
13:15:23.519	13:16:14.519	4.88	1	2	15	
13:15:23.519	13:15:29.479	5.96	1	3	1	" ""Truck"""
13:15:23.519	13:15:39.559	10.08	1	3	2	
13:15:23.519	13:15:42.359	2.8	1	3	3	
13:15:23.519	13:15:43.639	1.28	1	3	4	
13:15:23.519	13:15:44.839	1.2	1	3	5	
13:15:23.519	13:15:46.799	1.96	1	3	6	
13:15:23.519	13:15:48.559	1.76	1	3	7	
13:15:23.519	13:15:50.719	2.16	1	3	8	
13:15:23.519	13:15:53.359	2.64	1	3	9	
13:15:23.519	13:15:55.359	2	1	3	10	
13:15:23.519	13:15:58.119	2.76	1	3	11	
13:15:23.519	13:16:04.039	5.92	1	3	12	
13:15:23.519	13:16:05.479	1.44	1	3	13	
13:15:23.519	13:16:07.559	2.08	1	3	14	
13:15:23.519	13:16:09.719	2.16	1	3	15	
13:15:23.519	13:16:12.319	2.6	1	3	16	
13:15:23.519	13:16:18.759	6.44	1	3	17	

Total cars in green cycle: 47

Green cycle 2: 13:18:19.479 - 13:19:19.159 length: 59.7 s. time between cycles: 176.0 s.

Green Time	Crossing Time	Hdwy(s)	Cycle	Lane	Row	Comment
13:18:19.479	13:18:22.839	3.36	2	1	1	
13:18:19.479	13:18:25.879	3.04	2	1	2	
13:18:19.479	13:18:28.279	2.4	2	1	3	
13:18:19.479	13:18:31.319	3.04	2	1	4	
13:18:19.479	13:18:36.199	4.88	2	1	5	
13:18:19.479	13:18:38.799	2.6	2	1	6	
13:18:19.479	13:18:42.639	3.84	2	1	7	
13:18:19.479	13:18:49.279	6.64	2	1	8	
13:18:19.479	13:18:51.999	2.72	2	1	9	
13:18:19.479	13:18:56.279	4.28	2	1	10	
13:18:19.479	13:18:57.719	1.44	2	1	11	
13:18:19.479	13:18:59.679	1.96	2	1	12	
13:18:19.479	13:19:15.759	16.08	2	1	13	
13:18:19.479	13:18:23.759	4.28	2	2	1	
13:18:19.479	13:18:27.079	3.32	2	2	2	
13:18:19.479	13:18:30.359	3.28	2	2	3	
13:18:19.479	13:18:32.319	1.96	2	2	4	
13:18:19.479	13:18:37.359	5.04	2	2	5	
13:18:19.479	13:18:40.839	3.48	2	2	6	
13:18:19.479	13:18:44.039	3.2	2	2	7	
13:18:19.479	13:18:48.119	4.08	2	2	8	
13:18:19.479	13:18:53.199	5.08	2	2	9	
13:18:19.479	13:18:54.199	1	2	2	10	
13:18:19.479	13:18:56.679	2.48	2	2	11	
13:18:19.479	13:19:05.679	9	2	2	12	
13:18:19.479	13:19:09.199	3.52	2	2	13	
13:18:19.479	13:19:11.319	2.12	2	2	14	
13:18:19.479	13:19:13.439	2.12	2	2	15	
13:18:19.479	13:19:15.639	2.2	2	2	16	
13:18:19.479	13:18:23.439	3.96	2	3	1	" ""Truck"""
13:18:19.479	13:18:27.999	4.56	2	3	2	
13:18:19.479	13:18:31.479	3.48	2	3	3	
13:18:19.479	13:18:37.639	6.16	2	3	4	
13:18:19.479	13:18:45.239	7.6	2	3	5	
13:18:19.479	13:18:50.879	5.64	2	3	6	
13:18:19.479	13:18:57.679	6.8	2	3	7	
13:18:19.479	13:18:58.919	1.24	2	3	8	
13:18:19.479	13:19:00.999	2.08	2	3	9	
13:18:19.479	13:19:03.799	2.8	2	3	10	
13:18:19.479	13:19:08.799	5	2	3	11	
13:18:19.479	13:19:10.919	2.12	2	3	12	
13:18:19.479	13:19:12.279	1.36	2	3	13	
13:18:19.479	13:19:14.799	2.52	2	3	14	
13:18:19.479	13:19:16.119	1.32	2	3	15	
13:18:19.479	13:19:17.599	1.48	2	3	16	

Total cars in green cycle: 45

Intersection: I6- SR482 & OBT
Number of lanes: 3
Recording date and time: Thursday August 5 2021 07:00:01 AM
Number of green cycles: 4

Green cycle 1: 07:00:59.085 - 07:01:38.765 length: 39.7 s.

Green Time	Crossing Time	Hdwy(s)	Cycle	Lane	Row	Comment
7:00:59.085	07:01:02.805	3.72	1	1	1	
7:00:59.085	07:01:08.925	6.12	1	1	2	" ""large truck"""
7:00:59.085	07:01:12.365	3.44	1	1	3	
7:00:59.085	07:01:14.285	1.92	1	1	4	
7:00:59.085	07:01:16.205	1.92	1	1	5	
7:00:59.085	07:01:18.205	2	1	1	6	
7:00:59.085	07:01:19.845	1.64	1	1	7	
7:00:59.085	07:01:21.405	1.56	1	1	8	
7:00:59.085	07:01:25.045	3.64	1	1	9	
7:00:59.085	07:01:02.605	3.52	1	2	1	
7:00:59.085	07:01:05.685	3.08	1	2	2	" ""Pickup w trailer"""
7:00:59.085	07:01:13.765	8.08	1	2	3	
7:00:59.085	07:01:16.325	2.56	1	2	4	
7:00:59.085	07:01:17.845	1.52	1	2	5	
7:00:59.085	07:01:22.565	4.72	1	2	6	
7:00:59.085	07:01:04.085	5	1	3	1	
7:00:59.085	07:01:07.045	2.96	1	3	2	
7:00:59.085	07:01:11.245	4.2	1	3	3	
7:00:59.085	07:01:15.685	4.44	1	3	4	
7:00:59.085	07:01:17.605	1.92	1	3	5	
7:00:59.085	07:01:19.125	1.52	1	3	6	
7:00:59.085	07:01:20.685	1.56	1	3	7	

Total cars in green cycle: 22

Green cycle 2: 07:03:35.045 - 07:04:14.805 length: 39.8 s. time between cycles: 156.0 s.

Green Time	Crossing Time	Hdwy(s)	Cycle	Lane	Row	Comment
7:03:35.045	07:03:38.725	3.68	2	1	1	
7:03:35.045	07:03:41.445	2.72	2	1	2	
7:03:35.045	07:03:44.085	2.64	2	1	3	
7:03:35.045	07:03:45.605	1.52	2	1	4	
7:03:35.045	07:03:47.285	1.68	2	1	5	
7:03:35.045	07:03:49.565	2.28	2	1	6	
7:03:35.045	07:03:50.965	1.4	2	1	7	
7:03:35.045	07:03:54.365	3.4	2	1	8	
7:03:35.045	07:03:59.845	5.48	2	1	9	
7:03:35.045	07:03:39.245	4.2	2	2	1	
7:03:35.045	07:03:41.725	2.48	2	2	2	
7:03:35.045	07:03:44.685	2.96	2	2	3	
7:03:35.045	07:03:46.605	1.92	2	2	4	
7:03:35.045	07:03:49.125	2.52	2	2	5	
7:03:35.045	07:03:51.805	2.68	2	2	6	
7:03:35.045	07:03:55.045	3.24	2	2	7	
7:03:35.045	07:03:58.165	3.12	2	2	8	
7:03:35.045	07:04:01.445	3.28	2	2	9	
7:03:35.045	07:03:39.285	4.24	2	3	1	
7:03:35.045	07:03:41.845	2.56	2	3	2	
7:03:35.045	07:03:44.125	2.28	2	3	3	
7:03:35.045	07:03:48.285	4.16	2	3	4	
7:03:35.045	07:03:49.805	1.52	2	3	5	
7:03:35.045	07:03:52.165	2.36	2	3	6	
7:03:35.045	07:03:54.685	2.52	2	3	7	
7:03:35.045	07:03:56.205	1.52	2	3	8	
7:03:35.045	07:03:57.445	1.24	2	3	9	
7:03:35.045	07:03:59.885	2.44	2	3	10	

Total cars in green cycle: 28

Green cycle 3: 07:06:08.125 - 07:06:56.805 length: 48.7 s. time between cycles: 153.1 s.

