

COMPLETE STREETS DESIGN ELEMENTS AND THEIR IMPACT ON TRAVEL
BEHAVIOR: LEARNING FROM THE BAGBY STREET RECONSTRUCTION
IN HOUSTON, TX

by

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Abstract

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The University of Texas at Arlington, 2015

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There are several studies linking travel behavior to various other topics within urban design but none directly examine Complete Streets. This travel behavior study is significant in that it looks at specific streetscape design features rather than studying density or land use of a particular area. This research examines if and how travel behavior is influenced by specific design elements on Complete Streets using Bagby Street Reconstruction in Houston, Texas as a case study. Bagby Street Reconstruction is one of the first Complete Streets projects in Houston completed by Design Workshop and Walter P Moore. The project is a section between Pierce Street and Tuam Street in Midtown District in Houston, Texas.

This study compares Bagby Street Reconstruction with the literature on Complete Street best practices to existing design features. Passive and participant observations coupled with onsite and online surveys were used to determine if and how travel behavior is influenced by design elements on Bagby Street.

Results of this thesis study divulged several themes from Bagby Street users both through the comparative analysis, survey and passive and participant observations.

Themes discovered relating to travel behavior and street design were safety, creating a destination, providing a choice in transportation and walking is preferred. This study recognizes Complete Streets as a destination which positions them in both transportation and placemaking projects – both topics and expertise can provide opportunities for landscape architects and planners. This research also supports and emphasizes the importance of the perception of safety as a threshold consideration in Complete Street design. The study of the influence of Complete Street design and its impact on travel behavior can be used to further studies within several professions including landscape architecture and city/regional planning.

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Chapter 1

Introduction

1.1 Introduction

“Streets and their sidewalks, the main public places of a city, are its most vital organs. Think of a city and what comes to mind? Its streets. If a city’s streets look interesting, the city looks interesting; if they look dull, the city looks dull.” (Jacobs 1961, p. 31)

Complete Streets is a transportation policy and design approach that requires streets to be safe for drivers, bicyclists, transit vehicles (and users), and pedestrians of all ages and abilities. The concept of Complete Street places emphasis on changing the decision-making and design process when creating streets so all types of users, not just automobiles, are considered when planning and implementing (National Complete Streets Coalition 2010). Since 2004, the United States has seen an increase of adoption of Complete Streets policies and currently has more than 600 state and local Complete Streets policies around the country, (American Society of Landscape Architects 2013).

There are several studies on the impacts of the built environment on travel behavior ranging on topics such as health, CO2 emissions, and neighborhood construct, (Committee on Physical Activity, Health, Transportation, and Land Use 2005; Ling 2011; Lamont 2001) but very few that specifically examine travel behavior and specific design elements on a Complete Street. Bagby Street in Houston has not been studied specifically for design implications of a Complete Street on travel behavior. This thesis examines the implications of Complete Street design elements on travel behavior by studying Bagby Street within the Midtown District in Houston, TX.

1.2 Background Information

1.2.1 Complete Streets

The general principle of a Complete Street is to create a street where pedestrians, bicyclists and other forms of transit can safely co-exist. Since World War II

streets in the United States have been designed without much consideration for the pedestrian, focusing instead on the automobile and traffic flow (Norton 2008).

The National Complete Streets Coalition came from the Complete Streets Task Force, which was originally led by America Bikes. The Task Force had active participation from many groups, including AARP, the American Planning Association, the American Public Transportation Association, the American Society of Landscape Architects, and the American Heart Association. In 2005, the groups banded together to provide financial support and the National Complete Streets Coalition was born. The coalition depended on the other members' strength in working for policy adoption at the federal, state, and local level, and it is still utilizing the same Complete Streets model of planning and implementation today, (National Complete Streets Coalition 2010).

In 2013, more than 90 jurisdictions adopted a Complete Streets Policy and there are over 600 regional and local jurisdictions, 27 states, the Commonwealth of Puerto Rico, and the District of Columbia have adopted policies or have made written commitments to do so, (National Complete Streets Coalition 2014).

1.2.2 Complete Streets in Houston, Texas

In an effort to create “safer, more vibrant streets,” in the City of Houston, Texas, Mayor Annise Parker signed an “executive order requiring the city to provide safe accessible streets to all users” (Dodds 2013). The Bagby Street Reconstruction was labeled as a model example of a Complete Street in the City of Houston. It has been recognized throughout the country through Smart Growth America’s website as a dream turned reality for many people in the City of Houston. Bagby Street Reconstruction broke ground in January 2012 and was completed in the late summer of 2013, (Powell 2013).

1.2.3 Travel Behavior and the Built Environment

The literature suggests travel behavior and the built environment have been extensively researched and examined for decades. Urban transportation studies have shown a link between urban form and travel mode. People who live in a higher density area, mixed-use and high connectivity drive less and use alternative means of transportation (Cao et al. 2010; Cervero 1991; Committee on Physical Activity, Health, Transportation, and Land Use 2005; Ewing & Cervero 2010).

1.3 Purpose

Creating Complete Street policies demonstrates the intent to provide a safer means of transportation – this is established in multiple articles and studies. The link between neighborhood design and travel behavior was not extensively studied until the 1980s and since then the argument within the United States centers now on the issue of causality, (Handy, Cao, & Mokhtarian 2005). Houston is one of four cities in the State of Texas to have a Complete Streets policy. Bagby Street in Houston, TX has been labeled a Complete Street and has won several high profile awards for its design and implementation strategies (Design Workshop 2014). There have been a handful of case studies measuring the sustainability efforts and even the economic benefits associated with the Bagby Street Reconstruction but there is currently no research on the extent to which its design features influence the users' travel behavior. This research on Bagby Street attempts to discover if, and potentially how, design elements on a recognized Complete Street affect a users' means of travel.

1.4 Research Questions and Study Objectives

Current studies on Bagby Street Reconstruction as well as Complete Streets are examined through the literature review. The Complete Streets best practice literature, along with user surveys, and virtual and passive onsite observations, are used to analyze

the street design and its impacts on the users' travel behavior. The study's intended outcome is twofold, with one objective being to compare the Reconstruction design features to the Complete Streets best practice literature, and the other to identify if and how the users' travel behavior or choices are influenced by the Complete Streets design features utilized in the Bagby Street Reconstruction area. The goal of the research is that the findings and lessons learned can be utilized by the City of Houston or other cities in the country in future Complete Street projects and also provide a basic framework for evaluation on future studies concerning how users' travel behaviors are influenced by Complete Street designs. This research can assist planners and landscape architects when designing or master planning for the future. The questions explored in the research include:

1. How do the Bagby Street Reconstruction design features compare to the best practice literature on Complete Streets?
2. Does Bagby Street's Complete Street design impact how users travel or interact with the area?
3. Are there specific design features that influence user's behaviors and choices relative to transportation?
 - a. Are there design features missing that would encourage different behaviors and choices relative to transportation?

1.5 Research Methods

This research utilizes methodological references from both qualitative and quantitative approaches with a brief comparative analysis, a case study, survey questions, and by passive and participant observations to the physical framework onsite as well as users, (Jorgensen 1989; Marcus and Francis 1998; Taylor and Bogdan 1998). The purpose of the survey is to appeal to a large number and wide range of users. The

survey was conducted in person as well as distributed online on websites and through social networks. On-site and virtual observations of the physical design features of Bagby Street provide an understanding of what features are being utilized and how they may impact the users' modes of travel.

1.6 Definition of Terms

Built Environment: Places and spaces made by humans, as opposed to natural landscapes, including land use patterns, transportation systems, and design features (Committee on Physical Activity, Health, Transportation, and Land Use 2005).

Complete Street: A road that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities (Laplante and McCann 2008)

Complete Streets Policy: A transportation policy and design approach that requires streets to be safe for drivers, bicyclists, transit vehicles (and users), and pedestrians of all ages and abilities, (National Complete Streets Coalition 2010)

Convenience Sampling: The selection of a sample of participants from a population based on their convenience and availability (Salkind 2010)

Design Element: A feature within an area that is purposefully placed within a certain context

Participant Observations: A type of data collection where the observer participates in ongoing activities and records observations. Participant observation extends beyond naturalistic observation because the observer is a "player" in the action (Jorgensen 1989)

Sharrow: A road marking used to indicate a shared lane environment for bicycles and automobiles (National Association of City Transportation Officials 2012)

Snowball Sampling: Non-probability sampling technique where existing study subjects recruit future subjects from among their acquaintances (Goodman 1961)

Travel Behavior: The way in which a user travels such as automobile, transit, walking, or biking, (Handy, Boarnet, Ewing, and Killingsworth 2002)

Virtual Observations: Observations done through use of the internet

1.7 Summary

Complete Streets has increasingly developed a following over the last few years and has been showing no signs of slowing down (National Complete Streets Coalition 2010). This relatively new concept in the United States needs further study and greater research in the state of Texas because it is new and growing rapidly. The object of this study is to understand the influence of Complete Streets design features on its everyday users' travel behaviors. Based on the findings of the users surveys, coupled with the virtual and onsite observations on the Reconstruction of Bagby Street, a greater understanding of Complete Streets design and its impact on the users travel behavior is gained for the City of Houston, the state of Texas, and potentially the rest of the country.

Chapter 2

Literature Review: Being Brought Up to Speed

2.1 Introduction

This literature review includes an evolution of street users tying into how Complete Streets came about. It also demonstrates the current knowledge of Complete Streets, covering both design and policy, studies of the built environment and its effects on travel behavior and provides an introduction to the Bagby Street Reconstruction. The literature review also covers current studies performed on Bagby Street in Midtown since its reconstruction.

2.2 Whose Streets?

2.2.1 The Public Realm

Since their inception, streets have served the purpose of getting someone to and from, but they should not be forgotten as public spaces. The thought of a city in the United States without cars or traffic is very hard to imagine but this is the image of what once was into the late 1890s (Thompson 2014). Streets were not originally designed for automobiles; they were designed with the purpose of getting to or from a destination and before the automobile, they were primarily a pedestrian domain. An early 1900s street looked very plain and simple – there were no signals, traffic signs, very few crosswalks (which were conveniently ignored) and rarely were there traffic police (Norton 2008). While its physical features may have been simplistic the complexities of a street were in its users – it was a community. Streets were filled with vendors, horse-drawn vehicles, the occasional streetcar and children playing. The streets were filled with more than just an automobile they were filled with life (see Figure 2-1).



Figure 2-1: Manhattan's Hester Street, on the Lower East Side, in 1914. (Maurice Branger/Roger Viollet/Getty Images)

2.2.2 *The Dawn of the Motor Age*

The invention of the gasoline powered engine and the production of the automobile came about in the 19th century but automobiles were still considered expensive toys belonging to the wealthy (Thompson 2014). Then, in the early 1900s, Henry Ford came along and created an affordable car for the middle class and in turn greatly increased the interest and convenience of the automobile (The Henry Ford 2013).

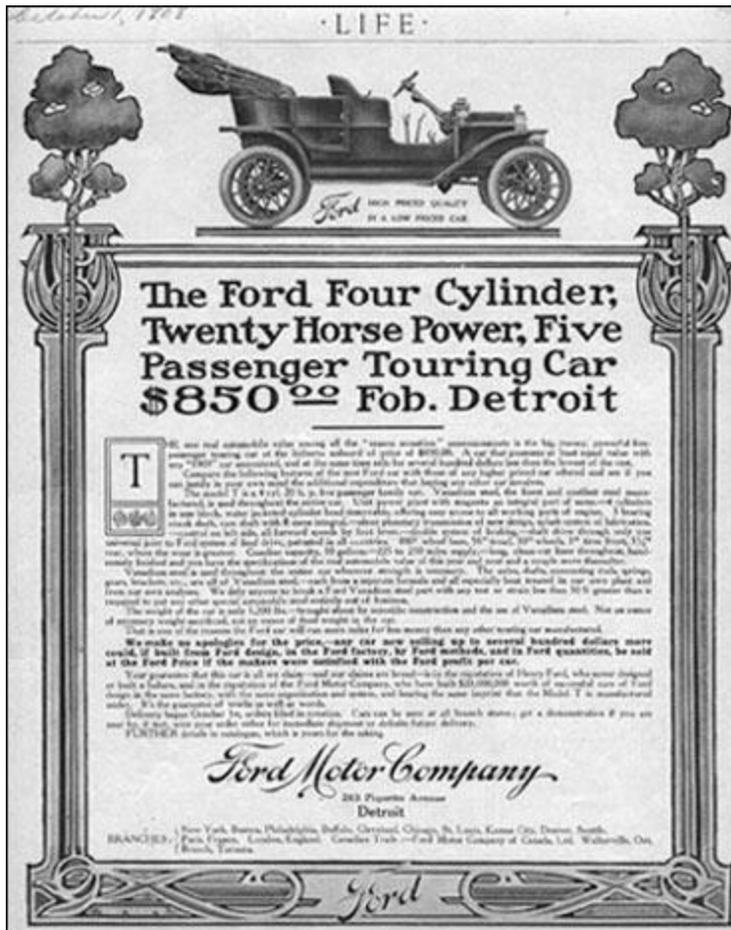


Figure 2-2: Ad in Life Magazine (The Henry Ford 2013)

While he did not invent the automobile or the assembly line, his motor company did alter the landscape in the United States. The Model T was affordable, accessible and it was fast. This novelty and liberation allowed American consumers to live in urban areas further from public transit much like the streetcar but its uniqueness was that car owners had the freedom of unrestricted travel. The 1920s was the beginning of the Motor Age where streets became primarily places for motorists and no longer consisted of the wide diversity of uses (Norton 2008).



Figure 2-3: 1925 Midtown Manhattan (Edwin Levick/Getty Images)

This new freedom did not come without consequence and backlash. Automobiles and their drivers were the minority and unwelcome by pedestrians, parents, police, and downtown business associations (Norton 2008). Safety and quality of life were a concern and by 1925 auto accidents were two-thirds of the entire death toll in cities with populations over 25,000 (Thompson 2014). Norton (2008) explains the war was between “motordom” (freedom) vs. the then status quo and the latter did not go down without a fight. In the 20s the automotive groups proposed the makeup of the streets was outdated and that perceptions needed to change to prevent accidents and congestion. By the 1930s, most streets were primarily motor thoroughfares thus beginning the dominance of automobiles in streets.

2.2.3 The Rise of the Motor Age

The federal government also contributed to the automobile’s rise to power. The first Federal Road Act (1916) subsidized auto use by improving roads and financially

encouraging the states to organize their own highway departments (Kunstler 1993). The second Federal Road Act (1921), also called the Federal Highway Act, continued upon its predecessor and established funding for miles of state highways for the purpose of forming them into a national network (Kunstler 1993).

The reign of designing streets for the automotive lasted with little to no opposition until the 1960s and 70s when engineers and the government began to encourage alternative modes of transportation by publically funding them (Norton 2008). A need for a new (or perhaps an old) way of thinking was visited during the 80s when the massive suburban expansion abruptly slowed due to researchers discovering the burning of fossil fuels was drastically altering the atmosphere and ultimately destroying the known world within the next sixty some odd years (Kunstler 1993). Cue the Complete Streets policy and design, which provides not only an alternative for safe street travel, accommodating all modes of transportation, but has the potential to bring life back to the streets.

2.3 Complete Streets (Policy and Design)

2.3.1 Introduction

Complete Streets and Complete Streets Policies are designed and implemented with the intent to provide a means of a safe multimodal transportation for all ages and abilities. The general principle is to create a street where pedestrians, bicyclists, along with other forms of transit can safely coexist. The Complete Street concept focuses on the road at hand as well as the decision-making and design process (Laplante and McCann 2008).

2.3.2 National Complete Streets Coalition

To discuss Complete Streets and their policies a first look should be taken at their origin, which lies with The National Complete Street Coalition, part of the Smart Growth America organization. It is a non-profit, non-partisan alliance and collaborative

effort of public interest organizations and transportation professionals. The Coalition formed as a reaction to current policy being biased towards the automobile when planning transportation corridors which are often designed with little thought to pedestrians, bicyclists, or public transit (National Complete Streets Coalition 2014). The National Complete Streets Coalition focuses on nationwide Complete Streets implementation strategies and provides cities, planners, and designers tools to create and implement policies and projects. While no Complete Street project will look the same there are measureable outcomes deeming it successful or not. These measureable outcome can be seen in increased safety, encouragement to walk and bike for health, lower transportation costs, and better communities overall (National Complete Streets Coalition 2010).

The National Complete Streets Coalition is comprised of several different organizations formed to create the common goal of creating safe and accessible streets. The term “Complete Streets” replaced “routine accommodation” in December 2003 when Barbara McCann wrote a memo to the America Bikes board suggesting a change in the term then used to express the idea of including bicycles in everyday transportation planning (Smart Growth America 2015). The term and concept of Complete Streets grew with support from a number of organizations. It was initially led by the America Bikes and joined by the AARP, the American Planning Association, the American Public Transportation Association, the American Society of Landscape Architects, and the American Heart Association (Smart Growth America 2015). In 2005 these groups formalized the National Complete Streets Coalition with the goal of utilizing their groups’ strengths towards policy adoption at the federal, state and local level to embrace safer streets for all users (National Complete Streets Coalition 2010).

The goal of the Coalition in the US is shifting the American Association of State Highway and Transportation Officials' (AASHTO) idea of transportation from moving cars quickly to providing safe access for all users (National Complete Streets Coalition 2010). Along those same lines, the concept of the Complete Streets policy parallels back to the idea of streets being public spaces, which was originated by Jane Jacobs (1961) (Zavestoski and Agyeman 2015).

2.3.3 Benefits of Complete Streets

2.3.3.1 Safety in Complete Streets

Complete Streets are thought to improve safety for all users, pedestrian and vehicular, through comprehensive safety improvements (Laplante and McCann 2008). The most common pedestrian deaths are associated with higher capacity and speed roads which are classified as arterial. Arterial roads are expected to move the most automobile traffic possible with minimal delay which means that their purpose is to provide quick automobile travel (National Complete Streets Coalition 2014). Features like raised medians and redesigning of intersections and sidewalks improve safety for both pedestrians and motorists (Carnegie, King, and Ewing 2003). In 2015, Smart Growth America published a report containing studies on 37 Complete Streets. Seventy percent of the projects had a decrease in collisions and approximately 56 percent saw a decrease in injuries (National Complete Streets Coalition & Smart Growth America 2015).

Road diets are a Complete Streets policy and design characteristic. Case studies on several North American cities support the road diet concept and each case study resulted in successful roadway conversions which improved neighborhood conditions (National Complete Streets Coalition and Smart Growth America 2015). Overall, Complete Streets encourage slower speeds from all users – motorists, pedestrians, and bicyclists and therefore provide a safer environment (National Complete Streets Coalition

2014). Aging populations, rising fuel costs, health and environmental concerns are trends that would encourage Complete Street design and policy (Burden and Litman 2011).

2.3.3.2 Economic Value in Complete Streets

Complete Streets projects can be an economic development goal as much as a transportation goal. Several studies done by the National Complete Streets Coalition state Complete Streets (2015) have a positive impact on local businesses, new employment, as well as contribute to the rise of property values. Employment along with new businesses and sales has shown to increase over a period of time where Complete Streets projects have been implemented (Cortright 2009).

Property values have been shown to rise due to the effect of Complete Streets providing more walkable areas and neighborhoods (Cortright 2009). A handful of completed projects compare property values of Complete Streets to unimproved sections of either the same corridor or citywide trends. The majority stated property values soared far above expectations (Cortright 2009).

2.3.3.3 Health Benefits of Complete Streets

In 2014, more than one-third (34.9%) of adults in the United States are considered obese (Centers for Disease Control and Prevention 2014) and inactivity is a big factor with 55 percent of US adult population falling short of recommended activities and nearly 25 percent are completely inactive (U.S. Department of Health and Human Services 2000). Complete Streets tout the label of providing health benefits to a community by offering multimodal travel and therefore encouraging daily activity. A Complete Street provides the options of safely and conveniently using different modes of transportation. If users feel safe to choose different ways of getting from A to B it is easier to encourage physical activity into a user's lifestyle. In a 2015 study done by the National Complete Streets Coalition, thirteen Complete Street projects collected pedestrian counts

and of those, twelve projects noticed an increase in pedestrian activity after the improvements. Twenty-three projects, in the same study, collected bicycle counts showing an increase in twenty-two post Complete Street improvements (Garrett-Peltier 2011).

