**Module 7: Portfolio Project Final – Connecting Communities: Urban Rejuvenation Through Strategic Investment in Urban Cycling Infrastructure**

Robert Nicholson

Colorado State University Global

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Dr. Justin Bateh

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**Abstract**

This paper examines the role motorized vehicles have played in creating disparities between urban and suburban areas in Dallas, Texas. Utilitarian cycling has the potential to connect communities, bring about economic development, and dissolve social inequities with regards to access to affordable housing and employment opportunities. This body of work does not argue for carless cities, nor does it promote public transportation-only options.

This paper does outline potential options to connect communities, both new development in suburban areas and re-development in urban areas, through strategic cycling infrastructure investment. Supported by peer-reviewed studies and data collected by the United States Census Bureau and the Texas Comptroller of Public Accounts, the study affirms the viability of reducing the current allotted widths of car lanes in order to reallocate to protected bike laneswithout the need for major overhauls of Dallas’s primary arterials.

To further entice the investment opportunity, the study also affirms new businesses and employment opportunities are likely to be created in conjunction with cycling infrastructure, and real estate sales within urban areas are likely to see increases and enjoy increases in value when located near cycling infrastructure, just as home values have seen an increase when located near rail and bus lines across DFW.

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# Introduction

The decline of the urban setting has been a troubling reality for decades that brings with it both a physical crumbling of tangible infrastructure and the often overlooked social inequities that afford some areas with public infrastructure benefits while not affording the same benefits elsewhere. Hortas-Rico (2015) establishes post-war suburbanization as a leading driver that is *reshaping the spatial pattern of growth* impacting a number of urban and larger metropolitan cities throughout the United States.

This effect was further exacerbated by the COVID-19 pandemic as working from home allowed millions of people the option to migrate away from urban areas and into outlying suburban and rural locations, and it remains difficult to not see the negative impact that years of neglect and migration has had on urban environments. While these areas are beginning to see a rise in the daily volume of vehicles as people exercise the option to return or commute back into the city, the local and small businesses continue to decline due to the transient working populations that migrate back to the suburbs and the residents in the surrounding neighborhoods that need to travel elsewhere for goods and services because there are no stores in the immediate urban area.

Dallas, Texas is a city where people have a strong connection to cars and trucks; however, this connection can be explained because of the layout of the Dallas-Fort Worth Metroplex (DFW), which encompasses 19 counties and approximately 15,600 square miles. Coupled with a population of just under 8 million people, which constitutes a pre-pandemic growth rate of 18.5% increase between 2019 and 2020 (Texas Comptroller of Public Accounts, 2020), and the very definition of urban sprawl can be placed into context.

However, public transportation infrastructure across DFW, and especially in Dallas, has lagged when compared to other metropolitan areas, which forces people into cars and trucks as the primary means to get from Point A to Point B. This lag in public transportation infrastructure seemingly goes against the grain outlined in the AlQuhtani and Anjomani (2019) scenario where an urban population rebounds, so too does its public transportation. The lack of public transportation can impact the economic development and inequities across DFW, so what can urban planners and local leaders do to reduce localized motorized transportation, bolster economic growth, and connect communities? The answer may reside within local cycling culture and the willingness to invest in cycling infrastructure to support a resurgence of interest in breathing life back into Dallas’s urban settings.

# Problem Statement

The prominence of developing a reliable economic restoration plan specific to the urban environment has long been recognized by urban planners and city leaders as having value to social equality and economics. Many city projects have the best intentions, but are oftentimes shelved, underfunded, delayed, or just abandoned leaving urban areas none the better. In Dallas’s downtown area, vehicle volume across primary arterials is hovering in the hundreds of thousands per day despite being built to only handle tens of thousands per day (A New Dallas, 2021). This ultimately leads to a visually recognizable problem, as well as an economically decline to Dallas’s urban environment.