Green Time	Crossing Time	Hdwy(s)	Cycle	Lane	Row	Comment
7:06:08.125	07:06:12.205	4.08	3	1	1	
7:06:08.125	07:06:12.245	0.04	3	1	2	
7:06:08.125	07:06:14.845	2.6	3	1	3	
7:06:08.125	07:06:18.405	3.56	3	1	4	
7:06:08.125	07:06:19.925	1.52	3	1	5	
7:06:08.125	07:06:23.605	3.68	3	1	6	
7:06:08.125	07:06:25.245	1.64	3	1	7	
7:06:08.125	07:06:26.685	1.44	3	1	8	
7:06:08.125	07:06:43.205	16.52	3	1	9	
7:06:08.125	07:06:12.325	4.2	3	2	1	
7:06:08.125	07:06:14.405	2.08	3	2	2	
7:06:08.125	07:06:16.645	2.24	3	2	3	
7:06:08.125	07:06:22.245	5.6	3	2	4	
7:06:08.125	07:06:24.925	2.68	3	2	5	
7:06:08.125	07:06:27.565	2.64	3	2	6	
7:06:08.125	07:06:29.805	2.24	3	2	7	
7:06:08.125	07:06:33.245	3.44	3	2	8	
7:06:08.125	07:06:34.805	1.56	3	2	9	
7:06:08.125	07:06:35.965	1.16	3	2	10	
7:06:08.125	07:06:11.765	3.64	3	3	1	
7:06:08.125	07:06:14.725	2.96	3	3	2	
7:06:08.125	07:06:17.485	2.76	3	3	3	
7:06:08.125	07:06:21.525	4.04	3	3	4	
7:06:08.125	07:06:22.645	1.12	3	3	5	
7:06:08.125	07:06:24.525	1.88	3	3	6	
7:06:08.125	07:06:26.805	2.28	3	3	7	
7:06:08.125	07:06:31.565	4.76	3	3	8	
7:06:08.125	07:06:32.525	0.96	3	3	9	
7:06:08.125	07:06:35.005	2.48	3	3	10	
7:06:08.125	07:06:36.645	1.64	3	3	11	

Total cars in green cycle: 30

Green cycle 4: 07:08:56.965 - 07:09:40.685 length: 43.7 s. time between cycles: 168.8 s.

Green Time	Crossing Time	Hdwy(s)	Cycle	Lane	Row	Comment
7:08:56.965	07:09:00.205	3.24	4	1	1	
7:08:56.965	07:09:04.725	4.52	4	1	2	
7:08:56.965	07:09:08.285	3.56	4	1	3	
7:08:56.965	07:09:11.365	3.08	4	1	4	
7:08:56.965	07:09:14.405	3.04	4	1	5	
7:08:56.965	07:09:20.125	5.72	4	1	6	
7:08:56.965	07:09:25.805	5.68	4	1	7	
7:08:56.965	07:09:02.885	5.92	4	2	1	
7:08:56.965	07:09:06.485	3.6	4	2	2	
7:08:56.965	07:09:08.925	2.44	4	2	3	
7:08:56.965	07:09:13.485	4.56	4	2	4	
7:08:56.965	07:09:15.445	1.96	4	2	5	
7:08:56.965	07:09:17.245	1.8	4	2	6	
7:08:56.965	07:09:21.045	3.8	4	2	7	
7:08:56.965	07:09:23.805	2.76	4	2	8	
7:08:56.965	07:09:26.485	2.68	4	2	9	
7:08:56.965	07:09:28.045	1.56	4	2	10	
7:08:56.965	07:09:29.885	1.84	4	2	11	
7:08:56.965	07:09:31.965	2.08	4	2	12	
7:08:56.965	07:09:02.205	5.24	4	3	1	
7:08:56.965	07:09:05.725	3.52	4	3	2	
7:08:56.965	07:09:08.085	2.36	4	3	3	
7:08:56.965	07:09:09.805	1.72	4	3	4	
7:08:56.965	07:09:14.445	4.64	4	3	5	
7:08:56.965	07:09:17.685	3.24	4	3	6	
7:08:56.965	07:09:21.245	3.56	4	3	7	
7:08:56.965	07:09:23.165	1.92	4	3	8	
7:08:56.965	07:09:24.445	1.28	4	3	9	
7:08:56.965	07:09:28.925	4.48	4	3	10	
7:08:56.965	07:09:39.925	11	4	3	11	

Total cars in green cycle: 30

APPENDIX V: SAMPLE OF PEDESTRIANS' DATA EXTRACTED AT GEMINI & E PLAZA (WEST APPROACH)

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.5	3.981	18.136	Not Distracted	27	7:40:32.632 AM	7:40:33.132 AM	7:40:51.268 AM	7:40:59.632 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	1.333	4.393	16.436	Distracted	27	7:45:34.884 AM	7:45:36.217 AM	7:45:52.653 AM	7:46:01.884 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.567	3.521	20.503	Not Distracted	27	7:56:10.431 AM	7:56:10.998 AM	7:56:31.501 AM	7:56:37.431 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.034	4.230	17.069	Not Distracted	27	8:09:06.074 AM	8:09:07.108 AM	8:09:24.177 AM	8:09:33.074 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.001	3.482	20.736	Not Distracted	27	8:13:49.989 AM	8:13:50.990 AM	8:14:11.726 AM	8:14:16.989 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.733	4.197	17.203	Not Distracted	27	8:18:30.938 AM	8:18:31.671 AM	8:18:48.874 AM	8:18:57.938 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Male	Alone	Young	2.967	3.823	18.887	Distracted	27	8:19:36.982 AM	8:19:39.949 AM	8:19:58.836 AM	8:20:03.982 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Male	Alone	Young	3.667	4.698	15.369	Distracted	27	8:19:36.982 AM	8:19:40.649 AM	8:19:56.018 AM	8:20:03.982 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2.2	4.511	16.004	Distracted	27	8:21:57.924 AM	8:22:00.124 AM	8:22:16.128 AM	8:22:24.924 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.8	4.041	17.869	Not Distracted	27	8:24:19.615 AM	8:24:20.415 AM	8:24:38.284 AM	8:24:46.615 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.267	3.793	19.037	Not Distracted	27	8:26:01.532 AM	8:26:02.799 AM	8:26:21.836 AM	8:26:28.532 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2.733	4.125	17.503	Distracted	27	8:28:20.032 AM	8:28:22.765 AM	8:28:40.268 AM	8:28:47.032 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	5.033	4.899	14.737	Distracted	27	8:29:26.077 AM	8:29:31.110 AM	8:29:45.847 AM	8:29:53.077 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.733	4.990	14.469	Not Distracted	27	8:32:59.380 AM	8:33:00.113 AM	8:33:14.582 AM	8:33:26.380 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.933	4.349	16.603	Not Distracted	27	8:32:59.380 AM	8:33:01.313 AM	8:33:17.916 AM	8:33:26.380 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.033	4.149	17.403	Not Distracted	27	8:35:01.034 AM	8:35:02.067 AM	8:35:19.470 AM	8:35:28.034 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.033	3.786	19.07	Not Distracted	27	8:35:01.034 AM	8:35:02.067 AM	8:35:21.137 AM	8:35:28.034 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.667	3.867	18.67	Not Distracted	27	8:35:02.034 AM	8:35:03.701 AM	8:35:22.371 AM	8:35:29.034 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.667	4.141	17.436	Not Distracted	27	8:35:59.744 AM	8:36:01.411 AM	8:36:18.847 AM	8:36:26.744 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	1.466	4.003	18.038	Not Distracted	27	8:35:59.744 AM	8:36:01.210 AM	8:36:19.248 AM	8:36:26.744 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	1.466	4.003	18.038	Not Distracted	27	8:35:59.744 AM	8:36:01.210 AM	8:36:19.248 AM	8:36:26.744 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.867	5.901	12.235	Not Distracted	27	8:40:54.294 AM	8:44:55.161 AM	8:41:07.396 AM	8:41:21.294 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.2	3.874	18.638	Not Distracted	27	8:40:54.294 AM	8:40:55.494 AM	8:41:14.132 AM	8:41:21.294 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.2	3.708	19.47	Not Distracted	27	8:40:54.294 AM	8:40:55.494 AM	8:41:14.964 AM	8:41:21.294 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.2	3.609	20.004	Not Distracted	27	8:40:54.294 AM	8:40:55.494 AM	8:41:15.498 AM	8:41:21.294 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.4	4.340	16.636	Not Distracted	27	8:40:54.294 AM	8:40:55.694 AM	8:41:12.330 AM	8:41:21.294 AM