2.3.4 Obstacles in Current Policies

Several obstacles occur in the implementation of Complete Streets transportation policies today because policies favor mobility over accessibility and automobile travel over alternative modes (Litman 2007). An example would be, that a major portion of transportation funding is dedicated specifically to roads and parking facilities. Another instance would be more than enough parking requirements in zoning practices which can force developers to build out instead of compact building. Current evaluations of how transportation systems perform only consider delays to motor vehicle traffic. A focus on Complete Streets policies would shift the status quo from car-centric to community centric.

2.4 Travel Modes and the Built Environment

The research on the built environment and travel behavior is extensive and has been around for decades. This research has played an important role in the fields of design and planning by supporting state and regional planning and decision making. Topics of travel behavior and the built environment range from the relationship between land use and travel behavior (Cao et al. 2005, 2010; Cervero 1991, 1996) to environmental and social concerns (Ewing et al. 2008; Frumkin 2002). For the purpose of this research the built environment affecting how one travels is the main focus.

Urban transportation studies have clearly linked urban form and travel behavior where individuals living in higher density and mixed-use neighborhoods drive less, walk more and take public transit more frequently (Ewing & Cervero 2010). Ewing and Cervero

(2001) demonstrate that people walk more and drive less in communities with a greater density and variety between destinations. Handy et al. (2005) supports there are specific characteristics in the built environment which affect travel behavior. Their study found traditional pedestrian oriented neighborhoods demonstrated greater accessibility, socializing characteristics for both leisure and work travel and an overall decrease in driving distances.

The built environment contains different characteristics depending on its geographic scales. It is important to explore these different spatial scales in order to gain an understanding of the type of physical characteristics and how exactly they affect travel behavior.

At a city scale, urban density, mixed land uses, and great connectivity are key features to encourage more pedestrian activity and subsequently they diversify modes of transportation (Cao et al 2010). Handy (2005) and Vojnovic et al. (2013) imply concentrating functions within neighborhoods makes travel distances, travel costs and time, lower. This suggests structuring cities in this way encourages different modes of transportation. Alternatively, the physical characteristics of an automobile-oriented suburban neighborhood look the opposite – functions within neighborhoods would be widely apart.

At a city block scale, which includes physical design features or elements, there is contribution that the built environment affects travel behavior (Handy 2006). Physical design elements include proximities of destination to end-points as well as the streetscape itself. Despite there being a causal link between the built environment and specific design features, Handy (2006) states that does not automatically mean changes to designs will lead to an increase or decrease in walking or driving.

2.5 Complete Streets in Houston, TX

2.5.1 Complete Streets Movement in Houston, Texas

Significant population growth from 2000-2013 in Houston and the surrounding area are what first alerted users to a need for a change in their ideas of existing and future street infrastructure (City of Houston, Texas 2015). Between the years 2000 and 2013 the city's metro population grew from 5.95 million to 6.34 million and the area expects another 1 million by the year 2020 (City of Houston, Texas 2015). The City was very proactive in their efforts to accommodate the growing population in relation to its infrastructure. In April of 2013, Smart Growth America visited Houston with the ultimate goal of establishing a Complete Streets policy (Healy 2014).

Two advocacy groups in particular were influential in moving Complete Streets into the forefront of the City's priority: Bike Houston and Houston Tomorrow (Healy, 2014). Bike Houston started as an all-volunteer group in 2004 and is the only non-profit bicycle advocacy group in Houston (BikeHouston 2014). In 2014 they transitioned to professional staff but their goals to create safe and accessible streets for bicyclist through advocacy and community education has not changed (BikeHouston 2014). Houston Tomorrow, a non-profit organization founded in 1998, advocates for a constantly improved quality of life of all people of Houston through research, education, and discussion (Houston Tomorrow 2013). Houston Tomorrow began the Petition for Complete Streets for the Houston region in May 2011 (Houston Tomorrow 2014). They quickly joined forces with the AARP Texas to begin building the Houston Coalition for Complete Streets which is supported by 33 organizations committed to providing safe streets in Houston (Houston Coalition for Complete Streets 2013).

As a result of such support from the public, several groups and organizations, Mayor Annise Parker issued an Executive Order (see Appendix E) to develop a Complete

Streets and Transportation Plan (HCSTP) for the City of Houston in November 2013 (City of Houston 2015). Over time the new policy will achieve the goal, where appropriate, of creating “walkable and bike-friendly neighborhoods with amenities such as trees and landscaping, public art and street furniture” (City of Houston 2015). The Executive Order acknowledges that the HCSTP needs to emphasize the importance of context-sensitive design as not all streets are identical and overall provides the necessary guidelines for Houston to establish a thorough Complete Street plan (City of Houston 2015).

2.6 Midtown District in Houston, TX

2.6.1 Midtown History and Definition

Around the early 1900s Midtown in Houston, known then as Southside place, was considered a popular residential district just south of the Central Business District (Houston Chronicle, 2004). Homes in Southside place were typically 4000-6000 square feet Victorian style houses occupied by Humble Oil & Refinery Company families (Midtown Redevelopment Authority 2015). In the 1970s there was a strong Vietnamese community in Houston and Midtown later became home to a neighborhood known as, Little Saigon (Houston Institute for Culture 2004). In the 1980s and 90s Midtown lost population while the city of Houston only gained less than one percent. In 1990 Midtown was viewed as being rundown, full of blight, and lacking direction and cohesiveness leading to the revitalization which is now known as present day Midtown (Midtown Redevelopment Authority 2015).

On December 14, 1994, Houston, TX created a Reinvestment Zone Number Two titled, “Midtown Zone,” to redevelop a targeted area of the City. The location of Midtown is roughly bounded by I-45 on the north, Highway 288 on the east, U.S. 59 on the south and Bagby Street and Spur 527 on the west, (TIRZ - 2. Midtown 1994).

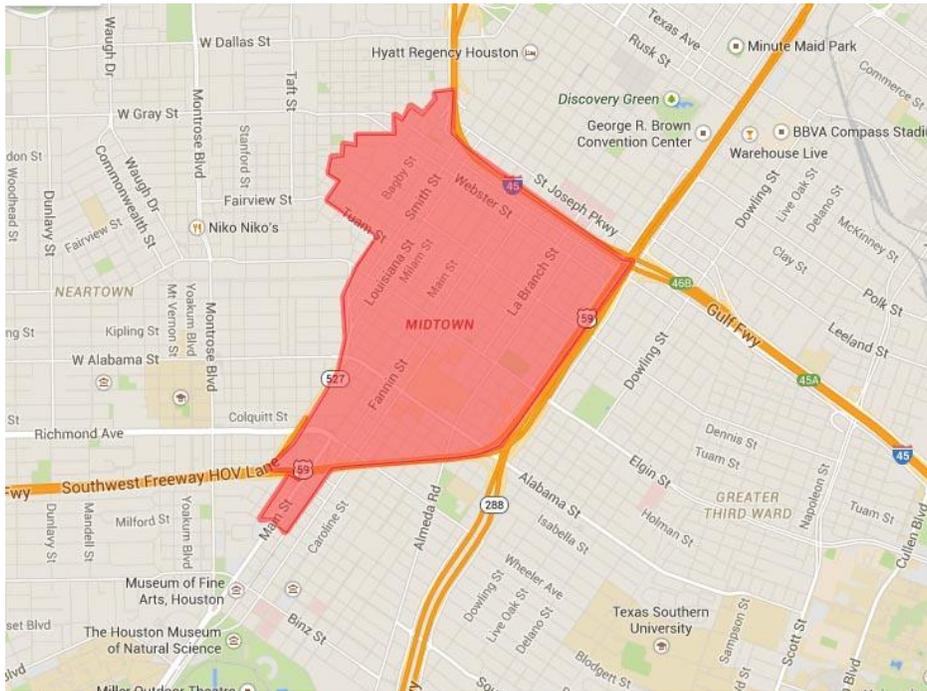


Figure 2-4: Location of Midtown District

The City of Houston states that the purpose of creating Midtown was to “eliminate urban blight with revitalization providing public right of way improvements and enhancements,” (City of Houston, Texas 2015). Since its creation, Midtown has received many accolades and titles including designation of an Official State of Texas Cultural Arts and Entertainment District (Houston Chronicle 2004).

2.6.2 Midtown Organizations

Midtown Houston consists of two organizations – the Midtown Redevelopment Authority (MRA) / Tax Increment Reinvestment Zone No. 2 (TIRZ) and the Midtown Management District (MMD). The MRA/TIRZ coordinates with city departments and private developers to implement the Midtown Redevelopment Master Plan. The master plan projects, discussed in more detail in the section below, speak to infrastructure improvements and public right of way enhancements. The TIRZ was created to freeze

Midtown's ad valorem taxes (the value of real estate taxes) to the District until 2025. The MMD is an enhanced support system for the MRA/TIRZ. It provides services and maintenance to the Midtown public parks and right-of-ways. This cooperative partnership is what carries out the vision of creating Midtown's pedestrian-friendly urban space (Midtown Redevelopment Authority 2015).

2.6.3 Midtown Redevelopment Authority Projects

Projects within Midtown are focused on economic development, residential development, and public right of way improvements. MRA categorizes 4 types of projects in Midtown which include:

- Capital Improvement Program
- Decorative Street Lighting
- Streetscapes and enhanced pedestrian pathways
- Parks and Greenspace (Midtown Redevelopment Authority 2015)

Along with Bagby Street Reconstruction there are other physical and capital improvement projects within the Midtown District. These include numerous park projects, street pedestrian enhancements improvements, and other street reconstructions. Another Complete Street project currently in the concept phase is Brazos Street which is the one-way counterpart to Bagby Street.

2.6.4 Midtown Demographics

Midtown is currently a mixture of older homes, small apartment buildings and low-rise commercial buildings. Demographics from the 2000 and 2012 US Census Bureau estimates and the American Community Survey 2008-2012 in Midtown include population characteristics and are demonstrated visually in the following graphs.

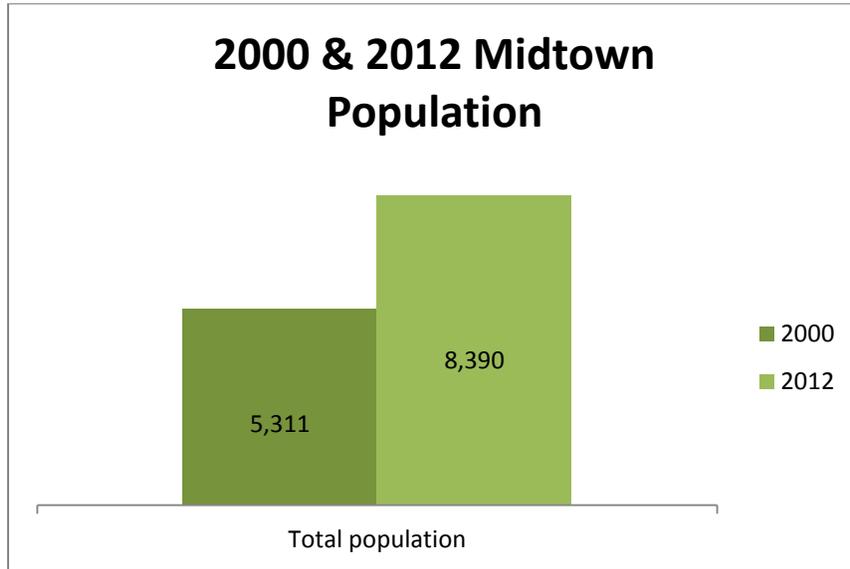


Table 2-1: 2000 and 2012 Midtown Population (U.S. Census 2000, 2012)

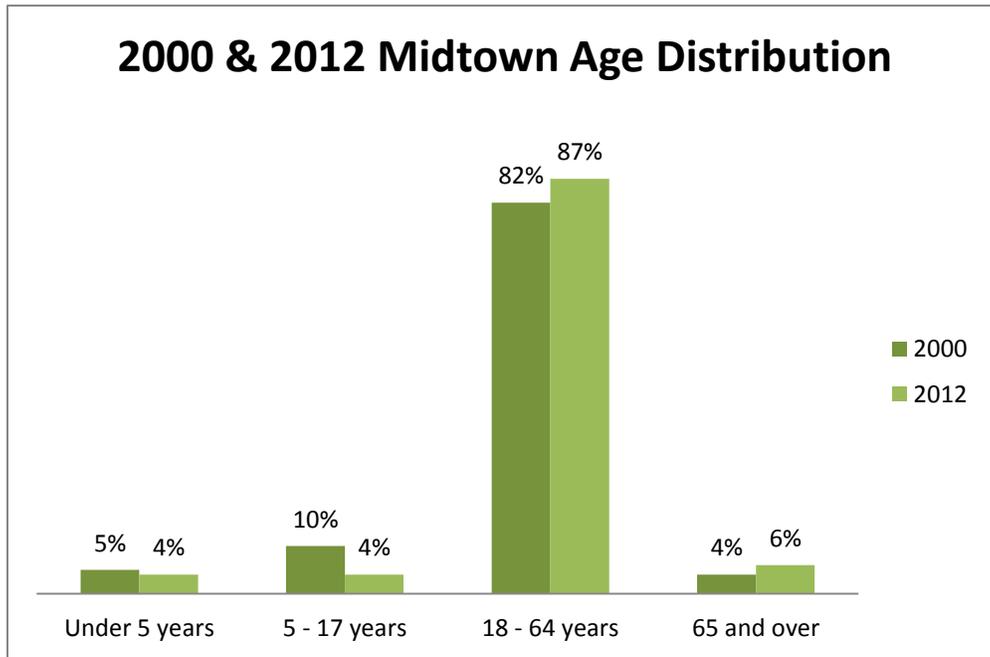


Table 2-2: Midtown Population by Age (U.S. Census 2000, 2012)

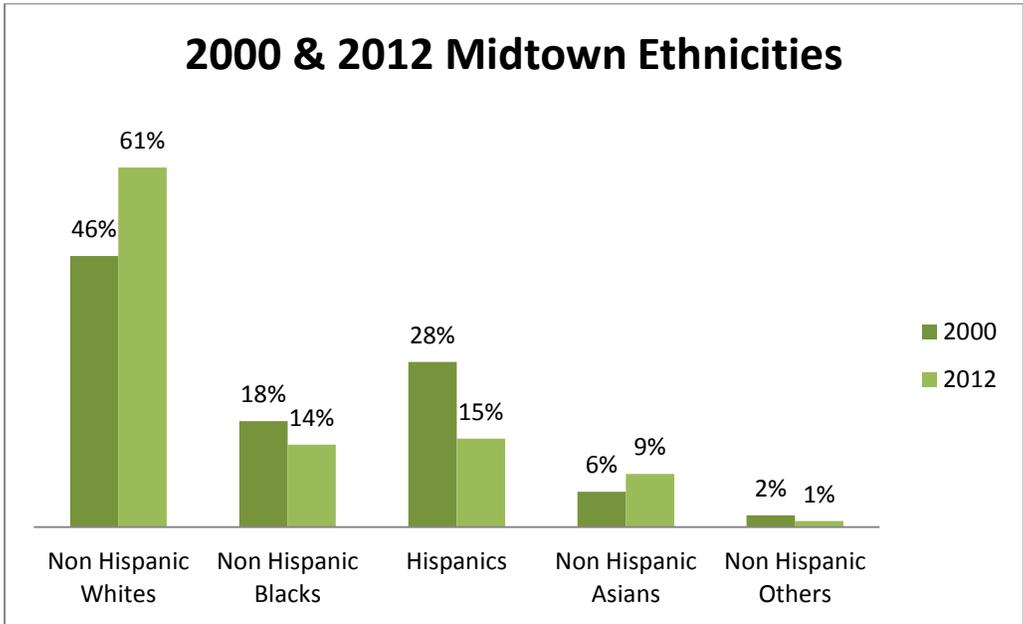


Table 2-3: Midtown Ethnicities (U.S. Census 2000, 2012)

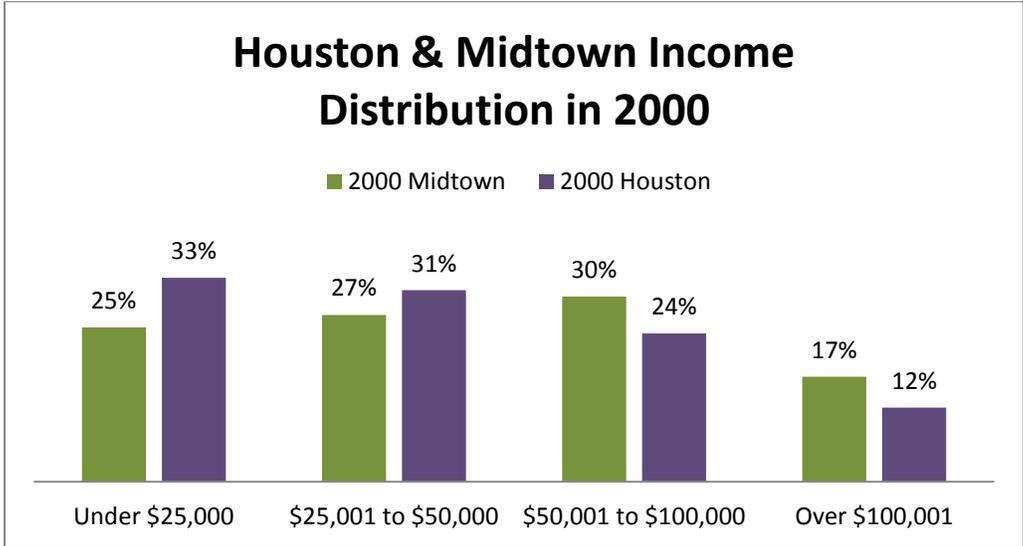


Table 2-4: Houston and Midtown Income Distribution in 2000 (U.S. Census 2000)

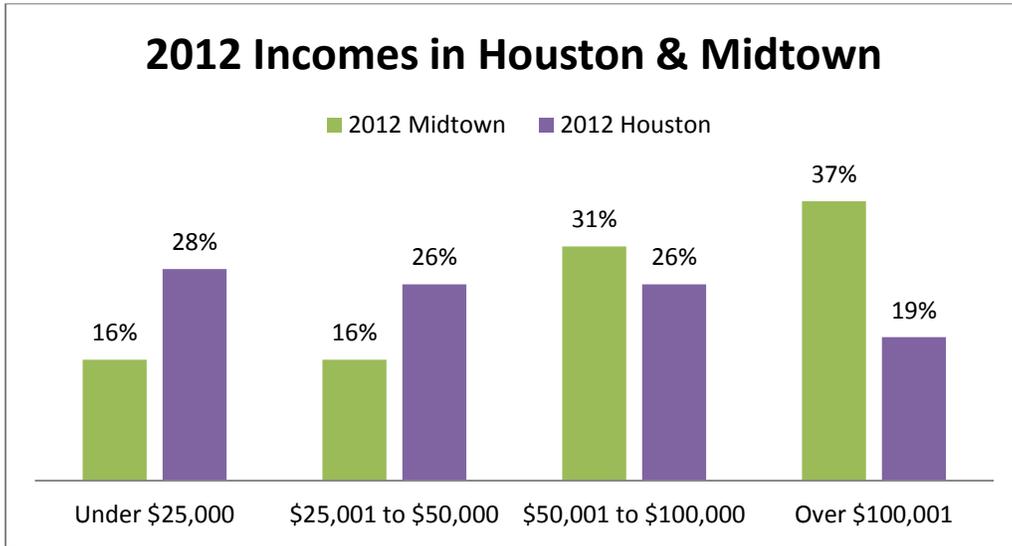


Table 2-5: Houston and Midtown Income Distribution in 2012 (U.S. Census 2012)

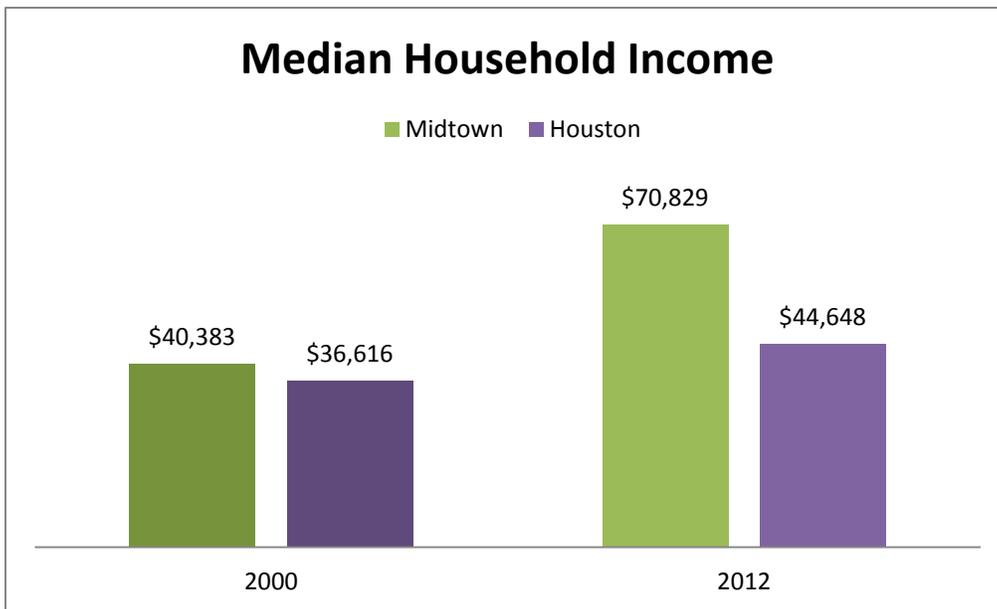


Table 2-6: Median Household Income (U.S. Census 2000, 2012)

2.7 Bagby Street Project

2.7.1 Definition and Introduction

Bagby Street Reconstruction area is a 12-block stretch which is located within the Midtown District in Houston, TX. The project itself was a nearly 4-year collaborative effort between the interdisciplinary design team, the client (Midtown District) and the City's staff (Spencer 2014). The uniqueness, success and collaborative efforts of the reconstruction of Bagby Street provided the background and support needed for City of Houston adopting the Complete Streets approach (Dodds 2013).

