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## Proposal for UTA-Downtown Arlington Bike Network

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PROPOSAL FOR UTA-DOWNTOWN  
ARLINGTON BIKE NETWORK

by

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Presented to the Faculty of the Honors College of  
The University of Texas at Arlington in Partial Fulfillment  
of the Requirements  
for the Degree of

HONORS BACHELOR OF ARTS OF POLITICAL SCIENCE

THE UNIVERSITY OF TEXAS AT ARLINGTON

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April 22, 2022

## ABSTRACT

### PROPOSAL FOR UTA-DOWNTOWN ARLINGTON BIKE NETWORK

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The University of Texas at Arlington, 2022

Faculty Mentor: Ariadna Reyes-Sánchez

Bicycling offers great benefits for cities including sustainable, efficient, and affordable transportation, improved health and wellness, and creating vibrant communities. Universities offer a good starting point for young adults to form sustainable transportation habits. This study explores how the University of Texas at Arlington's community perceives existing bike infrastructure, services, and amenities on campus and off-campus to create a well-connected and safe bike network. An online survey was used to collect feedback from students and employees on commuting patterns, cycling experience and barriers, perceived safety on various bike facilities, and suggestions. Based on survey responses, a bike network analysis was created to project expanded connections to the University and Downtown Arlington. The research findings indicate the top barriers in cycling include unsafe driver behavior, disconnected bike lanes, and lack of secure bike parking. Perceived safety increased among respondents with the addition of buffers and

separation from cars. Most respondents show interest in traveling to Downtown Arlington destinations by bike and would bike more frequently if desired bike facilities were implemented.

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## CHAPTER 1

### INTRODUCTION

Cities across the world, especially in Northern Europe, have taken the lead in promoting bicycling as a tool to lower transportation air pollution and greenhouse gas emissions (Gössling 2013). Cycling provides opportunities to meet many of the United Nations Sustainable Development Goals such as Sustainable Communities, Climate Action, Gender Equality, No Poverty, etc. (Sustainable Development Goals & Cycling, n.d.). Despite the progress of biking in cities in the Northern Europe, such as Amsterdam and Vienna, where the majority of commuters bike or use bike in their intermodal trips, most U.S. cities have struggled in encouraging commuters to bike (Buehler et al., 2016). Less than 1% of the commuters in the U.S. bike for recreational purposes, not as the main mode of transportation (National House Travel Survey, 2001, as cited in Dill, 2009). Some cities in the U.S. have supported non-motorized transportation with some success, as exemplified by Oregon and Portland (Pucher et al., 2010). This report focuses on the city of Arlington, Texas which was built and designed around the automobile. Arlington is the largest city in the U.S. that lacks transit (Harrington, 2018). Consequently, the Dallas-Fort Worth-Arlington area was ranked at the bottom, sixth worst car-free large metropolitan areas in the United States by Bloomberg CityLab (Florida, 2019). Arlington's car dependency takes a dangerous toll on its micro transportation, being ranked the 13th deadliest city for cyclists in America. In 2019 only .065% of Arlington's residents used a

bicycle as a commuting method (Routhier, 2021) (Arlington, TX Census Place, 2019) The Arlington Hike and Bike System Masterplan from 2011 envisioned for “more people ...[to] choose to hike or bike to their destinations instead of driving” and for “bicycle and pedestrian policy ...[to] be integrated into city codes and a hike and bike culture will be integrated into Arlington life” (City of Arlington, 2011). Over a decade has passed since the Hike and Bike System Masterplan was adopted. Such discrepancy addresses the need for updated infrastructure and bike services to allow for safer bicycle travel and increase the share of commuter trips through non-motorized forms of transportation. Despite the remarkable challenges of mobility and transportation in Arlington, universities are a great starting place for young adults to form sustainable transportation habits. Close proximity between classrooms and residences would make bicycling an efficient and affordable transportation mode for students and staff alike. The University of Texas at Arlington’s close location to Downtown Arlington would offer a great opportunity for a bicycle network, encompassing off-campus housing, businesses, restaurants, and places of worship. The North Central Texas’ projected population is expected to grow by 5 million by the year 2050 (North Texas 2050, 2010). The City of Arlington should adjust its micro transit infrastructure to mitigate expected congestion levels and provide safety measures for bicycle commuters.

A strong bike network includes safe infrastructure and services for all ages, abilities, and inclusive of all income levels. This research study aims to identify the gaps in Downtown Arlington and UTA’s bicycle infrastructure and services. First, a literature review was conducted to explore the various factors affecting people’s willingness and preference for biking. Next, the study areas of the University and Arlington are introduced,

studying demographics, travel modes, and previous transportation studies. The methods outline the UTA community survey exploring the following research questions (See Appendix):

- 1) What are UTA and Downtown Arlington's bike infrastructure and services strengths and weaknesses?
- 2) What is the UTA community's perceived level of safety in various bicycle lane infrastructure?
- 3) How would preferred bike infrastructure and services impact their commuting pattern?
- 4) What areas near UTA and Downtown Arlington are in greatest need of bicycle infrastructure upgrades?

Using the data collected from the survey, a network analysis was created to expand biking routes beyond Downtown Arlington and UTA. Arlington's largest employers are identified within the network to plan for greater access to career opportunities for UTA students. Finally, policy recommendations are presented for the City of Arlington and UTA proposing a strong and improved UTA-Downtown Arlington bike network.

## CHAPTER 2

### LITERATURE REVIEW

This section examines previous academic studies and government reports on bike commuting behavior, barriers, and the built environment. The literature review reveals various factors that influence people's commute preferences and willingness to cycle, including infrastructure, weather, transportation costs, crime/safety, demographics, and existing bike culture (Hull and O'Holleran 2014) (Pucher et al., 1999) (Rybarczyk and Gallagher 2014).

#### 2.1 Infrastructure

Infrastructure encompasses elements such as bike lanes and paths, intersection elements, end destinations, and lighting. The literature differentiates between risk perception and safety of bicycle infrastructure. Risk perception studies a population's comfort in biking on different bicycle facilities, while safety analyzes crash and injury data on bike infrastructure.

The "Four Types of Bicyclists" typology by Roger Geller, Bicycle Coordinator for the City of Portland, studies risk perceptions and experience into the following categories of cyclists: *strong and fearless*, *enthused and confident*, *interested but concerned*, and *no way, no how* (Geller 2006). The *strong and fearless* are willing to ride a bike, regardless of infrastructure conditions, *enthused and confident* feel somewhat comfortable sharing the roadway with cars but prefer riding in bicycle facilities, *interested but concerned* are interested to ride but afraid of traffic safety and other concerns, and *no way no how* are

those “not interested in bicycling or comfortable doing so, or physically unable to do so” (National Research Center, 2017).

Studies have shown that bicycle infrastructure design encourages people to cycle more (Hull and O’Holleran, 2014) (Rybarczyk and Gallagher, 2014). Separated bike facilities such as shared pedestrian and bicyclist paths are rated with the highest perceived safety and comfort (McNeil et al. 2015) (Lusk et al. 2019). McNeil et al. found that those *interested but concerned*, are more likely to feel safer biking on facilities with a buffer, showing higher comfort levels with planter separations than flex post alignments (McNeil et al. 2015). Installations in cycle tracks in Downtown Portland found that cyclists were using the bicycle facilities more often than the previous painted bike lanes, with stronger safety perceptions from cyclists and motorists (Monsere et al. 2012). Painted vs non painted lanes have mixed findings on safety perceptions as bicyclists find that the paint gives them more visibility and direction while motorists could argue that painted bike lanes could lead to a “false sense of security” (Hunter et al., 2000).

The literature shows mixed results on injury risks of bicycle infrastructure. Stephen Wall et al. studied the severity and occurrence of bicycle-car collision injuries in New York City. The study found that protected bicycle lanes had “approximately 23% fewer injuries compared to non-bicycle route locations” (Wall et al., 2016). Similarly, Cicchino et al. found that risks of crashing and falling was lower on heavily buffered bike lanes such as raised paths and greenways (Cicchino et al. 2020). However, local roads and conventional bike lanes were found to be “less risky than street-level protected bike lanes”; however, it is hypothesized that this is because the roads themselves are safer to begin with (Young, 2019 cited from Cicchino et al. 2020).

Although cycle tracks have been found to have the lowest rates of injury, the greatest crash and injury risks have been recorded at intersections, where cars and cyclists come closer in closer contact (Cicchino et al. 2020). To reduce crash and injury rates some cities have implemented bike boxes and bike-specific signals to give cyclists a head start over cars. A study held in Portland Oregon at signalized intersections found that using bike boxes correctly has a high rate of compliance among motorists and cyclists, with higher preference for colored bike boxes among motorists (Dill et al. 2010).

A connected bicycle network allows cyclists to travel to different destinations with improved traffic flow and a safer more comfortable biking experience. Studies have shown that availability and connectivity of bicycle lanes increases the number of bicyclist commuters (Buehler & Pucher, 2011) (Dill & Carr, 2003). Dill and Voros found that lack of bicycle infrastructure is one of the greatest barriers to travel by bicycle, the second after “too much traffic” (Dill & Voros, 2007). Additionally, Dill and Voros indicate that strong bike network connectivity allows cyclists to take utilitarian trips rather than just recreational cycling (Dill & Voros, 2007).

End destinations include bike parking availability, location, design, and showers/lockers can play an important role in encouraging cycling. An attitudinal survey found that students are more likely to bike with more bicycle racks on a college campus (Rybarczyk and Gallagher 2014). As bicycles spend most of the time parked, safety from bike thefts and weather conditions can impact people’s willingness to commute by bike. For workplace settings it is preferred to have a location to freshen up such as locker rooms with showers. According to Bueno et al., individuals with workplace locker rooms with shower were 50 times more likely to bike to work (Bueno et al. 2017).



Sufficient lighting and shading create a more comfortable biking and environment keeping cyclists, pedestrians, and motorists safe. Street lighting makes cyclists visible to motorists, pedestrians, and other cyclists, helps them avoid potholes and obstructions on the road, and helps guide cyclists towards their destination. A study by Utley et al. found that only a minimal addition of lighting to roadways increased cycling levels in Birmingham, UK (Utley et al., 2020). Improved lighting was considered one of the greatest determinants of increased cycling levels among faculty of a commuter university campus (Rybarczyk and Gallagher 2014). Furthermore, shading can impact people's willingness to cycle. Trees along bike facilities allow for shading, reduced noise and air pollution for cyclists.

## 2.2 Weather

There are mixed findings on the impact weather has on cycling levels. Buehler & Pucher did not find that extremely hot or cold weather nor precipitation predicted bike commuting levels across 90 large American cities (Buehler & Pucher, 2011). On the other hand, other studies have found that weather has a significant effect on bike ridership (Miranda-Moreno and Nosal, 2011) (Fowler et al., 2017). Willingness to bike could depend on the community's adaptation to the weather.

## 2.3 Transportation Costs

Although income has shown not to be significantly correlated to bicycle commuting, many people choose to bike due to its affordable transportation costs (Dill & Carr, 2003). A study found that choosing bicycle as a commuting method was "significantly correlated with [...] gasoline price variables" (Dill & Carr, 2003). Some communities have seen an increase in bike sales in spring 2022 after spikes in gasoline

prices (Piekos, 2022). Furthermore, Transportation Demand Management (TDM) strategies such as parking cost/availability management and congestion management can increase bike commuting (Rybarczyk and Gallagher 2014).

