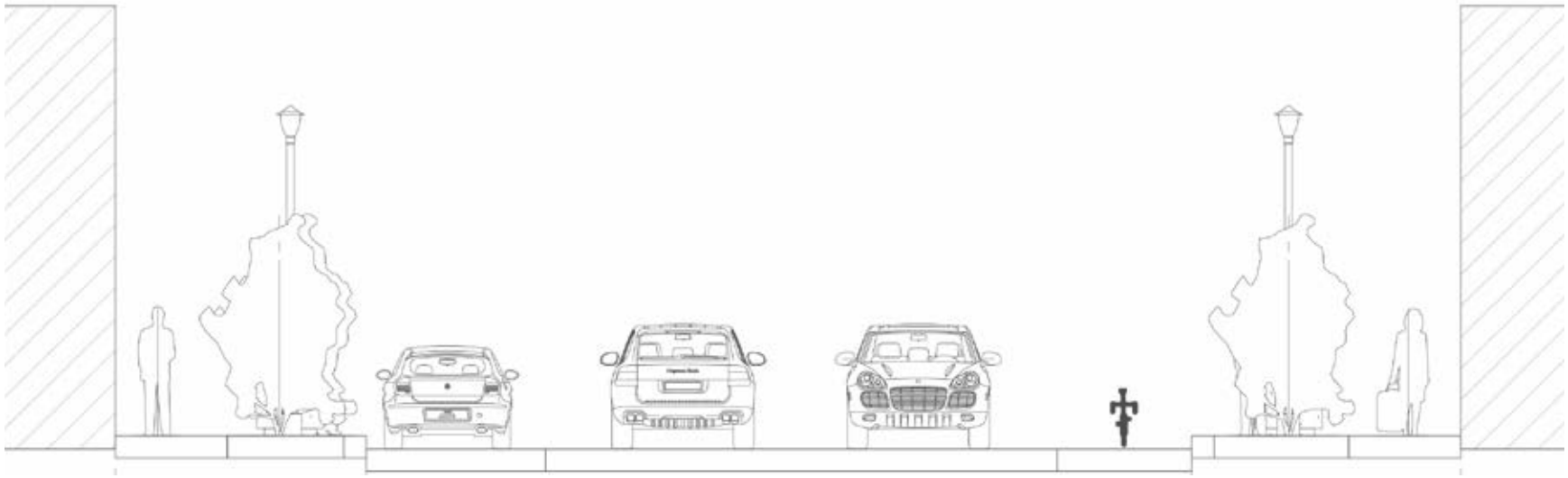
KNOX STREET AND THE COMPLETE STREETS INITIATIVE: A COMPARATIVE ANALYSIS OF COMPLETE STREET IMPLEMENTATION IN THE CITY OF DALLAS

Presented to the Faculty of the Graduate School of The University of Texas at Arlington in Partial Fulfillment of the Requirements for the Degree of Master of City and Regional Planning

Kelsey Berry | December 2013

The University of Texas at Arlington



THIS PAGE INTENTIONALLY LEFT BLANK

ACKNOWLEDGMENTS

Cabo. Nam, temqui sim quia net aut litatus cienis eatis doluptatur sitions edisquia volupta que simetur alicidelent, nobit, sae eatio iumquas sinimendunt laciatium vendeleni dolut mo torrum num alibustis qui is num, vereribus acimagn isitatu riasperiori dellum ut landem quaesti quam unt, seque non nessimos con re cume illaciet ut audit volupiderum eum fugias saperenia corem rerate pere nonsecae por reperfe runturem fugia auda quosae volut lanimpore, sitatem rerrunt estrum nam, sitaqui as que nonsendame a im sit hit que aut odit, utemposam ut ea delique posseque magnitia cus eatem. Itatem quiscip saestet fuga. Et facepedist volupta nos atisit, tectur as experfero odis esciducid et qui ute laborate iunt, cone nulla doloremo offictur alia de dit molupient officiisi des ea veneseque occullu ptaspicias ea veles debis dundaeria nossitatqui ipiendi tatasi deles a nos velit, nonsequaepre maximincimus sita quiaepro coris nonectis aut mi, conseque voloria erfernatur?