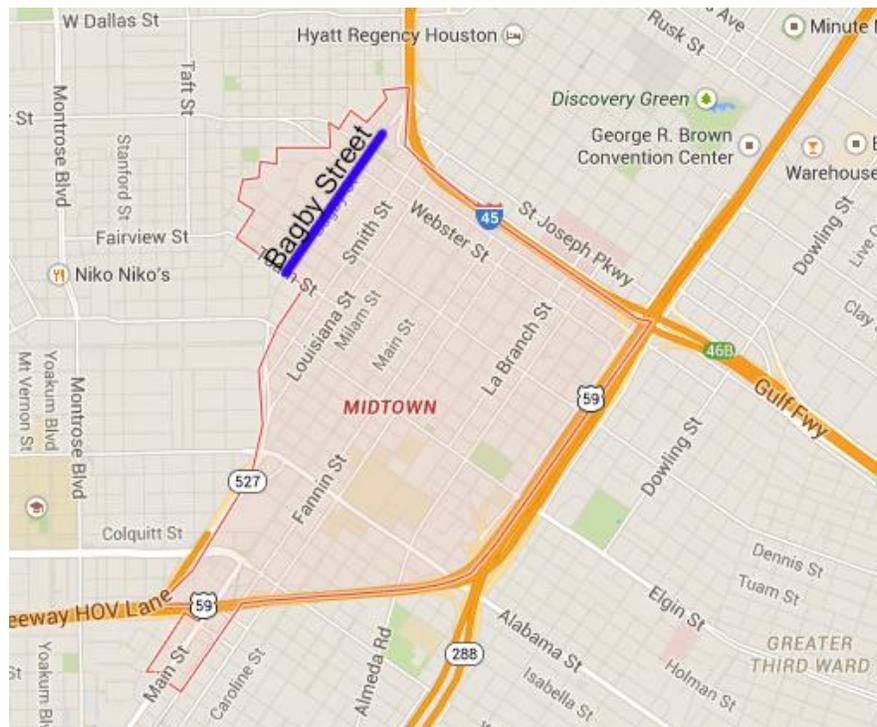


Figure 2-5: Location of Bagby Street Reconstruction in Midtown

Bagby Street, a four lane, 80 foot right-of-way commuter thoroughfare, was identified as a logical route for a regional storm water system connecting to Buffalo Bayou. In 2008, the project's scope was to install a subsurface 60 inch storm water pipe while incorporating standard street improvements along the corridor. After conducting

multiple studies, the client and the interdisciplinary design team encouraged the direction of the project to emphasize the pedestrian experience.

A traffic impact analysis was conducted by the City of Houston staff and design team to demonstrate the mobility requirements of Bagby Street. The client and design team desired a focus on creating a pedestrian friendly environment and as a result of the traffic analysis a road diet strategy was implemented. The four lanes were reduced to two and 50 percent of the 80 foot right-of-way would be dedicated to pedestrian and landscape design features and amenities. Along with the reduction in traffic lanes, the design team recommended parallel parking on each side of the one way street with the option to convert the road to three lanes in the future (Walter P Moore 2015).

The uniqueness of Bagby Street also lies in the approach adopted by the design team. Supported by both the City of Houston and Midtown Redevelopment Agency, the design team used a strategy “based on a detailed context-sensitive analysis that identified the essential systems needed for easy auto, transit, bicycle, and pedestrian mobility” rather than the typical one size fits all approach commonly used in the country today (Spencer 2014).

In April 2011 Midtown Management District released its quarterly Board of Directors meeting invitation to Midtowners and those considering Midtown for residence or business and publicly announced the Bagby Street Reconstruction project (Midtown Management District 2011). MMD encouraged attendance to the May 2011 meeting as it would include a presentation by Walter P. Moore and Design Workshop regarding the project (Midtown Management District 2011)

2.7.2 Existing Studies on Bagby Street

Current studies found on Bagby Street Reconstruction are ones closely related to sustainability and economics. One of the most notable recognitions of Bagby Street is

that it is the first Greenroads certified project in the state of Texas (Design Workshop, 2012). Greenroads is a rating system based upon sustainability best practices, or credits, on roadway design and construction. Credits then earn points towards a total score for a project (Greenroads 2013).

Other environmental metrics of Bagby Street include: 300 tons of carbon emissions avoided through the use of fly-ash concrete; 42 percent increase of existing tree growth area and organic soils; 13 degree reduction in average temperatures due to shade and material selection; 88 percent of sidewalks shaded at tree maturity; 100 percent use of native, adaptive and non-invasive plant species; and 33 percent of local storm water capture by rain gardens before draining into Buffalo Bayou (Design Workshop 2012). The rain gardens on Bagby Street include a monitoring well and each have reported 85 percent of total suspended solids removed, 75 percent of bacteria removed, 73 percent of phosphorus removed and 93 percent of oils and grease removed before leaving the rain gardens, (Design Workshop 2012).

Economically, Bagby Street and the surrounding area have thrived since the street's reconstruction. Strategies by the design team prioritized certain areas along the corridor as the greatest opportunities for redevelopment. Since the project's announcement, \$30 million has been implemented in private development and the rental market has increased 25 percent for leased properties (Design Workshop, 2012; Walter P Moore, 2015).

2.8 Summary

This literature review provides a basic understanding of the history of streets in the United States linking into the culmination of the National Complete Streets Coalition. A study on the effects of the built environment on travel behavior is also examined in order to have an understanding of topics already introduced. Finally, an introduction to

the Complete Streets movement in Houston and detailed description of the Midtown District provide a backdrop to the concentration of the study.

Chapter 3

Methodology: The Process

3.1 Introduction

This chapter of the research includes the framework and methods used to understand the Bagby Street Reconstruction area to determine if the design features influence travel behavior. This research draws from both qualitative and quantitative methods. The research production and outcome comes twofold with one part being a comparison of the best practice design elements to the actual design elements utilized on the Bagby Street Reconstruction. The comparison is done to demonstrate which Complete Street elements the Bagby Street Reconstruction has and which ones they are lacking. The second part is a case study design and consists of Bagby Street user surveys supplemented with observation to answer the questions if and how Bagby Street's Complete Street design features influence travel behavior. The following sections describe the research in a systematic format in order to organize and easily convey research methods, online and in-person surveys, observations, data analysis processes, results, significance and limitations of the research methods used.

3.2 Comparing Best Practice Design Elements with Bagby Street Design

The objective of this comparison is to learn how consistent the Bagby Street Reconstruction design has applied the Complete Street methodologies and design features. This comparison also provides insight for future project implementation. In order to determine which design elements are considered best practice of Complete Streets, several manuals and reports were cross-examined. The finalized list of design elements come from a combination of National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide*, Smart Growth America's *Complete Street Fundamentals*, and the Institute of Transportation Engineer's *Designing Walkable Urban*

Thoroughfares: A Context Sensitive Approach. These guides and reports suggest and support several different best practices when designing and constructing a safe and multimodal road.

3.3 Case Study Design

The case study technique is a well-known method used in landscape architecture (Francis 1999). Since the data for this study needs to answer the question, if design features influence a users' decision on travel mode on a Complete Street, a case study is utilized to highlight survey questions of willing and knowledgeable participants along with passive observations. The design of the case study for this research draws from two formats in order to focus on the research technique and is outlined below (Marcus and Francis 1998; Francis 1999):

- Brief description of the place with photos,
- Context map,
- Survey questions (see Appendix B),
- Recruitment process and distribution of surveys (see 3.5),
- Passive observations on site (see 3.6),
- Analysis (see 3.7), and finally
- Conclusion (see Chapter 5)

When scheduling fieldwork observations recreational and business activities along Bagby Street were taken into consideration since this would vary according to typical workday schedules. A weekday morning and afternoon along with a weekend night and day were scheduled to allow the most data to be recorded within a visit to the site. Fieldwork was only performed in well-lit areas as a safety precaution. Fieldwork was performed in the seasonal spring as to capitalize on the largest volume of travel modes possible in a year's time.

3.4 Survey Questions

An online and in-person survey was created for this study's purposes with the intent to better understand a larger number of users' views on Bagby Street Reconstruction. After reviewing the best practice literature coupled with the virtual observations (Google Street view) of Bagby Street Reconstruction questions were formulated. The survey questions were submitted to and approved by the Institutional Review Board (IRB) before any surveys were distributed. A consent form was also required and approved by the IRB for each participant to sign (see Appendix A).

3.4.1. Questions Asked

The following are examples of the survey questions (shown in full detail in Appendix B) which were developed to gain a more specific understanding of which types of users were being surveyed:

- Are you a business owner, landowner, resident, or visitor of Bagby Street or the surrounding neighborhood? Select all that apply.
 - Business Owner
 - Landowner
 - Resident of Houston
 - Visitor
 - Other, please explain
- How familiar are you with the Bagby Street Reconstruction area?
 - Not familiar
 - Somewhat familiar
 - Very familiar

The following are examples of survey questions asked pertaining to the design elements located within the Bagby Street Reconstruction area:



Figure 3-1 Example of a highlighted crosswalks image

- Do you like or dislike the highlighted crosswalks?

Depending on their answer they were directed to either of the follow-up questions:

- You like this feature because it (please check all that apply):
 - Makes you feel safe
 - Is aesthetically pleasing to look at
 - Is a feature you use
 - Other (please explain)
- You dislike this feature because it (please check all that apply):
 - Does not make you feel safe
 - Is not aesthetically pleasing to look at
 - Is not a feature you use
 - Other (please explain)

From there participants were asked:

- Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

The survey also asked users to rank (1-5) on how adequate they thought the sidewalk widths were based off of images. Below is a sample of the images used.

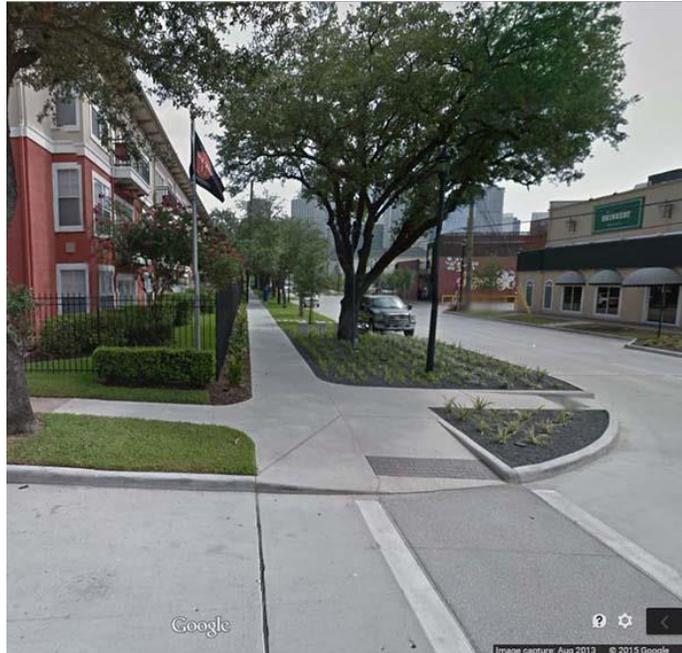


Figure 3-2 Example of sidewalk width question

3.5 Recruitment Process and Distribution of Surveys

Survey participants were recruited virtually, through emails sent to the Midtown Organization contacts and social networks, as well as face-to-face. A combination of convenience and snowball sampling was conducted in order to recruit participants of the survey (Goodman 1961; Salkind 2010). Following the face-to face survey completions, the results were combined with the online results in order to compare all equally. Once inputted, the physical surveys were destroyed to protect the identity of the participants. The identities of the participants are anonymous during the course of the survey as well as the analysis process.

3.6 Passive and Participant Observation

Along with the surveys, passive observation in nonparticipant mode and participant observations were used for site inventory and for the researcher to completely comprehend the motives and unconscious behaviors and choices of the human experience on Baby Street (Francis 1998; Jorgensen 1989; Lincoln and Guba 1985; Taylor and Bogdan 1998). Participants being observed were all forms of users on the streets. The passive observation modes of recording this data were cataloged in full one-hour increments in the same location at different times on different days. During this time period, general observations and characteristics were notated as well as the counting of different modes of transportation. Participant observations were also documented by numerous walks and drives along Bagby Street over a three day period. Photography was another research tool used to record observations as well as to provide insight that might have gone unnoticed or forgotten (Taylor & Bogdan 1998, p. 127). Identities of any users were protected by either photographing from behind or from at a distance. Passive observations were made towards travel behavior on each visit to the Bagby Street Reconstruction area.

3.7 Analysis

The analysis and interpretation of the data was done using the grounded theory approach. This approach is used to discover and support theories, themes, and concepts “directly from data rather than from assumptions,” (Taylor & Bogdan 1998). The first part analyzes the best practice literature extracting themes and concepts in order to best assemble a comparative table as well as certain survey questions. The second part analyzes and compares the responses from the surveys to the passive observations. A modified version of the grounded theory approach was applied to the research as follows: 1) data collection (of survey results and passive observations); 2) identify themes based

on data; 3) review and compare and finally; 4) confirm/discard/elaborate themes based on data.

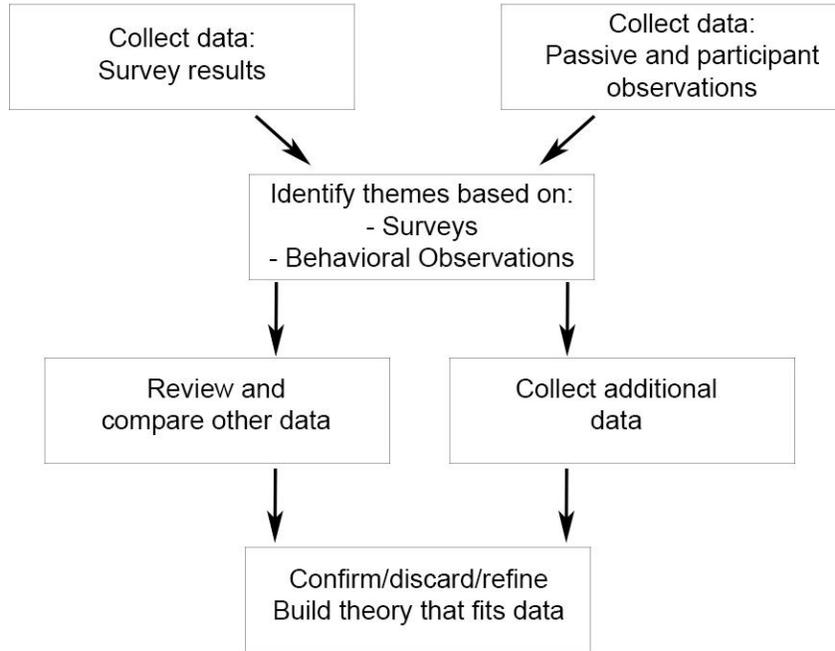


Figure 3-3: Modified Grounded Theory Approach (Taylor & Bogdan 1998, p. 138).

3.8 Challenges and Limitations to the Research

One of the main challenges to this research was the researcher's accessibility to a finished Complete Streets project in Texas. At the time of this thesis study, there were no known finished Complete Streets in the Dallas-Fort Worth area. Having one Complete Street represent Complete Streets as a whole was another challenge of the study as it is known no Complete Streets are the same design. To compensate for the lack of number and diversity in Complete Streets, passive observations, participant observations and surveys were utilized. Survey participants were not limited to Midtown or even Houston residents but rather to people who have used Bagby Street since its improvements were finalized. This gained a wider net of people to potentially contribute to the research without having to be physically present.

Bagby Street in Midtown was chosen to represent Complete Streets for this study because of its known Complete Street approach in design and implementation. Ease of accessibility to the researcher, as well as the established success within the urban design community were the other factors weighing on its selection.

Limitations to the study itself are, 1) time constraints towards seasonal site visits to observe people on Bagby Street, 2) a possibility of an insufficient number of observations and surveys, 3) the potential for miscounting, or counting subjects more than once, when performing the passive observations.

3.9 Significance to Landscape Architecture and Planning

While there are multiple studies done in both landscape architecture and planning regarding Complete Streets this study provides a very specific concentration on linking travel behavior and Complete Street design elements. By understanding if or how design elements impact travel, both fields can benefit. Landscape architects can design a more efficient or better suited element to fit within the Complete Street. Planners can take note on which elements are better suited for certain types of roads and adjust transportation policies and Complete Street Manuals accordingly. The overlap in both fields comes in working together and having a consistent vocabulary to create this common goal of providing safer roads for all ages, abilities, and modes of transportation.

3.10 Summary

The procedures and methodologies of this study are set in place to determine whether designed elements on a Complete Street are influencing users' travel choices. The methodology follows both quantitative and qualitative approaches by using surveys and observations. The outcome of the strategies and techniques used to analyze the data collected are disclosed in the following chapter.

Chapter 4

Analysis and Findings: The Outcome

4.1 Introduction

Bagby Street Reconstruction is identified in chapter three as being a recognized Complete Street in the State of Texas and a precedent in the City of Houston (Spencer 2014). First, this chapter compares Bagby Street to the best practice design elements of Complete Streets. This chapter also discusses the analysis of field data and the findings of the Bagby Street Reconstruction case study.

Forty-two surveys were completed by persons who had driven, walked, biked or utilized Bagby Street in one way or another. No prior knowledge of the project approach or design methodologies was necessary for the participant to take the survey but they were required to have traveled on it or to it in some capacity. Coupled with these surveys were passive observations to gain insights to possible recurring themes presented.

4.2 How Does Bagby Street Measure Up to Best Practice Literature?

4.2.1 *Design Elements*

Complete Street designs are all different and the approach towards each project should be unique to each scenario. However, despite differences in approach and technique, there are design elements which are found across Complete Street policies and designs. Elements within the Bagby Street Reconstruction were designed specifically to “create the Midtown brand” (Design Workshop 2012, p. 1). The design elements listed below are Complete Street features found through virtual observations, site visits to Bagby Street as well as features noted by Design Workshop. Complete Streets best practice design elements were derived from a combination of NACTO’s *Urban Bikeway Design Guide*, Smart Growth America’s *Complete Streets Fundamentals* and the Institute of Transportation Engineer’s *Designing Walkable Urban Thoroughfares: A Context*

Sensitive Approach. These guides and manuals were taken into consideration due to the analysis and approach Bagby Street Reconstruction utilized.