#### 2.4 Traffic/Driving Conditions

One of the greatest issues for cyclists, especially for beginners, are traffic and driving conditions. Fowler et al. found that lack of traffic safety was the biggest barrier among men and women, and unsafe driver behavior ranked as third highest obstacle for cyclists (Fowler et al., 2017). Similarly, Dill & Voros found that traffic was the greatest barrier for cyclists (Dill & Voros, 2007). Stronger traffic enforcement and design can impact traffic and driving conditions to create safer streets for all transportation methods.

#### 2.5 Crime

Crime and safety can deter people from cycling, due to fear of getting their bicycle stolen, or being physically targeted while bicycling (Rybarczyk and Gallagher 2014). Forming more direct routes and protected infrastructure could help create a safer cycling environment. Bicycles remain parked most of the time, so parking safety is a significant concern for most cyclists (Rybarczyk and Gallagher 2014) (Dill & Voros, 2007). Having bike lockers at workplaces and schools allow for safer bike parking. Additionally, following urban theorist Jane Jacob's "eyes on the street" concept, including bike parking in public spaces with higher visibility could further discourage bike thefts.

#### 2.6 Demographics

Some demographics are less likely to bike, especially noticeable in the existing gender gap in cycling. According to the League of American Bicyclists, only 24 percent of bike trips were made by women in 2009 (Szczepanski). There are several reasons for this

imbalance, including exposure to crime and harassment, lack of connectivity, and infrastructure safety concerns. Women are more likely to view crime as a barrier to cycling (Mosquera et al., 2012). This concern is backed by evidence as women are twice more likely to be harassed or receive driver aggression than their male cyclist counterparts (Aldred & Crossweller, 2015) (Evans et al., 2018). Monsere et al. found that women cyclists believed that an addition to buffered bicycle infrastructure improved their safety (Monsere et al. 2012). Furthermore, commuting parents are less likely to be cyclists because they need to transport their children and mothers are more likely to trip-chain (stopping at multiple locations such as school, grocery stores, work, etc.) (Dill & Carr, 2003).

On the other end, young people, especially students consist of the larger bicycling population in cities (Dill & Carr, 2003). However, commuter universities have a more diverse student life with students of different cultural backgrounds and ages, focused on balancing jobs, families, and may commute longer to get to the university (Delmelle & Delmelle, 2012). For some students, driving may be more convenient than active transportation. However, bicycling offers many benefits for students living in close proximity of the university including improved mental and physical health, affordable and sustainable transportation.

## CHAPTER 3

### STUDY AREA

The study contributes the perspective of biking among university students and staff in a car-dependent city, surveying factors including infrastructure, weather, crime/safety, and amenities. This section revises the characteristics of the UTA community demographics, existing bike infrastructure, programs, and masterplans.

#### 3.1 University of Texas at Arlington

The University of Texas at Arlington is a growing and diverse community located in the heart of the DFW metroplex. In Fall 2021 student enrollment reached 45,942, with 6,000 staff members (UTA, n.d.). UTA has a prominent commuter population, estimated at 85 percent of the student population (Off-Campus Mavericks, 2021). UTA holds a significant non-traditional student population. The institution has been recognized as the top four-year university in Texas for adult learners (above the age of 25) in 2017 in Washington Monthly's 2017 College Guide (UT Arlington Media Relations, 2017). Additionally, UTA tied as the number one university in Texas serving first-generation low-income students by the nonprofit organization Scholarshot (Carlton 2020). A strong bike network and supporting programs can support low-income and first-generation students that do not own or drive private vehicles. This will incentivize sustainable mobility behavior among the University community.

In Spring of 2021, UTA formed the Bicycle Coordinating Committee which is composed of representatives from the Office of Sustainability, Parking and Transportation

Services, the UTA Police Department, faculty, students, and staff from a variety of departments. The goal of the coalition is to “support bicycle culture on campus, promote and advocate for infrastructure upgrades, conduct audits and surveys to encourage a bike friendly campus” (UTA Office of Sustainability, 2021). In spring of 2022, UTA received the status of Bronze-level Bike Friendly University by the League of American Cyclists, signifying the University’s support for the furtherment of sustainable transportation on campus.

### *3.1.1 Bike Infrastructure on Campus*

UTA cyclists go through campus using shared bike-pedestrian spaces, bicycle infrastructure such as traditional striped bike lanes and sharrows, and streets without bike markings shared with motorized vehicles. Striped bike lanes can be found along Spaniolo Dr., outside of the campus on UTA Blvd, and on-campus sharrows include segments on College St. and Oak St. Outside of the east side of campus, sharrows are located on S. Center Street and N. Mesquite Street, passing through various off-campus housing. The paint on the striped bike lanes on Spaniolo Dr. show signs of wear and are located on uneven pavement on both sides of the street. On-campus streets with sharrow markings show signs of fading.

As of March 2022, UTA has over 1,900 bike parking spaces available. Bike parking is located next to all on-campus housing, most UTA classroom buildings, administrative offices, the MAC, the University Center, and the Commons. Most bike parking uses wave style bike racks across campus. Bike parking is free to use for everyone.

### *3.1.2 Bicycle Programs*

Bike repair stations are located in different locations on campus with pumps and tools at free of charge. Stations are located in the University Center, between the Fine Arts and Music building, between the Physical Education building and Maverick Activities Center (MAC), South of the MAC, Heights on Pecan (student housing, Nedderman Hall, Meadow Run Apartments, Chemistry Research Building, and West Hall (Transportation, 2021).

The UTA bike share program with Blue Duck opened in the spring 2022 semester. The fleets are a dockless electric bike model. Students are given complimentary credit when signing up for Blue Duck with their UTA addresses (Transportation, 2021). The bike share program uses pay-per use, monthly, semester, and annual memberships. Low-income students get 50% off on each ride. Memberships allow for 30 minutes of daily riding time.

The UTA police department registers bicycles for free for UTA community members. On the UTA PD website tips on bicycle theft prevention are detailed including different types of bike locks, ways and locations of locking a bicycle.

The UTA Green Fund resolution was passed in the April 2022 student elections. The Green Fund is a \$5 per semester and \$2.50 per summer semester tuition allocation that funds a variety of sustainability programs on campus. Some of the expected programs covered by the green fund include expanded bike infrastructure (more bicycle repair stations, more/improved bike parking), and a campus bike repair shop.

### *3.1.3 UTA Bike Study*

The “UTA Bike Study” (professional report) was conducted in Spring 2012 by UTA City and Regional Planning student Christina Sebastian, highlighting UTA’s

strengths and weaknesses in bike infrastructure and programs with recommendations for a UTA bicycle plan. Sebastian held a student survey to collect information on commuting habits, barriers in cycling, and student recommendations. The study found the greatest barriers for non-cyclists and cyclists were safety, high speed traffic and time and safety, high speed traffic, and weather conditions respectively (Sebastian 2012). The top requested improvements to biking in UTA included improved bikeways, better/more bike racks, and better bike-pedestrian separation (Sebastian 2012). The student survey found the streets with most needed bicycle improvements near UTA were Cooper Street, UTA Boulevard, and Mitchell Street (Sebastian 2012). Overall, most students indicated in their comments that “cycling around UTA was dangerous” (Sebastian 2012). Data from the “UTA Bike Study” can be used as a comparison point to study changes in UTA’s bike infrastructure and culture from the last 10 years.

### 3.2 City of Arlington

The City of Arlington is the seventh largest city in Texas with a growing population estimated at over 400,000 residents (World Population Review, 2022). Arlington’s streets have been designed around the automobile; a car culture rooted in its local history from the opening of the General Motors assembly plant in 1954, to its present-day artistic mural when entering Arlington depicting a car mechanic, followed by rows of car dealerships along Division Street. Consequently, 82.2 percent of Arlington residents’ primary commute method is driving alone, compared to the American average of 76.4% (Arlington, TX | Data USA, 2019) (bestplaces.net, 2019).

Citizen input was collected during the process of creating the “Arlington Hike and Bike System Masterplan”, surveying the community’s feedback on existing hike and bike

facilities, commuting patterns, and preferences. The survey found that most respondents (93.9%) would bike more often with the addition of more and safer bike infrastructure (City of Arlington, 2011). The most listed barriers in cycling were lack of bicycle lanes, shoulders, or paths, narrow lanes, and high-speed traffic (City of Arlington, 2011). Areas in most need of hike and bike improvements included Cooper Street, Green Oaks Boulevard and Collins Street, the intersections of Center St. and Division St., and Cooper St. and Randol Mill St., Fielder St. and Pioneer St. The public input in the plan prioritized recreational biking, showing preference for connections to trails and greenways for fitness and leisure travel (City of Arlington, 2011).

Downtown Arlington is located a block away from the University, offering various cultural and entertainment destinations and amenities. Downtown Arlington offers high and middle density housing popular among university residents. The Downtown Arlington Masterplan acknowledges the existing bike infrastructure gaps including infrastructure which is “not buffered or protected” and a lack of continuity “particularly in the east-west directions” (City of Arlington, 2018). The plan highlights residential support for “complete and connected bikeway systems in Downtown Arlington” and emphasizes the need to connect Downtown to adjacent destinations (City of Arlington, 2018). The close proximity of Downtown Arlington to the University and dense environment makes it feasible for a connected bike network, to encourage more residents to use more sustainable transportation methods.



## CHAPTER 4

### METHODS

This section reviews the methodology to the research questions of the study, determining existing data on commuting preferences, bike infrastructure, and services in Arlington. The community survey contributes to a better understanding of students and staff's experience, observations, and recommendations of biking on and off-campus.

#### 4.1 Community Survey

The online survey was created and published through QuestionPro software. After the study was reviewed and approved by UTA's Institutional Review Board, the survey was opened for approximately six weeks between February 7, 2022, to March 17, 2022. Respondents had to be UTA students and/or employees 18 and older to participate in the study. Recruitment for survey responses was shared through emails, posters, social media, and word of mouth. None of the respondents are identifiable, the study is confidential as all responses were anonymous.

Some of the study used existing and similar survey questions from the North Central Texas Council of Government's 2017 Bicycle Opinion Survey and the "UTA Bike Study" by Christina Sebastian. Images from the article "Influence of Bike Lane Buffer Types on Perceived Comfort and Safety of Bicyclists and Potential Bicyclists" designed by Nick Falbo from Alta Planning and Design and images from the Urban Bikeway Design Guide from the National Association of City Transportation Officials (NACTO) were

included to showcase different bicycle lane designs. For the complete set of survey questions, please refer to the Appendix.

The survey was divided into four sections. The part focused on the UTA population's commuting patterns including zip codes, transportation methods to UTA and Downtown Arlington, reasons for biking (recreational, utilitarian), and frequency of biking. Respondents were asked to rank their biking experience, barriers to biking in Arlington (e.g., lack of shade, unsafe driver behavior, etc.), and preferred bike trip duration. Using the Four Types of Cyclists typology, the first question of the second section asked respondents to classify their biking experience as "Strong and Fearless", "Enthusied and Confident", "Interested but Concerned", "No Way No How", or other. The third section of the survey collects feedback on bicycle facilities, infrastructure, and services in Downtown Arlington and UTA. The last section of the survey is focused on comfort and perceived safety on different types of bicycle infrastructure. Six images were presented displaying different types of bicycle infrastructure with captions describing the image (see Figure 1). Respondents were asked to rate these bicycle infrastructures from "Very comfortable" riding on them to "Very uncomfortable". As a follow-up, respondents were asked how their biking habits would change if their bicycle lane infrastructure was implemented in the City of Arlington. Next, the survey asked what streets in Arlington need bicycle infrastructure improvements. A free-form response option was provided at the end of the survey to include more comments to enhance the biking experience in Arlington.