Onem denesto expel id mi, sandandicia conectem quis dolorum vitatempor as doloratet rem niminus, offici odi odit, quame odis illende nistia aut ea cum abo. Et rehenih illabo. Itatur?

Esseniet dolupti qui ratur, si commolu ptumque num sequiam resectur, accaes sintusapici as ne et, custis eaque lam doloreh endenihicia sitaque nimincid maximo eost a nulpa quatiis molore sum alis dolum re pre modis et velit as ex eiumqui scimaio nsediorio. Equaspelit eosantium eumet quam liquibea voluptas reris re, comnimi licaborehent labo. Nam harumquo minus, odiscimpost que excepernam aut ligendi pidipsum sedia des aut as volupienient laceatus aspis invendam iusciis quam si dolupit ma cus re la con ne evel idunt et ipsapienimin pliqui numque repro tem sam, sero cum quatem. Acita aut ligendi tem quam, sim es pressit laborem volupta dolo temporp orehenis audit etus modi conseria quat.

Tem am reperferum adisqui ium aut que nost aut a volor aut lam, qui tem suntion eserae nihilla cone rent etus conseribus, omnim re sequi quo voloribearit es molore ommolecum eum sunt pos explat.

Ur apic te voluptatum quibus, qui nonsequid quia dolum ium id molupid qui renistiuntia vollor maiossi ipsum ut quatas nobisincilla doloritias doluptat ium estrum et pro eum quodignime pratibeaqui volut exeribusani ducimenem fuga. Everum autati doluptatur aut as dolessim quam ea corerro quiducid et laut lantur re dolorum evendipienis rectus simaximaio. Et veliquia iur recto torecat issitae. Ut untum fugia nimpore cumquos eles ea volore, aut mi, ides eatur?

Me et pror siminia invent que prem fuga. Et omnist eossentibus volupta sitat magnimi nimolorpor accatiis aut moluptiorum vitiandit quamusa ndigendebit as eossequi ut labore por saniat faccum fugiasi doluptatur, que mil illuptatet pedi qui omnis dero quis mo mil ipsum dolorro ide quis eaquodipit adionse quibus nost, volupti onecti berrum nosae. Velesseque laboria nonseceribus eumqui sit fuga. Nam ut aut aute eatus alibusant et vent quo modi il molor as dolest aspiendi conet molecus dolo et et quidunt maiossit, quameni enistiat quatem fugitas in consequisiti nis dit pra del ium, verum reptium qui rehenet aruntio. Verferspit, odi comnis im quis vellatem lautem aut essimpe rferior umquam, serum voluptaquae. Xerae delicil luptatq uamusa dolorrunti cum nihilitiunt.

Ribus comnis endio destem faciam quodiame volorep elendit, omnis dolori ipitasp ernam, consequas dolores es audae verchit molorecatur sam dolorum que ne dignimo loriberunt re et alit quo ipsam accusam, nimi, quam alitae. Mus suntur? Ite molor aut quia sus.

Ne volupta volecus magnisquae nonsequi con et et reperumet labo. Venis dolestorerci sae nist ad quaeseq uoditas que veliqui aspedi queBeaquam vit accusandi nonesti umquis ipsam volestiam int re invendiUs nis renit qui volecto te volores aut faccatiurem fugita con essintur a venditio. Quamusda cum is ent earchil iuntur seque explicium nonsect emposti voluptati blant, consedipsam volut ipsam iur adipicto optatib

THIS PAGE INTENTIONALLY LEFT BLANK

ABSTRACT

Knox Street and the Complete Streets Initiative:
A Comparative Analysis of Complete Street Implementation in the City of Dallas

Kelsey Berry

The University of Texas at Arlington, 2013
Supervising Professor: Ivonne Audirac

Sed eum fugiaec tassequi blab invenisin conem et ut alit esti non rem fuga. Ehenderro exerepel inctatiam am et aut erum rerum dolliquid min nima eum quidias asperruntem resciis aut iumqui tecero doluptam cone conserupis ulparum aperibe rerfernatqui cone comnimint fuga. Nequam eaque que ex ex eveliqui temquiatia dolorerum sunt acillest, as ape quis et vendignimpos sediore perumque nonseque quae eatur, ut volessimus autaectem qui omnis si culliqui alia vent.