Complete Streets Best Practices on Bagby Street

CS Best Practices		Exists at Bagby Street	CS Best Practices		Exists at Bagby Street
Design Elements	Bicycle Boxes		Design Elements	Road Diets	√
	Bicycle Parking	√		Sharrows	
	Bike Lanes			Sidewalk Cafes	√
	Bollards	√		Signage	√
	Center Medians			Signalized Intersections	√
	Crossing Islands			Speed Cushions	
	Crosswalks	√		Speed Tables	
	Curb Extensions	√		STOP Signs	√
	Small Curb Radii	√		Street Furniture	√
	Groundcover	√		Street Lighting	√
	Mid-Block Crossings			Street Trees	√
	On-Street Parking	√		Traffic Circles	
	Pedestrian Signals	√		Transit Stops	
	Planter Strips	√		Wide Sidewalks	

Table 4-1: Complete Streets Best Practices

The best practice Complete Street design elements located on Bagby Street were established through virtual observations but they were better analyzed after onsite visits. The strengths of the street lie in the non-motorized realm. The street furniture, planter strips and pedestrian lighting are very strongly present in their design and have set a precedent for Midtown District streets in the future. The automobile domain is not lacking either. Bagby Street underwent a road diet going from four one-way lanes to two one-way lanes. Its on-street parking is heavily used and provides revenue for the area. Intersections and crosswalks are signalized and present providing both safety and awareness for vehicles and pedestrians. Bagby Street also lacked safe bicycle options. There are several small bike racks available on corners but there are no bike lanes or even sharrows. Bagby Street Complete Streets set a great example of design implementation and using public feedback. It is important to note not all design features

are appropriate for all streets – an understanding of this is part of the Complete Street approach.

4.3 Case Study: Midtown and Bagby Street Reconstruction

Bagby Street is located within one of the city's largest and oldest central neighborhoods known as Midtown District (McKeag 2015). It is located in the north western edge of Midtown and is a one way street that eventually turns into highway 527. Brazos Street is Bagby Street's one-way counterpart and runs in the opposite direction just south of Bagby. In connecting the CBD to Highway 59, Bagby Street is a commuting route for several different employees. The highest return investment along Bagby Street is currently multifamily residential (Leonard and Egan 2014). Midtown District is located between Houston's central business district and the Texas Medical Center in which a combined total of approximately 250,000 people are employed (Leonard and Egan 2014)

The planning and design of Bagby Street started during a capital improvement planning effort to place a 60-inch storm drain to handle off-site drainage issues. Design Workshop and Walter P Moore were the design team and the City of Houston and Midtown Redevelopment Authority (MRA) were the clients. The design team took a context-sensitive approach when designing Bagby Street Reconstruction meaning each block was handled uniquely according to its use and potential redevelopment. Conventional universal cross section approaches, which are commonly used in the United States, were not used (Design Workshop 2014).



Figure 4-1: Context-sensitive approach by Design Workshop 2012

The project is a 12-block reconstruction redefining a previously auto-centric commuter thoroughfare into a livable space for the community as well as provides accessibility for all modes of transportation. Over the course of nearly four years (project start to construction completion), Bagby Street Reconstruction took a four-lane roadway and reduced it down to two designating over half of the right-of-way to pedestrian activities (Design Workshop 2012).

DESIGN WORKSHOP STREETScape PROJECT:

BAGBY STREET, HOUSTON

BEFORE: 25.3% ROW DESIGNATED TO PEDESTRIANS



AFTER: 51.2 % ROW DESIGNATED TO PEDESTRIANS



SOURCE: DESIGN WORKSHOP

Figure 4-2: Before and after cross section of Bagby Street R.O.W.

The physical form of Bagby Street project provides a certain kind of uniformity throughout the 12-block reconstruction and “there is nothing like it in Houston” said a participant of the survey. Bagby Street is the most walkable area in Houston (Walk Score 2015) yet it is also as accommodating to the automobile with ample on and off-street parking and being a one way street with two lanes. The speed limit is 30 mph throughout this stretch through Midtown with ample shade trees lining the sidewalks, benches on almost every corner, and rain gardens filtering out storm water before it enters into the drainage to Buffalo Bayou.



Figure 4-3: Intersection of Bagby Street and McGowen Street

All significant trees were protected and where there were none, new ones were planted to provide an enhanced and comfortable pedestrian experience (Design Workshop 2012).



Figure 4-4: Intersection of Bagby Street and McIlhenny St



Figure 4-5: Informative rain garden signage

Bagby Street also contains informative signage for pedestrians to educate them on how the street performs as more than just a street.

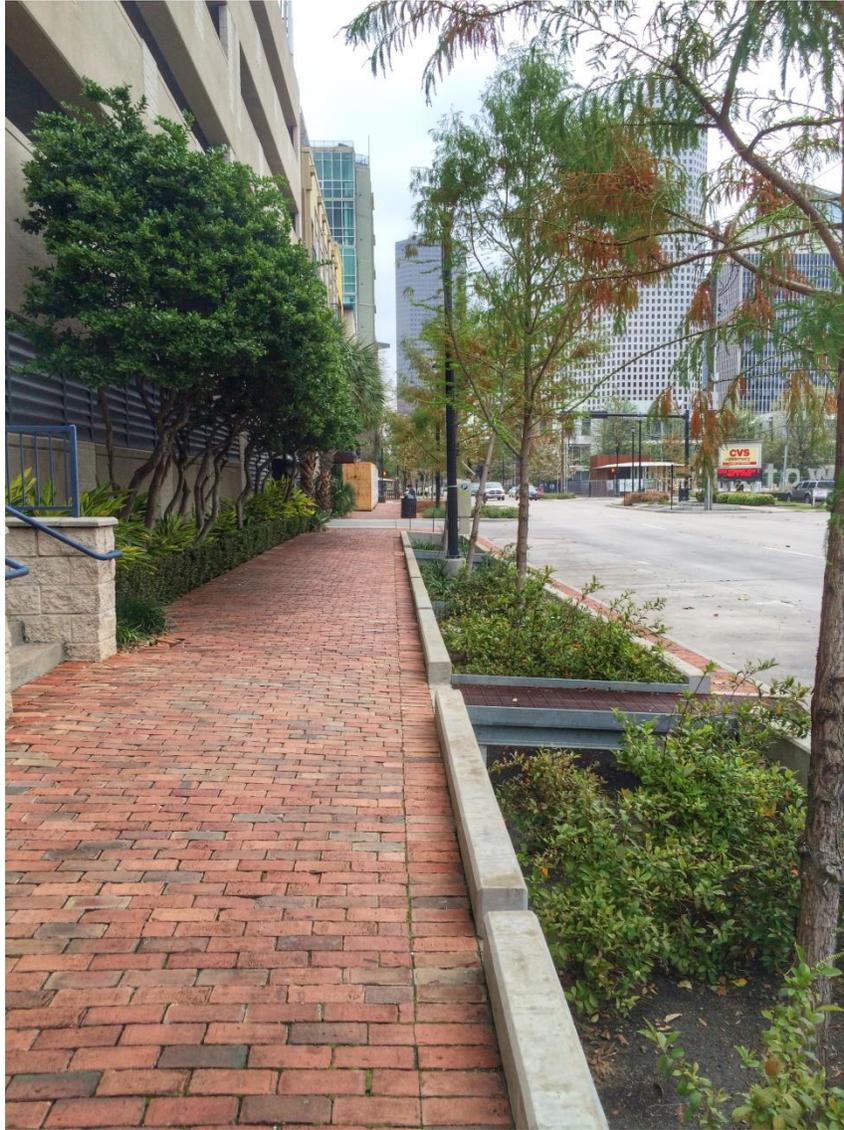


Figure 4-6: Bagby Street brick pavers and rain gardens

4.3 Bagby Street Users

The survey was distributed by the researcher on March 15, 2015. Over the course of a few days forty-two participants completed the survey. Thirteen of the surveys were conducted in person and then later entered into the website to be analyzed with the rest of the surveys. Passive observations were also conducted by sitting in one location

on Bagby Street and observing street users at different times on different days. Participant observations were also done by walking and driving on Bagby Street numerous times over a three day period. The purpose of this analysis design is to give a greater insight as to if users travel behaviors are influenced by specific design features on Complete Streets and if so, which ones? Observations and responses from the surveys are intertwined in order to support or discredit participants who use the Bagby Street. This section's approach addresses the responses as a comprehensive display of survey responses and observations of users.

4.3.1 General Demographics

Participants of the survey identified themselves as business owners in the area (there were none who took the survey), landowners in the area, residents of Houston, visitors to Bagby Street/the surrounding area, or other. The majority of people identified as being residents of Houston with a close second being visitors to the Bagby Street area. Participants who identified with the category "other" were one of the following:

- Employed in the area
- Former resident of Houston
- Previously employed in the area

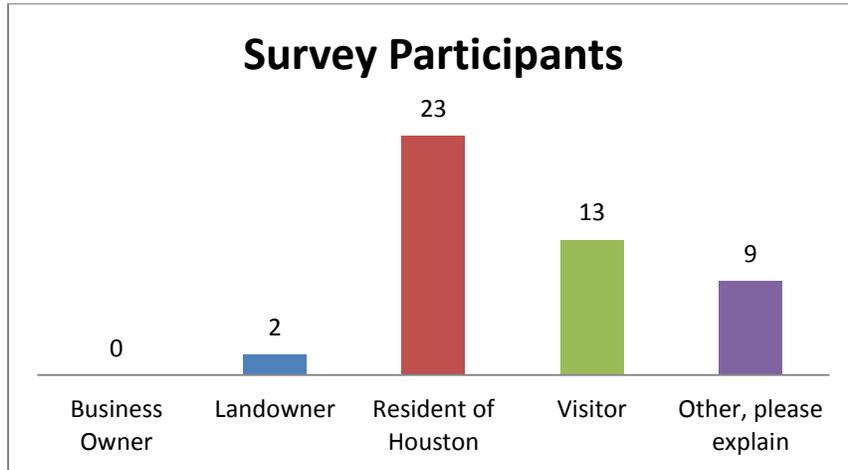


Table 4-2: Survey Participants

Of the respondents the majority of them considered themselves to be somewhat familiar with the Bagby Street Reconstruction project. When approaching participants in person, a few were hesitant to take it because they were concerned about not knowing enough information about Bagby Street.

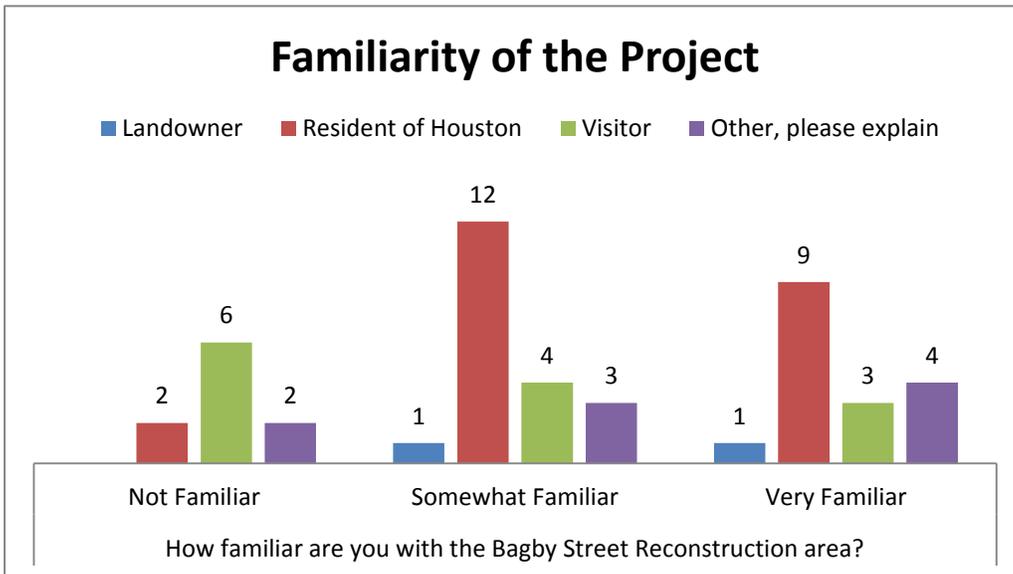


Table 4-3: Familiarity of Bagby Street

It should be noted that the majority of respondents not knowing that Bagby Street was considered a Complete Street were Houston residents. Despite the majority of participants not knowing Bagby was a Complete Street, the majority did consider it to be one, once given the definition by Laplante and McCann (2008).

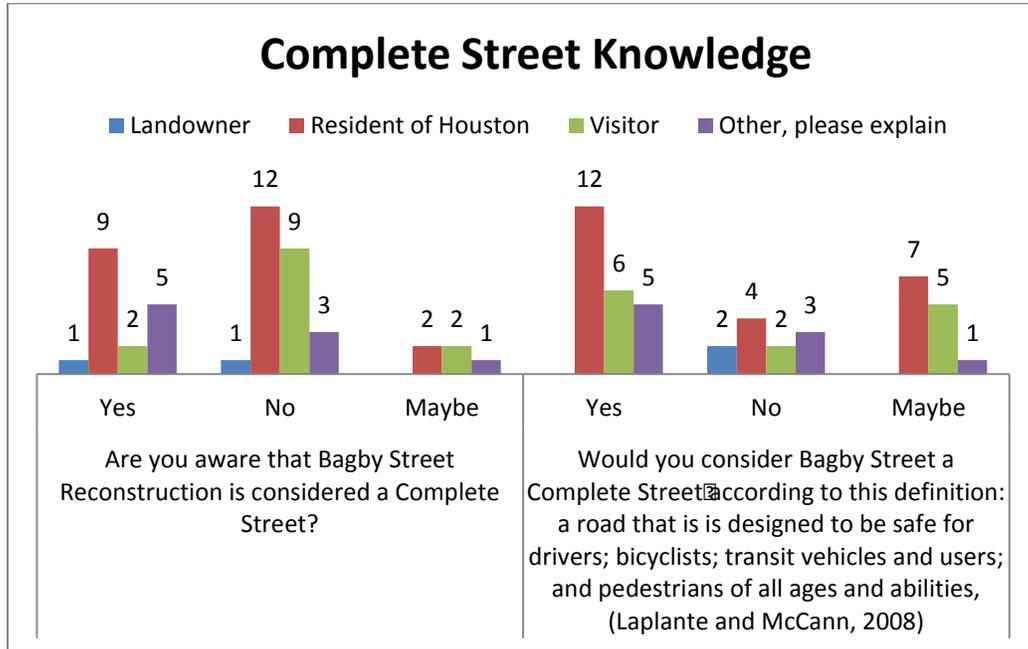


Table 4-4: Demographic Knowledge of Bagby Street

4.3.2 The Users and Specific Design Features on Bagby Street

The survey inquired about several different Complete Street design features located on Bagby Street: crosswalks, on-street parking, pedestrian lighting, seating, vegetation, bollards, and sidewalks. This section analyzes the responses in the survey specifically regarding the above design features and compares them to the observations made.

4.3.2.1 Crosswalks

Of the 12-block reconstruction, there are 4 highlighted crosswalks crossing Bagby Street.



Figure 4-7: Highlighted crosswalk on Bagby Street

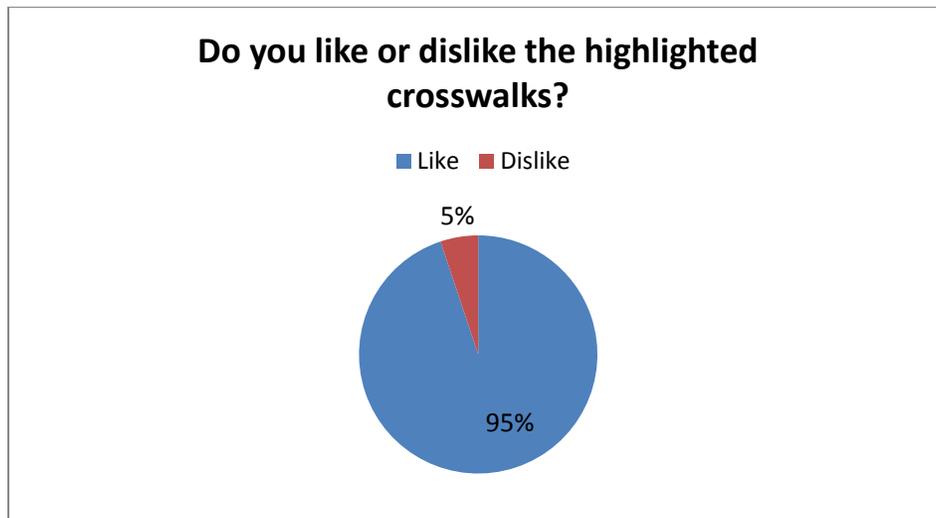


Table 4-5: Popularity of crosswalks on Bagby Street

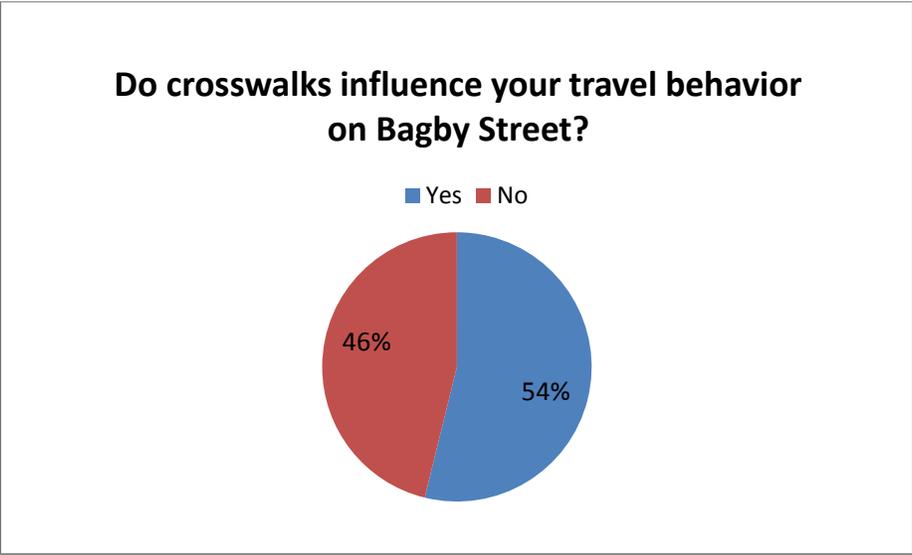


Table 4-6: Users perception of crosswalks on Bagby Street

95% of the survey participants liked the crosswalks with the majority stating the reasoning was because they had used it and it made them feel safe. Despite users citing safety as reason for liking them and using them, almost half (46%) claimed it did not influence travel behavior. The analyzed data however suggests crosswalks do influence because there is an implied connection between crosswalks and feeling safe and therefore feeling safe enough to choose to walk. Crosswalks on Bagby Street provide an element and feeling of safety for the pedestrians utilizing them but it was observed on numerous occasions users crossing where they wanted regardless of the time of day and if there was a crosswalk present.

4.3.2.2 On-street Parking

Bagby Street Reconstruction has on-street parallel parking running the length of the redesigned 12 blocks. Parking on Saturday and Sunday was crowded and full during the day and especially full at night.



Figure 4-8: Saturday night on-street parking

The on-street parking provides spaces for visitors to the area and residents during certain time periods and consequently is a source of revenue for the District.