As businesses seemingly disappear overnight, the social and economic inequities begin to seep through what was once a thriving downtown community interconnected with populous and vibrant neighborhoods. Unlike new development on the outskirts of the city of Dallas where space is abundant, space in the urban area is a premium and needs to be considered, which leads to the question, *can reducing the lane space allotted for vehicles lead to strategic investment in cycling infrastructure in Dallas?*

# Objectives

The contribution to the transportation field of study, and the objective of this paper, is to determine the viability of reducing the physical space of car lanes. The objective will be met by analyzing demographic data for the city of Dallas and correlate to the findings and observations with cities showing successful cycling infrastructure. The referenced literature highlighted in this paper point out Portland, Minneapolis, New York City, and Chicago in the United States, and Paris, London, and the Netherlands in Europe as the key cities where the car is not always the primary mode of transportation when looking at urban environments. The overall analysis can then be associated with the probability of success in Dallas and its surrounding neighborhoods.

An example of the urban area in question traverses the center of downtown Dallas and is a 1.8 mile stretch of Main Street between Houston Street in the Historic West End and steps away from Dealey Plaza, and Hall Street in heart of artistic Deep Ellum on the Eastern end of Main Street. While the entire 1.8 mile stretch of Main Street does have some existing cycling infrastructure in the form of Sharrows, the bike symbol with a double arrow depicted in Figure 1 that indicates a shared lane amongst bikes and vehicles, fully protected bike lanes do not exist; subsequently, core businesses, such as grocery and convenience stores, have been closing locations and migrating to other parts of the city.

**Figure 1**

A picture containing text

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*Main Street, Dallas with bicycle Sharrow painted on road (author’s own photo)*

Super sharrows, the bike symbol arrows combined with a painted green stripe, also symbolize a shared road for bikes and motorized vehicles as depicted in Figure 2. Super sharrows emit a slightly more protected feel to the bike lane, and also appear throughout the corridor, but the absence of truly separated or dedicated and protected bike lanes along the corridor is noted. Without these types of protected bike lanes, the number of cyclists could be greatly reduced simply due to safety furthering the over-reliance on motorized transportation (Momeni, 2022) and widening the gap in social-spatial inequities (Firth, 2021).

**Figure 2**



*Super sharrow, from Rethinking Streets, An Evidence-Based Guide to 25 Complete Street Transformations, by Schlossberg et al., 2013, University of Oregon (*[*https://pages.uoregon.edu/schlossb/ftp/RS/RethinkingStreets\_All\_V2\_high\_wCover.pdf*](https://pages.uoregon.edu/schlossb/ftp/RS/RethinkingStreets_All_V2_high_wCover.pdf)*). In the public domain.*

# Overview of the Study

Most people have choices when commuting from Point A to Point B, the study reviewed Dallas’s demographic and economic data collected by the United States Census Bureau during the 2020 Decennial Census to identify trends that impacted commuting and commuting choices. These findings were then corroborated with demographic and economic data from the Texas Comptroller of Public Accounts for the city and county of Dallas.

The primary research method for this study was literature review; however, data modeling was also used to support the findings of economic and social inequities that have led to dilapidated and abandoned storefronts as shown in Figure 3. The primary tool used was SAS Studio as it is a reliable tool that is feature rich. Microsoft Excel was also used, but only for mathematical computation and some cleaning, where it was applicable.

## **Methods**

As for the testing method, the SAS features used were: 1) Linear Regression to better understand the correlation between employment and housing in Dallas, 2) Predictive Regression Models to forecast the causal impact of cycling infrastructure on economic and social inequities, and 3) Partial Least Squares Regression to reduce the factors and work with a smaller set of predictors to further support the predictive analysis.

## **Limitations**

The only known data limitation was with the United States Census Bureau collection methods that might have contained unasked and unanswered questions specific for individual commuting data, road conditions, and any unknown scenarios for or against the reduction of physical vehicle lane space.

**Figure 3**

A person on a bicycle in front of a storefront

Description automatically generated with medium confidence

*Security guard riding on sidewalk in front of empty storefront, Main Street, Dallas*

*(own photo)*

# Research Question and Hypotheses

## **Research Question**

The study begins with the primary research question, *can reducing the lane space allotted for vehicles lead to strategic investment in cycling infrastructure in Dallas?* Supporting the research question are two additional contextual questions:

1. In cities with well-established cycling infrastructure, does an increase in protected bike lanes have a correlation to an increase in economic development within urban environments?
2. Will an increase in cycling infrastructure investment lead to breaking the social inequities across urban neighborhoods?