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.4	3.357	21.505	Not Distracted	27	8:40:54.294 AM	8:40:55.694 AM	8:41:17.199 AM	8:41:21.294 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.4	3.281	22.004	Not Distracted	27	8:40:54.294 AM	8:40:55.694 AM	8:41:17.698 AM	8:41:21.294 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	2.867	5.025	14.369	Distracted	27	8:42:04.373 AM	8:42:07.240 AM	8:42:21.609 AM	8:42:31.373 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.567	3.945	18.303	Not Distracted	27	8:42:04.373 AM	8:42:05.940 AM	8:42:24.243 AM	8:42:31.373 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	4.454	3.799	19.004	Distracted	27	8:42:59.716 AM	8:43:04.170 AM	8:43:23.174 AM	8:43:26.716 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.333	4.405	16.39	Not Distracted	27	8:42:59.616 AM	8:43:00.949 AM	8:43:17.339 AM	8:43:26.616 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.266	4.781	15.103	Not Distracted	27	8:44:01.548 AM	8:44:02.814 AM	8:44:17.917 AM	8:44:28.548 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.266	4.420	16.336	Not Distracted	27	8:44:01.548 AM	8:44:02.814 AM	8:44:19.150 AM	8:44:28.548 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.266	4.125	17.503	Not Distracted	27	8:44:01.548 AM	8:44:02.814 AM	8:44:20.317 AM	8:44:28.548 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	3.1	4.102	17.603	Distracted	27	8:44:01.548 AM	8:44:04.648 AM	8:44:22.251 AM	8:44:28.548 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Group	Young	1.3	4.197	17.203	Not Distracted	27	8:45:12.559 AM	8:45:13.859 AM	8:45:31.062 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Group	Young	1.3	4.197	17.203	Not Distracted	27	8:45:12.559 AM	8:45:13.859 AM	8:45:31.062 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	2.234	3.556	20.303	Not Distracted	27	8:45:12.559 AM	8:45:14.793 AM	8:45:35.096 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	2.234	3.405	21.203	Distracted	27	8:45:12.559 AM	8:45:14.793 AM	8:45:35.996 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.3	6.016	12.002	Not Distracted	27	8:45:12.559 AM	8:45:13.859 AM	8:45:25.861 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	2.234	3.556	20.303	Distracted	27	8:45:12.559 AM	8:45:14.793 AM	8:45:35.096 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	2.234	3.327	21.704	Not Distracted	27	8:45:12.559 AM	8:45:14.793 AM	8:45:36.497 AM	8:45:39.559 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	2.434	4.749	15.202	Distracted	27	8:48:08.689 AM	8:48:11.123 AM	8:48:26.325 AM	8:48:35.689 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.367	4.856	14.869	Not Distracted	27	8:48:08.689 AM	8:48:10.056 AM	8:48:24.925 AM	8:48:35.689 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.635	4.238	17.035	Not Distracted	27	8:48:09.689 AM	8:48:10.324 AM	8:48:27.359 AM	8:48:36.689 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	2.967	5.144	14.036	Distracted	27	8:49:17.168 AM	8:49:20.135 AM	8:49:34.171 AM	8:49:44.168 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.034	4.760	15.169	Not Distracted	27	8:50:15.311 AM	8:50:16.345 AM	8:50:31.514 AM	8:50:42.311 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	2	4.521	15.971	Not Distracted	27	8:54:57.326 AM	8:54:59.326 AM	8:55:15.297 AM	8:55:24.326 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Male	Alone	Young	2.901	4.102	17.602	Distracted	27	8:54:57.326 AM	8:55:00.227 AM	8:55:17.829 AM	8:55:24.326 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.6	4.578	15.771	Not Distracted	27	8:57:52.654 AM	8:57:53.254 AM	8:58:09.025 AM	8:58:19.654 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.067	3.012	23.972	Not Distracted	27	8:57:52.654 AM	8:57:53.721 AM	8:58:17.693 AM	8:58:19.654 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	5.902	3.773	19.137	Distracted	27	8:57:52.654 AM	8:57:58.556 AM	8:58:17.693 AM	8:58:19.654 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.734	4.677	15.436	Not Distracted	27	9:00:41.153 AM	9:00:41.887 AM	9:00:57.323 AM	9:01:08.153 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.734	4.677	15.436	Not Distracted	27	9:00:41.153 AM	9:00:41.887 AM	9:00:57.323 AM	9:01:08.153 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.734	3.586	20.136	Not Distracted	27	9:00:41.153 AM	9:00:41.887 AM	9:01:02.023 AM	9:01:08.153 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.533	3.753	19.237	Not Distracted	27	9:01:48.198 AM	9:01:48.731 AM	9:02:07.968 AM	9:02:15.198 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	6.134	4.521	15.969	Distracted	27	9:01:48.198 AM	9:01:54.332 AM	9:02:10.301 AM	9:02:15.198 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.767	3.708	19.469	Not Distracted	27	9:03:18.172 AM	9:03:18.939 AM	9:03:38.408 AM	9:03:45.172 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	3.334	4.420	16.336	Distracted	27	9:03:18.172 AM	9:03:21.506 AM	9:03:37.842 AM	9:03:45.172 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2	5.206	13.869	Distracted	27	9:03:18.172 AM	9:03:20.172 AM	9:03:34.041 AM	9:03:45.172 AM

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.8	5.625	12.835	Not Distracted	27	9:04:24.650 AM	9:04:26.450 AM	9:04:39.285 AM	9:04:51.650 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.8	8.131	8.88	Not Distracted	27	9:04:24.650 AM	9:04:26.450 AM	9:04:35.330 AM	9:04:51.650 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.6	4.149	17.403	Not Distracted	27	9:05:53.598 AM	9:05:54.198 AM	9:06:11.601 AM	9:06:20.598 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.067	3.959	18.237	Not Distracted	27	9:11:03.185 AM	9:11:04.252 AM	9:11:22.489 AM	9:11:30.185 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	3.467	4.197	17.203	Distracted	27	9:11:03.185 AM	9:11:06.652 AM	9:11:23.855 AM	9:11:30.185 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Male	Alone	Young	2.2769	5.392	13.3911	Distracted	27	9:14:02.122 AM	9:14:04.399 AM	9:14:17.790 AM	9:14:29.122 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.034	4.411	16.369	Not Distracted	27	9:15:31.103 AM	9:15:32.137 AM	9:15:48.506 AM	9:15:58.103 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.301	4.189	17.237	Not Distracted	27	9:16:25.645 AM	9:16:26.946 AM	9:16:44.183 AM	9:16:52.645 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	2.667	4.384	16.47	Distracted	27	9:16:25.645 AM	9:16:28.312 AM	9:16:44.782 AM	9:16:52.645 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.333	4.738	15.237	Not Distracted	27	9:18:38.202 AM	9:18:38.535 AM	9:18:53.772 AM	9:19:05.202 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.501	3.888	18.569	Not Distracted	27	9:19:32.011 AM	9:19:33.512 AM	9:19:52.081 AM	9:19:59.011 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Group	Young	0.833	4.608	15.67	Not Distracted	27	9:22:40.110 AM	9:22:40.943 AM	9:22:56.613 AM	9:23:07.110 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	0.833	4.608	15.67	Not Distracted	27	9:22:40.110 AM	9:22:40.943 AM	9:22:56.613 AM	9:23:07.110 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.833	4.010	18.003	Not Distracted	27	9:22:40.110 AM	9:22:40.943 AM	9:22:58.946 AM	9:23:07.110 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	1.533	3.996	18.07	Not Distracted	27	9:26:57.259 AM	9:26:58.792 AM	9:27:16.862 AM	9:27:24.259 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	1.533	3.996	18.07	Not Distracted	27	9:26:57.259 AM	9:26:58.792 AM	9:27:16.862 AM	9:27:24.259 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.701	3.931	18.369	Not Distracted	27	9:28:25.807 AM	9:28:26.508 AM	9:28:44.877 AM	9:28:52.807 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.701	4.055	17.803	Not Distracted	27	9:28:25.807 AM	9:28:27.508 AM	9:28:45.311 AM	9:28:52.807 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2.2	4.117	17.536	Distracted	27	9:32:39.084 AM	9:32:41.284 AM	9:32:58.820 AM	9:33:06.084 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	4.334	3.271	22.07	Distracted	27	9:32:39.084 AM	9:32:43.418 AM	9:33:05.488 AM	9:33:06.084 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.301	5.308	13.602	Not Distracted	27	9:42:44.156 AM	9:42:45.457 AM	9:42:59.059 AM	9:43:11.156 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	1.1	3.454	20.904	Not Distracted	27	9:43:42.766 AM	9:43:43.866 AM	9:44:04.770 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Group	Young	1.1	3.454	20.904	Not Distracted	27	9:43:42.766 AM	9:43:43.866 AM	9:44:04.770 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Group	Young	3.601	3.416	21.136	Distracted	27	9:43:42.766 AM	9:43:46.367 AM	9:44:07.503 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Group	Young	3.601	3.029	23.837	Distracted	27	9:43:42.766 AM	9:43:46.367 AM	9:44:10.204 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Talking to others	Male	Group	Young	2.801	3.296	21.903	Distracted	27	9:43:42.766 AM	9:43:45.567 AM	9:44:07.470 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Talking to others	Male	Group	Young	2.801	3.296	21.903	Distracted	27	9:43:42.766 AM	9:43:45.567 AM	9:44:07.470 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Talking to others	Male	Group	Young	2.801	3.296	21.903	Distracted	27	9:43:42.766 AM	9:43:45.567 AM	9:44:07.470 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Talking to others	Male	Group	Young	2.801	3.296	21.903	Distracted	27	9:43:42.766 AM	9:43:45.567 AM	9:44:07.470 AM	9:44:09.766 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.7	3.671	19.67	Not Distracted	27	9:45:15.849 AM	9:45:16.549 AM	9:45:36.219 AM	9:45:42.849 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.7	4.823	14.969	Not Distracted	27	9:45:15.849 AM	9:45:16.549 AM	9:45:31.518 AM	9:45:42.849 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.7	4.314	16.736	Not Distracted	27	9:45:15.849 AM	9:45:16.549 AM	9:45:33.285 AM	9:45:42.849 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.834	5.096	14.169	Not Distracted	27	9:47:57.643 AM	9:47:58.477 AM	9:48:12.646 AM	9:48:24.643 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.933	4.133	17.47	Not Distracted	27	9:48:55.720 AM	9:48:56.653 AM	9:49:14.123 AM	9:49:22.720 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	3.434	4.608	15.669	Distracted	27	9:49:50.930 AM	9:49:54.364 AM	9:50:10.033 AM	9:50:17.930 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	3.634	4.055	17.803	Distracted	27	9:49:50.930 AM	9:49:54.564 AM	9:50:12.367 AM	9:50:17.930 AM