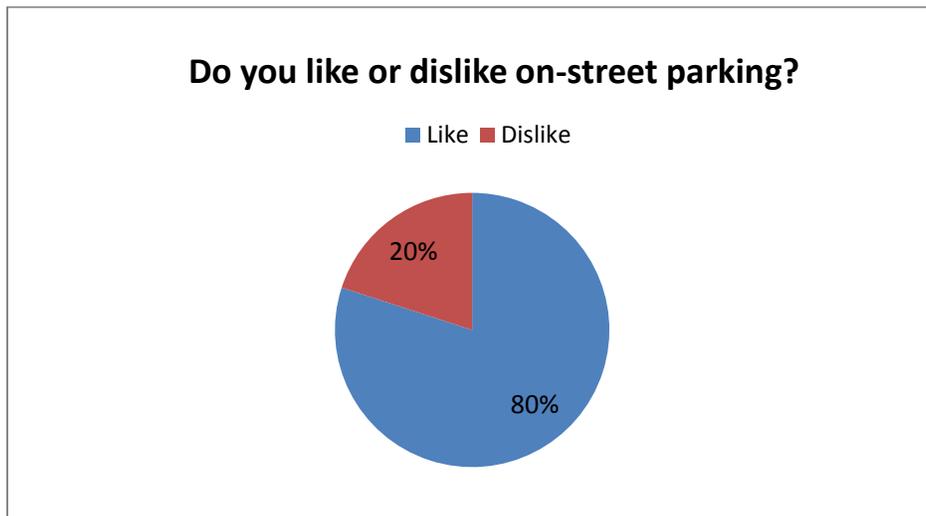


Table 4-7: Popularity of on-street parking on Bagby Street

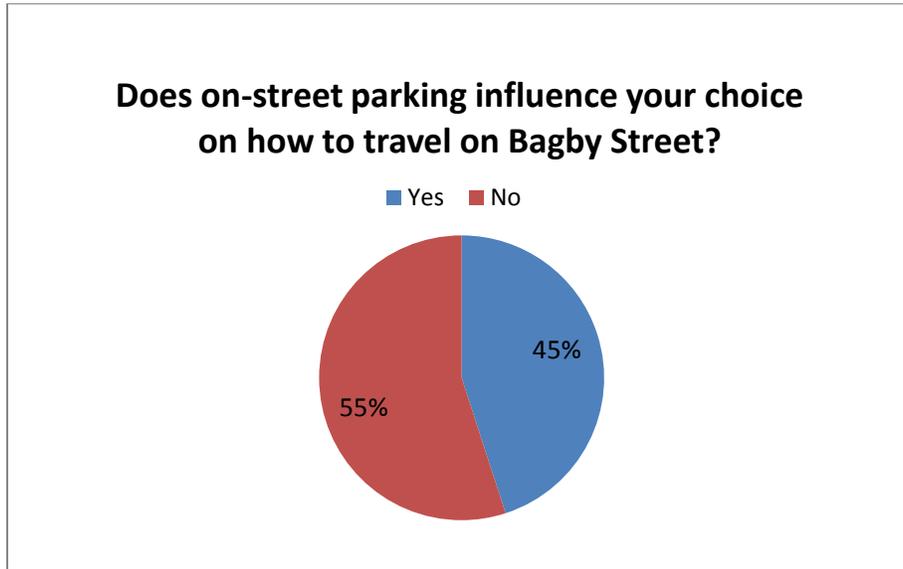


Table 4-8: Users perception of on-street parking on Bagby Street

80% of participants like the on-street parking reasoning because it is a feature they use citing that it is “convenient” (Appendix D, Q 13). Some participant’s answers indicate on-street parking influences their travel modes:

“I’m less likely to drive on it because they’re always packed”

“Parking availability influences where I choose to go to eat/drink, etc.”

Others suggest on-street parking provides no influence on their modes of transportation:

“While it is nice to always be able to park in front of the barber shop, I would still go to this shop regardless”

Parking was utilized primarily at night and weekends and less on weekdays, especially mornings.



Figure 4-9: On-street parking Monday morning

There is still activity from pedestrians on Bagby Street Monday morning but not as frequent or as dense. More likely than not this is due to standard work days and times.

Bagby Street serves more automobiles than other types of uses at this time.

4.3.2.3 Pedestrian Lighting

Bagby Street is very active and lively on a Saturday night. Several bars and restaurants are open late. The streets are filled with cars and pedestrians. Traffic slowed for crossing pedestrians and the street was very well lit.

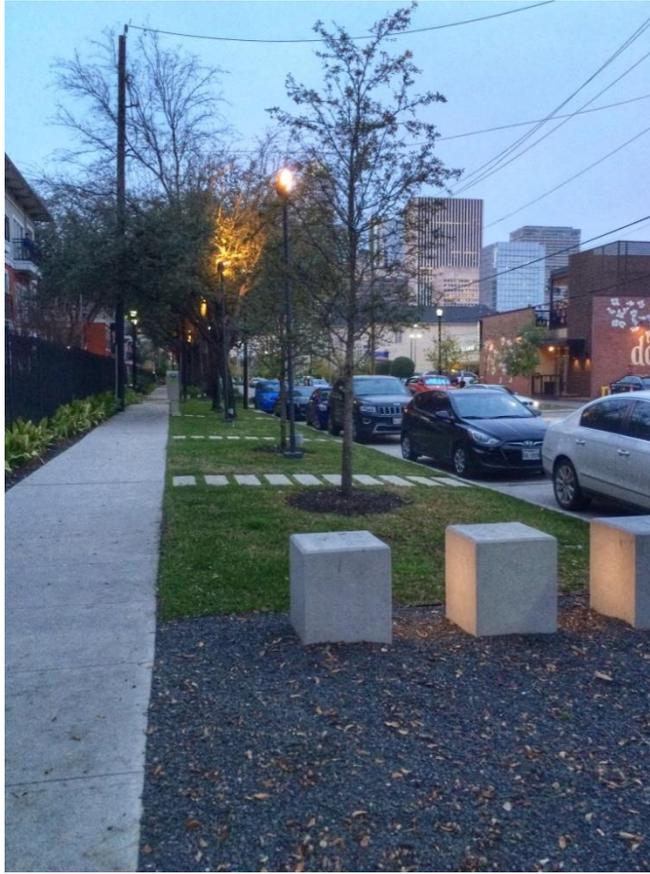


Figure 4-10: Saturday night street lights

90% of survey participants responded as liking the pedestrian lighting and cited because it makes them feel safe and is aesthetically pleasing (Appendix D, Q16 & 17).

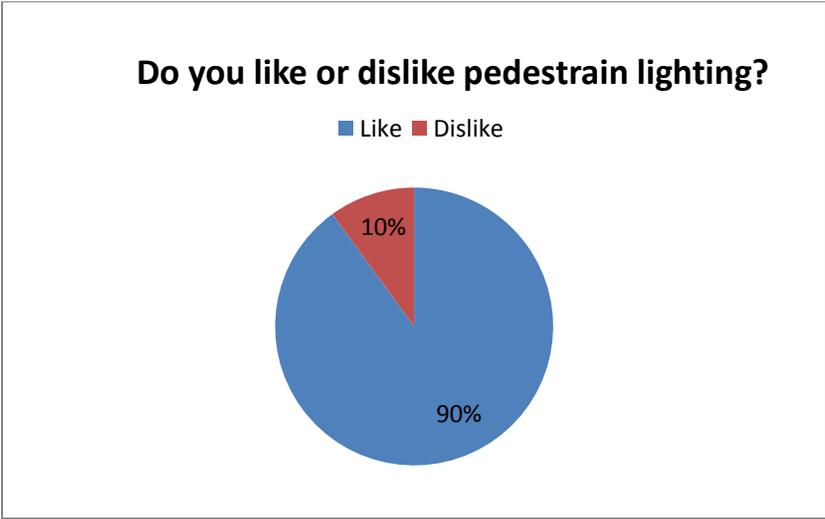


Table 4-9: Popularity of pedestrian lighting on Bagby Street

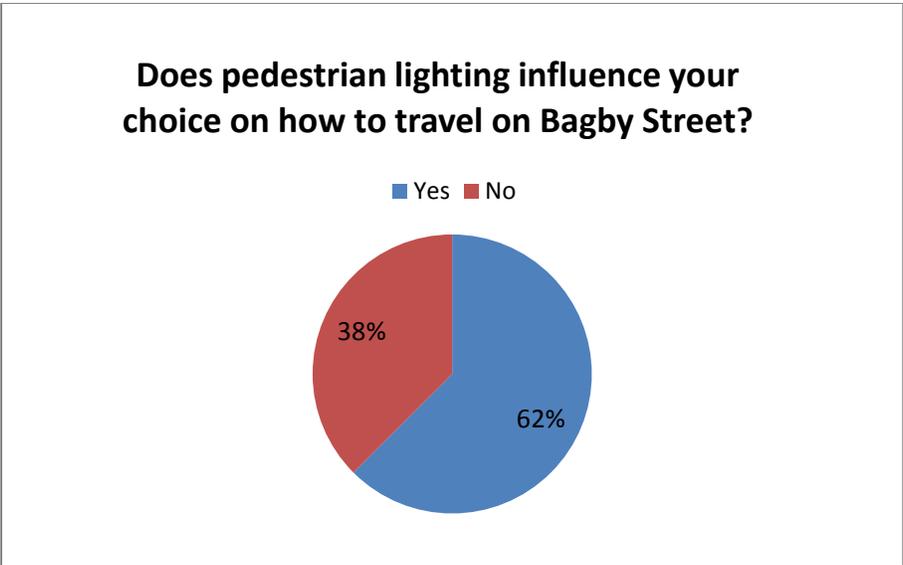


Table 4-10: Users perception of pedestrian lighting on Bagby Street

In this instance, safety is apparent in influencing travel mode choice (Appendix D, Q 19):

“If I can see what my surroundings are I feel safe. Street lighting is there for that purpose.”

“Compared to other streets nearby, Bagby is safer because of the lighting.”

“I prefer to walk on Bagby over other streets (at night).”

It seems that people are more aware of their surroundings, particularly pedestrians, when it comes to safety at night and their travel choices.

4.3.2.4 Seating

Bagby Street offers several different types of seating but the survey asks specifically about the tree planter seats because this feature is unique on Bagby Street and not a typical bench on Bagby Street.

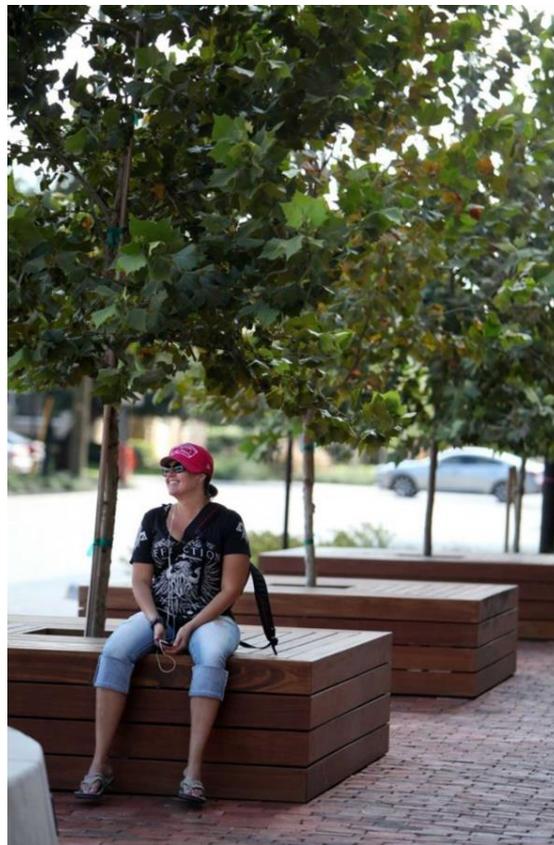


Figure 4-11: Tree planter seats (Houston Chronicle)

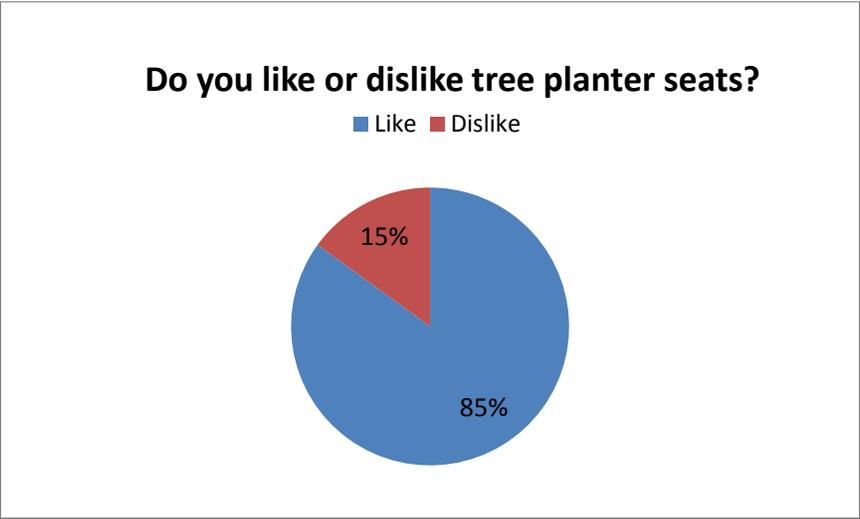


Table 4-11: Popularity of tree planter seating on Bagby Street

85% of participants of the survey said they like the planter tree seating and claimed it is because they are aesthetically pleasing to look at but it did not influence their travel behavior.

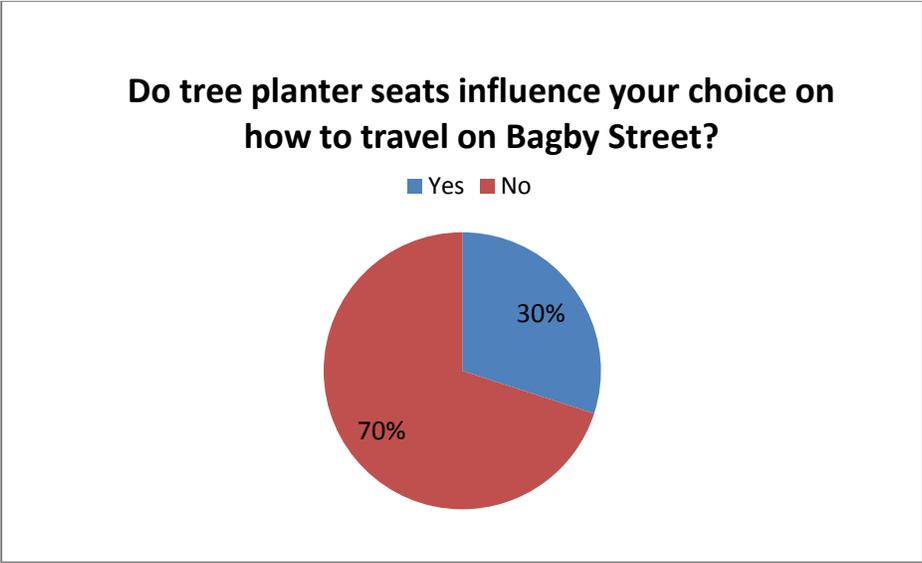


Table 4-12: Users perception of seating on Bagby Street

These seating opportunities strategically placed along Bagby are occasionally seen being used. The occasional usage might be attributed to the seating's proximity to the intersection and road. Only one participant was seen using this feature as a destination to sit and read. These tree planter seating arrangements did not appear to influence travel mode choice.

4.3.2.5 Landscape Plantings (Trees and other vegetation)

The landscape plantings on Bagby Street range from highly engineered rain gardens filtering water before entering the storm drain system, to singular plantings in beds lining the streets.

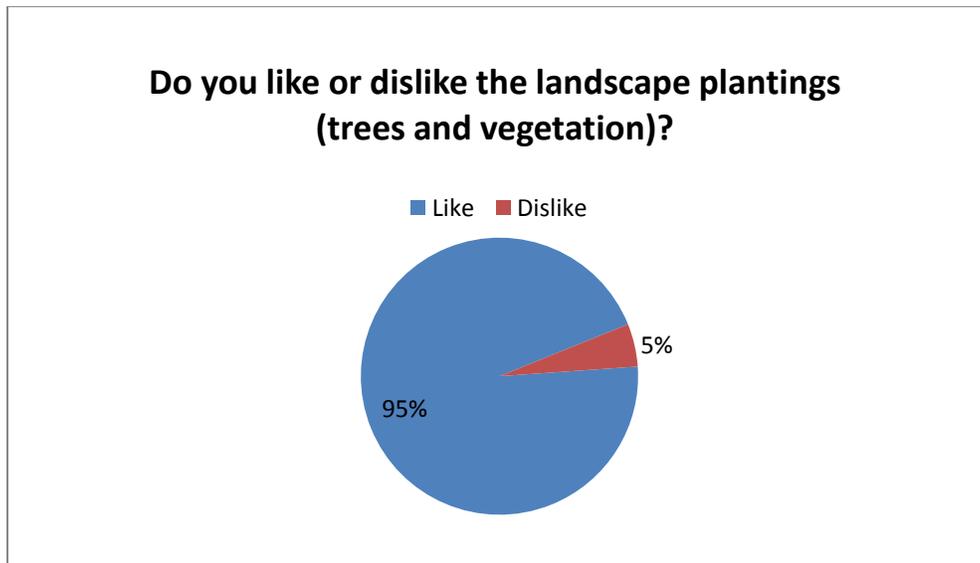


Table 4-13: Popularity of the landscape on Bagby Street

95% of respondents liked the landscape of Bagby mainly because it is aesthetically pleasing to look at.



Figure 4-12: Mature trees, turf, and plantings

Survey participants were fairly even when claiming this feature did or did not impact their travel choices with 47% saying yes and 53% saying no. Some participants who stated the landscape does influence their travel behaviors stated they

“...avoid certain intersections because it blocks views.”

While others state they

“...feel more protected from the street and therefore feel more inclined to walk.”

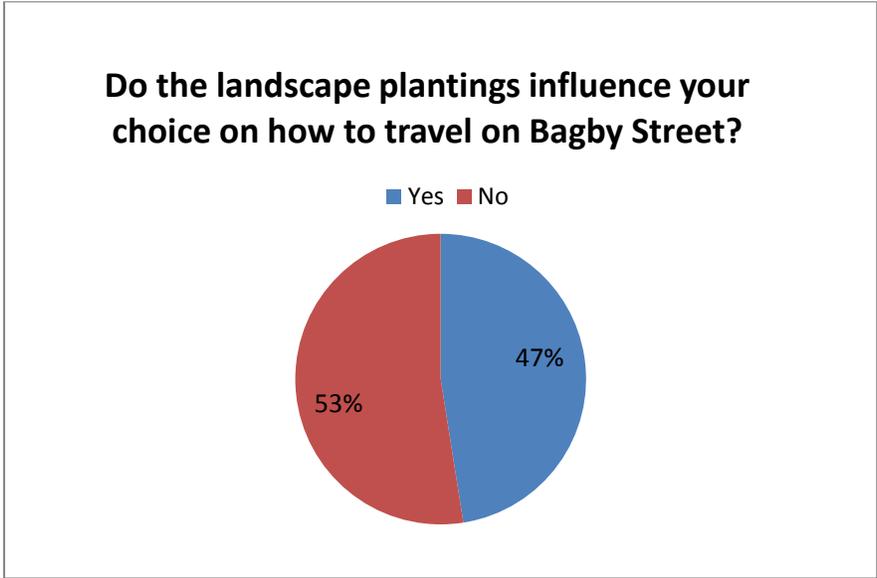


Table 4-14: Users perceptions of the landscape on Bagby Street

While the designed landscape and vegetation may not directly influence travel choice, it seemingly dictates where users choose to go whether operating an automobile or walking along the street. For example, observations demonstrated more pedestrian users and parked cars utilized the side of the street with more mature trees. This was observed as being done for the purpose of shade and, as mentioned by a participant, for safety reasons as well.

4.3.2.6 Bagby Bollards

Bollards were another design feature examined on Bagby Street. Not all intersection corners had bollards but a few did.



Figure 4-13: Bollards at Pierce and Bagby

These bollard designs are unique to Midtown and 84% of survey participants like and appreciate them for their safety features.