The study leveraged these research questions to drive the analysis of the data. Van Eijk et al. (2022) highlight the focus on how a *single* research question may lead researchers to determine the correct the type of model(s) and defining parameters for a study. Using this same concept, the focus on the holistic question will dictate each supporting question’s modeling approach and how the analysis will be performed to ultimately prove or disprove the hypothesis.

## **Research Hypothesis**

The hypothesis for this study supports the recommendations that are generally required to for a well-developed study (Toledo, 2011). The following hypothesis is specific to this study:

1. Can reducing the physical lane space allotted for vehicles lead to strategic investment in cycling infrastructure in Dallas?
   1. HO: Reducing the width of vehicle lanes does not lead to strategic investment in cycling infrastructure.
   2. HA: Reducing the width of vehicle lanes does lead to strategic investment in cycling infrastructure.

# Literature Review

The reduction of vehicle lane space to make room for cycling infrastructure is a controversial topic, especially when looking at a city where cars and trucks are embedded into the cultural norm. But it is important to look at the potential benefits to economic and social inequities that investment in cycling infrastructure can bring. Ultimately, the study will seek to have impact on urban planning and revitalizing Dallas’s urban areas.

The study will not explore the use of cycling infrastructure for sport cycling, e.g., competitive racing and/or distance events, but it should be known that cycling infrastructure will be used by all types of cyclists. However, utilitarian cycling was the focus for this study; utilitarian cycling is commuting and running daily errands, or Point A to Point B micro mobility.

There are ample peer-reviewed sources available that highlight the benefits of cycling and the corresponding cycling infrastructure, bike lane safety, and economic growth of urban areas that support cycling infrastructure. Many of the studies conducted have concluded a favorable view for investment in cycling infrastructure, and while transformation to successful cycling infrastructure has not been an overnight occurrence, the studies have generally shown evidence exists to support the opportunities that result in positive economic prosperity, connecting communities, and lower health expenditures.

# Evaluation of Sources

## **Theme: Economic Prosperity & Social Inequities**

The general overview of the economic and social inequity theme encompasses the positive relationship between cycling infrastructure and economic development. The general discussions center around answering questions related to the effect of managing vehicle volume relative to urban revitalization.

* Study 1: Andersen, M., Hall, M.L. (2014). Protected Bike Lanes Means Business: How 21st Century Transportation Networks Help New Urban Economies Boom. Abstract – The conventional bike lane is getting a makeover in American cities. No longer relying on just a few inches of white paint to give people on bikes a feeling of security and comfort on busy streets, modern protected bike lanes use curbs, planters, parked cars, or simple posts to clearly separate bikes from auto traffic and sidewalks.

The conclusion of the study is that protected bike lanes create safe and appealing experiences for all types of utilitarian cyclists. Protected bike lanes also promote new businesses to open along the routes that are frequented by utilitarian cyclists. The study highlights repeat business as the amount of purchased goods cyclists can carry is limited and therefore, frequent trips to business along cycling infrastructure is prominent.

* Study 2: Cunha, I., & Silva, C. (2022). Equity impacts of cycling: examining the spatial-social distribution of bicycle-related benefits. Abstract – Cities worldwide are developing and implementing strategies to promote the bicycle as a viable and competitive mobility option, to foster the development of resilient, livable, accessible, inclusive, and low-carbon societies. Nevertheless, empirical evidence has shown that equity issues have been far less addressed during bicycle planning and decision-making processes, regardless of the importance of the social dimension within the sustainable mobility policy.

The conclusion the study makes encompasses how grass roots organizations may be the catalyst to promote the socio-economic aspects that break the inequity barrier. When cycling infrastructure is distributed equally, the benefits can be realized by entire and connected communities, as opposed to one single group of individuals.

## **Theme: The Dissenting Opinion**

* Study 3: Braun, L.M. (2021). Disparities in Bicycle Commuting: Could Bike Lane Investment Widen the Gap? Abstract – This article examines how bicycle commuting is associated with bike lane access and sociodemographic advantage at the block group level in twenty-two U.S. cities. This indicates the importance of considering heterogeneous effects in urban planning research and suggests that bike lane investment, in isolation, could widen sociodemographic disparities in cycling and its benefits if non-infrastructure barriers to cycling are not also addressed.