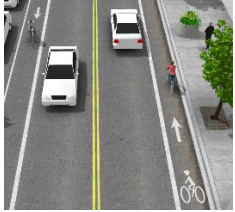



Image	Bike Facility Description
	Sharing the road with other vehicles, traffic speeds of 35 mph.
	Sharing the road with other vehicles, traffic speeds of 35 mph, with shared lane markings.
	Separate bike lane, traffic speeds of 35 mph, white lane markings.
	Protected cycle track with painted buffer and delineator posts.
	Protected cycle track with parking buffer and raised curb.
	On a path or trail separate from the street.

Figure 5.1: Bike Facility Designs (Falbo, n.d., as cited in McNeil et al., 2015) (Evans et al. 2014)

## CHAPTER 5

### FINDINGS

#### 5.1 Background Information on Respondents

The survey received a total of 209 responses at a completion rate of 75.45%. For full survey questions and responses refer to the Appendix. Students comprised the majority of survey responses, 68.86% being undergraduates, 14.29% graduate students, and 15.38% employees (faculty staff), 1.47% classified as others. Most of the University community resides in Arlington (54.26%). Among those living in Arlington, most live in close proximity to the University: 36.36% residing in 76013 and 23.48% live in 76010. Most Arlington residents live in off-campus locations (62.88%).

#### 5.2 Commuting Habits of Respondents

Corresponding to previous studies, most of the UTA community drives alone to get to Downtown Arlington (44.55%), followed by walking (17.82%), and carpooling (11.88%). Only 8.66% of respondents bike to Downtown Arlington. Similarly, the majority of respondents drive alone to UTA (43.98%), 17.28% walk to UTA, and 8.64% get dropped off on campus. 8.38% of respondents bike to UTA. Determining the bike-use purposes can help us determine what destinations should be focused and invested in further. In this study, most cyclists bike for utilitarian purposes such as commuting to work, school, and running errands (56.86%), and 39.22% of cycle for recreational/leisure purpose, on a regular basis for at least once a week 78.13%. The 4 Types of Cyclist Typology was used to understand the experience levels of cyclists in Arlington. The majority of respondents consider

themselves ‘Enthusied & Confident’ at 39 percent, followed by 36% ‘Interested but Concerned’, ‘No Way No How’ at 13.98 percent, and ‘Strong and Fearless’ at 6.78 percent, and 4.24 classified as other.

### 5.3 Biking in Arlington

The top barriers for cyclists in Arlington were unsafe driver behavior (14.18%), Bike lanes, trails, and paths are not connected (12.86%), and lack of secure bike parking (8.29%). Issues of safety, infrastructure gaps, and driver behavior match with previous findings in the “UTA Bike Study” and the “Arlington Hike and Bike System Masterplan”. Respondents were most satisfied with bike parking on campus (13.14%) and car speed limits on campus (10.26%); however, coming in third, respondents chose the response “I am not familiar with on-campus bicycle facilities”. This may indicate a need for the University to further publicize available resources and services for biking on campus. Similarly, the majority of respondents were “not familiar with bicycle facilities, infrastructure, and/or services in Downtown Arlington” (51.05%). Some respondents are satisfied with current bicycle paths/bicycle lanes (11.72%) while others chose being satisfied with none of the options listed (7.95%).

To the question “How often do you ride on a sidewalk to Downtown Arlington”, most responded that they do not bike to Downtown Arlington (54.30%), Never (21.51%), Sometimes (16.67%), and 7.53% said Always. This question could have been better phrased, which of the following best describe your biking habits in Downtown Arlington: I ride on the sidewalk, I ride on the street, I do not ride a bike in Downtown Arlington. The majority of the UTA community is interested in traveling to Downtown Arlington destinations such as the Levitt Pavilion, Arlington Theater, etc. by bike, 60.66% indicating

yes and 28.96% responding maybe. The most amount of time respondents would be willing to bike one way averaged at 26.45 minutes.

The following survey section focused on perceived comfort on various bike facilities of hypothetical scenarios. The findings show that the addition of buffers and separation from cars increased comfort levels among respondents. The most comfortable bike facility was riding on a path separate from the street, followed by a protected cycle track with a parking buffer and raised curb, protected cycle track with painted buffer and delineator, conventional bike lanes, Sharrows, and sharing the road with cars with no signage ranked as the least comfortable. The biggest shift in average comfort levels was from sharrows to conventional bike lanes, and from sharrows to protected cycle tracks.

Many respondents expect an increase in biking if their desired bicycle lane infrastructure was implemented in the City of Arlington: 51.45% stated they would bike much more in Arlington, 30.64% would bike slightly more in Arlington, and 16.18% would make no changes in their biking.

Some of the most voted streets in need of improvement in bicycle infrastructure were S. Cooper Street (15.93%), followed by E. and W. Mitchell Street (11.23%), Abram Street (9.79%), Center and Mesquite Street (9.53%), and UTA Boulevard/E. Border Street (9.27%). All listed streets had responses for needed improvements in bicycle infrastructure. Other streets respondents listed included Park Row and S. Fielder. These findings are consistent with the previous “UTA Bike Study”, with the exception of UTA Boulevard being rated a lower priority. This change could be explained by the fact that the present conventional bike lanes were not striped until 2014, two years after the study was published.

Comments at the end of the survey highlighted existing problems including bike theft, concerns about bike lane conditions and intersection safety, bike parking, and unsafe driver behavior.

## CHAPTER 6

### ANALYSIS

#### 6.1 Bike Network Analysis

A network analysis was conducted in ArcGIS Pro to determine potential areas for an Arlington Bike Network. Forming a network can help us visualize a possible expansion of the existing bike network beyond UTA and Downtown Arlington, measuring potential access given a certain amount of time at specific speeds. The network analysis used the survey response to the question “What is the most amount of time you would be willing to spend commuting in a bike one-way”.

The facilities chosen for the network analysis included the following destinations near UTA and Downtown Arlington:

- 1) Midtown Urban Student Housing (North-West)
- 2) E.E. Davis Hall (Center)
- 3) Liv+ Apartments (South-East)
- 4) 404 Border Apartments (North-East)

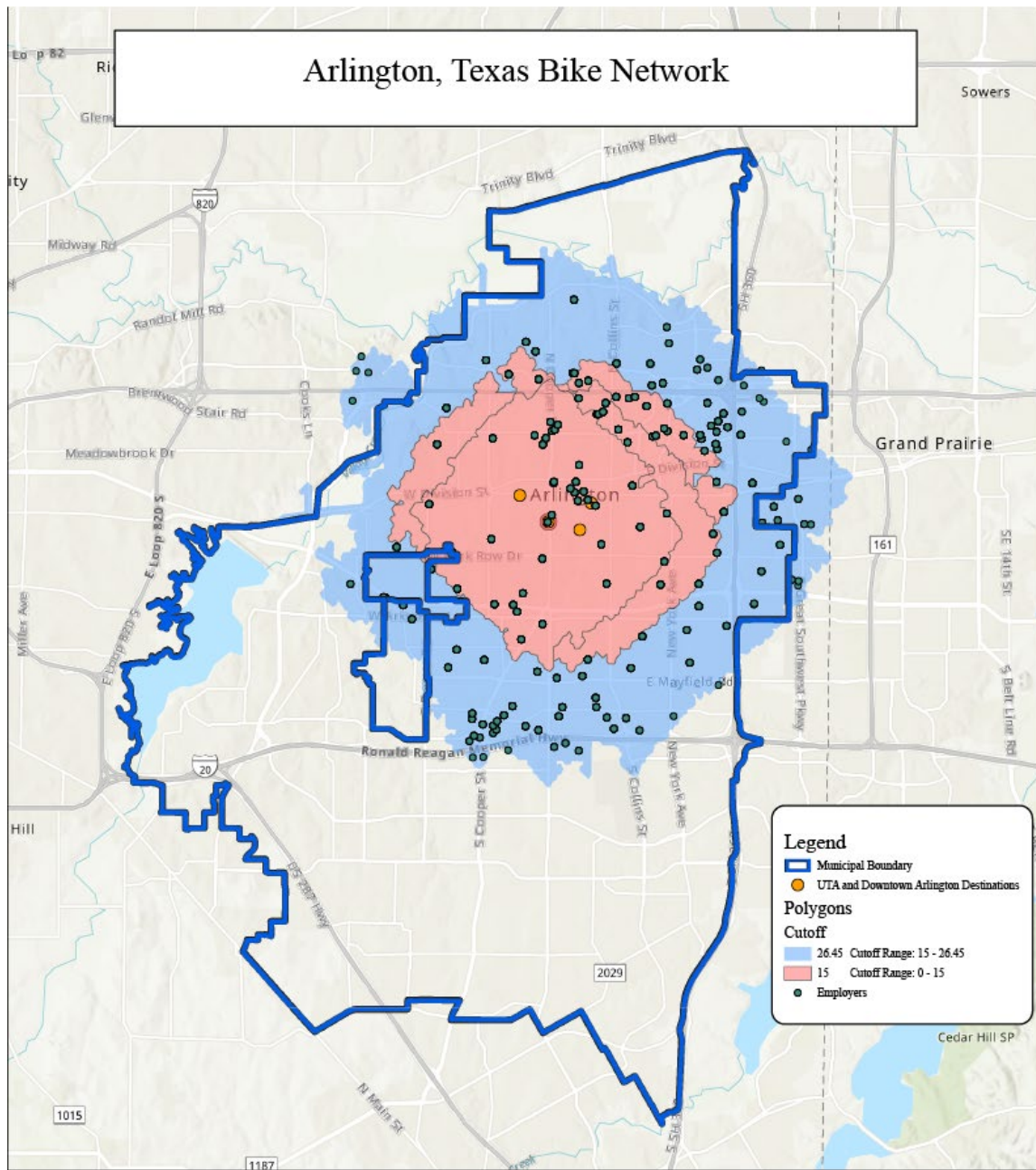
These locations were chosen due to their close proximity (within one mile) from the University, representing popular commuting points including student apartments and the campus itself. 16kmph was chosen as the representative speed for cyclists, based on records of average novice cyclist speeds (Bike Finest Team, 2021) (Purdum, 2019). The network was calculated away from the four facilities within the Arlington base map (Zhou, 2021).



Employer data (organizations with at least 100 employees) was used from the North Central Texas Council of Governments Regional Data Center and intersected with the network parameters.

The study used employer data to explore an expanded network connecting University students to areas of employment within the bike network. Many students work or participate in internships during their college career, so accessibility to employers plays a significant role in creating a well-rounded network for college students. Employment data was used from the North Central Texas Council of Governments Regional Data Center of organizations with at least 100 employees.

The 26.45-minute network was established based on the respondents' average, and a 15-minute buffer was added to the network for comparison. The 26.45-minute network crossed city boundaries East and West of Arlington, parts of Grand Prairie and Dalworthington Gardens, covering most of Central Arlington (see Figure 2). A total of 572 employers were located in the network within Arlington's boundaries.