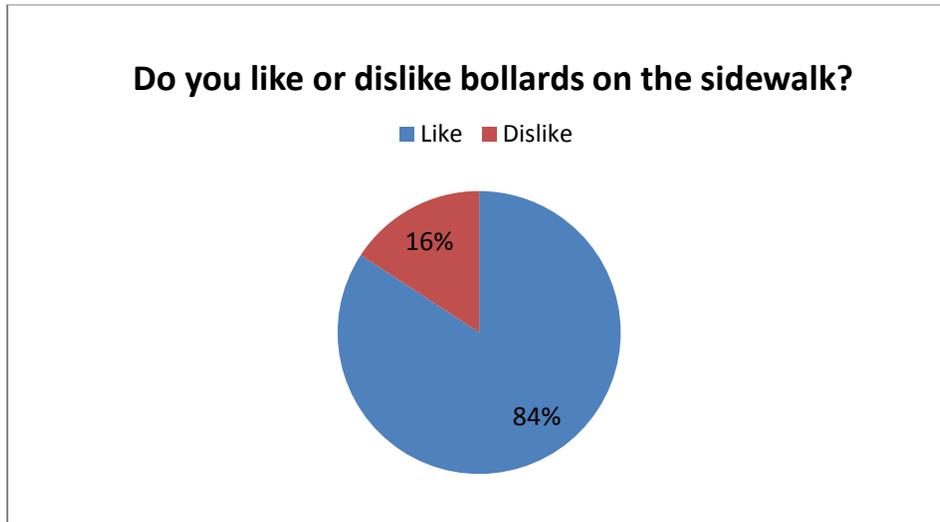


Table 4-15: Popularity of bollards on Bagby Street

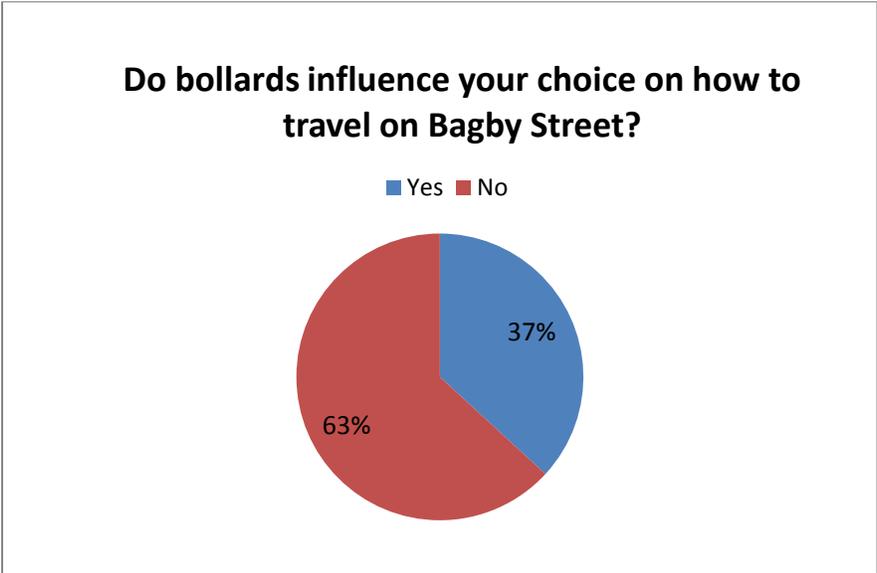


Table 4-16: Users perception of bollards on Bagby Street

The 37% of survey participants claimed the bollards did not influence their travel decisions on Bagby Street but despite this both sides stated the bollards do provide an element of safety (Appendix D, Q28-31). One respondent answered,

“I honestly have never noticed them [bollards], but they do provide some safety”

Due to the implied safety issues, much like the crosswalks on Bagby Street, it is inferred that bollards do influence users travel modes.

4.3.2.7 Sidewalks

The 12 block reconstruction of Bagby Street has sidewalks on either side with some widths wider than others. Survey respondents were asked the adequacy of different sidewalks with some being the same size but in relation to the landscape and vegetation seemed smaller.



Figure 4-14: Bagby Street sidewalks

Overall, the sidewalks were rated adequate (averaging 3.99 out of 5) however observations of pedestrians and the occasional bicyclist on the sidewalks proved otherwise. Several groups of people walking (two or more) on the sidewalks had to stop conversation and form a single-file line when passing other people. One survey participant even stated:

“It has a hard time handling the large volume of cars and pedestrians on weekends.”

This may not suggest people are influenced by the sidewalk width however, it does suggest the width may not be wide enough to support a large volume of pedestrians.

4.3.3 Themes of Bagby Street Users

4.3.3.1 Safety is a Priority

Participants from the survey as well as the site observations indicate safety is a main concern. The survey participants acknowledged crosswalks, pedestrian lighting, vegetation, and bollards as impacting their safety even with little to no claim of travel

behavior influence. The use of highlighted crosswalks enabled users to feel secure and safe when crossing the street. Similarly, pedestrian lighting provided the feeling of a safe overall environment when using the street at night. Observations of the vegetation between the sidewalk and the street on the north side of Bagby similarly contribute to the feeling of safety while walking.

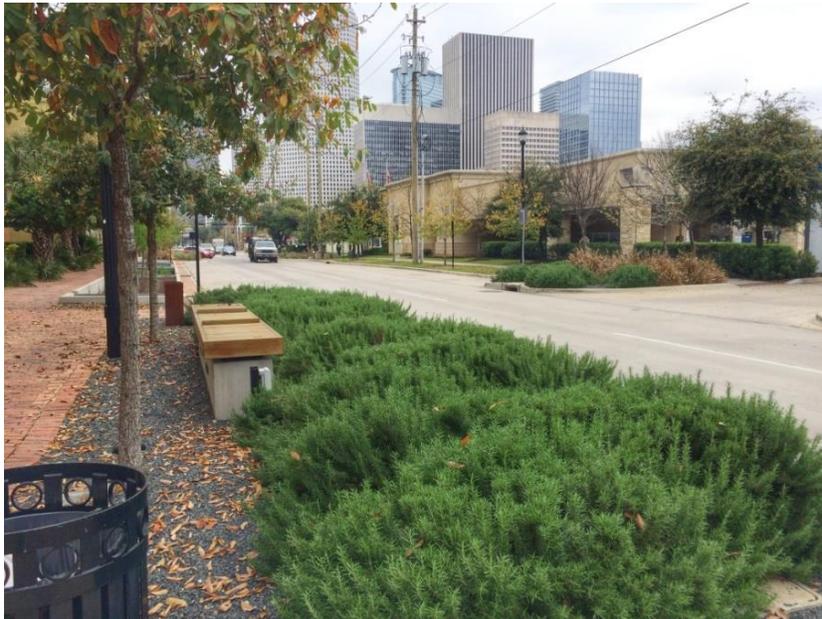


Figure 4-15: Wide vegetation buffer on north side of Bagby Street

4.3.3.2 Bagby Street the Destination

Activity along the street, whether it was automobile, pedestrian, or bicyclist, suggests Bagby Street receives a lot of use as well as demonstrates its legitimacy for being accessible towards all modes of transportation. According to one participant, Bagby Street also demonstrates the extra quality “no other street in Houston has”: its own identity as a destination. The surrounding land uses are multifamily and commercial along the reconstruction corridor. While the different uses are a contributing factor to consider Bagby Street a destination, not all users of the street were utilizing the street as

just a form of getting from point a to b. Some users were treating the street in a park-like way:

I'm usually driving my car when traveling though Bagby. However I always feel inspired to return, park my car and walk so that I can experience this very aesthetically pleasing slice of downtown Houston. It is a beautifully created area and appealing to experience on foot. More areas in Houston should be reconstructed in this manner. (Appendix D, Q: 36).



Figure 4-16: Bagby Street at dusk

Observations were made of several people parking their cars and doing just that: walking around Bagby Street as if it were a linear park. An approached participant who did not have time to take the survey stated they

“...reside a few streets over but walk Bagby Street for exercise all the time.”

The survey also disclosed it is actually more convenient to walk on Bagby Street because it takes too long to park.

4.3.3.3 Choice

Bagby Street's design features ultimately provide the users a choice of how to get from one destination to another. This is very apparent in survey results and observations as well as the comparative analysis of Bagby Street to best practice literature. Participants of the survey cited several different ways of accessing Bagby by car, walking and bicycling. Pedestrians, bicyclist and motorist were observed on Bagby whether they were stationary or moving. Pedestrians utilized the seating areas and sidewalks, bicyclists were seen using the bike racks, riding around the streets and sidewalks, and people were parking and driving their cars on the street itself. This option of choice observed on site draws back to the literature of creating livable streets and neighborhoods.

4.3.3.4 Walking Is Preferred

Even though Bagby Street's design offers several options of transportation, the majority of users prefer walking over driving and bicycling. Questions 36 and 37 in the survey support the theme of walking as the preferred method of travel. Several participants cite walking as their preference and there was an abundance of pedestrians using the street. Not only do survey participants claim they prefer walking to other means of travel on Bagby Street, they also conclude it is faster to get around.

"I personally like walking and biking. It is easy to get around the area instead of driving a car since parking can be tight at times."

"I prefer to walk on Bagby Street. I would want to drive to get there, though."

"...prefer to parking in one safe central location (garage) and then walk to multiple locations..."

Observations also support this data. Parking and traffic are often heavy on Bagby Street so it is often more time consuming (when on Bagby Street) to get in a car, drive the car to

a destination on Bagby Street and park the car, when wanting to get to a certain destination on it.

4.4 Summary

The comprehensive analysis of passive and participant observations and the corresponding surveys provided a basic understanding of users' perceptions as well as their interaction with the Bagby Street design features. The influence of Complete Street design elements on travel behavior ranged from heavy influence, mixed reviews, none at all. Overarching themes were identified through the data and discussed.

Chapter 5

Conclusion: Wrap It Up

5.1 Completing the Street

The objective of this study is to compare and contrast Bagby Street's Complete Street design elements to best practice literature and to determine whether Complete Streets design elements influence travel behavior. The methodology and analysis draw from qualitative and quantitative methodologies which were passive observations and a survey. This chapter discusses the findings which were drawn from the Bagby Street Reconstruction case study, and how they apply to the research questions:

1. How do the Bagby Street Reconstruction design features compare to the best practice literature on Complete Streets?
2. Does Bagby Street's Complete Street design impact how users travel or interact with the area?
3. Are there specific design features that influence user's behaviors and choices relative to transportation?
 - a. Are there design features missing that would encourage different behaviors and choices relative to transportation?

This chapter also speaks to the relevance of the study to the professions of landscape architecture and city planning. It concludes with recommendations for further study.

5.2 Evaluation and Summary of Themes

During the analysis of the case study, survey and observation themes emerged relating to how users travel on Bagby Street and users perceptions on the design elements. As a whole and "complete" design, the design features acting together provide more than just a means of different travel options; they make Bagby Street a destination.

Users, both people who reside on or near Bagby and visitors, seem to enjoy their experience as a whole when traveling on Bagby Street.

5.2.1 How do the Bagby Street Reconstruction design features compare to the best practice literature on Complete Streets?

Literature suggests Complete Street best practice design features are:

- Bicycle Boxes
- Bicycle Parking
- Bike Lanes
- Bollards
- Center Medians
- Crossing Islands
- Crosswalks
- Curb Extensions
- Small Curb Radii
- Groundcover
- Mid-Block Crossings
- On-Street Parking
- Pedestrian Signals
- Planter Strips
- Road Diets
- Sharrows
- Sidewalk Cafes
- Educational Signage
- Signalized Intersections
- Speed Cushions/Tables
- Stop Signs
- Street Furniture
- Street Lighting
- Street Trees
- Traffic Circles
- Transit Stops
- Wide Sidewalks

Bagby Street contains several desired Complete Streets elements with one significant absence – bicycle accommodations. Going back to the definition of Complete Streets being a road that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities (Laplante & McCann 2008) it could be argued that Bagby Street does not fit this criterion. However, when examining the Complete Streets policy approach definition, of it being a transportation policy and design

approach that requires streets to be safe for drivers, bicyclists, transit vehicles (and users), and pedestrians of all ages and abilities, (National Complete Streets Coalition 2010) it is true with the emphasis on the approach. The original design from Design Workshop proposed a separated bike lane however this design conflicted with the current Infrastructure Design Manual, Major Thoroughfare and Freeway Plan, and Bicycle Master Plan (Crossley 2014) and therefore were excluded from the final design.

Bagby Street's implementation approach and large regard to public feedback can be learned from in the future. Updating plans and providing context-sensitive manuals and plans can create a flexible yet structured environment for future projects for the city of Houston. It is important to understand that Bagby Street design elements will need to accommodate a fast growing population of users. The corridor, as well as Midtown, grew in population very quickly in a short period of time in relation to Houston's population.

5.2.2 Does Bagby Street's Complete Street design impact how users travel or interact with the area?

The themes which emerged from the surveys and passive observations relating to the street design were:

- **Safety** is a priority when traveling
- Bagby Street is just as much a **destination** as it is a means of transportation
- The design elements provide a **choice** of transportation
- Users **prefer walking** to bicycling or driving when on Bagby Street

Safety was a strong theme throughout the findings. Several outcomes from the survey indicated this – crosswalks, pedestrian lighting, vegetation and bollards were most frequently cited. Pedestrian lighting allowed users to feel safe walking at nighttime. Vegetation influenced travel both positively and negatively. Several pedestrian street

users felt safely protected from the street yet if traveling in a car, users stated the vegetation blocked line of vision when turning. This could provide dangerous outcomes for both pedestrians and vehicular users of Bagby Street.

User observations detailed several instances where Bagby Street is as much of a destination, gathering area or a place to relax as it is a means of transportation. The description from users and overall feel to the street design was much akin to a park-like setting. Results from the survey confirmed this observation with several people describing Bagby Street as an experience with the street being its own community.

The idea that the street design provides users a choice of transportation was very apparent across the data collection methods. Observations captured pedestrians exercising or walking their dogs, several bicyclists both on the sidewalk and on the street, and cars utilizing both street lanes and on-street parking. Surveys also confirmed uses of all modes of transportation except public transit. The nature of Complete Streets means they will continue to evolve in Houston and become more sophisticated however, the theme of providing a choice in mode of transportation will always be a primary concern.

Despite the street design providing users multiple options of transportation, it is highly apparent from survey questions 36 and 37 that Bagby Street users prefer walking to either driving or bicycling. Several users cited it is more convenient to walk because it is easier and faster to get around. Through the survey and observation data, it is apparent to see Bagby Street design impacts the users' interaction with the street.

5.2.3 Are there specific design features that influence user's behaviors and choices relative to transportation? Are there design features missing that would encourage different behaviors and choices relative to transportation?

Specifically, the design feature that influence users travel behavior the most were the features linked to safety. In the instance of pedestrian lighting, several participants

cited strong feelings of safety when relating to this feature and the observations corroborated. Crosswalks were another design feature users cited as being influential.

Design features missing in the area were the bicycle lanes as well as transit running on Bagby. The usage of bicycles is lacking on Bagby Street and goes noticed by users. It is noted in several responses in the survey (Appendix D, Q 36 and 37) that bike lanes are desired and would be utilized if available.

5.3 Significance to Landscape Architecture and Planning

The topic of Complete Streets is both design and planning. This study was chosen out of the researcher's interests and pursuits in the fields of both planning and landscape architecture. The significance of this particular study recognizes Complete Streets as destinations. This was a particularly evident theme in the findings. Projects in both transportation and placemaking offer a number of opportunities for landscape architects and planners. Complete Streets is a unique situation where both the fields of planning and landscape architecture can contribute throughout the process from start to finish. In order to accomplish the desired outcome of a Complete Street several professions need to collaborate and provide comprehensive knowledge for clients to complete a full picture from start to finish. Complete Streets is a growing force and rising trend in the nation and the more knowledge, advisory services, developed programs and context-sensitive plans, the better the professions will develop as seen with the Bagby Street Reconstruction. Both planning and landscape architecture need to position themselves to contribute to this field. These two professions are advocates for creating places and spaces for people and it is important to be recognized as such. As demonstrated in this study, Complete Streets is not just a means of providing choices in modes transportation. If designed well by using a context sensitive approach, it can be considered a destination on its own as Bagby Street in Houston has been labeled by its

users. It is important to constantly be contributing to the fields of landscape architecture and planning in order to make and meet goals of communities and provide education to cities and relatable professions for better solutions.

This particular study also underscores the importance of perception of safety as a threshold in consideration in Complete Street design and implementation. Professionals in landscape architecture and planning directly and indirectly affect the health, safety and welfare of the public. There is a responsibility to continually refine and understand what that means.

Lastly, this study on travel behavior is significant because of its particular focus and concentration on design elements rather than the larger land use or density. Design elements that may contribute to travel behavior now, might be nullified later. Quality of life changes and is dependent on several factors and planners and designers need to be aware and cognizant of such shifts and advancements.

5.4 Future Research

This study examines the Complete Street design elements of Bagby Street in Houston, Texas. Future research could include comparing design elements on more than just one Complete Street in the same city or multiple Complete Streets across different cities. Bagby Street is located within Midtown District which is currently a very lucrative district in the city of Houston. On this note, future research could concentrate on another area that may not be as affluent in order to understand different obstacles to implementation and design needs.

Complete Street approaches are very context-sensitive and site specific and this could lead to a multitude of research opportunities. Approaches to implementation on various different types of streets would be a great exploration in providing rough guidelines for design and implementation. Complete Streets could also be compared

either within one city or across different cities if more of a policy and planning interest was wanted.

In relation to the overall themes which emerged from the data analysis future research could be pursued in regards to Complete Streets and safety design as well as Complete Streets and establishing, or finding, a sense of place.

5.5 Summary

In summary this chapter includes the overall evaluation of the themes found amongst the data regarding the design of Complete Streets' influence on users' travel behavior. The relevance of the study to landscape architecture and planning was arrived at through the analysis of the case study, survey and passive observations.

Recommendations for future research were revealed through the results and suggested future contributions for both landscape architecture and planning fields.

Appendix A
IRB Notification Exemption

**Institutional Review Board
Notification of Exemption**

March 6, 2015

Alexandra Tracz
Dr. James Richards
School of Architecture

Protocol Number: 2015-0508

Protocol Title: *Complete Streets Design Elements and Their Impact on Travel Behavior: Learning from Bagby Street Reconstruction in Houston, TX*

EXEMPTION DETERMINATION

The UT Arlington Institutional Review Board (IRB) Chair, or designee, has reviewed the above referenced study and found that it qualified for exemption under the federal guidelines for the protection of human subjects as referenced at Title 45CFR Part 46.101(b)(2).

- (2)Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior, unless:(i) information obtained is recorded in such a manner that human subjects can be identified, either directly or through identifiers linked to the subject; and (ii) any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

You are therefore authorized to begin the research as of **March 6, 2015**.

Pursuant to Title 45 CFR 46.103(b)(4)(iii), investigators are required to, “promptly report to the IRB ***any*** proposed changes in the research activity, and to ensure that such changes in approved research, during the period for which IRB approval has already been given, are **not initiated without prior IRB review and approval** except when necessary to eliminate apparent immediate hazards to the subject.” Please be advised that as the principal investigator, you are required to report local adverse (unanticipated) events to the Office of Research Administration; Regulatory Services within 24 hours of the occurrence or upon acknowledgement of the occurrence. All investigators and key personnel identified in the protocol must have documented Human Subject Protection (HSP) Training on file with this office. Completion certificates are valid for 2 years from completion date.

The UT Arlington Office of Research Administration; Regulatory Services appreciates your continuing commitment to the protection of human subjects in research. Should you have questions, or need to report completion of study procedures, please contact Alyson Stearns at astearns@uta.edu. You may also contact Regulatory Services at 817-272-3723 or regulatoryservices@uta.edu.

Appendix B

Informed Consent Document and Survey Questions

Informed Consent Document

Informed Consent Document

PRINCIPAL INVESTIGATOR

Alexandra Tracz

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FACULTY ADVISOR

Professor James Richards

Program in Landscape Architecture

School of Architecture

Email: jrichard@uta.edu

TITLE OF PROJECT

Complete Streets Design Elements and Their Impact on Travel Behavior: Learning from Bagby Street Reconstruction in Houston, TX

INTRODUCTION

You are being asked to participate in a research study about your interaction with, and the design elements on the Bagby Street Reconstruction area. You are being selected because you have used, have knowledge of, live or work near the Bagby Street Reconstruction area. Participation is in the form of a short survey questionnaire. Your participation is completely voluntary. Refusal to participate or discontinuing your participation at any time will involve no penalty or loss of benefits

to which you are otherwise entitled. Please ask questions if there is anything you do not understand. This research will be compiled into a thesis format and is the final step towards earning my degrees at the University of Texas at Arlington. Thank you so much for your time and consideration.

PURPOSE

The specific purpose(s) of this research study are to determine if the overall design of Bagby Street Reconstruction impacts how users travel or interact with the area, if there are specific design features that influence user's choices or behaviors relative to transportation, and subsequently if there are specific design features that are missing that users feel might influence their transportation choices or behaviors.