The study takes the opposite view that investing in cycling infrastructure further negatively impacts disenfranchised groups as cycling infrastructure trends away from urban areas. The study also indicates planning for an increased volume of motor vehicles is needed for future growth of the suburban landscape, but not necessarily a downtown urban area.

* Study 4: Firth, C.L., Hosford, K., Winters, M. (2021). Who were these bike lanes built for? Social-spatial inequities in Vancouver’s bikeways, 2001-2016. Abstract – Over the past 15 years, Vancouver, British Columbia, has made substantial investments to their bikeway network, adding over 150 km of protected bike lanes, painted bike lanes, and local street bikeways. This investment in bicycling infrastructure corresponded with increases in city-wide commuting to work by bicycle (from 4.1% in 2001 to 6.1% in 2016). This study aimed to examine whether increases in bikeway access corresponded with increases in bicycle commuting, and whether there are socio-demographic inequities in bikeway access, and if these inequities changed over a fifteen-year period from 2001 to 2016.

The study concluded that the challenges for communities to access bike lanes continue to persist. And confirms areas with higher educated adults have more access to protected bike lanes leading to disparate opportunities amongst communities. An interesting finding are the areas that contain higher numbers of children have less access to protected bike lanes that further support the disparities amongst specific demographic groups.

# Research Design

## **Methodology**

The study will leverage a series of datasets to support the data modeling and analytics component of this project. Attention was afforded to identify useable datasets that could be analyzed; the selected datasets can be rooted back to two primary sources: the United States Census Bureau (Census) and the Texas Comptroller of Public Accounts (TCPA).

The data and subsequent analysis will be used to formulate a recommended course of action that can be taken by city leaders, presented in a format to make an informed decision to reduce the space afforded to motorized vehicles while increasing the investment in cycling infrastructure, or remain status quo. The selected datasets will be less about competitive cycling, and will focus on utilitarian cycling, e.g., commuting to work, running daily errands, grocery shopping, and casual recreation. It is the utilitarian cycling that has the potential to have a positive impact to what Florida and McLean (2017) describe as a developed inclusive urban area, or areas of economic benefit for all segments of society.

## **United States Census Bureau**

The general Census data was collected during the most recent 2020 Decennial Census conducted through direct United States Postal Service mailers and direct outreach and door-to-door manual data collection. Additional information comes from The American Community Survey (ACS), which is a survey that is administered by the Census on an annual basis and provides *comparable and quality information about the people in all our communities* (United States Census Bureau, 2021). The data collected encompassed demographic and economic variables in a series of tables; however, this study will leverage three datasets that stem from the 2020 Census and ACS.

The datasets are subsets of the broader census data and were selected as they are specific to Dallas County in Texas and contain raw, clean data for modeling and analysis:

* 2020 Decennial Census Dataset P1: Provides general demographic data, e.g., total population, race, and housing counts.
* 2020 American Community Survey Dataset S1901: Provides financial demographic data, e.g., median household income, education level, and employment rates.
* 2020 American Community Survey Dataset S0804: Provides individual commuting data.

## **Texas Comptroller of Public Accounts**

The study will leverage data from the TCPA, which also utilizes the Census for the majority of its Texas, Dallas County, and City of Dallas data, which will provide continuity in the data for comparing and contrasting views encompassing national, regional, and local economic and transportation. The data is comprised of demographic and economic variables pulled from the United States Census Bureau and from TCPA questionnaires.

* Key Economic Indicators Dataset: Provides data specific variables that highlight the economic activity in Dallas. The data can be analyzed for economic performance and modeled predictions of current and future economic performance (Texas Comptroller of Public Accounts, 2020).

## **Initial Data Exploration & Data Dictionary**

Looking at the TCPA Key Economic Indicators dataset, the initial data exploration tells us there are 215 observations covering 31 variables. There are no deleted observations indicating the dataset is whole and the size is 256KB, which is manageable for SAS Studio and should not adversely impact the performance of running the applicable models within the application.