City of Arlington TX, Esri, NASA, NGA, USGS, Baylor University, City of Fort Worth, Texas Parks & Wildlife, CONANP, Esri, HERE, Garmin, SafeGraph, METI/NASA, USGS, EPA, NPS, USDA

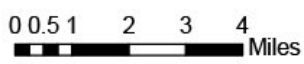


Figure 6.1: Bike Network Analysis (North Central Texas Council of Governments, 2022) (Zhou, 2021)

## CHAPTER 7

### POLICY RECOMMENDATIONS

The survey highlighted existing gaps and dangers of biking in UTA and Downtown Arlington. The most prevalent issues and barriers identified in the survey responses and comments were lack of safe bike facilities on and off-campus, dangerous driver behavior, and bike thefts. These impediments affect people's willingness and comfort in cycling. Appropriate infrastructure design can improve the biking experience and safety in Arlington. The following recommendations are given for a safer and well-connected UTA-Downtown Arlington Bike Network:

1. Protected Bike Facilities
2. Expanded Bike Network
3. Traffic Calming Road Design
4. Pedestrian Bicycle Separation on Campus
5. Safe Bicycle Parking Infrastructure

#### 7.1 Protected Bike Facilities

The survey responses and comments highly support the introduction of protected bike facilities along UTA and Downtown Arlington. Respondents felt most comfortable riding on buffered bike infrastructure, especially on completely separate trails and bike lanes with parking buffers. For lower infrastructure costs, bike paths with flexible delineators and paint can be implemented while still providing sufficient comfort for cyclists.

Infrastructure updates should be prioritized by the survey responses for roadways with most needed improvements. All streets must first go under a traffic study to determine the appropriate design for pedestrian and bike facilities as outlined by the Arlington Hike and Bike System Masterplan all. At minimum, all one-way bike lanes/paths must be 5-6ft wide depending on the existence on-street parking.

Cooper Street also called Farm to Market 157 was rated the top street in most need of bike infrastructure improvements. Cooper Street stretches 12.9 miles from north to south Arlington, covering various businesses, UTA, Downtown Arlington, schools, and housing. FM 157 is considered a state highway and is therefore under state jurisdiction. Changes in the infrastructure must first undergo a traffic study through the Texas Department of Transportation. The Cooper Street corridor is being studied to improve pedestrian and bicyclist safety (*Documentation of Public Hearing, 2021*).

The Hike and Bike System Masterplan planned a road diet on E. and W. Mitchell Street to re-purpose car lanes into bike facilities, a project which has not been implemented. Rather than transforming the road space into a planned conventional bike lane, this study recommends protected bike paths on both sides of the street, corresponding with survey response preferences.

Abram Street forms an East-West connection crossing Downtown Arlington and residential areas and was rated as one of the streets with most needed bike infrastructure in Arlington. The stretch of Abram Street crossing through Downtown Arlington has wide sidewalks available that can be marked as a shared pedestrian bicycle space. Sidewalk expansions and/or road diets are recommended further East on Abram Street crossing S. Cooper and West crossing N. Collins to accommodate a bike/pedestrian path. Expanding

bike infrastructure further West on Abrams would help form a safer bike route connecting student apartments and housing to Downtown Arlington and UTA.

Center and Mesquite Street have a one-way traffic flow with three lanes, sharrow markings, and a speed limit of 35mph, located along the University, Downtown Arlington businesses, and housing. Two possible solutions could be applied to both streets to implement protected bike facilities. The first option would be to revert Center and Mesquite Street to two-way roads installing bike lanes on each side. Conversions of one-way to two ways have shown to reduce traffic collisions, slow traffic speeds, and reduce crime (Riggs and Gilderbloom 2016). The second option would be to transform one car lane of each street into a bike boulevard which could reduce car speeds along the corridor, a recommendation which has been supported by the Heart of Arlington Neighborhood Association (HANA) (R. Boxall, personal communication, 2021). A current traffic study is underway to determine the best course of action.

Although not included in the study, protected intersection design plays a key role in creating safe bike networks. Intersection elements such as bike queue areas, bike signal heads, traffic roundabouts, or completely separated bike paths should be explored with the implementation of protected bike lanes.

## 7.2 Expanded Bike Network

The study found that UTA students and employees are community are willing to bike a maximum of 26.45 minutes one-way. The highest UTA student and employee populated zip codes can be prioritized for a university connection; however, the bike network should be expanded city wide in order to create an equitable and well-connected

transportation system. Access to employers, stores, housing, schools, and parks should be prioritized in the bike route design.

### 7.3 Traffic Calming Road Design

Unsafe driver behavior was one of the most prevalent issues highlighted in the survey findings. Using traffic calming elements can help reduce car speeds and make drivers more aware of pedestrians and cyclists. The Institute of Traffic Engineers defines traffic calming as the combination of mainly physical measures that reduce the negative effects of motor vehicle use, alter driver behavior and improve conditions for non-motorized street users (Lockwood, 1997). Some examples of traffic calming designs include lane width reductions, medians, pinch points, street trees, and two-way streets. Traffic studies can determine which streets are drivers more likely to speed in to determine the appropriate design in accordance with the City of Arlington Thoroughfare Development plan following the required dimension of Arlington's roads (City of Arlington, 2011).

### 7.4 Pedestrian-Bicycle Separation on Campus

The growing University population will require greater separation between pedestrians and cyclists on campus, an issue which has been highlighted by survey respondents. UTA can follow Bike Friendly University's footsteps such as the University of California, Davis, Colorado State University, and University of Minnesota by creating separate pedestrian and cycling paths marked by paint, concrete or planters. Separate lanes and dismount zones decrease pedestrian-bicycle congestion and collisions. Survey respondents want to see improvements for bike infrastructure crossing S. Cooper Street. Currently bicyclists have to share pedestrian ramps on the bridges to get across the east-

west sides of campus. Underpasses or bike bridge designs should be explored to develop a more direct and less crowded path across S. Cooper Street for safer and more efficient bike commuting across campus.

### 7.5 Safe Bike Parking

Bike thefts have been a rising issue in UTA as the biking community continues to grow on campus (Shaw, 2022). The University and Downtown Arlington can take preventative measures reduce bike thefts by implementing and updating bike parking designs. Bike lockers and shelters are ideal for long-term parking in housing and workplaces, protecting bicycles from weather and safer storage in an enclosed space. Some bike lockers require key fobs or IDs, reducing opportunities for stealth crimes. For short term parking, inverted “U” bike parking design is recommended by the Association of Pedestrian and Bicycle Professionals Guide on Bicycle Parking, replacing existing wave or comb designs parking on campus and Downtown Arlington (Broom et al., 2015). Inverted “U” racks allow users to lock both wheels to the frame and rack, and with the correct lock, can keep bicycles well-secured. Public bike parking (e.g., in front of classrooms, restaurants, stores) should be kept in highly visible locations with ‘eyes on the street’ for greater safety.

## CHAPTER 8

### CONCLUSION

The study provides insight of how infrastructure upgrades in car dependent cities and commuter universities can encourage cycling levels and comfort. The survey found that existing bike infrastructure, parking safety, and driver behavior were the greatest predictors for bike commuting in Arlington, more than any other factor such weather, repair services, access to showers, and education programs. Respondents felt most comfortable riding in protected bike facilities. Additionally, respondents were willing to bike more if their desired bike facilities were implemented. The study on infrastructure is limited to paths and does not study perceived comfort in intersection design, a topic which can be explored in future studies. The UTA community is more satisfied with existing bike infrastructure on campus than in Downtown Arlington, likely due to the pedestrian-centered planning on campus closed off from motor vehicles. UTA respondents are interested in cycling to cultural amenities and entertainment destinations, a potential modal switch promoting bike culture in Arlington. Future studies can research the impact of fuel costs and housing prices on sustainable travel modes, identifying additional barriers that may prevent university communities from cycling.

Commuter students often hold multiple roles outside of school such as job and family responsibilities and commitments (Jacoby, 1990). Academic institutions and cities need to pay attention to the needs of commuter students in developing sustainable transportation systems. Creating an inclusive bike network in Arlington will allow



commuter students to trip-chain, increasing accessibility to employers and reducing travel costs and emissions.

Policy recommendations outline needed infrastructure improvements for a safer, bike-friendly Arlington. Some infrastructure solutions proposed have previously been envisioned in existing Arlington masterplans and survey findings. Many of the proposals were made over a decade ago have not been implemented yet. These findings underscore the impact and significance of political will from the university, political leaders, and residents to develop bike friendly communities. As major contributors to climate change, cities have responsibility in reducing emissions, an ongoing challenge for car-dependent communities. Cities and institutions must think globally and act locally, taking the leadership role to developing safe and connected bike networks for sustainable and equitable transportation.

APPENDIX A  
UTA SURVEY

Viewed	Started	Completion Rate	Drop Outs (After Starting)	Average Time to Complete Survey
891	277	209	68	6 minutes

**Q1. Informed Consent for studies with Adults**

Title of Research Project: Proposal for UTA-Downtown Arlington Bike Network

Researcher: Anna Laura Harmjanz

**Important Information:**

The purpose of this survey is to understand the UTA community's feedback on bicycle infrastructure, behavior, amenities, and services on campus and Downtown Arlington. Your feedback will help identify how we can create a well-connected and safe bike network in Arlington. All responses, regardless of your level of experience or background in biking are important.

**Time Commitment:** This survey should take no more than 10 minutes of your time.

**Exclusion Criteria:** This survey only studies feedback from the UTA community (current UTA students and staff, at least 18 years old). Any other respondents will not be considered as this survey is only focused on the UTA community’s observations and needs.

**Procedures:**

If you decide to participate in this research study, you will be asked to read through the informed consent before deciding to take the survey. Your decision about whether to participate is entirely up to you. You will not be paid for completing this study. If you decide not to be in the study, there will not be any penalty or punishment. Even if you choose to begin the study, you can also change your mind and quit at any time without any consequences.

**Confidentiality:** We are committed to protecting your rights and privacy as a research subject. The results of the study may be published and presented, but the respondents will not be identifiable, all responses are anonymous. While absolute confidentiality cannot be guaranteed, every effort will be made to protect the confidentiality of your records as described here and to the extent permitted by law. If you have questions about the study, you can contact Anna Laura Harmjanz at [annalaura.harmjanz@mavs.uta.edu](mailto:annalaura.harmjanz@mavs.uta.edu) For questions about your rights or to report complaints, contact the UTA Research Office at 817-272-3723 or [regulatoryservices@uta.edu](mailto:regulatoryservices@uta.edu).

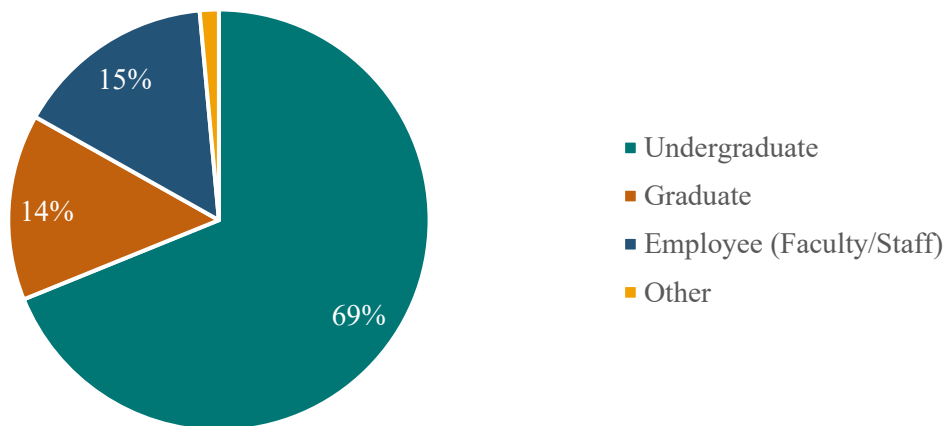
Consent:

By signing this form, you are confirming that you understand the study’s purpose, procedures, potential risks, and your rights as a research subject. By agreeing to participate, you are not waiving any of your legal rights. You can refuse to participate or discontinue participation at any time, with no penalty or loss of benefits that you would ordinarily have. Please sign below if you are at least 18 years of age and voluntarily agree to participate in this study.