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.901	3.180	22.703	Not Distracted	27	10:10:03.090 AM	10:10:03.991 AM	10:10:26.694 AM	10:10:30.090 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.901	4.366	16.537	Not Distracted	27	10:10:03.090 AM	10:10:04.991 AM	10:10:21.528 AM	10:10:30.090 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.467	3.262	22.137	Not Distracted	27	10:10:03.090 AM	10:10:04.557 AM	10:10:26.694 AM	10:10:30.090 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.067	3.204	22.537	Not Distracted	27	10:10:03.090 AM	10:10:04.157 AM	10:10:26.694 AM	10:10:30.090 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	2.101	4.967	14.535	Distracted	27	10:10:03.090 AM	10:10:05.191 AM	10:10:19.726 AM	10:10:30.090 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Talking to others	Female	Group	Young	2.233	3.050	23.67	Distracted	27	10:11:11.503 AM	10:11:13.736 AM	10:11:37.406 AM	10:11:38.503 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Talking to others	Female	Group	Young	2.233	3.050	23.67	Distracted	27	10:11:11.503 AM	10:11:13.736 AM	10:11:37.406 AM	10:11:38.503 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.866	4.588	15.735	Not Distracted	27	10:11:11.503 AM	10:11:12.369 AM	10:11:28.104 AM	10:11:38.503 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.866	3.952	18.269	Not Distracted	27	10:11:11.503 AM	10:11:12.369 AM	10:11:30.638 AM	10:11:38.503 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	3.167	4.010	18.004	Distracted	27	10:12:59.219 AM	10:13:02.386 AM	10:13:20.390 AM	10:13:26.219 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.335	4.598	15.702	Not Distracted	27	10:12:59.219 AM	10:13:00.554 AM	10:13:16.256 AM	10:13:26.219 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.335	4.094	17.636	Not Distracted	27	10:12:59.219 AM	10:13:00.554 AM	10:13:18.190 AM	10:13:26.219 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2.135	4.041	17.869	Distracted	27	10:12:59.219 AM	10:13:01.354 AM	10:13:19.223 AM	10:13:26.219 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2.135	4.288	16.836	Distracted	27	10:12:59.219 AM	10:13:01.354 AM	10:13:18.190 AM	10:13:26.219 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1	4.366	16.536	Not Distracted	27	10:14:06.998 AM	10:14:07.998 AM	10:14:24.534 AM	10:14:33.998 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1	4.366	16.536	Not Distracted	27	10:14:06.998 AM	10:14:07.998 AM	10:14:24.534 AM	10:14:33.998 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.432	4.305	16.771	Not Distracted	27	10:15:13.010 AM	10:15:14.442 AM	10:15:31.213 AM	10:15:40.010 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.868	4.041	17.868	Not Distracted	27	10:17:17.997 AM	10:17:18.865 AM	10:17:36.733 AM	10:17:44.997 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Group	Young	1.967	3.840	18.803	Not Distracted	27	10:17:17.997 AM	10:17:19.964 AM	10:17:38.767 AM	10:17:44.997 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Group	Young	1.334	3.715	19.436	Not Distracted	27	10:17:17.997 AM	10:17:19.331 AM	10:17:38.767 AM	10:17:44.997 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.334	4.314	16.737	Not Distracted	27	10:17:17.997 AM	10:17:19.331 AM	10:17:36.068 AM	10:17:44.997 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.667	5.206	13.869	Not Distracted	27	10:18:23.775 AM	10:18:24.442 AM	10:18:38.311 AM	10:18:50.775 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Eating/Drinking/Smoking	Female	Alone	Young	2.768	3.677	19.636	Distracted	27	10:18:23.775 AM	10:18:26.543 AM	10:18:46.179 AM	10:18:50.775 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Eating/Drinking/Smoking	Female	Alone	Young	3.934	3.597	20.07	Distracted	27	10:18:23.775 AM	10:18:27.709 AM	10:18:47.779 AM	10:18:50.775 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Other	Female	Alone	Young	2.167	3.895	18.537	Distracted	27	10:18:23.775 AM	10:18:25.942 AM	10:18:44.479 AM	10:18:50.775 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.567	3.773	19.137	Not Distracted	27	10:18:23.775 AM	10:18:25.342 AM	10:18:44.479 AM	10:18:50.775 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.567	4.173	17.303	Not Distracted	27	10:18:23.775 AM	10:18:25.342 AM	10:18:42.645 AM	10:18:50.775 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Male	Alone	Young	4.301	4.438	16.269	Distracted	27	10:19:22.952 AM	10:19:27.253 AM	10:19:43.522 AM	10:19:49.952 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.7	3.510	20.57	Not Distracted	27	10:20:20.596 AM	10:20:21.296 AM	10:20:41.866 AM	10:20:47.596 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.5	4.323	16.703	Not Distracted	27	10:20:20.596 AM	10:20:22.096 AM	10:20:38.799 AM	10:20:47.596 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	1.5	4.033	17.903	Not Distracted	27	10:20:20.596 AM	10:20:22.096 AM	10:20:39.999 AM	10:20:47.596 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.7	4.595	15.714	Not Distracted	27	10:20:20.596 AM	10:20:21.296 AM	10:20:37.010 AM	10:20:47.596 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	0.934	4.540	15.902	Not Distracted	27	10:21:29.540 AM	10:21:30.474 AM	10:21:46.376 AM	10:21:56.540 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.501	3.539	20.399	Not Distracted	27	10:21:29.540 AM	10:21:31.041 AM	10:21:51.440 AM	10:21:56.540 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Male	Alone	Young	0.934	5.169	13.969	Not Distracted	27	10:21:29.540 AM	10:21:30.474 AM	10:21:44.443 AM	10:21:56.540 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	No Distraction	Female	Alone	Young	1.501	4.384	16.469	Not Distracted	27	10:21:29.540 AM	10:21:31.041 AM	10:21:47.510 AM	10:21:56.540 AM
I09-Gemini&E Plaza-PED W	Sunny	School/College	Texting/Talking on phone	Female	Alone	Young	2.834	4.314	16.736	Distracted	27	10:22:39.730 AM	10:22:42.564 AM	10:22:59.300 AM	10:23:06.730 AM