Figure 4 identifies the 31 variables within the TCPA. The study will leverage these to measure the city and county of Dallas’s housing data, consumer pricing, retail gas prices, and employment rates. It is anticipated the resulting model output will support the amount of traffic and subsequent commuting distances Dallas residents travel each day that leads to traffic challenges and lost work (A New Dallas, 2021).

**Figure 4**

*Table

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*31 variables within the TCPA Key Economic Indicators dataset*

## **Ethical Considerations**

Domagala (2021) discusses uncertainties with the use of data and potential modeling errors that can lead to erroneous or false statements within studies and reports. However, with regards to ethics for this study, it is not the uncertainties Domagala (2021) highlight, but the collection of the data that will be used within the study is the only concern for the author.

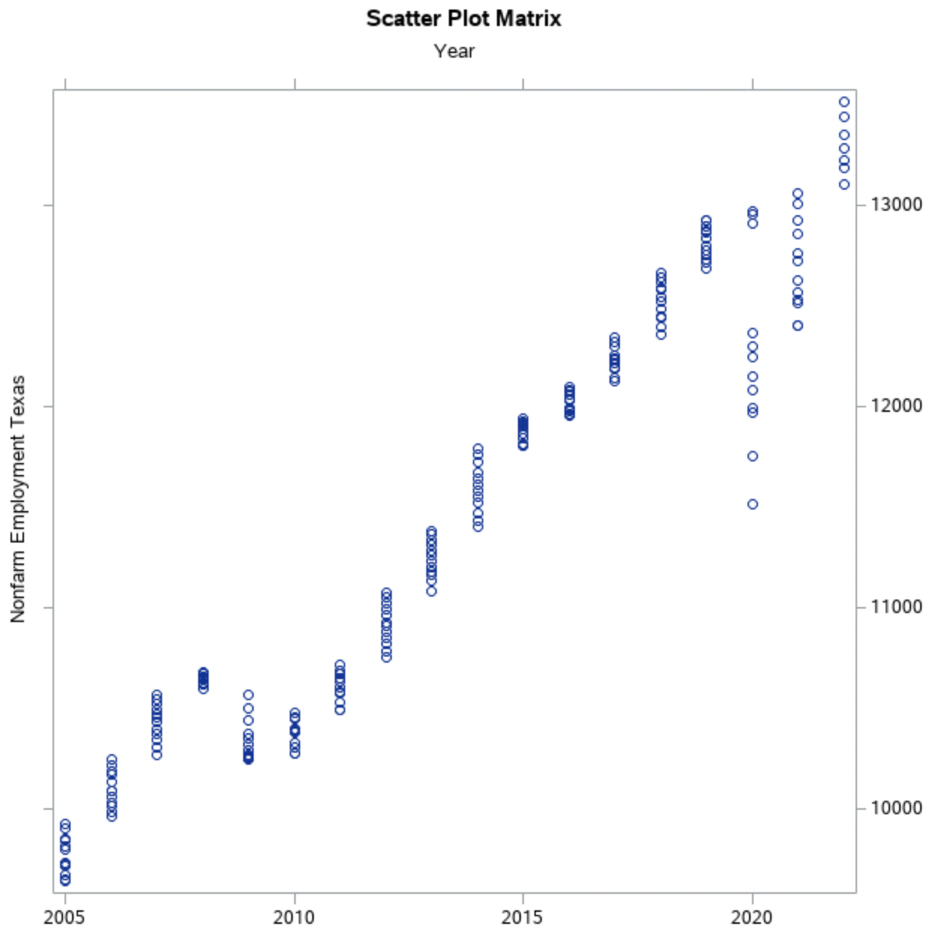
The primary source of data for the study will come from the United States Census Bureau. The author is confident in the methodology of collection, review, and cleaning of the data prior to its publication (United States Census Bureau, 2021). State, or Texas, and local Dallas data collection methodologies are where the author has concern. The TCPA leverages a combination of United States Census Bureau data, as well as data it has collected. The methodology of the TCPA collection is unknown with regards to the questionnaire designed to solicit data.