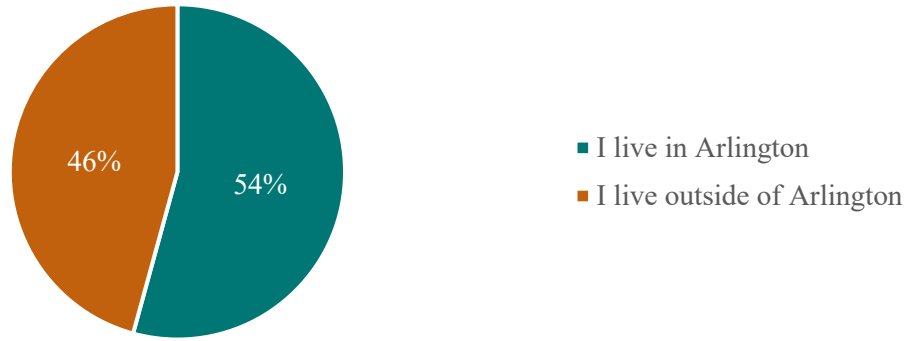
Q2. If you consent to participate, please select the "I consent to participate" option below. If you do not consent, please select "I do not consent to participate", which will result in exiting from the survey

	Answer	Count	Percent
1.	Yes	272	99.27%
2.	No [Terminates Survey]	2	0.73%
	Total	274	100%

Q3. Are you currently an undergraduate student, graduate student, or employee?



	Answer	Count	Percent
1.	Undergraduate	188	68.86%
2.	Graduate	39	14.29%
3.	Employee (Faculty/Staff)	42	15.38%
4.	Other	4	1.47%
	Total	273	100%



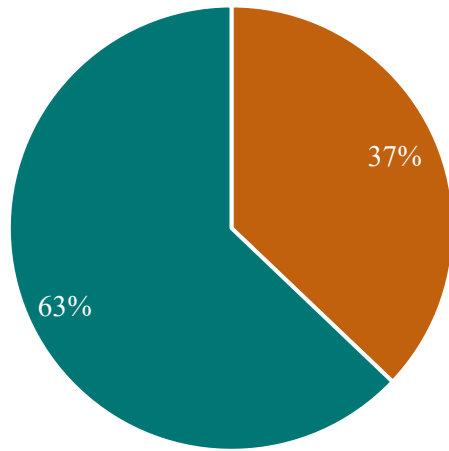
Q4. Do you live in our outside of Arlington?

	Answer	Count	Percent
1.	I live in Arlington [Proceed to Question 5]	140	54.26%
2.	I live outside of Arlington [Branch to Question 7]	118	45.74%
	Total	258	100%

Q5. What is your zip code?

Zip Code	Count of Zip Code
	2
75249	1
76001	2
76002	2
76005	4
76006	4
76010	31
76011	3
76012	3
76013	47
760130	1
76014	6
76015	4
76016	3
76017	1
76018	1
76019	8
76039	1
76109	1
76039	1
76109	1
76112	1
76210	1
76248	1
76919	1
78247	1
79106	1
98223	1
Grand Total	132

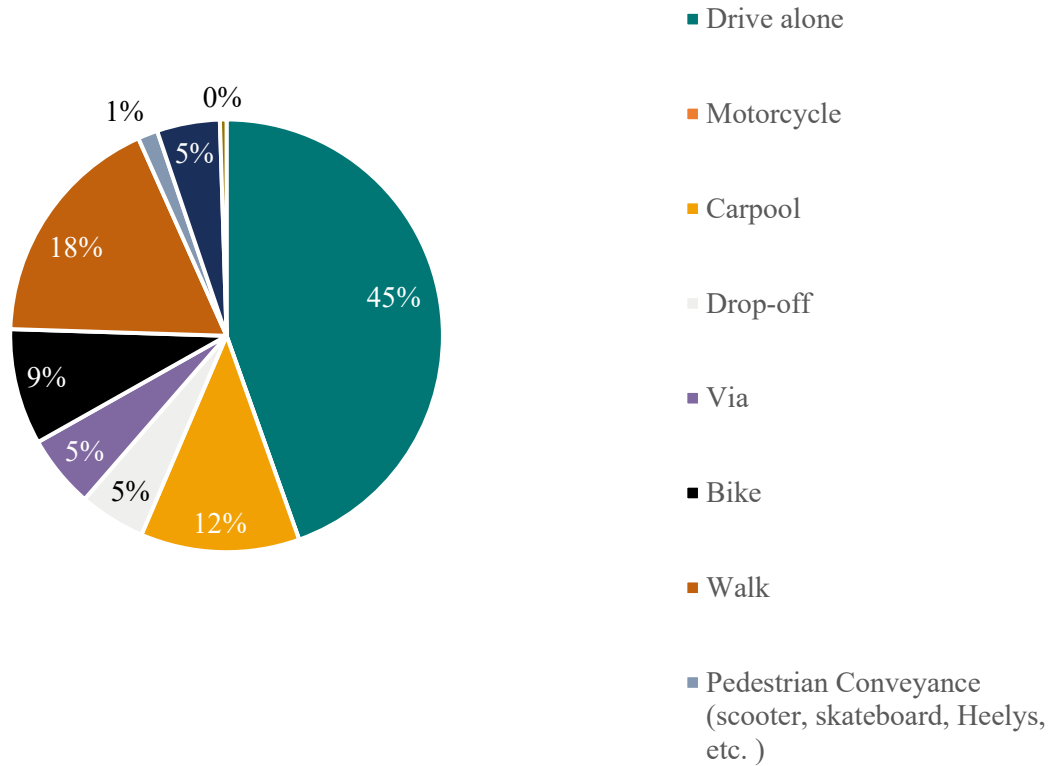
Q6. Do you live on or off-campus?



- On campus (on campus residences include: Vandergriff Hall, Arlington Hall, West Hall, KC Hall, on campus apartments include: University Village, Arbor Oaks, Heights on Pecan, Meadow Run, The Lofts at College Park, Timber Brook)
- Off campus

	Answer	Count	Percent
1.	On campus (on campus residences include: Vandergriff Hall, Arlington Hall, West Hall, KC Hall, on campus apartments include: University Village, Arbor Oaks, Heights on Pecan, Meadow Run, The Lofts at College Park, Timber Brook)	49	37.12%
2.	Off campus	83	62.88%
	Total	132	100%

Q7. What means of transportation do you use to get to Downtown Arlington? Select all that apply:



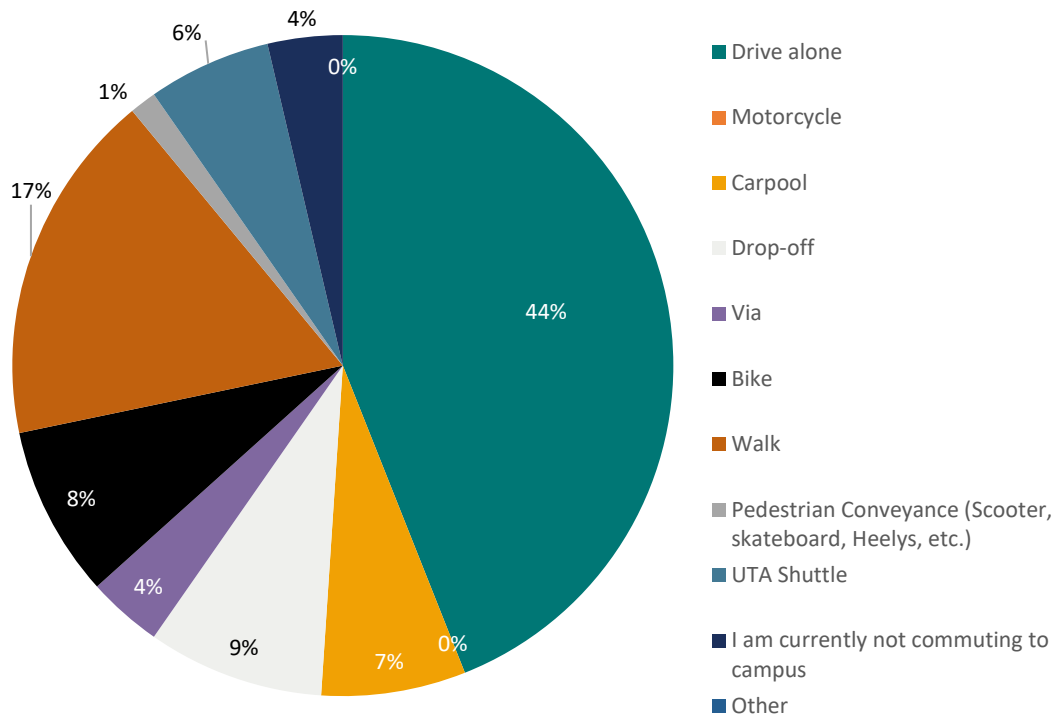
	Answer	Count	Percent
1.	Drive alone	180	44.55%
2.	Motorcycle	0	0.00%
3.	Carpool	48	11.88%
4.	Drop-off	20	4.95%
5.	Via	22	5.45%
6.	Bike	35	8.66%
7.	Walk	72	17.82%
8.	Pedestrian Conveyance (scooter, skateboard, Heelys, etc. )	6	1.49%
9.	I do not travel to Downtown Arlington	19	4.70%
10.	Other	2	0.50%
	Total	404	100%

Other Option:

Data	Skateboard
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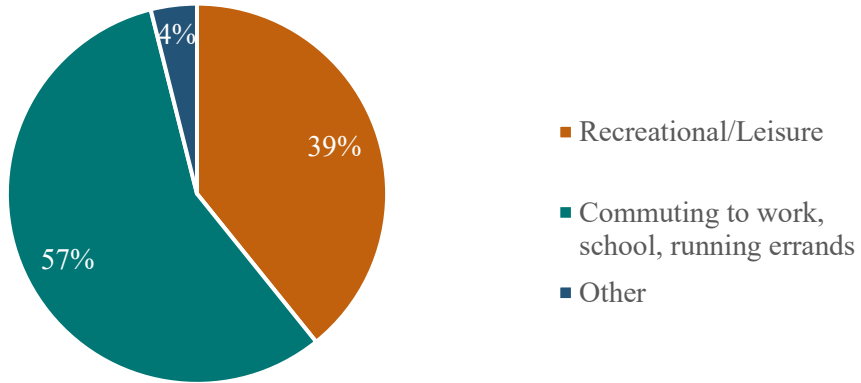


Q8. What means of transportation do you use to get to UTA? Select all that apply:



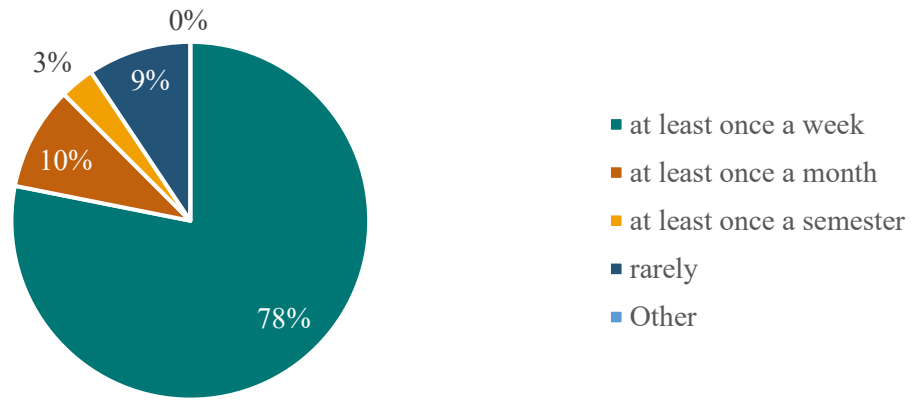
	Answer	Count	Percent
1.	Drive alone	168	43.98%
2.	Motorcycle	0	0.00%
3.	Carpool	27	7.07%
4.	Drop-off	33	8.64%
5.	Via	14	3.66%
6.	Bike [Branch to question 9]	32	8.38%
7.	Walk	66	17.28%
8.	Pedestrian Conveyance (Scooter, skateboard, Heelys, etc.)	5	1.31%
9.	UTA Shuttle	23	6.02%
10.	I am currently not commuting to campus	14	3.66%
11.	Other	0	0.00%
	Total	382	100%

Q9. How do you use your bike?