APPENDIX X: SAMPLE OF PEDESTRIANS' DATA EXTRACTED AT SR482 & OBT (NORTH & WEST APPROACHES)

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Other	Male	Alone	Young	4.08	4.299	28.761	Distracted	48	10:09:25.597 AM	10:09:29.677 AM	10:09:58.438 AM	10:10:13.597 AM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3.121	3.797	32.56	Distracted	48	11:05:10.082 AM	11:05:13.203 AM	11:05:45.763 AM	11:05:58.082 AM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3.121	3.797	32.56	Distracted	48	11:05:10.082 AM	11:05:13.203 AM	11:05:45.763 AM	11:05:58.082 AM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Other	Male	Alone	Young	3.2	4.552	27.16	Distracted	48	11:16:40.166 AM	11:16:43.366 AM	11:17:10.526 AM	11:17:28.166 AM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	2.36	3.821	32.361	Distracted	48	11:40:13.729 AM	11:40:16.089 AM	11:40:48.450 AM	11:41:01.729 AM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Male	Alone	Young	1.08	7.188	17.201	Not Distracted	48	11:51:53.000 AM	11:51:54.080 AM	11:52:11.281 AM	11:52:41.000 AM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	4.88	4.360	28.36	Distracted	48	12:15:26.697 PM	12:15:31.577 PM	12:15:59.937 PM	12:16:14.697 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Female	Group	Young	2.48	3.733	33.122	Distracted	48	8:40:48.470 AM	8:40:50.950 AM	8:41:24.072 AM	8:41:36.470 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Female	Group	Young	2.48	3.733	33.122	Distracted	48	8:40:48.470 AM	8:40:50.950 AM	8:41:24.072 AM	8:41:36.470 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.8	4.099	30.161	Not Distracted	48	10:14:09.003 AM	10:14:09.803 AM	10:14:39.964 AM	10:14:57.003 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.92	4.149	29.8	Not Distracted	48	10:35:38.987 AM	10:35:39.907 AM	10:36:09.707 AM	10:36:26.987 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	2.92	4.251	29.082	Distracted	48	10:40:49.052 AM	10:40:51.972 AM	10:41:21.054 AM	10:41:37.052 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	2.92	4.251	29.082	Distracted	48	10:40:49.052 AM	10:40:51.972 AM	10:41:21.054 AM	10:41:37.052 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.44	4.539	27.24	Not Distracted	48	10:43:38.858 AM	10:43:40.298 AM	10:44:07.538 AM	10:44:26.858 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.44	4.539	27.24	Not Distracted	48	10:43:38.858 AM	10:43:40.298 AM	10:44:07.538 AM	10:44:26.858 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.401	2.975	41.56	Not Distracted	48	11:42:19.086 AM	11:42:20.487 AM	11:43:02.047 AM	11:43:07.086 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	2.05	6.218	19.885	Not Distracted	48	12:06:19.019 PM	12:06:21.069 PM	12:06:40.954 PM	12:07:07.019 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.2	6.662	18.56	Not Distracted	48	12:16:59.201 PM	12:17:00.401 PM	12:17:18.961 PM	12:17:47.201 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.76	5.203	23.762	Not Distracted	48	2:14:19.405 PM	2:14:20.165 PM	2:14:43.927 PM	2:15:07.405 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1	4.532	27.28	Not Distracted	48	2:22:47.860 PM	2:22:48.860 PM	2:23:16.140 PM	2:23:35.860 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	4.532	27.28	Not Distracted	48	2:22:47.860 PM	2:22:48.860 PM	2:23:16.140 PM	2:23:35.860 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Eating/Drinking/Smoking	Male	Alone	Young	4.36	3.720	33.24	Distracted	48	2:27:39.308 PM	2:27:43.668 PM	2:28:16.908 PM	2:28:27.308 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Eating/Drinking/Smoking	Male	Alone	Young	1.52	2.515	49.161	Distracted	48	3:20:59.558 PM	3:21:01.078 PM	3:21:50.239 PM	3:21:47.558 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Male	Alone	Young	2.12	4.719	26.2	Distracted	48	3:52:59.512 PM	3:53:01.632 PM	3:53:27.832 PM	3:53:47.512 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.32	3.415	36.202	Not Distracted	48	4:14:19.597 PM	4:14:20.917 PM	4:14:57.119 PM	4:15:07.597 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.68	3.751	32.961	Not Distracted	48	4:30:19.801 PM	4:30:20.481 PM	4:30:53.442 PM	4:31:07.801 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	3.512	35.201	Not Distracted	48	4:38:20.910 PM	4:38:21.910 PM	4:38:57.111 PM	4:39:08.910 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Female	Alone	Young	3.56	4.627	26.721	Distracted	48	5:26:19.920 PM	5:26:23.480 PM	5:26:50.201 PM	5:27:07.920 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Texting/Talking on phone	Female	Alone	Young	3.84	3.528	35.041	Distracted	48	5:26:19.920 PM	5:26:23.760 PM	5:26:58.801 PM	5:27:07.920 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.44	3.807	32.48	Not Distracted	48	8:25:02.340 AM	8:25:03.780 AM	8:25:36.260 AM	8:25:50.340 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.6	4.662	26.52	Not Distracted	48	8:43:42.778 AM	8:43:43.378 AM	8:44:09.898 AM	8:44:30.778 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.801	4.275	28.92	Not Distracted	48	8:57:02.800 AM	8:57:04.601 AM	8:57:33.521 AM	8:57:50.800 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.96	4.299	28.76	Not Distracted	48	9:16:34.468 AM	9:16:35.428 AM	9:17:04.188 AM	9:17:22.468 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.92	5.247	23.562	Not Distracted	48	10:09:20.532 AM	10:09:21.452 AM	10:09:45.014 AM	10:10:08.532 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.08	3.903	31.677	Not Distracted	48	11:37:12.216 AM	11:37:13.296 AM	11:37:44.973 AM	11:38:00.216 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Male	Alone	Young	3.119	4.353	28.401	Distracted	48	3:05:34.818 PM	3:05:37.937 PM	3:06:06.338 PM	3:06:22.818 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Male	Alone	Young	2.799	4.898	25.241	Distracted	48	3:05:34.818 PM	3:05:37.617 PM	3:06:02.858 PM	3:06:22.818 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Talking to others	Male	Alone	Young	5.44	3.948	31.321	Distracted	48	3:20:20.444 PM	3:20:25.884 PM	3:20:57.205 PM	3:21:08.444 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Talking to others	Male	Alone	Young	5.44	3.948	31.321	Distracted	48	3:20:20.444 PM	3:20:25.884 PM	3:20:57.205 PM	3:21:08.444 PM