# Analysis of Findings

The objective of this study is to examine the viability of increased cycling infrastructure through the reduction of vehicle lane space, vis-a-vie, changing the approach to urban mobility in Dallas. While cities across the United States, as well as in Europe, have implemented cycling infrastructure in lieu of motorized vehicle infrastructure, and have realized increases in economic development and heightened community connectivity, Dallas has lagged in its efforts to invest in the necessary infrastructure as means to enhance its economic development and community connectivity.

Employment plays a significant role in determining the transportation habits of individuals in Dallas. Employment opportunities have steadily increased year-over-year (YOY) as seen in Figure 5; however, the data does show a wider gap in nonfarm employment opportunities from 2020 to 2022 indicating a mild employment recovery post-COVID-19. It also indicates the work from home (WFH) opportunities with employers out of state, which can impact the creation of adding employment in traditional brick-and-mortar locations.

**Figure 5**



*TCPA scatter plot depicting nonfarm employment growth in Dallas, 2005-2022*

Transportation, whether it be commuting to work or driving to the grocery store, does require individuals to maintain a vehicle, which includes filling the tank with gas. In review of the Least Squares Model specific to an Analysis of Variance that leveraged the same TCPA data, the p-value is calculated to <.0001 indicating a strong statistical significance that gas prices are not influenced by year. Returning to the nonfarm employment plot, this would mean that individuals would be forced to accept the opportunity cost of [potentially] higher costs to fill the tank in order to drive their vehicle for commuting, running errands, or both.

Where people live within Dallas is another component that plays a significant role in determining how people leverage transportation. With a county population of 2,613,539 and an area of 909 square miles (United States Census Bureau, 2021), connecting communities via primary and secondary arterial roads all but invites motorized vehicles to be the primary means of transportation and seemingly supports the Hortas-Rico (2015) observation regarding migration to housing located on the outer limits of Dallas.

**Figure 6**

Chart, line chart

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*TCPA R-Square analysis of nonfarm employment and existing home sales for Dallas*

Reviewing the R Square analysis in Figure 6, the data supports the relationship between employment and sales of existing homes in Dallas. The analysis indicates as the number of employment opportunities increase, so too do the factors that drive home sales. Therefore, there is a greater confidence level to predict that as employment increases, existing home sales will increase.

Logically, and using the inverse of the R Square analysis, if urban decay drives people from living in an urban area, then it can be predicted that supporting businesses and employment opportunities may also decline within those same areas, which triggers the beginning of a vicious migration cycle. As people locate to the outer edges of Dallas, driving higher housing costs and furthering employment inequities for residents of urban areas, the migration cycle will leave behind groups of individuals without the necessary strategic investment to bolster utilitarian cycling and economic development within urban areas of Dallas.

This is not to debate the merits of how the housing cost factor trends higher on the outer limits of a given city, which in turn can create additional inequities for residents of urban areas, e.g., mobility difficulties. However, this is an example highlighting the Braun (2021) view of potentially widening the *sociodemographic disparities in cycling and its benefits if non-infrastructure barriers to cycling are not also addressed* by urban planners. What this is indicating are the claims that bike lanes are more prominent in new development communities versus communities experiencing economic declines, which further impedes the process to connect communities through cycling infrastructure if the full breadth of connectivity is not explored by urban planners to make cycling infrastructure a priority for the city of Dallas’s 1,304,442 residents (United States Census Bureau, 2021).

Why does this matter? What purpose does it serve to the conversation? With regards to real estate value, for every quarter mile nearer to cycling infrastructure, especially off street infrastructure, property value can increase approximately $510 (Andersen, 2014) as depicted in Figure 7. The scenario is similar to the AlQuhtani and Anjomani (2019) conclusion that home values throughout DFW are positively impacted when located in close proximity to rail stations.

**Figure 7**

Chart, box and whisker chart

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*TCPA box plot data showing home sales and employment relative to home values*

# Conclusion

To conclude, the study set out to test the viability of reducing the physical space drivers have today on arterial roads in Dallas and reallocate the residual space for protected cycling infrastructure. The study makes a strong argument that the factors impacting transportation infrastructure, specifically, housing and employment, have a strong statistical connection. The study then looked at successful cycling infrastructure implemented in other cities that concluded a strong correlation with positive economic development once cycling infrastructure was set into place.