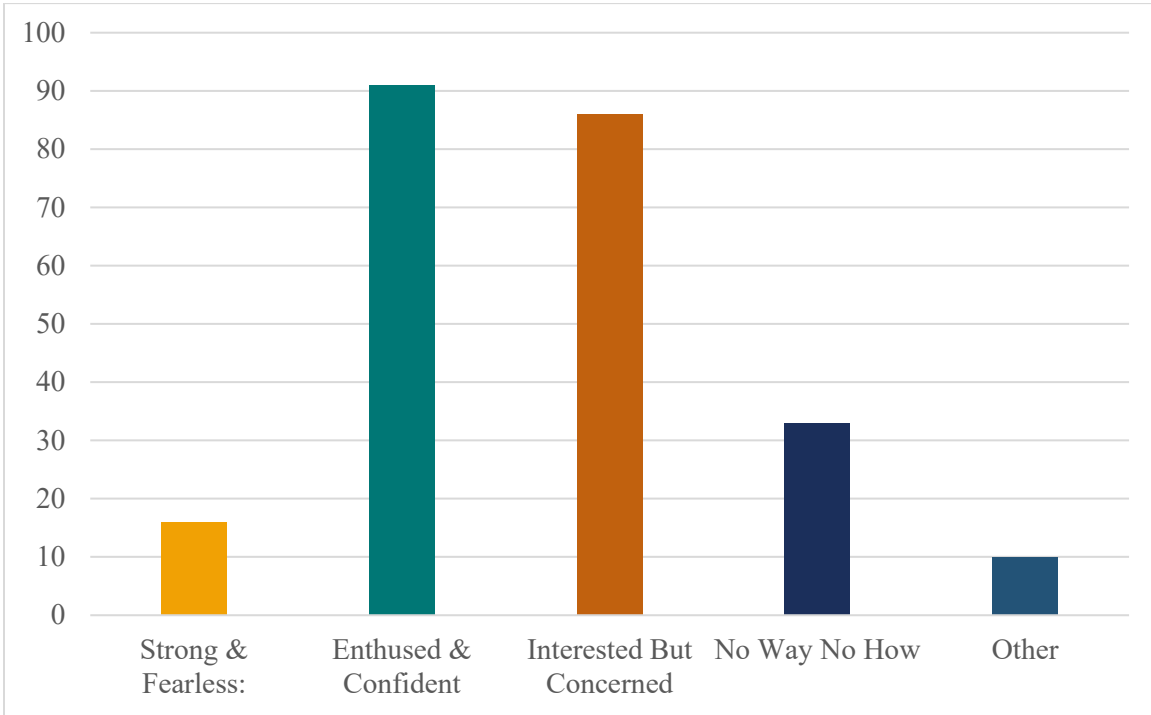
	Answer	Count	Percent
1.	Recreational/Leisure	20	39.22%
2.	Commuting to work, school, running errands	29	56.86%
3.	Other	2	3.92%
	Total	51	100%

Q10. How often do you use your bike?



	Answer	Count	Percent
1.	at least once a week	25	78.12%
2.	at least once a month	3	9.38%
3.	at least once a semester	1	3.12%
4.	rarely	3	9.38%
5.	Other	0	0.00%
	Total	32	100%

Q11. “How would you classify your experience in cycling?”



	Answer	Count	Percent
1.	Strong & Fearless: Will ride a bicycle regardless of the conditions	16	6.78%
2.	Enthused & Confident: Somewhat comfortable sharing the roadway with vehicle traffic but prefer to have bike-specific facilities.	91	38.56%
3.	Interested But Concerned: Curious about bicycling, like riding, but afraid to ride.	86	36.44%
4.	No Way No How: Not interested in bicycling or uncomfortable doing so, or physically unable to do so. [Send to Thank you Page]	33	13.98%
5.	Other	10	4.24%
	Total	236	100%

(National Research Center, 2017)

Q12. Do any of the following prevent you from riding a bike more often in Arlington than you currently do:

	Answer	Count	Percent
1.	It does not fit my lifestyle	28	3.37%
2.	I am not physically able	2	0.24%
3.	Lack of secure bike parking	69	8.29%
4.	I do not own a bike	68	8.17%
5.	My bike is not in good working condition	21	2.52%
6.	Destinations are too far	72	8.65%
7.	It takes too long	43	5.17%
8.	I do not feel safe (exposure to crime, harassment, etc.)	62	7.45%
9.	Biking lanes, trails, and paths are not connected	107	12.86%
10.	Existing bikeways are in poor condition	66	7.93%
11.	Weather conditions (e.g., too hot or too cold)	64	7.69%
12.	No showers or place to freshen up at my destination	44	5.29%
13.	Unsafe driver behavior	118	14.18%
14.	Not enough lighting	30	3.61%
15.	Not enough shade	26	3.12%
16.	Other	12	1.44%
	Total	832	100%

Q13. What is the most amount of time you would be willing to spend commuting in a bike one way? [Respondents are given a numerical slider between 0 to 100+ minutes]

	Question	Count	Score
1.	Minutes	192	26.453

Q14. What do you like about the bicycle facilities, infrastructure, and/or services on campus? Select all that apply:

	Answer	Count	Percent
1.	Safe intersections	38	6.09%
2.	Bicycle signage on campus streets	46	7.37%
3.	Bike Parking	82	13.14%
4.	Self-Repair Stations	58	9.29%
5.	Shared paths for pedestrians and bicyclists	45	7.21%
6.	Bicycle Paths/Bicycle Lanes	61	9.78%
7.	Good lighting	50	8.01%
8.	Good shading	29	4.65%
9.	Police bicycle registry	47	7.53%
10.	Car speed limits on campus	64	10.26%
11.	Free access to shower facilities (e.g. Maverick Activities Center)	35	5.61%
12.	None of the above	6	0.96%
13.	I am not familiar with on-campus bicycle facilities, infrastructure, or services.	62	9.94%
14.	Other	1	0.16%
	Total	624	100%

Q15. What do you like about the bicycle facilities, infrastructure, and/or services in Downtown Arlington? Select all that apply:

	Answer	Count	Percent
1.	Bicycle paths/ bicycle lanes	28	11.72%
2.	Safe intersections	10	4.18%
3.	Bicycle signage on streets	16	6.69%
4.	Bike parking	18	7.53%
5.	None of the above	19	7.95%
6.	Good lighting	11	4.60%
7.	Good shading	3	1.26%
8.	Car speed limits	11	4.60%
9.	I am not familiar with bicycle facilities, infrastructure, and/or services in Downtown Arlington	122	51.05%
10.	Other	1	0.42%
	Total	239	100%

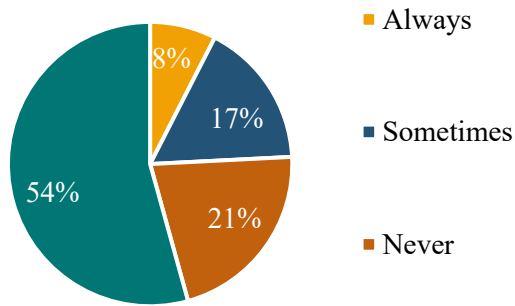
Q16. What improvements are needed in bicycle facilities, infrastructure, and/or services on campus? Select all that apply:

	Answer	Count	Percent
1.	Improved bikeways (bike lanes, bike paths, trails)	123	16.55%
2.	Better pedestrian-bicycle separation	103	13.86%
3.	Increase bike parking	69	9.29%
4.	More secure bike parking	100	13.46%
5.	On-campus bicycle repair shop	59	7.94%
6.	Improved bicycle signage	58	7.81%
7.	Greater access to showers/changing facilities	46	6.19%
8.	Bicycle education programs (bicycle classes, safety training, etc.)	46	6.19%
9.	Bike share service	51	6.86%
10.	Better lighting	40	5.38%
11.	Better shading	39	5.25%
12.	None of the above	6	0.81%
13.	Other	3	0.40%
	Total	743	100%

Q17. What improvements are needed in bicycle facilities, infrastructure, and/or services in Downtown Arlington? Select all that apply

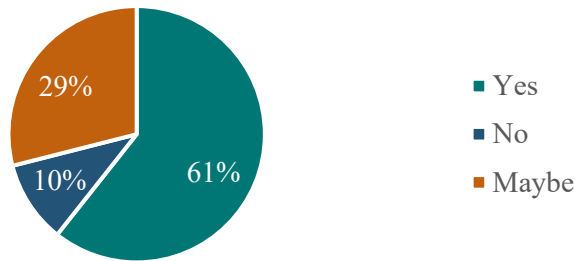
	Answer	Count	Percent
1.	Improved bikeways (bike lanes, bike paths, trails)	137	17.59%
2.	Better pedestrian-bicycle separation	96	12.32%
3.	Increase bike parking	83	10.65%
4.	More secure bike parking	100	12.84%
5.	Downtown Arlington bicycle repair shop	61	7.83%
6.	Improved bicycle signage	72	9.24%
7.	Greater access to showers/changing facilities	32	4.11%
8.	Bicycle education programs (bicycle classes, safety training, etc.)	41	5.26%
9.	Bikeshare service	49	6.29%
10.	Better lighting	45	5.78%
11.	Better shading	42	5.39%
12.	None of the above	11	1.41%
13.	Other	10	1.28%
	Total	779	100%

Q18. How often do you ride on a sidewalk in Downtown Arlington?



	Answer	Count	Percent
1.	Always	14	7.53%
2.	Sometimes	31	16.67%
3.	Never	40	21.51%
4.	I do not bike to Downtown Arlington	101	54.30%
	Total	186	100%

Q19. Are you interested in traveling to Downtown Arlington destinations (such as Levitt Pavilion, Arlington Museum of Art, etc.) by bike?