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.56	5.010	24.681	Not Distracted	48	3:49:35.828 PM	3:49:36.388 PM	3:50:01.069 PM	3:50:23.828 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.281	5.385	22.96	Not Distracted	48	4:12:59.823 PM	4:13:01.104 PM	4:13:24.064 PM	4:13:47.823 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Female	Alone	Old	2.8	3.054	40.481	Distracted	48	4:42:15.552 PM	4:42:18.352 PM	4:42:58.833 PM	4:43:03.552 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Female	Alone	Young	8.92	3.963	31.202	Distracted	48	5:14:40.848 PM	5:14:49.768 PM	5:15:20.970 PM	5:15:28.848 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	3.44	2.697	45.842	Distracted	48	2:09:54.319 PM	2:09:57.759 PM	2:10:43.601 PM	2:10:42.319 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Male	Group	Young	1.84	3.615	34.201	Distracted	48	3:29:01.771 PM	3:29:03.611 PM	3:29:37.812 PM	3:29:49.771 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	1.84	3.615	34.201	Distracted	48	3:29:01.771 PM	3:29:03.611 PM	3:29:37.812 PM	3:29:49.771 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	1.84	3.615	34.201	Distracted	48	3:29:01.771 PM	3:29:03.611 PM	3:29:37.812 PM	3:29:49.771 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Other	Male	Alone	Young	6.56	4.384	28.2	Distracted	48	5:05:52.496 PM	5:05:59.056 PM	5:06:27.256 PM	5:06:40.496 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Male	Group	Young	3	3.917	31.561	Distracted	48	5:49:49.087 PM	5:49:52.087 PM	5:50:23.648 PM	5:50:37.087 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3	3.917	31.561	Distracted	48	5:49:49.087 PM	5:49:52.087 PM	5:50:23.648 PM	5:50:37.087 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3	3.917	31.561	Distracted	48	5:49:49.087 PM	5:49:52.087 PM	5:50:23.648 PM	5:50:37.087 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3	3.917	31.561	Distracted	48	5:49:49.087 PM	5:49:52.087 PM	5:50:23.648 PM	5:50:37.087 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3	3.541	34.921	Distracted	48	5:49:49.087 PM	5:49:52.087 PM	5:50:27.008 PM	5:50:37.087 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Talking to others	Female	Group	Young	3	3.541	34.921	Distracted	48	5:49:49.087 PM	5:49:52.087 PM	5:50:27.008 PM	5:50:37.087 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Texting/Talking on phone	Male	Group	Young	4.56	4.441	27.84	Distracted	48	6:10:21.160 PM	6:10:25.720 PM	6:10:53.560 PM	6:11:09.160 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Texting/Talking on phone	Female	Group	Young	4.56	4.441	27.84	Distracted	48	6:10:21.160 PM	6:10:25.720 PM	6:10:53.560 PM	6:11:09.160 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	Texting/Talking on phone	Female	Group	Young	4.56	4.441	27.84	Distracted	48	6:10:21.160 PM	6:10:25.720 PM	6:10:53.560 PM	6:11:09.160 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Male	Alone	Young	6.8	4.829	25.601	Distracted	48	6:13:18.364 PM	6:13:25.164 PM	6:13:50.765 PM	6:14:06.364 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.641	4.532	27.279	Not Distracted	48	6:42:39.289 PM	6:42:39.930 PM	6:43:07.209 PM	6:43:27.289 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	0.92	3.903	31.682	Not Distracted	48	6:45:33.573 PM	6:45:34.493 PM	6:46:06.175 PM	6:46:21.573 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	0.92	3.903	31.682	Not Distracted	48	6:45:33.573 PM	6:45:34.493 PM	6:46:06.175 PM	6:46:21.573 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	0.92	3.903	31.682	Not Distracted	48	6:45:33.573 PM	6:45:34.493 PM	6:46:06.175 PM	6:46:21.573 PM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.84	4.506	27.441	Not Distracted	48	8:57:02.645 AM	8:57:03.485 AM	8:57:30.926 AM	8:57:50.645 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.64	4.733	26.121	Not Distracted	48	9:51:42.646 AM	9:51:44.286 AM	9:52:10.407 AM	9:52:30.646 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	4.454	4.664	26.507	Distracted	48	9:51:42.646 AM	9:51:47.100 AM	9:52:13.607 AM	9:52:30.646 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	4.454	4.664	26.507	Distracted	48	9:51:42.646 AM	9:51:47.100 AM	9:52:13.607 AM	9:52:30.646 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.96	4.493	27.521	Not Distracted	48	10:06:28.640 AM	10:06:29.600 AM	10:06:57.121 AM	10:07:16.640 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Other	Male	Alone	Young	2.761	3.983	31.041	Distracted	48	10:23:58.694 AM	10:24:01.455 AM	10:24:32.496 AM	10:24:46.694 AM
I07-SR482&OBT-PED N	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	17.361	4.275	28.92	Distracted	48	11:52:00.713 AM	11:52:18.074 AM	11:52:46.994 AM	11:52:48.713 AM

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Male	Alone	Young	1.32	5.798	21.323	Not Distracted	48	12:33:01.728 PM	12:33:03.048 PM	12:33:24.371 PM	12:33:49.728 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Female	Alone	Young	1.32	5.798	21.323	Not Distracted	48	12:33:01.728 PM	12:33:03.048 PM	12:33:24.371 PM	12:33:49.728 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Male	Alone	Young	1.24	4.105	30.12	Not Distracted	48	12:47:51.738 PM	12:47:52.978 PM	12:48:23.098 PM	12:48:39.738 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Female	Alone	Young	1.08	3.825	32.322	Not Distracted	48	1:20:00.985 PM	1:20:02.065 PM	1:20:34.387 PM	1:20:48.985 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Female	Alone	Young	1.36	5.910	20.921	Not Distracted	48	2:59:50.219 PM	2:59:51.579 PM	3:00:12.500 PM	3:00:38.219 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Male	Alone	Young	0.68	5.854	21.119	Not Distracted	48	3:52:34.432 PM	3:52:35.112 PM	3:52:56.231 PM	3:53:22.432 PM
I07-SR482&OBT-PED N	Cloudy	Residential/Commercial	No Distraction	Male	Alone	Young	0.88	3.883	31.841	Not Distracted	48	4:36:36.460 PM	4:36:37.340 PM	4:37:09.181 PM	4:37:24.460 PM
I07-SR482&OBT-PED N	Rainy	Residential/Commercial	No Distraction	Female	Alone	Old	0.84	3.342	37.001	Not Distracted	48	4:51:19.573 PM	4:51:20.413 PM	4:51:57.414 PM	4:52:07.573 PM
I07-SR482&OBT-PED N	Rainy	Residential/Commercial	No Distraction	Female	Alone	Old	1.8	2.978	41.522	Not Distracted	48	5:17:32.568 PM	5:17:34.368 PM	5:18:15.890 PM	5:18:20.568 PM
I07-SR482&OBT-PED N	Rainy	Residential/Commercial	No Distraction	Female	Group	Young	1.6	4.051	30.52	Not Distracted	48	5:20:28.294 PM	5:20:29.894 PM	5:21:00.414 PM	5:21:16.294 PM
I07-SR482&OBT-PED N	Rainy	Residential/Commercial	No Distraction	Male	Group	Young	1.6	4.051	30.52	Not Distracted	48	5:20:28.294 PM	5:20:29.894 PM	5:21:00.414 PM	5:21:16.294 PM
I07-SR482&OBT-PED N	Rainy	Residential/Commercial	No Distraction	Male	Group	Young	1.6	3.765	32.841	Not Distracted	48	5:20:28.294 PM	5:20:29.894 PM	5:21:02.735 PM	5:21:16.294 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.734	5.215	25.737	Not Distracted	45	3:03:26.149 PM	3:03:27.883 PM	3:03:53.620 PM	3:04:11.149 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.667	4.146	32.372	Not Distracted	45	3:06:26.613 PM	3:06:28.280 PM	3:07:00.652 PM	3:07:11.613 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.268	4.129	32.505	Not Distracted	45	7:48:54.805 AM	7:48:56.073 AM	7:49:28.578 AM	7:49:39.805 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Female	Alone	Young	21.504	3.813	35.205	Distracted	45	7:59:44.506 AM	8:00:06.010 AM	8:00:41.215 AM	8:00:29.506 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.567	4.260	31.505	Not Distracted	45	8:52:53.840 AM	8:52:55.407 AM	8:53:26.912 AM	8:53:38.840 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.667	5.339	25.138	Not Distracted	45	10:37:26.806 AM	10:37:28.473 AM	10:37:53.611 AM	10:38:11.806 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	2.667	5.561	24.138	Not Distracted	45	10:37:26.806 AM	10:37:29.473 AM	10:37:53.611 AM	10:38:11.806 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	3.667	5.318	25.238	Not Distracted	45	10:37:26.806 AM	10:37:30.473 AM	10:37:55.711 AM	10:38:11.806 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	4.667	5.538	24.238	Not Distracted	45	10:37:26.806 AM	10:37:31.473 AM	10:37:55.711 AM	10:38:11.806 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Female	Alone	Young	3.5	4.565	29.405	Distracted	45	11:24:06.201 AM	11:24:09.701 AM	11:24:39.106 AM	11:24:51.201 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Male	Alone	Young	2.834	5.064	26.505	Distracted	45	11:59:13.884 AM	11:59:16.718 AM	11:59:43.223 AM	11:59:58.884 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	45	•	•	Distracted	45	1:15:30.521 PM	•	•	1:16:15.521 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.534	5.001	26.838	Not Distracted	45	1:33:06.744 PM	1:33:08.278 PM	1:33:35.116 PM	1:33:51.744 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.534	5.001	26.838	Not Distracted	45	1:33:06.744 PM	1:33:08.278 PM	1:33:35.116 PM	1:33:51.744 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Male	Alone	Young	2.967	5.188	25.872	Distracted	45	1:38:58.487 PM	1:39:01.454 PM	1:39:27.326 PM	1:39:43.487 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.567	5.155	26.038	Not Distracted	45	1:41:54.418 PM	1:41:55.985 PM	1:42:22.023 PM	1:42:39.418 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.567	5.155	26.038	Not Distracted	45	1:41:54.418 PM	1:41:55.985 PM	1:42:22.023 PM	1:42:39.418 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.567	5.096	26.337	Not Distracted	45	7:16:54.684 AM	7:16:55.251 AM	7:17:21.588 AM	7:17:39.684 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.967	7.925	16.936	Not Distracted	45	8:26:24.993 AM	8:26:25.960 AM	8:26:42.896 AM	8:27:09.993 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.3	6.222	21.571	Not Distracted	45	8:47:44.778 AM	8:47:46.078 AM	8:48:07.649 AM	8:48:29.778 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.967	4.748	28.271	Not Distracted	45	10:10:42.038 AM	10:10:43.005 AM	10:11:11.276 AM	10:11:27.038 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	0.967	4.748	28.271	Not Distracted	45	10:10:42.038 AM	10:10:43.005 AM	10:11:11.276 AM	10:11:27.038 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Female	Alone	Young	2.299	4.534	29.606	Distracted	45	11:53:21.811 AM	11:53:24.110 AM	11:53:53.716 AM	11:54:06.811 AM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Female	Group	Young	2.067	4.591	29.238	Distracted	45	12:02:10.164 PM	12:02:12.231 PM	12:02:41.469 PM	12:02:55.164 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Other	Male	Group	Young	2.067	4.591	29.238	Distracted	45	12:02:10.164 PM	12:02:12.231 PM	12:02:41.469 PM	12:02:55.164 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.833	7.742	17.337	Not Distracted	45	1:06:42.258 PM	1:06:44.091 PM	1:07:01.428 PM	1:07:27.258 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	0.8	4.112	32.639	Not Distracted	45	2:17:06.341 PM	2:17:07.141 PM	2:17:39.780 PM	2:17:51.341 PM
I08-SR482&OBT-PED W	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	2.8	5.168	25.971	Distracted	45	3:12:50.371 PM	3:12:53.171 PM	3:13:19.142 PM	3:13:35.371 PM