The connection can be made that as urban sprawl continues to occur in Dallas, residents will be forced to commute by car or truck if infrastructure investment is solely focused on motorized forms of transportation, and not on public transportation options, especially cycling infrastructure. As employment opportunities move towards suburban areas, residents in urban areas can experience deeper inequities.

To address the overall economic and social inequities, the study concludes with a successful prediction suggesting a higher probability of success for reducing the physical space for car lanes to reallocate to protected cycling infrastructure as a viable option for economic redevelopment of Dallas’s urban areas. The analysis supports the alternative hypothesis that there is evidence to support reducing car lane size to reallocate to protected bike lanes; however, additional research in the form of a sentiment analysis can be conducted to identify adoption probabilities.

While investment in cycling infrastructure can have positive impact on downtown Dallas, there is a human component that needs to be addressed, which is the adoption of cycling as a viable and sustainable mode of transportation, and an economic development opportunity to inject new life into downtown Dallas. The adoption speaks to the sociological approach to becoming a cyclist in a motorized society (Shilling, 2021) and changing the views of how people move throughout communities, support local businesses, and distribute wealth.

# Recommendations

The final recommendation compliments Dallas’s own city 2019 Street Design Manual that acknowledges the benefits of cycling and depicts its approach to designing the necessary infrastructure, however, the design highlights the building of new infrastructure, not retrofitting the existing infrastructure.

Figure 8 shows the three approaches, which are standard to many cities across the United States. The first visual is the Protected Bike Lanes, which cyclists consider the safest on-road option. Next is the shared road, or Sharrows, where motorized vehicles and cyclists share a designated lane, which cyclists consider the least safe option. Finally, there is the dedicated cycling lane that is oftentimes its own well established path with noticeable distance between it and the road; cyclists consider this the safest option.

**Figure 8**

Dallas Street Planning; Bike Lane Options


*Dallas Street Planning Manual Cycling Lane Options*

While this is a viable solution for new communities, it may not be the most viable approach for existing urban communities due to the existing design of primary and secondary arterial and local streets, as well as the existing buildings that may promote space restrictions for new cycling infrastructure. In many cases, the only options are to incorporate the Sharrow bike lane option into the existing street, or no bike lane option at all, furthering the inequities between older urban neighborhoods and new development neighborhoods.

Because space is a commodity in an urban setting, the best viable option is to reduce the width of vehicle and parking lanes from 12 feet to 10 feet and reallocate the remaining free space to protected cycling infrastructure. Reducing the space will also help promote slower driving speeds, which can positively impact the severity of inevitable crashes. A narrow street can also reduce the distances pedestrians must walk to cross the street, it has the ability to allow for a shorter signal cycle (NACTO, 2022). Figure 9 depicts typical existing arterials across many large urban areas, including Dallas. These arterials often have two to three lanes of moving traffic and one to two lanes of parking, with all four lanes each having a width of 12 feet wide.

**Figure 9**

Diagram

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*NACTO existing arterial urban street design, 2022. In the public domain: https://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/#:~:text=Travel%20lane%20widths%20of%2010,lanes%20in%20the%20opposing%20direction.*

Figure 10 depicts how the space can be redistributed without requiring major construction to relocate buildings or communal sidewalk space. The proposed redesign uses the same forty-eight foot width of the existing four lane wide arterial road. A reduction in lane size to 10 feet wide and reducing the number of vehicle lanes to two can yield room for a 9 foot wide protected bike lane in conjunction with: 1) the ability to still maintain moving vehicle traffic patterns, 2) a single side parking that doubles as an added physical barrier protecting the bike lane, and 3) an optional bus lane that can further promote public transportation and aid in addressing the inequities to get to where employment opportunities reside in Dallas.

**Figure 10**

Diagram

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*NACTO post arterial urban design street, 2022. In the public domain: https://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/#:~:text=Travel%20lane%20widths%20of%2010,lanes%20in%20the%20opposing%20direction.*

The final recommended solution for city leaders is to maintain status quo as it pertains to new development; however, there is ample opportunity to address Dallas’s existing urban area in an effort to reinvigorate the economy, entice people to buy property, and promote a cycling culture.

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