	Answer	Count	Percent
1.	Yes	111	60.66%
2.	No	19	10.38%
3.	Maybe	53	28.96%
	Total	183	100%



Q20. Rate how comfortable you would be riding a bicycle in each place:

Scores:

1 = Very Comfortable

2 = Somewhat Comfortable

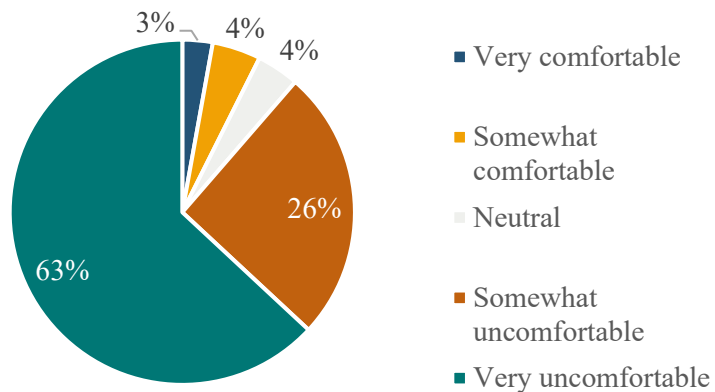
3 = Neutral

4 = Somewhat Uncomfortable

5 =Very Uncomfortable

	Question	Count	Score
1.	Sharing the road with other vehicles, traffic speeds of 35mph	176	4.415
2.	Sharing the road with other vehicles, traffic speeds of 35 mph, with shared lane markings	176	3.619
3.	Separate bike lane, traffic speeds of 35 mph, white lane markings	176	2.466
4.	Protected cycle track with painted buffer and delineator posts	176	1.443
5.	Protected cycle track with parking buffer and raised curb	175	1.303
6.	On a path or trail separate from the street	176	1.222

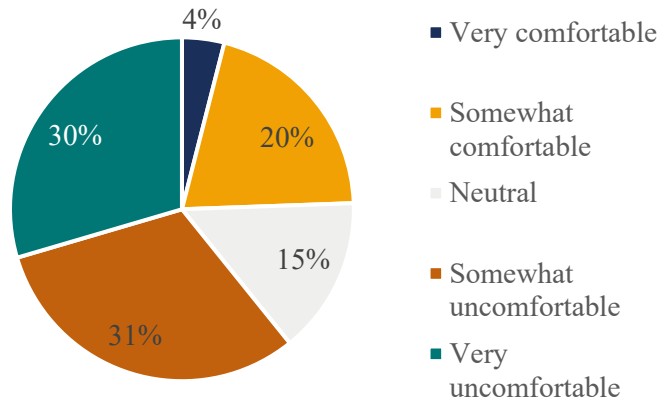
Q20. Sharing the road with other vehicles, traffic speeds of 35mph



(Falbo, n.d., as cited in McNeil et al., 2015)

Score	Answer	Count	Percent
1	Very comfortable	5	2.84%
2	Somewhat comfortable	8	4.55%
3	Neutral	7	3.98%
4	Somewhat uncomfortable	45	25.57%
5	Very uncomfortable	111	63.07%
	Total	176	100%

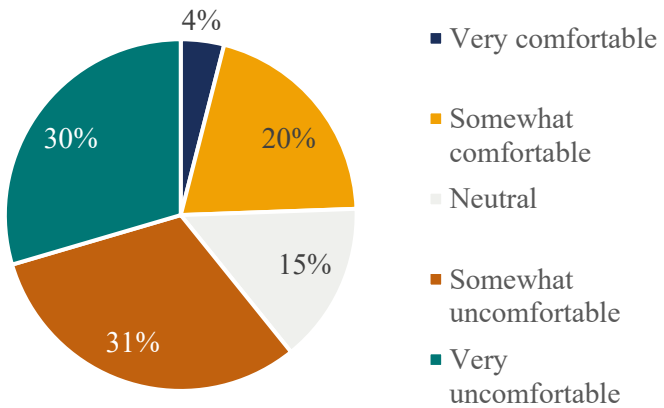
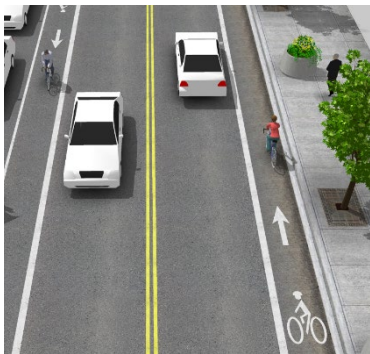
Q20. Sharing the road with other vehicles, traffic speeds of 35 mph, with shared lane markings



(Evans et al., 2014)

	Answer	Count	Percent
1.	Very comfortable	7	3.98%
2.	Somewhat comfortable	36	20.45%
3.	Neutral	26	14.77%
4.	Somewhat uncomfortable	55	31.25%
5.	Very uncomfortable	52	29.55%
	Total	176	100%

Q20. Separate bike lane, traffic speeds of 35 mph, white lane markings



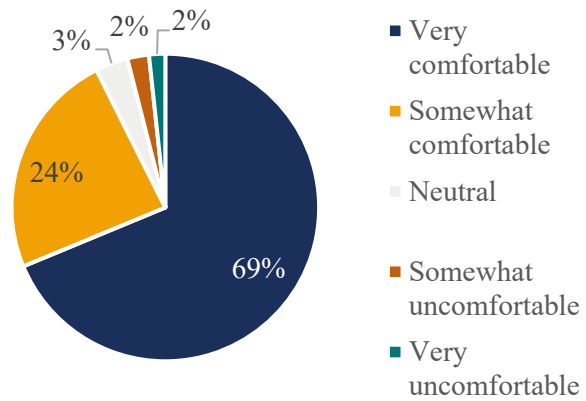
(Evans et al., 2014)

	Answer	Count	Percent
1.	Very comfortable	43	24.43%
2.	Somewhat comfortable	67	38.07%
3.	Neutral	17	9.66%
4.	Somewhat uncomfortable	39	22.16%
5.	Very uncomfortable	10	5.68%
	Total	176	100%

Q20. Protected cycle track with painted buffer and delineator posts



(Evans et al., 2014)

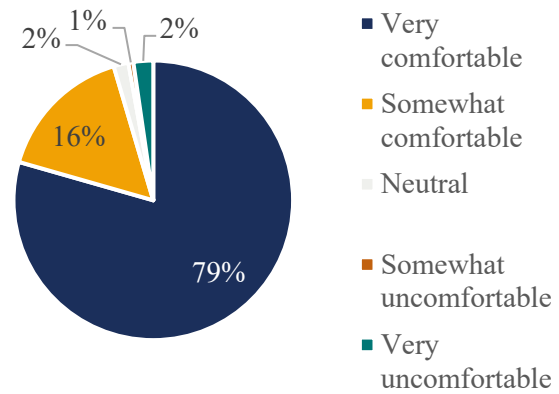


	Answer	Count	Percent
1.	Very comfortable	121	68.75%
2.	Somewhat comfortable	42	23.86%
3.	Neutral	6	3.41%
4.	Somewhat uncomfortable	4	2.27%
5.	Very uncomfortable	3	1.70%
	Total	176	100%

Q20. Protected cycle track with parking buffer and raised curb



(Evans et al., 2014)

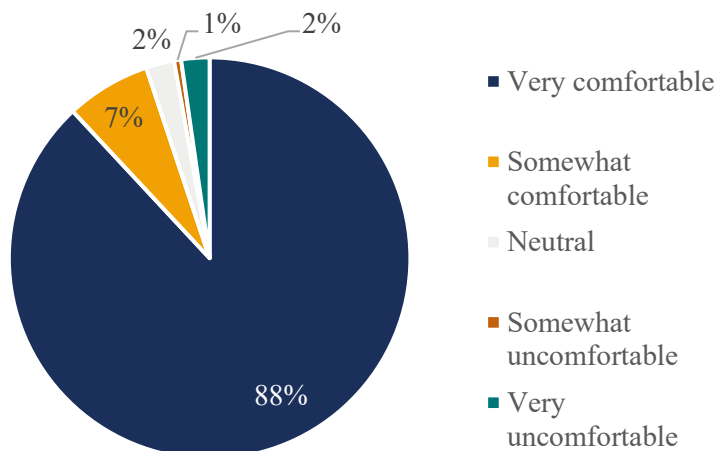


	Answer	Count	Percent
1.	Very comfortable	139	79.43%
2.	Somewhat comfortable	28	16.00%
3.	Neutral	3	1.71%
4.	Somewhat uncomfortable	1	0.57%
5.	Very uncomfortable	4	2.29%
	Total	175	100%

Q20. On a path or trail separate from the street

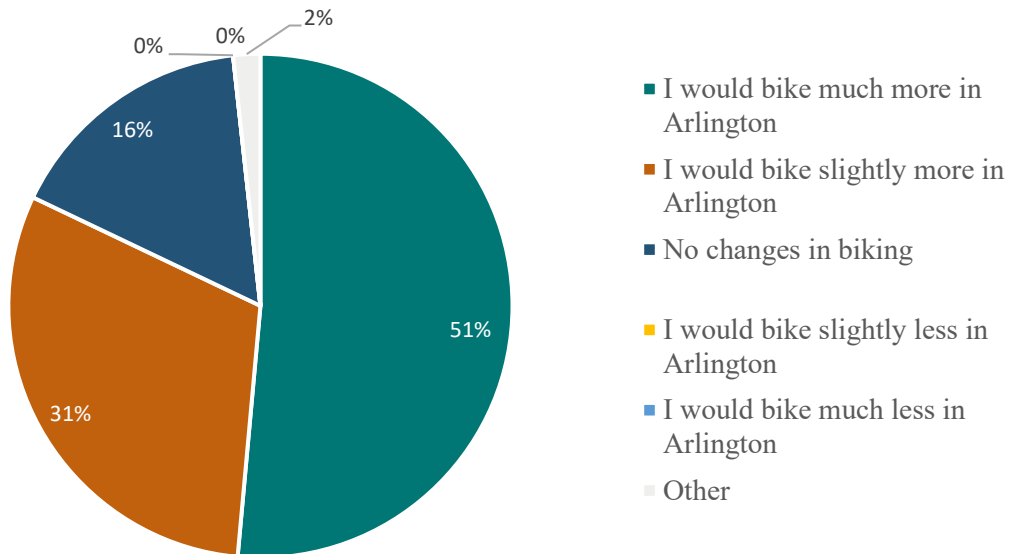


(Falbo, n.d., as cited in McNeil et al., 2015)



	Answer	Count	Percent
1.	Very comfortable	155	88.07%
2.	Somewhat comfortable	12	6.82%
3.	Neutral	4	2.27%
4.	Somewhat uncomfortable	1	0.57%
5.	Very uncomfortable	4	2.27%
	Total	176	100%

Q21. How would your current biking habits change if your desired bicycle lane infrastructure was implemented in the City of Arlington



	Answer	Count	Percent
1.	I would bike much more in Arlington	89	51.45%
2.	I would bike slightly more in Arlington	53	30.64%
3.	No changes in biking	28	16.18%
4.	I would bike slightly less in Arlington	0	0.00%
5.	I would bike much less in Arlington	0	0.00%
6.	Other	3	1.73%
	Total	173	100%

Q22. Which streets are in need of improvements in bicycle infrastructure in Arlington?  
 Select all that apply (Sebastian, 2012)

	Answer	Count	Percent
1.	S. Cooper Street	122	15.93%
2.	E. and W. Mitchell Street	86	11.23%
3.	Center/Mesquite Street	73	9.53%
4.	UTA Boulevard/E. Border Street	71	9.27%
5.	No Improvements needed in bicycle infrastructure	2	0.26%
6.	Pecan Street/Spaniolo Drive	38	4.96%
7.	Davis Drive	53	6.92%
8.	Abram Street	75	9.79%
9.	West Street	49	6.40%
10.	Front Street	41	5.35%
11.	Oak Street	40	5.22%
12.	Main Street	61	7.96%
13.	None of the above	2	0.26%
14.	I am not familiar with any of these streets	44	5.74%
15.	Other	9	1.17%
	Total	766	100%

Q23. Please provide any comments to enhance the biking experience in Arlington  
[Multiple row answer text]

To enhance the biking experience in Arlington there must be new bike-way infrastructure to help bikers feel safer. Safety is our primary concern.