APPENDIX Y: SAMPLE OF PEDESTRIANS' DATA EXTRACTED AT LAKE UNDERHILL RD. & WOODBURRY RD (SOUTH APPROACH)

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	Eating/Drinking/Smoking	Male	Alone	Young	3	4.712	13	Distracted	27	1:34:23.000 PM	1:34:26.000 PM	1:34:39.000 PM	1:34:50.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	Other	Male	Alone	Young	5	10.208	6	Distracted	27	4:38:29.000 PM	4:38:34.000 PM	4:38:40.000 PM	4:38:56.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	2	4.712	13	Not Distracted	27	5:31:34.000 PM	5:31:36.000 PM	5:31:49.000 PM	5:32:01.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	2	4.712	13	Not Distracted	27	6:19:15.000 PM	6:19:17.000 PM	6:19:30.000 PM	6:19:42.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	Texting/Talking on phone	Female	Alone	Young	9	4.083	15	Distracted	27	7:12:33.000 PM	7:12:42.000 PM	7:12:57.000 PM	7:13:00.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1	3.603	17	Not Distracted	27	12:40:39.000 PM	12:40:40.000 PM	12:40:57.000 PM	12:41:06.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1	4.083	15	Not Distracted	27	1:26:06.000 PM	1:26:07.000 PM	1:26:22.000 PM	1:26:33.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	2	7.656	8	Not Distracted	27	4:02:59.000 PM	4:03:01.000 PM	4:03:09.000 PM	4:03:26.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	Other	Male	Alone	Young	9	10.208	6	Distracted	27	5:31:39.000 PM	5:31:48.000 PM	5:31:54.000 PM	5:32:06.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	4.375	14	Not Distracted	27	6:05:22.000 PM	6:05:23.000 PM	6:05:37.000 PM	6:05:49.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	4.375	14	Not Distracted	27	6:05:22.000 PM	6:05:23.000 PM	6:05:37.000 PM	6:05:49.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	3.828	16	Not Distracted	27	6:41:30.000 PM	6:41:31.000 PM	6:41:47.000 PM	6:41:57.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	3.828	16	Not Distracted	27	6:41:30.000 PM	6:41:31.000 PM	6:41:47.000 PM	6:41:57.000 PM
I02-LkUndrhl&Wodbry-PED S	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	3	4.083	15	Distracted	27	6:52:36.000 PM	6:52:39.000 PM	6:52:54.000 PM	6:53:03.000 PM

APPENDIX Z: SAMPLE OF PEDESTRIANS' DATA EXTRACTED AT I-DRIVE & JAMAICAN CT. (NORTH-SOUTH-WEST APPROACHES)

Int. No.	Weather	Land Use	Distraction Cause	Gender	Group Status	Age	Start up time	Walking Speed	Cross. Time	Distraction Status	Signal Time	Green Start	Time Peds. Started Crossing	Time Peds. Finished Crossing	Green End
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	0.667	4.602	11.268	Not Distracted	43	4:22:58.023 PM	4:22:58.690 PM	4:23:09.958 PM	4:23:41.023 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	0.667	4.602	11.268	Not Distracted	43	4:22:58.023 PM	4:22:58.690 PM	4:23:09.958 PM	4:23:41.023 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Alone	Old	1.132	3.467	14.958	Distracted	43	5:07:58.021 PM	5:07:59.153 PM	5:08:14.111 PM	5:08:41.021 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	2.868	4.182	12.402	Distracted	43	5:59:00.248 PM	5:59:03.116 PM	5:59:15.518 PM	5:59:43.248 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	1.334	3.282	15.803	Distracted	43	6:23:00.295 PM	6:23:01.629 PM	6:23:17.432 PM	6:23:43.295 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	1.334	3.282	15.803	Distracted	43	6:23:00.295 PM	6:23:01.629 PM	6:23:17.432 PM	6:23:43.295 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	0.467	4.861	10.668	Not Distracted	43	6:59:18.870 PM	6:59:19.337 PM	6:59:30.005 PM	7:00:01.870 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	0.467	4.861	10.668	Not Distracted	43	6:59:18.870 PM	6:59:19.337 PM	6:59:30.005 PM	7:00:01.870 PM
I10-iDrive&Jamaican Ct. PED N...	Rainy	Residential/Commercial	No Distraction	Female	Group	Young	0.933	4.321	12.002	Not Distracted	43	7:27:19.092 PM	7:27:20.025 PM	7:27:32.027 PM	7:28:02.092 PM
I10-iDrive&Jamaican Ct. PED N...	Rainy	Residential/Commercial	No Distraction	Male	Group	Young	0.933	4.321	12.002	Not Distracted	43	7:27:19.092 PM	7:27:20.025 PM	7:27:32.027 PM	7:28:02.092 PM
I10-iDrive&Jamaican Ct. PED N...	Rainy	Residential/Commercial	No Distraction	Female	Group	Young	0.666	4.009	12.936	Not Distracted	43	7:41:19.103 PM	7:41:19.769 PM	7:41:32.705 PM	7:42:02.103 PM
I10-iDrive&Jamaican Ct. PED N...	Rainy	Residential/Commercial	No Distraction	Male	Group	Young	0.666	4.009	12.936	Not Distracted	43	7:41:19.103 PM	7:41:19.769 PM	7:41:32.705 PM	7:42:02.103 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Old	2.8	3.928	13.202	Distracted	43	7:45:59.151 PM	7:46:01.951 PM	7:46:15.153 PM	7:46:42.151 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Male	Group	Young	2.8	3.928	13.202	Distracted	43	7:45:59.151 PM	7:46:01.951 PM	7:46:15.153 PM	7:46:42.151 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Old	0.801	3.652	14.202	Not Distracted	43	8:16:17.209 PM	8:16:18.010 PM	8:16:32.212 PM	8:17:00.209 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Old	0.801	3.652	14.202	Not Distracted	43	8:16:17.209 PM	8:16:18.010 PM	8:16:32.212 PM	8:17:00.209 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.601	3.457	15.002	Not Distracted	43	8:16:17.209 PM	8:16:18.810 PM	8:16:33.812 PM	8:17:00.209 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	1.601	3.162	16.402	Not Distracted	43	8:16:17.209 PM	8:16:18.810 PM	8:16:35.212 PM	8:17:00.209 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1	4.444	11.669	Not Distracted	43	8:23:16.615 PM	8:23:17.615 PM	8:23:29.284 PM	8:23:59.615 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Male	Group	Young	3.133	4.657	11.136	Distracted	43	8:30:08.286 PM	8:30:11.419 PM	8:30:22.555 PM	8:30:51.286 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Young	2.133	4.273	12.136	Distracted	43	8:30:08.286 PM	8:30:10.419 PM	8:30:22.555 PM	8:30:51.286 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Male	Group	Young	2.133	4.273	12.136	Distracted	43	8:30:08.286 PM	8:30:10.419 PM	8:30:22.555 PM	8:30:51.286 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Young	2.133	4.273	12.136	Distracted	43	8:30:08.286 PM	8:30:10.419 PM	8:30:22.555 PM	8:30:51.286 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	1.867	4.274	12.135	Not Distracted	43	8:47:41.000 PM	8:47:42.867 PM	8:47:55.002 PM	8:48:24.000 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.867	5.477	9.468	Not Distracted	43	8:47:41.000 PM	8:47:42.867 PM	8:47:52.335 PM	8:48:24.000 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	1.867	4.274	12.135	Not Distracted	43	8:47:41.000 PM	8:47:42.867 PM	8:47:55.002 PM	8:48:24.000 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.867	4.954	10.468	Not Distracted	43	8:47:41.000 PM	8:47:42.867 PM	8:47:53.335 PM	8:48:24.000 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Young	3.801	4.630	11.201	Distracted	43	8:57:53.305 PM	8:57:57.106 PM	8:57:08.307 PM	8:58:36.305 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Young	3.801	4.630	11.201	Distracted	43	8:57:53.305 PM	8:57:57.106 PM	8:57:08.307 PM	8:58:36.305 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Female	Group	Young	3.202	3.175	16.336	Distracted	43	9:03:50.899 PM	9:03:54.101 PM	9:03:10.437 PM	9:04:33.899 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Group	Young	4.267	3.396	15.271	Distracted	43	9:03:50.899 PM	9:03:55.166 PM	9:03:10.437 PM	9:04:33.899 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Female	Group	Old	1.534	4.159	12.468	Distracted	43	9:09:40.693 PM	9:09:42.227 PM	9:09:54.695 PM	9:10:23.693 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Old	1.534	4.159	12.468	Distracted	43	9:09:40.693 PM	9:09:42.227 PM	9:09:54.695 PM	9:10:23.693 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.401	4.009	12.935	Not Distracted	43	9:19:43.529 PM	9:19:44.930 PM	9:19:57.865 PM	9:20:26.529 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	1.401	4.009	12.935	Not Distracted	43	9:19:43.529 PM	9:19:44.930 PM	9:19:57.865 PM	9:20:26.529 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	2.534	2.808	18.47	Distracted	43	9:19:43.529 PM	9:19:46.063 PM	9:19:04.533 PM	9:20:26.529 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	2.534	2.808	18.47	Distracted	43	9:19:43.529 PM	9:19:46.063 PM	9:19:04.533 PM	9:20:26.529 PM