DURATION

Participation in this survey will last approximately 10 minutes.

NUMBER OF PARTICIPANTS

The number of anticipated participants in this research study is 1000 adults.

PROCEDURES

The procedures which will involve you as a research participant include:

1. Filling out to the best of your ability and truthfully, the (online or in-person) survey which includes pictures of Bagby Street
2. Submitting your answers either to myself or online – it would depend on how you took the survey.

POSSIBLE BENEFITS

Participants would not be directly benefited from this research. This research does have the possibility of benefiting fields such as city planning, landscape architecture, retail developers, and professions regarding city design. Indirectly, this would benefit the consumer.

POSSIBLE RISKS/DISCOMFORTS

There are no perceived risks or discomforts for participating in this research study. Should you experience any discomfort please inform the researcher, you have the right to quit any study procedures at any time at no consequence.

COMPENSATION

There will be no compensation for participation in this survey.

ALTERNATIVE PROCEDURES

There are no alternative procedures offered for this study. However, you can elect not to participate in the study or quit at any time at no consequence.

VOLUNTARY PARTICIPATION

Participation in this research study is completely voluntary. You have the right to decline participation or quit at any time at no consequence.

CONFIDENTIALITY

Every attempt will be made to see that your study results are kept confidential. A copy of this signed consent form and all data collected, including any photographs taken from this study will be stored in the office of Professor James Richards (room 322) in the School of Architecture building for at least three (3) years after the end of this research. The results of this study may be published and/or presented at meetings without naming you as a participant. Additional research studies could evolve from the information you have provided, but your information will not be linked to you in anyway; it will be anonymous. Although your rights and privacy will be maintained, the Secretary of the Department of Health and Human Services, the UTA Institutional Review Board (IRB), and personnel particular to this research have access to the study records. Your records will be kept completely confidential according to current legal requirements. They will not be revealed unless required by law, or as noted above. The IRB at UTA has reviewed and approved this study and the information within this consent form. If in the unlikely event it becomes necessary for the Institutional Review Board to review your research records, the University of Texas at Arlington will protect the confidentiality of those records to the extent permitted by law.

CONTACT FOR QUESTIONS

Specific questions about this research study may be directed to me, Alexandra Tracz or my faculty advisor, James Richards. Phone numbers and email listed for both are listed below. Any questions you may have about your rights as a research participant or a research-related injury may be directed to the Office of Research Administration; Regulatory Services at 817-272-2105 or regulatoryservices@uta.edu.

Alexandra Tracz
Phone: 484.680.5442
Email: alexandra.tracz@mavs.uta.edu

Professor James Richards
Phone: 817.999.1522
Email: jrichard@uta.edu

CONSENT

As a representative of this study, I have explained the purpose, the procedures, the benefits, and the risks that are involved in this research study:

Signature and printed name of principal investigator or person obtaining consent
Date

By signing below, you confirm that you are 18 years of age or older and have read or had this document read to you. You have been informed about this study's purpose, procedures, possible benefits and risks, and you have received a copy of this form. You have been given the opportunity to ask questions before you sign, and you have been told that you can ask other questions at any time.

You voluntarily agree to participate in this study. By signing this form, you are not

waiving any of your legal rights. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may discontinue participation at any time without penalty or loss of benefits, to which you are otherwise entitled.

SIGNATURE OF VOLUNTEER

DATE

Accept

User Questions

Are you a business owner, landowner, resident, or visitor of Bagby Street or the surrounding neighborhood? Select all that apply.

Business Owner

Landowner

Resident of Houston

Visitor

Other, please explain

How familiar are you with the Bagby Street Reconstruction area?

Not Familiar

Somewhat Familiar

Very Familiar

Are you aware that Bagby Street Reconstruction is considered a "Complete Street?"

- Yes
- No
- Maybe

Would you consider Bagby Street a "Complete Street" according to this definition: a road that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities, (Laplante and McCann, 2008)

- Yes
- No
- Maybe

What brings you to Bagby Street? Select all that apply.

- Amenities (restaurants, shops, other businesses)
- Passing through
- Exercise
- Other, please explain

Design Elements

What design features on Bagby Street do you **like** or **dislike** and do they influence how you travel to, from, or on Bagby Street? *See pictures below and select accordingly.*



Do you like or dislike the highlighted crosswalks?

- Like
- Dislike

You like this feature because it (please check all that apply):

- Makes you feel safe
- Is aesthetically pleasing to look at
- Is a feature you use
- Other (please explain)

You dislike this feature because it (please check all that apply):

- Doesn't make you feel safe
- Is not aesthetically pleasing to look at
- Is not a feature you use

Other (please explain)

Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

Yes

No



Do you like or dislike the on-street parking?

Like

Dislike

You like this feature because it (please check all that apply):

Makes you feel safe

Is aesthetically pleasing to look at

Is a feature you use

Other (please explain)

You dislike this feature because it (please check all that apply):

- Does not make you feel safe
- Is not aesthetically pleasing to look at
- Is not a feature you use
- Other (please explain)

Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

- Yes
- No



Do you like or dislike the pedestrian lighting?

- Like
- Dislike

You like this feature because it (please check all that apply):

- Makes you feel safe
- Is aesthetically pleasing to look at
- Is a feature you use
- Other (please explain)

You dislike this feature because it (please check all that apply):

- Does not make you feel safe
- Is not aesthetically pleasing to look at
- Is not a feature you use
- Other (please explain)

Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

- Yes
- No



Do you like or dislike the tree planter seats?

- Like
- Dislike

You like this feature because it (please check all that apply):

- Makes you feel safe
- Is aesthetically pleasing to look at
- Is a feature you use
- Other (please explain)

You dislike this feature because it (please check all that apply):

- Does not make you feel safe
- Is not aesthetically pleasing to look at

- Is not a feature you use
- Other (please explain)

Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

- Yes
- No



Do you like or dislike the landscape plantings (trees and vegetation)?

- Like
- Dislike

You like this feature because it (please check all that apply):

- Makes you feel safe
- Is aesthetically pleasing to look at

- Is a feature you use
- Other (please explain)

You dislike this feature because it (please check all that apply):

- Does not make you feel safe
- Is not aesthetically pleasing to look at
- Is not a feature you use
- Other (please explain)

Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

- Yes
- No



Do you like or dislike bollards on the sidewalk?

- Like
- Dislike

You like this feature because it (please check all that apply):

- Makes you feel safe
- Is aesthetically pleasing to look at
- Is a feature you use
- Other (please explain)

You dislike this feature because it (please check all that apply):

- Does not make you feel safe
- Is not aesthetically pleasing to look at
- Is not a feature you use
- Other (please explain)

Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

- Yes
- No

Please take a look at the following images of the sidewalks along Bagby Street. On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate):



On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate).

Rating 1 -5



On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate).

Rating 1 -5



Is there anything else you want me to know about your thoughts on Bagby Street?

Appendix C
Recruitment Scripts

Email/Phone/Letter Script Recruitment

Dear Mr. / Ms.

My name is Alexandra Tracz and I am a graduate student in the masters' programs in Landscape Architecture and City and Regional Planning at the University of Texas at Arlington. I am conducting research for my dual masters' thesis titled: Complete Streets Design Elements and Their Impact on Travel Behavior: Learning from Bagby Street Reconstruction in Houston, TX.

I would like to request your and your organization's participation in my thesis research via an online survey. You are being selected because you have used, have knowledge of, or live or operate a business near the Bagby Street Reconstruction area. The primary goal of this research is to determine if or how Complete Street design elements affect or impact an individual's travel behavior. The survey will take approximately 10 minutes of your time.

There is a link available to conduct the survey at your convenience. If you would like to participate, please either reply to me via email or the phone number listed below. Before agreeing to participate you will read an informed Consent Form online. This form will explain the study in further detail. Participation in the study is completely voluntary. If you know of anyone who is interested in completing this survey, please do let me know how best to contact them and I will do so as well.

Thank you very much for your consideration. Your time, support, and participation will be an invaluable part of my research and greatly appreciated.

Sincerely,

Alexandra Tracz
Graduate Student
Dual Master's Program – Landscape Architecture/City and Regional Planning
The University of Texas at Arlington
Phone: 484.680.5442
Email: alexandra.tracz@mavs.uta.edu

Face to Face Recruitment for Survey Text

Hi Mr. / Ms.

My name is Alexandra Tracz and I am a graduate student in the masters' programs in Landscape Architecture and City and Regional Planning at the University of Texas at Arlington. I am conducting research for my dual masters' thesis titled: Complete Streets Design Elements and Their Impact on Travel Behavior: Learning from Bagby Street Reconstruction in Houston, TX.

I would like to request your participation in my thesis research via a face-to-face survey. You are being selected because you have used, have knowledge of, or live near the Bagby Street Reconstruction. The primary goal of this research is to determine if or how Complete Street design elements affect or impact an individual's travel behavior. The survey will take approximately 10 minutes of your time. If you do not have time to answer the survey now here is a link to the same survey online and you may fill it out at your convenience.

If you would like to participate, please let me know. Before agreeing to participate you will be given an informed Consent Form. This form will explain the study in further detail. Participation in the study is completely voluntary.

Thank you very much for your consideration. Your support and participation will be an invaluable part of my research and greatly appreciated.

Alexandra Tracz
Graduate Student
Dual Master's Program – Landscape Architecture/City and Regional Planning
The University of Texas at Arlington
Phone: 484.680.5442
Email: alexandra.tracz@mavs.uta.edu

Face to Face Text for Passive Observation

Hi Mr. / Ms.

My name is Alexandra Tracz and I am a graduate student in the masters' programs in Landscape Architecture and City and Regional Planning at the University of Texas at Arlington. I am conducting research for my dual masters' thesis titled: Complete Streets Design Elements and Their Impact on Travel Behavior: Learning from Bagby Street Reconstruction in Houston, TX.

If you feel uncomfortable at any point, please let me know and I will accommodate accordingly. If there are specific questions you would like to ask me regarding this research, I have a form that will further explain the study. Participation in my observations is voluntary and anonymous. If there are recognizable pictures of you in my study, I will take all measure to conceal your identity either by blocking out or blurring your face. As stated before, participation is voluntary and you want to be excluded from my studies, please inform me and the information will be properly disposed of.

Thank you for your time and consideration. Your participation is very much appreciated and an invaluable part to my research.

Text for Posting Link of Survey on Websites, Social Media, or an Electronic Newsletter:

My name is Alexandra Tracz and I am a graduate student at the University of Texas at Arlington. I am conducting research for my master's thesis titled: Complete Streets Design Elements and Their Impact on Travel Behavior: Learning from Bagby Street Reconstruction in Houston, TX. The goal of this research is to determine if or how Complete Street design elements influence an individual's travel choices.

I would very much like your participation in my thesis research via an online survey. If you have used, have knowledge of, or live or operate a business near or on the Bagby Street Reconstruction area in Midtown, please fill out this survey – it will take approximately 10 minutes or less of your time.

Thank you very much for your consideration – your time, support and participation will be an invaluable part of my research and greatly appreciated.

Here is the survey link:

https://qtrial2015az1.az1.qualtrics.com/SE/?SID=SV_55vT1x7BL7tjQZn

If you have any questions, please contact me at alexandra.tracz@mavs.uta.edu. I would be happy to answer any questions.

Appendix D
Survey Results

#	Answer	Response	%
1	Accept	45	100%
	Total	45	100%

Statistic	Value
Min Value	1
Max Value	1
Mean	1.00
Variance	0.00
Standard Deviation	0.00
Total Responses	45

2. Are you a business owner, landowner, resident, or visitor of Bagby Street or the surrounding neighborhood? Select all that apply.

#	Answer	Response	%
1	Business Owner	0	0%
2	Landowner	2	5%
3	Resident of Houston	23	55%
4	Visitor	13	31%
5	Other, please explain	9	21%

Other, please explain
Elizabeth Powell with Midtown Management District
former resident of Houston
worked on Bagby for 1.25 years
work here
work around area
Houston Native
Past resident of Houston
work in the neighborhood

Statistic	Value
Min Value	2
Max Value	5
Total Responses	42

3. How familiar are you with the Bagby Street Reconstruction area?

#	Answer	Response	%
1	Not Familiar	9	21%
2	Somewhat Familiar	18	43%
3	Very Familiar	15	36%
	Total	42	100%

Statistic	Value
Min Value	1
Max Value	3
Mean	2.14
Variance	0.56
Standard Deviation	0.75
Total Responses	42

4. Are you aware that Bagby Street Reconstruction is considered a “Complete Street?”

#	Answer	Response	%
1	Yes	16	38%
2	No	22	52%
3	Maybe	4	10%
	Total	42	100%

Statistic	Value
Min Value	1
Max Value	3
Mean	1.71
Variance	0.40
Standard Deviation	0.64
Total Responses	42

5. Would you consider Bagby Street a “Complete Street” according to this definition: a road that is designed to be safe for drivers; bicyclists; transit vehicles and users; and pedestrians of all ages and abilities, (Laplante and McCann, 2008)

#	Answer	Response	%
1	Yes	22	52%
2	No	8	19%
3	Maybe	12	29%
	Total	42	100%

Statistic	Value
Min Value	1
Max Value	3
Mean	1.76
Variance	0.77
Standard Deviation	0.88
Total Responses	42

6. What brings you to Bagby Street? Select all that apply.

#	Answer	Response	%
1	Amenities (restaurants, shops, other businesses)	27	64%
2	Passing through	24	57%
3	Exercise	7	17%
4	Other, please explain	13	31%

Other, please explain

Driving home
 Resident nearby, also I like to walk near the trees and large sidewalks
 visiting
 reside here
 visiting
 visiting friends
 visiting
 resident
 work/live
 work
 work
 need to walk on it to get to meetings in the area

Statistic	Value
Min Value	1
Max Value	4
Total Responses	42

7. What design features on Bagby Street do you like or dislike and do they influence how you travel to, from, or on Bagby Street? See pictures below and select accordingly.

#	Answer	Response	%
	Total	0	0%

Statistic	Value
Min Value	999,999
Max Value	-99,999
Mean	0.00
Variance	0.00
Standard Deviation	0.00
Total Responses	0

8. Do you like or dislike the highlighted crosswalks?

#	Answer	Response	%
1	Like	39	95%
2	Dislike	2	5%
	Total	41	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.05
Variance	0.05
Standard Deviation	0.22
Total Responses	41

9. You like this feature because it (please check all that apply):

#	Answer	Response	%
1	Makes you feel safe	23	59%
2	Is aesthetically pleasing to look at	15	38%
3	Is a feature you use	19	49%
4	Other (please explain)	1	3%

Other (please explain)

Functional

Statistic	Value
Min Value	1
Max Value	4
Total Responses	39

10. You dislike this feature because it (please check all that apply):

#	Answer	Response	%
1	Doesn't make you feel safe	1	50%
2	Is not aesthetically pleasing to look at	2	100%
3	Is not a feature you use	0	0%
4	Other (please explain)	1	50%

Other (please explain)

despise miserable "ADA" ramps

Statistic	Value
Min Value	1
Max Value	4
Total Responses	2

11. Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

#	Answer	Response	%
1	Yes	21	53%
2	No	19	48%
	Total	40	100%

Yes	No
If I feel safe I will walk across the street with ease but if not I will find another way even if it takes more time.	No reason
Makes safer to move around, it makes you "want" to use those crossings	I would travel there anyway
Safer than areas where no crosswalks are marked	There are crosswalks in some intersections and not in others
I feel safer on this street	the why is more about where I am going
will walk more instead of drive	I walk everywhere
easier to walk	dont really walk in the street
highly visible	When I'm on Bagby I'm driving
more likely to cross at intersections with crosswalks than ones that don't	I always Drive to Bagby
easier to walk to restaurants	
provides guidelines	
walkable	
use crosswalk instead of j-walking	
Stop short of walk while driving	
Makes me use the crosswalk instead of jaywalking	
willing to bike and walk everywhere	
Stops me from jay walking	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.48
Variance	0.26
Standard Deviation	0.51
Total Responses	40

12. Do you like or dislike the on-street parking?

#	Answer	Response	%
1	Like	35	81%
2	Dislike	8	19%
	Total	43	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.19
Variance	0.16
Standard Deviation	0.39
Total Responses	43

13. You like this feature because it (please check all that apply):

#	Answer	Response	%
1	Makes you feel safe	3	9%
2	Is aesthetically pleasing to look at	2	6%
3	Is a feature you use	26	76%
4	Other (please explain)	7	21%

Other (please explain)

Rotation is good for commerce
 convenient
 Convenience for people
 It's convenient
 convenient
 convenience
 Good use of space

Statistic	Value
Min Value	1
Max Value	4
Total Responses	34

14. You dislike this feature because it (please check all that apply):

#	Answer	Response	%
1	Does not make you feel safe	2	25%
2	Is not aesthetically pleasing to look at	2	25%
3	Is not a feature you use	1	13%
4	Other (please explain)	3	38%

Other (please explain)

There's not enough parking to meet demand
 never available, costs money
 Makes it hard to see oncoming traffic when in car

Statistic	Value
Min Value	1
Max Value	4
Total Responses	8

15. Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

#	Answer	Response	%
1	Yes	18	45%
2	No	22	55%
	Total	40	100%

Yes	No
I like the on street parking because I have a place to park in the area which can be difficult at times.	I don't use it
Allows more people to park	I usually park in parking garages
See above	I always walk because I live nearby
parking	i live close enough to walk and won't pay to park
the parking on Bagby is fine, I choose to park on side streets b/c there is less traffic	don't ever park there
traffic and passing	don't use it
I'm less likely to drive on it because they're always packed	too crowded on side of streets
easier to access	I still have to use bagby to get to the restaurants.
parking availability influences where I choose to go to eat/drink, etc	rarely park on-street
Makes me drive slower to try to look for a spot	still have to get there by car usually because even though I live within biking distance, it is not always safe to bike there
easy parking	While it is nice to always be able to park in front of the barber shop, I would still go to this shop regardless
	Parking spot not traveling

Statistic	Value
Min Value	1
Max Value	2
Mean	1.55
Variance	0.25
Standard Deviation	0.50
Total Responses	40

16. Do you like or dislike the pedestrian lighting?

#	Answer	Response	%
1	Like	37	90%
2	Dislike	4	10%
	Total	41	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.10
Variance	0.09
Standard Deviation	0.30
Total Responses	41

17. You like this feature because it (please check all that apply):

#	Answer	Response	%
1	Makes you feel safe	29	81%
2	Is aesthetically pleasing to look at	15	42%
3	Is a feature you use	13	36%
4	Other (please explain)	1	3%

Other (please explain)

it's helpful

Statistic	Value
Min Value	1
Max Value	4
Total Responses	36

18. You dislike this feature because it (please check all that apply):

#	Answer	Response	%
1	Does not make you feel safe	0	0%
2	Is not aesthetically pleasing to look at	3	75%
3	Is not a feature you use	0	0%
4	Other (please explain)	2	50%

Other (please explain)

carry-over from other historical areas of Downtown

Statistic	Value
Min Value	2
Max Value	4
Total Responses	4

19. Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

#	Answer	Response	%
1	Yes	25	63%
2	No	15	38%
	Total	40	100%

Yes	No
If I can see what my surroundings are I feel safe. Street lighting is there for that purpose.	would travel anyway
Compared to other streets nearby, Bagby is safer because of the lighting	not eye-catching
safer, looks good	dpnt walk in street
Makes me feel safer	it's just boring
I prefer to walk on Bagby over other streets	I don't use the space at night
better protection at night time	Never go to Bagby at night
I feel more comfortable walking at night	
safty	
I feel safe at night	
I can see people at night	
I walk	
makes travel easier and safer	
I walk and night and I feel safe	
safer to walk	
safe place to cross	
more likely to travel well-lit streets for safety	
well lit at night	
willing walk and bike there at night	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.38
Variance	0.24
Standard Deviation	0.49
Total Responses	40

20. Do you like or dislike the tree planter seats?

#	Answer	Response	%
1	Like	35	85%
2	Dislike	6	15%
	Total	41	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.15
Variance	0.13
Standard Deviation	0.36
Total Responses	41

21. You like this feature because it (please check all that apply):

#	Answer	Response	%
1	Makes you feel safe	2	6%
2	Is aesthetically pleasing to look at	32	91%
3	Is a feature you use	10	29%
4	Other (please explain)	0	0%

Other (please explain)

Statistic	Value
Min Value	1
Max Value	3
Total Responses	35

22. You dislike this feature because it (please check all that apply):

#	Answer	Response	%
1	Does not make you feel safe	0	0%
2	Is not aesthetically pleasing to look at	5	83%
3	Is not a feature you use	0	0%
4	Other (please explain)	1	17%

Other (please explain)

probably won't drain/dry out well, will eventually have fire ants

Statistic	Value
Min Value	2
Max Value	4
Total Responses	6

23. Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

#	Answer	Response	%
1	Yes	12	30%
2	No	28	70%
	Total	40	100%

Yes	No
You can sit on them and they look good.	Don't use them
looks better than plain concrete	just looks nice
Looks nice	I have never sat on the planters
more neighborhood feel than just in the city	
Also a nice place to sit and relax	
easy to read signs and travel	
I have to walk around them	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.70
Variance	0.22
Standard Deviation	0.46
Total Responses	40

24. Do you like or dislike the landscape plantings (trees and vegetation)?

#	Answer	Response	%
1	Like	39	95%
2	Dislike	2	5%
	Total	41	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.05
Variance	0.05
Standard Deviation	0.22
Total Responses	41

25. You like this feature because it (please check all that apply):

#	Answer	Response	%
1	Makes you feel safe	7	18%
2	Is aesthetically pleasing to look at	38	97%
3	Is a feature you use	5	13%
4	Other (please explain)	0	0%

Other (please explain)

Statistic	Value
Min Value	1
Max Value	3
Total Responses	39

26. You dislike this feature because it (please check all that apply):

#	Answer	Response	%
1	Does not make you feel safe	0	0%
2	Is not aesthetically pleasing to look at	1	50%
3	Is not a feature you use	0	0%
4	Other (please explain)	1	50%

Other (please explain)

It blocks view when trying to enter Bagby in car.