NotJustBikes on YouTube is a good source for what should be implemented. Examples include just moving parking between vehicle traffic and the bicycle lane, dedicated bicycle paths separate from pedestrian traffic.

Basically, biking infrastructure is pretty poor. I do it and like the idea since I save gas and get exercise. But I feel it's a matter of time before a car hits me while biking.

I'd like more signs and bike paths to get around.

At least some share the road signs off south fielder and Mitchell so I get less cars honking at me."

Bike Repair Shop pleeaassee

Having a separated path from vehicle traffic would be great. Right now it seems dangerous sharing the road with vehicles.

Would love to see improvements in all cities. I love cycling but drivers are scary. They don't respect cyclists, value cyclist's lives, and aren't paying attention behind the wheel. If there were more protected lanes, wider sidewalks, shaded paths and trails, there would be a lot more cyclists. Even in large numbers for charity rides, like the Bike MS that ends in Fort Worth, drivers will swerve at cyclists, ride inches from the side of bikes or their rear tires, it's horrible. People have injured cyclists in multiple roads recently in TX without even a citation. More needs to be done but this is at least a step in the right direction.

I think we are on the right track, though slowly. I've been here 15 years and progress is made but painfully slow. We need separation from cars and pedestrians as cyclists. But the e-bikes and scooters should be allowed in bike lanes. There should not be people zooming around on sidewalks anywhere and especially downtown on scooters and e-bikes or traditional bikes. People should walk on a sidewalk. When I lived elsewhere it was the norm to walk your bike on the sidewalk in a downtown area, not slalom your way through people like here.

Maybe some placards, street flags promoting 'share the road with bikers' or 'bike-share resources' to improve Arlington citizen's overall awareness and cooperativeness of more bike-friendly operation of the city.

Separate bike paths are the safest and most enjoyable way to ride. Feeling safe lends to riding more often.

I think laws/penalties protecting cyclists need to be enforced more heavily and overall education on how cars should interact with cyclists on the road would improve conditions. And literally any amount of protection and existence of bike lanes.

Environmental education and awareness of the impacts of non-carpool driving, while introducing bicycle use as a more sustainable and interactive experience could increase the amount of people who may be interested in biking.

Better protection from theft. All my friends who have brought bikes to Arlington (4 friends) have gotten their bike stolen not including myself.

Residence halls should provide covered bicycle parking in order to reduce wear on residents' bicycles. The pedestrian bridges across Cooper Street are a major obstacle to east-west travel through the UTA campus both on foot and by bike — Cooper street must be removed or placed entirely below-grade. Protection at intersections is incredibly important and should be prioritized. Bicycle lanes must never be placed between on-street parking and car lanes.

Crossing Cooper Street is probably the most dangerous thing in Arlington for bikes or pedestrians.

I cross using the pedestrian bridge on campus. Making that safer would be the biggest help.

Also, the main East West streets (UTA Boulevard, Mitchell, Division, and Abram) are also dangerous for bikes until you get downtown.

Abram is really the only safe street to travel on downtown because of the narrow lanes and slower traffic.

I can ride Davis from Pioneer to UTA BLVD pretty safely and take a right at Greek Row to cross Cooper across the pedestrian bridge.

UTA BLVD/Border from campus to Mesquite and Center is usually not bad. But impossible during high traffic times.

I usually immediately try to get to South Street to get downtown.

Making a protected Bike route across Cooper to Downtown specifically Abram and Front Street (the nice areas) would be a huge help.

Lastly there is no bike parking downtown. Install a covered parking and add those paths and biking goes from sometimes doable to enjoyable.

Americans are VERY unfamiliar with bikers, from both the perspective of the person in the car AND the person on the bike itself. Expecting that it can be safe to have both in the



same space is always going to be unsafe. The idea of biking instead of driving a car is nevertheless exciting. I would love to be able to bike instead of having to drive every day, but eventually had to take it off the table until it's safer.

even with protected lanes enforcement against drivers (or cyclists) who do not follow rules drive safely is poor- too much lax enforcement in Arlington around UTA and even on campus of stop signs, speeds, and aggressive driving. Until that is added I don't know if it would be safe to ride to campus or around it.

Please more bike lanes in all of Arlington

Nothing more

Common knowledge of whether it's legal to bike on streets or sidewalks would greatly improve the safety for bikers and pedestrians. The intersections of E. Mitchell Street and Spaniolo Dr, Center, and Mesquite Streets lack any bicycle infrastructure to bicycle safely. Left turns onto Mitchell are dangerous for bikers as it stands.

N/A

Bike lanes need to be fixed. Raised roads act at the center of the bike lane making it difficult to bike

Make biking safer

N/A

I do not live in Arlington so I need to commute to school. That said, I am an avid cyclist and I love to ride recreationally all over Dallas. I prefer separation from cars primarily for safety reasons especially since so many drivers are constantly on their phones texting! I believe ridership would improve anywhere that people feel safer to be on their bikes! I am also a supporter of Rails to Trails!

Make driver not stupid

N/a

Need dedicated bike lanes on all major roads in arlington. I dont think there is any other way for getting people to bike. I dont want to share a road with cars or ride on the sidewalk.

Arlington roads are the worst. The city has fallen behind in maintenance - 20 years straight. These issues are all across the city. The council needs to get out and drive their roads. Pathetic.

"we need AT LEAST a cohesive network of routes with a painted shoulder bikelane or sidewalk.

That's a pitifully low bar and Arlington is nowhere close to meeting even that"

Personal bike lights

I would ride a bike more and am very interested in road cycling but I don't feel comfortable purchasing a bike that may cost over \$1000 and having it stolen wherever I may take it

I hope that your work to improve and encourage bike usage in Arlington will be successful and can serve to inform other cities about this mode of transportation. Good luck!

Would love to have better trails or separated lanes between 2-3 miles outside downtown to downtown because driving to campus that far every day wastes a lot of gas.

Generally a good community for biking, however the current standard for bike safety and drivers sharing the road is not satisfactory for a safe and enjoyable biking experience.

As a driver I definitely believe that we need to be more strict about car speed limits. So many cars will speed on streets that have a limit of 30mph, and most of the time they will get away with it. Along with that those are usually the streets that have small biking lanes (which don't even look safe, the paint usually looks all old and washed away and many cars will often pretend those lanes don't even exist).

I would appreciate a bike-first infrastructure in Downtown Arlington. Bike days and bike festivals similar to what they do in Ft. Collins, CO.

I live too far to bike in and around Arlington and UTA. I don't plan on biking anytime soon.

I believe a dedicated lane for cyclists would both make things safer and help the flow of traffic when cyclists are present.

We NEED more bike infrastructure!

If you wanted to ACTUALLY implement a way to commute via bike, you would need to overcome 4 things: The weather, the fact that people on bikes sweat, the fact that drivers are idiots and WILL run you over (like I said, I bike 30-40 miles a week, I have experience in the matter and I HAVE been hit by a car before) and most importantly the fact that bikes get stolen. I would not want to commute on a crappy bike because it would break and it would leave me stranded. I would not want to commute on a good bike because it would most certainly get stolen (I guess the crappy one would too). I don't want to bike somewhere and get caught in a storm on my way home. I also don't want to

bike in 110 degree heat to class and show up sweaty. I don't want to get hit by the idiot drivers on the road. I hate to be negative, but it just isn't feasible at all. This isn't England."

Please provide some time of police or security guard at several intersections during school hours!! Especially during school time on Cooper Street, there's strangers who approach students in the morning, especially women and girls who walk to campus!

None

Make sidewalks wider so that pedestrians and bicyclists can share them and it's safer without the risk of being run-over by a car; at least that's what they do in Japan. Also, make sidewalks mandatory in all streets. I have run into many instances where the sidewalks just ends abruptly and then you either have to be on the street or in the grass. I would rather ride on a wide sidewalk than risk being run-over by a vehicle.

Why does Arlington not have a protected cycle track with a parking buffer and raised curb???

Protected separation of cyclists from drivers (since drivers in Arlington are by and large unsafe in their behavior towards cyclists) is a must. Without dedicated/protected bike lanes cyclists are forced to often use sidewalks, but a lack of accessible ramps limits this possibility. Emblematic of this situation is UTAs recent elimination of kerby street which connected W 4th and greek row. Now there is only a side walk (which is not bike friendly to begin with) and there is no ramp connecting this sidewalk to greek row. Meaning cyclists trying to get to campus now have to bike on Davis to get to greek row (unsafe due to 35mph traffic [45mph not uncommon with texas drivers] with no cyclist separation) or bike through the winding sidewalks in the dorms.

In efforts to improve the bike infrastructure special attention needs to be paid to making sure that bike routes connect to one another, and actually go places, instead of dead ending on busy roads.

im more comfortable biking in wide sidewalks where i can maneuver around people and designated bike lanes when the sidewalks are too small. i dont like to hold up traffic

In a previous place that I lived, I rode my bike to and from work every day through a congested downtown - about a 10 minute commute. While there were not protected bike lanes, traffic moved slowly (speed limit was 25mph) and stopped at every corner with traffic lights and stop signs. There were many other people on bikes, meaning that drivers were more familiar with leaving space. Arlington has a long way to go but should absolutely make needed changes to support more transit alternatives and to attract more new residents looking for those alternatives.

The tire pumps on campus don't work and it made my tire more deflated

I wish there were more bike lanes in general so that people won't get mad at you for using your bike on the street.

Collins st. By the train tracks has very bad lighting and little to no sidewalks

The key problem in my area of arlington is that I live north of the trinity river. There is great bike paths along the trinity river but no bridge to get to the other side of the river to access the recreation center and shopping along green oaks and Collins. Collins is not a bicycle friendly roadway. Adding a bridge would be a big improvement to connect Viridian to nearby shopping and recreation would be great.

Might educate drivers too. I could see drivers being aggressive toward bikers even with infrastructure.

We need to make biking and bikeshare more mainstream in the way students living the Arlington goes to places.

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## BIOGRAPHICAL INFORMATION

Anna Laura Harmjanz's research focus is on sustainable transportation with an emphasis in bicycle infrastructure. Through research, local activism, and leadership, she has been able to work with a variety of stakeholders, planners, and engineers to come up with safer solutions for Arlington's pedestrians and cyclists. She has experience conducting research on transportation projects and public involvement in transportation planning through UTA undergraduate and graduate courses. Her personal and professional mission is to help develop effective, sustainable, and affordable transportation systems in the DFW metroplex. Anna Laura Harmjanz earned an Honors Bachelor of Arts in Political Science in May 2022. Her plans are to continue her education in the Masters of City and Regional Planning program at the University of Texas at Arlington. After earning her Masters, she hopes to pursue a career in active transportation planning.