I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	44.074	0.916	56.589	Distracted	43	9:46:19.337 PM	9:47:03.411 PM	•	9:47:02.337 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Male	Group	Young	1.867	4.072	12.735	Distracted	43	9:51:26.857 PM	9:51:28.724 PM	9:51:41.459 PM	9:52:09.857 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Male	Group	Young	1.867	4.072	12.735	Distracted	43	9:51:26.857 PM	9:51:28.724 PM	9:51:41.459 PM	9:52:09.857 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Young	1.867	4.072	12.735	Distracted	43	9:51:26.857 PM	9:51:28.724 PM	9:51:41.459 PM	9:52:09.857 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Female	Group	Young	1.867	4.072	12.735	Distracted	43	9:51:26.857 PM	9:51:28.724 PM	9:51:41.459 PM	9:52:09.857 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	0.201	3.497	13.269	Not Distracted	43	4:58:57.793 PM	4:58:57.994 PM	4:59:11.263 PM	4:59:40.793 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Other	Male	Group	Young	2.069	4.070	11.401	Distracted	43	4:58:57.793 PM	4:58:59.862 PM	4:59:11.263 PM	4:59:40.793 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Texting/Talking on phone	Male	Alone	Young	7.468	3.909	11.869	Distracted	43	6:52:19.264 PM	6:52:26.732 PM	6:52:38.601 PM	6:53:02.264 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Female	Group	Young	1.2	4.935	9.402	Not Distracted	43	9:36:16.633 PM	9:36:17.833 PM	9:36:27.235 PM	9:36:59.633 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	1.2	4.935	9.402	Not Distracted	43	9:36:16.633 PM	9:36:17.833 PM	9:36:27.235 PM	9:36:59.633 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	1.334	3.121	14.869	Distracted	43	9:59:16.537 PM	9:59:17.871 PM	9:59:32.740 PM	9:59:59.537 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Female	Group	Young	1.4	3.134	14.803	Distracted	43	9:59:16.537 PM	9:59:17.937 PM	9:59:32.740 PM	9:59:59.537 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	1.4	3.134	14.803	Distracted	43	9:59:16.537 PM	9:59:17.937 PM	9:59:32.740 PM	9:59:59.537 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Male	Group	Young	1.4	3.134	14.803	Distracted	43	9:59:16.537 PM	9:59:17.937 PM	9:59:32.740 PM	9:59:59.537 PM
I10-iDrive&Jamaican Ct. PED N...	Sunny	Residential/Commercial	Talking to others	Female	Group	Young	1.4	3.134	14.803	Distracted	43	9:59:16.537 PM	9:59:17.937 PM	9:59:32.740 PM	9:59:59.537 PM
I11-iDrive&Jamaican Ct. PED W	Rainy	Residential/Commercial	Other	Male	Alone	Young	1.734	4.933	17.336	Distracted	32	7:51:29.742 PM	7:51:31.476 PM	7:51:48.812 PM	7:52:01.742 PM
I11-iDrive&Jamaican Ct. PED W	Rainy	Residential/Commercial	Other	Male	Alone	Old	1.333	4.581	18.67	Distracted	32	7:54:00.235 PM	7:54:01.568 PM	7:54:20.238 PM	7:54:32.235 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	No Distraction	Female	Alone	Young	1.067	5.221	11.735	Not Distracted	43	4:28:45.355 PM	4:28:46.422 PM	4:28:58.157 PM	4:29:28.355 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	No Distraction	Male	Alone	Young	1.201	4.235	14.469	Not Distracted	43	6:31:03.682 PM	6:31:04.883 PM	6:31:19.352 PM	6:31:46.682 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	0.934	4.527	13.535	Not Distracted	43	7:06:03.575 PM	7:06:04.509 PM	7:06:18.044 PM	7:06:46.575 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	0.934	4.527	13.535	Not Distracted	43	7:06:03.575 PM	7:06:04.509 PM	7:06:18.044 PM	7:06:46.575 PM
I12-iDrive&Jamaican Ct. PED S	Rainy	Residential/Commercial	Other	Male	Group	Young	14.269	6.252	9.8	Distracted	43	7:08:26.433 PM	7:08:40.702 PM	7:08:50.502 PM	7:09:09.433 PM
I12-iDrive&Jamaican Ct. PED S	Rainy	Residential/Commercial	Other	Male	Group	Young	14.269	6.252	9.8	Distracted	43	7:08:26.433 PM	7:08:40.702 PM	7:08:50.502 PM	7:09:09.433 PM
I12-iDrive&Jamaican Ct. PED S	Rainy	Residential/Commercial	Talking to others	Male	Group	Young	2.067	5.438	11.268	Distracted	43	8:11:26.281 PM	8:11:28.348 PM	8:11:39.616 PM	8:12:09.281 PM
I12-iDrive&Jamaican Ct. PED S	Rainy	Residential/Commercial	Talking to others	Female	Group	Young	2.067	5.438	11.268	Distracted	43	8:11:26.281 PM	8:11:28.348 PM	8:11:39.616 PM	8:12:09.281 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	No Distraction	Male	Group	Young	0.867	2.344	26.138	Not Distracted	43	9:40:35.732 PM	9:40:36.599 PM	9:41:02.737 PM	9:41:18.732 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	Talking to others	Female	Group	Young	3.801	2.640	23.204	Distracted	43	9:40:35.732 PM	9:40:39.533 PM	9:41:02.737 PM	9:41:18.732 PM
I12-iDrive&Jamaican Ct. PED S	Sunny	Residential/Commercial	Talking to others	Female	Group	Young	3.801	2.640	23.204	Distracted	43	9:40:35.732 PM	9:40:39.533 PM	9:41:02.737 PM	9:41:18.732 PM