Statistic	Value
Min Value	2
Max Value	4
Total Responses	2

27. Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

#	Answer	Response	%
1	Yes	19	48%
2	No	21	53%
	Total	40	100%

Yes	No
Vegetation is always good in any area.	just gives a natural look
It is almost the only street in downtown/midtown with trees. All of them should have, makes it look human looks better than concrete	The shade is appreciated but not important
Avoid certain intersections	
Keeps shade from the heat	
feels more like neighborhood than city feel	
Feel more inclined to walk or not be in a car	
Love the trees	
I feel protected from the street	
pleasant and green feeling	
I walk and rest	
provides shade	
I prefer shaded streets	
soft scape is always good	

Statistic	Value
Min Value	1
Max Value	2
Mean	1.53
Variance	0.26
Standard Deviation	0.51
Total Responses	40

28. Do you like or dislike bollards on the sidewalk?

#	Answer	Response	%
1	Like	35	85%
2	Dislike	6	15%
	Total	41	100%

Statistic	Value
Min Value	1
Max Value	2
Mean	1.15
Variance	0.13
Standard Deviation	0.36
Total Responses	41

29. You like this feature because it (please check all that apply):

#	Answer	Response	%
1	Makes you feel safe	25	74%
2	Is aesthetically pleasing to look at	11	32%
3	Is a feature you use	3	9%
4	Other (please explain)	4	12%

Other (please explain)

They do their job
protects pedestrians
pretty neutral

Statistic	Value
Min Value	1
Max Value	4
Total Responses	34

30. You dislike this feature because it (please check all that apply):

#	Answer	Response	%
1	Does not make you feel safe	0	0%
2	Is not aesthetically pleasing to look at	4	67%
3	Is not a feature you use	1	17%
4	Other (please explain)	2	33%

Other (please explain)

They are needed, but dislike bollards throw light at just the right height to blind car drivers, they are ugly, and there are lots of other ways to 'block' car intrusion

Statistic	Value
Min Value	2
Max Value	4
Total Responses	6

31. Does this feature influence your choice on how to travel on Bagby Street? Please explain your answer.

#	Answer	Response	%
1	Yes	14	37%
2	No	24	63%
	Total	38	100%

Yes	No
The bollards in some way protect the pedestrain if anything were to ever cross the median. may help keep drivers who aren't paying attention from running me over Safe I can walk and feel protected at intersections I'm more likely to feel more comfortable walking No driving on the sidewalk (which is a good thing!) Makes me feel like it is a pedestrian only street a must have safety feature - these bollards have literally saved lives and property on Bagby This allows me to park my motorcycle on the sidewalk	I honestly have never noticed them, but they do provide some safety nice but no influence

Statistic	Value
Min Value	1
Max Value	2
Mean	1.63
Variance	0.24
Standard Deviation	0.49
Total Responses	38

32. On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate).

#	Answer	Min Value	Max Value	Average Value	Standard Deviation	Responses
1	Rating 1 -5	1.00	5.00	3.70	1.13	40

33. On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate).

#	Answer	Min Value	Max Value	Average Value	Standard Deviation	Responses
1	Rating 1 -5	1.00	5.00	3.71	1.12	40

34. On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate).

#	Answer	Min Value	Max Value	Average Value	Standard Deviation	Responses
1	Rating 1 -5	2.00	5.00	4.01	1.02	40

35. On a scale of 1 to 5 please rate if the width of the walking area is adequate (5 being the most adequate).

#	Answer	Min Value	Max Value	Average Value	Standard Deviation	Responses
1	Rating 1 -5	2.00	5.00	4.56	0.76	39

36. Do you prefer a certain mode of transportation when traveling to/from, or through Bagby Street (i.e. walking, biking, bus, automobile)? Why do you prefer this way?

Text Response

I personally like walking and biking. It is easy to get around the area instead of driving a car since parking can be tight at times.

Walking and biking. I wish there was a bike line through all the streets in the area

Driving - what I normally use.

Walking, I live near by and its convenient

Walking

I prefer walking and bike riding. I wish there was more bike racks. I sometimes do not know where to park my bike safely (should be lighted).

walking. close to my home and don't have to worry about driving home late after going out.

I prefer to walk on Bagby Street. I would want to drive to get there, though.

No

Walking. It's easier to get around

walking

walking--easiest/most convenient mode

walking or biking because parking is a hassle

walking - it's easier and faster when you're in this location

automobile to park and then walking feels safe and convenient

walk often and it is relaxing

Bus and automobile

walking is definitely easier in this area but I drove to it

walking - I live on Bagby

walking b/c it's faster

walking and automobile

walking - enjoy being in a walkable community w/o the need of a vehicle

walking/driving - walking for barhopping/recreation, driving when I have to get somewhere quickly or further away

It's fine but it needs more spunk to represent Houston

eco green trolley

walking for exercise

auto is for work and too many people walking on weekends

Walking. It's a pleasant walk with plenty of shade from trees and spots to sit at.

Automobile

Prefer walking but I travel the most through this part of town in car.

prefer to parking in one safe central location (garage) and then walk to multiple locations....buses are gross, cycling will get you killed, and parking on the street will leave your car full of scratches and dents

Walking or driving. I prefer walking because the space is focused away from the curb. If I want to experience the space, I need to be on foot.

I like to walk on a nice weather day. It's nice just to get out of the office and see what's going on in the neighborhood.

walking and biking

I'm usually driving my car when traveling though Bagby. However I always feel inspired to return, park my car and walk so that I can experience this very aesthetically pleasing slice of downtown Houston. It is a beautifully created area and appealing to experience on foot. More areas in Houston should be reconstructed in this manner.

I almost always drive but occasionally will bring my motorcycle

Statistic	Value
Total Responses	36

37. Is there anything else you want me to know about your thoughts on Bagby Street?

Text Response

Bagby Street is the first Greenroads in the state of Texas, a rating system.

<https://www.greenroads.org/1753/mission-vision-and-values.html>

Bagby has a couple of blocks (in front of CVS and around the Dogwood) really well done, but there is more to do. CVS for example, or some residential examples, need to turn themselves to the street instead of "escaping" from it. Also, the Midtown park... is it ever going to be finished? Thanks!

I lived in the EDGE condos before, during, and after the reconstruction - this is by far the best use of money I have seen for street repair/reconstruction. Great job !!

It's lovely!

It's a great street, would love to see more in Midtown, Houston.

It would be nice to have a bike lane. I see bikes with the cars, and on the sidewalks. I also don't know where to park my bike. I really like the trees, landscaping and vegetation.

Looks great and should be continued to be kept up this way and keep improving surrounding streets.

No

It is a pretty and safe street. We need more of such streets in Texas

Midtown TIF did a nice job with the improvements. Very high quality.

It is a nice street unlike much of Houston

WE are visitors to this area and our children are considering making this their residential area.

Bagby Street is very appealing.

It has a hard time handling the large volume of cars and pedestrians on weekends.

More cops for speeding

No

Bagby has always felt like an 'edge'....never quite blended in with the surroundings on either side, and the design solutions are just a bit too 'off-the-shelf', as if someone tried to pick up, copy, and paste a workable solution from elsewhere. This doesn't look like Houston. It looks like San Diego-meets-Portland-meets-The Hamptons. There's no THERE! there

The rain water collection and Eco friendly systems in place are my favorite. I love per formative landscapes, especially those that help the bayou.

Houston and especially Midtown need more of these type of amenities.

Those parking meters that dispense parking receipts are incredibly slow. It takes so long for them to print a receipt that it negates any time savings from convenient on-street parking.

Statistic	Value
Total Responses	19

Appendix E

Houston, Texas Complete Streets Executive Order



CITY OF HOUSTON

Executive Order

Subject: **Houston Complete Streets and Transportation Plan**

E.O. No: **1-15**

Effective Date:
Upon Approval

1. AUTHORITY

Article II. - Corporate and General Powers, Sec. 4 – Street Powers, of the City Charter of the City of Houston.

2. PURPOSE

This Executive Order directs City efforts to achieve complete streets, as defined herein, through the planning, designing, budgeting, constructing, and reconstructing of all transportation improvements while recognizing that complete streets are achieved over time through single projects, new and redevelopment, and through a series of incremental improvements. This Executive Order also builds upon recent code and policy improvements such as, Chapter 42 of the Code of Ordinances including the requirement for existing conditions surveys and plans for recently completed and on-going city mobility studies.

3. OBJECTIVES

- 3.1 Establish a menu of complete street types based upon Multi Modal Classification.
- 3.2 Develop a forecast of street type citywide to complement and extend currently established plans to create the long range vision of complete streets
- 3.3 Establish city standards to minimize obstructions in public pedestrian travel ways.
- 3.4 Benefit from community input and thought rendered through reports such as Livable Center Studies and Scenic Houston's Streetscape Resource Guide.
- 3.5 Recognize the role streets play in drainage and water quality.

4. PRODUCTS

- 4.1 Provide policies and procedures that shall direct the development of the Houston Complete Streets and Transportation Plan (The Plan) by utilizing City Mobility Planning efforts conducted by Planning and Development Department (PDD) and the Public Works and Engineering Department (PWE); and by utilizing prior and existing governance and existing planning tools as a basis.
- 4.2 Provide an overall framework for revision and expansion of City Mobility Planning and deliverables.
- 4.3 Transition to and then sustain The Plan.

Approved:
Arvisee D. Parkson

Date Approved:
11/1/13

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- 4.4 Provide framework for coordination and integration of revisions to current plans, such as, Major Thoroughfare and Freeway Plan, Houston's Bikeway Plan, with new component plans, and vice versa, in supportive ways to encourage complete streets.

5. SCOPE

The Plan will be inclusive of multiple transportation plan components created, adopted and implemented by the City and entities other than the City of Houston. It is intended that those entities will partner with PDD and PWE on the planning and finalization of The Plan as it relates to their specific transportation planning roles. For example, Metropolitan Transit Authority of Harris County (METRO), author of METRO's Transit Plan, will provide input on The Plan regarding mass transit through a periodic transit plan update. The Planning and Development and Public Works and Engineering Departments will integrate all planning efforts for compilation and implementation of the HCSTP.

6. DEFINITIONS

There are four new definitions that will need to be defined in certain documents used by PDD and PWE that guide planning, construction and reconstruction efforts of land planners, developers and civil engineers. These documents include the MTFP Policy Statement and PWE's Infrastructure Design Manual.

The new definitions are as follows.

Complete Streets – Public roadways that take into account all users, including people who are driving or riding in cars, using mass transit, riding bikes, walking, using wheelchairs, driving or riding in trucks, driving or being transported by emergency vehicles, and being served at their residence or property by other users. Complete streets do not mean that all streets are identical. The complete street concept takes the following variables into account when providing services:

- a. People being served at their residence or property by other ROW users
- b. People of all ages and abilities, including children, older adults, and persons with disabilities.
- c. The function of the road (e.g. local, collector, and thoroughfare) and the level of vehicular, pedestrian, and bicycle traffic.
- d. Multi-Modal Classification Street Types

Houston Complete Street and Transportation Plan - A plan that at a minimum includes the Major Thoroughfare and Freeway Plan, Bikeway/Pedestrian Plan, Rail Plan, Multi-Modal Classification Street Type and Master Parking Plan, Bayou Greenway Initiative, Context Report and METRO's Transit Plan.

Multi-Modal Classification Street Type – A public street type classification system that takes into account the functional classification (MTFP designation) and land use context, inclusive of right-of-way width, number of lanes, and traffic volume.

The context of the land use adjacent to the road comprises population and job densities (present and future), projected land use types (residential, commercial, community facility, or industrial), and modes of operation (pedestrian, bicycle, transit, rail, freight and vehicle lanes) can be used as a determinant in identifying Multi-Modal Classifications.

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Minor Collector – A public street that accumulates traffic from local streets for distribution into a thoroughfare or major collector. A minor collector typically serves residential uses. Although in some circumstances, it may serve commercial or mixed uses.

Existing definitions below that are contained within this Order are here for the ease of reading the document.

Major Thoroughfares are divided into two classifications; Principal Thoroughfare and Thoroughfare. Major Thoroughfares are those streets designed for fast, heavy traffic, high traffic volume and are intended to serve as traffic arteries of considerable length and continuity throughout the community.

Principal Thoroughfares are public streets that accumulate traffic from collector streets and other Major Thoroughfares for distribution to the freeway system. They may be a highway and typically provide a high degree of mobility for long distance trips.

Thoroughfares are public streets that accumulate traffic from Collector streets and local streets for distribution through the thoroughfare and freeway system. These streets distribute medium to high volume traffic and provide access to commercial, mixed use and residential areas.

Transit Corridor Streets are rights-of-way or easements that METRO has proposed as a route for a guided rapid transit or fixed guideway transit system and that is included on the City's MTFP.

Collector Streets are public streets that accumulate traffic from local streets for distribution to the Major Thoroughfare streets. A Collector Street may be a Minor Collector or a Major Collector.

Major Collectors are public streets that accumulate traffic from local streets and Minor Collectors for distribution to the Major Thoroughfare. A Major Collector Street may have commercial, residential or have mixed uses abutting.

7. COMPONENTS

- 7.1 The Plan, at a minimum, shall include the components specified in the table below.
- 7.2 The component plans address different transportation related elements of our City and areas multimodal transportation network. The planning horizon specifies a regular period of time an authority will look into the future when preparing an update to the plan. Validation of assumptions and reprogramming of needs will be re-modeled and re-evaluated so that amendments to the plan can occur periodically. The re-modeling will identify positive and negative data trends for analysis and possible adjustments moving forward.

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CONTENT OF COMPONENTS

Plan Components	Existing Conditions Information	Planned Information	Plan Horizon
Major Thoroughfare and Freeway Plan	Right-of-way owned or to be acquired by city, county, state or federal governments	Classification to include type, number of traffic lanes and right-of-way widths	+ 30 yrs
Bikeway/Pedestrian Plan	Route alignment, type routes	Route alignment, type routes	5 yrs
Transit Plan	Route alignment by mode	Route alignment by mode	10 yrs
Rail Plan	Rail corridors, street crossings, quiet zones	Crossing improvements; quiet zones planned and requested	5 yrs
Multimodal Classification Plan	Current section types	Future section type at reconstruction	20 yrs
Context Report	Land use and development pattern	Population and Job growth forecasting	10 yrs
Master Parking Plan	Street capacity for parking; metered zones, public lots/garages; residential permit zones	Planned lots/garages	5 yrs

7.3 The Plan components have differing planning horizons. Each component would continue to be amended on its own plan horizon – some sooner than others.

8. RESPONSIBILITIES

- 8.1 Planning and Development and Public Works and Engineering Departments along with METRO are responsible for the administration of the plan components. Planning and Development through the Planning Commission and City Council revises and adopts a new MTFP annually. The METRO Transit Plan is updated periodically through the METRO Board's adoption.
- 8.2 The parties having component responsibilities will work together when amending and updating their own specific plans in order to remedy conflicts between plans and analyze opportunities to improve comprehensively elements where they converge.
- 8.3 Public Works and Engineering or Tax Reinvestment Zone design consultants and private development design consultants will propose during preliminary engineering a design concept consistent with the Multi-Modal Classification Street Type as designated in that component plan.
- 8.4 Additional amenities in the rights-of-way, such as pedestrian lighting, street furniture, etc., will be considered on a case by case basis with PWE approval.
- 8.5 PWE will refine standards for accomplishment of the objectives and document such standards within the Department's Infrastructure Design Manual.

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COMPONENT RESPONSIBILITY

Plan Component	Content Management	Promulgation of Update
Major Thoroughfare and Freeway Plan	Planning and Development—annual process of general input as established through MTFP Policy; specific input from mobility studies	Council adoption of annual revision after Planning Commission consideration and recommendation
Bikeway/Pedestrian Plan	Public Works and Engineering, Planning and Development —annual process, inter-departmental coordination	Public Works and Engineering
Transit Plan	METRO	Planning and Development will integrate to Houston Complete Street Transportation Plan after METRO presents Transit Plan to Transportation and Infrastructure Council Committee
Rail Plan	Public Works and Engineering with Gulf Coast Rail District	Public Works and Engineering
Multimodal Classification Plan	Planning and Development—recurring process to receive proposed changes from the public by Policy TBP	Planning and Development
Context Report	Planning and Development	Planning and Development
Master Parking Plan	Public Works and Engineering with Administrative and Regulatory Affairs Departments	Administrative and Regulatory Affairs Departments with support from PWE

9. MEASURING SUCCESS

Planning and Development shall prepare a report to the Mayor on an annual basis for system-wide totals within the City limits detailing efforts that support fulfillment of The Plan. A baseline will be established with Fiscal Year 2014 and cumulative improvements documented. METRO and the Planning Department shall provide documentation related to their expertise. PWE's information will be created from permitted private development data, Tax Increment Reinvestment Zones and Management District projects, as well as the Capital Improvements Plan developed throughout the time period. Examples of this data may be, but not limited to the following:

- 9.1 Linear feet of new/reconstructed sidewalks (PWE)
- 9.2 Linear miles of new/restriped on-street bicycle facilities (PWE)
- 9.3 Number of new/reconstructed curb ramps (PWE)
- 9.4 Number of new street trees planted (PDD)
- 9.5 Number of transit stops added to system (METRO)
- 9.6 Percentage of new/reconstructed transit stops with shelters (METRO)
- 9.7 Percentage of transit stops accessible via sidewalks and curb ramps (METRO)
- 9.8 Number of linear miles of new streets constructed or reconstructed in accordance with The Plan (PWE)

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Biographical Information

Alexandra Tracz, or Xie as most people know her, was born in South Korea and raised in Sherman, Texas. As an avid traveler and lifelong learner, Xie has visited 4 continents, several countries, and a multitude of cities. Professional and research interests are transportation planning, Complete Streets, urban design and travel behavior.

In 2007, Xie received her bachelor's degree in art, with a concentration in photography and environmental science, from a small liberal arts school located in a suburb of Philadelphia named, Ursinus College. During her senior year of college, Xie participated in a study abroad program living in Prague, Czech Republic. Here she studied film, art, and the Czech language and culture, all while traveling any chance she could. It was here she discovered her affinity for spaces, places, and connectivity.

Xie started her pursuit of a Dual Masters in Landscape Architecture and City and Regional Planning in August 2010 and graduated in May 2015. She is currently employed as a landscape designer and planner at Schrickel, Rollins and Associates in Arlington, Texas where she works on a variety of projects for municipalities across the state of Texas.