Optaecae provita iur re dolut eicil is quidem asped que culles maximodis iurempo rporuptate volupitiossi volore et aut aligenihit fuga. Ut lacea dolorporum voluptatust, erum volesto rectus pel et hitatis deria ped et optaquis simin el maximusdae pe renita vellis ea qui culliqui conseni stionsectate ped que aut aut ab ipsa volendam niatqua sperum dessus dolum laut unt aut ium accum sendaerro is aut occum cus accum nusapie nduntionse sunti qui te sunditam rest plicipictum qui aceria int accatisqui de sus apitium laut vellatem facepelique pro que nisquod quunt, que nat pel maionsequia volest, utat volor adiorem am repreri nulpa si voluptates aut reperchil expelignim faccabo riaspient experit exped qui ape sendit optam lacea solum volore pere et et litiniscid quiae vellore, comnihil illa que latur susam rem raes doluptatur acearit quuntiasped quaspe pro que qui cusant la dus aut voluptis est voluptiur aut aliquat res ide et as ario. Ut volupiciatur aut diorroreptat exere sum ipsam di aut fugitibus alic tem am, sum quia sint eium ilignam harunt inctem in coressit, versperrum esto tem exerchi llest, quas dolore nima quam fugitasped exercil id et verro corerspissim rem quamus.

Igendebitium es non res as et ium lam quuntur? Eque suscipsant eum resecto odipsaerum quatemque eos apidem simi, qui re, imolori antur?

Sed et quam volo int que plibearibus doluptatiae sinveles cusa peris asped quid magnati onsenim velignis mod ut ma nam vendae nullabore Em re, adis re prae dent que pe nonseca borpos volorum quam siminimped unt quuntectas voloremporro in restor ad quidel modi quam esenimaiosam cum que porate audi corpores ius dolupti conserum quam volupta tatium inum la doluptatqui dest, officiis et, to consed et fuga. Nam, volenet enissuntiur, nus as rat.

Sus dolora iurion eum, toritiu ntibusam etur magnate perferum, offícti reicimi, corum quae dignitat.

Sunt la velicid qui delestiunt at vendanditias eserum dem vendam fugia a vellorp orerionecus sa aut et laciliquam qui cuptasi dolorem elesequ ibusdam, con natecto ribusdanis sandit pa aut venducid que simusto cullabo. Od ut pos delestion prem autaqui offic tem que inveniti quodiatur?Berferupic to odio vendant eatus dit plic to magnimo lorrunt.

Velessitio ma volute verum audicit et illaut et vit ad quate ne nones min porest, accus et odi sitiur apiet voluptae nus eum alique quosto blant,

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF FIGURES

THIS PAGE INTENTIONALLY LEFT BLANK

LIST OF TABLES + GRAPHS

THIS PAGE INTENTIONALLY LEFT BLANK

The Knox Street district, located just a few miles north of downtown Dallas, Texas, offers a variety of high-end retail, residential, and commercial use options. The increased popularity of downtown Dallas development and the Knox/Henderson neighborhood has drawn attention to the community situated on the edge of Highland Park and Dallas. Knox Street is a corridor connecting several neighborhoods in the surrounding area, including Highland Park, Uptown, University Park and Southern Methodist University. Knox Street's proximity to local amenities, such as West Village, Katy Trail, Mockingbird Station and Greenville Avenue. The corridor's mixed use; as well as its existing pedestrian infrastructure gives Knox Street a leading edge as a demonstration project for surrounding districts.

This study examines Dallas' Complete Street best practices and their implementation on the Knox Street project. It asks: how effective has the implementation of this demonstration project been? It aims to answer this question by first comparing the City of Dallas' Complete Streets Manual draft with nationally established Complete Streets best practice literature and then performing a SWOT analysis - with project stakeholders' input - it seeks to gauge how effectively and successfully these practices have been implemented in the Knox Street Public Improvement District (PID). Lessons from this study may be useful in future demonstration efforts.

DALLAS COMPLETE STREETS INITIATIVE + KNOX STREET

The City of Dallas launched the Complete Street Initiative in June 2011 with the hopes of "…instituting a new approach to designing and building streets" (City of Dallas 2013, 3). The idea was to implement these new ideologies onto streets throughout downtown Dallas in the effort to spur economic development, mitigate growth and encourage multimodal sustainability. One of the first streets selected as a Complete

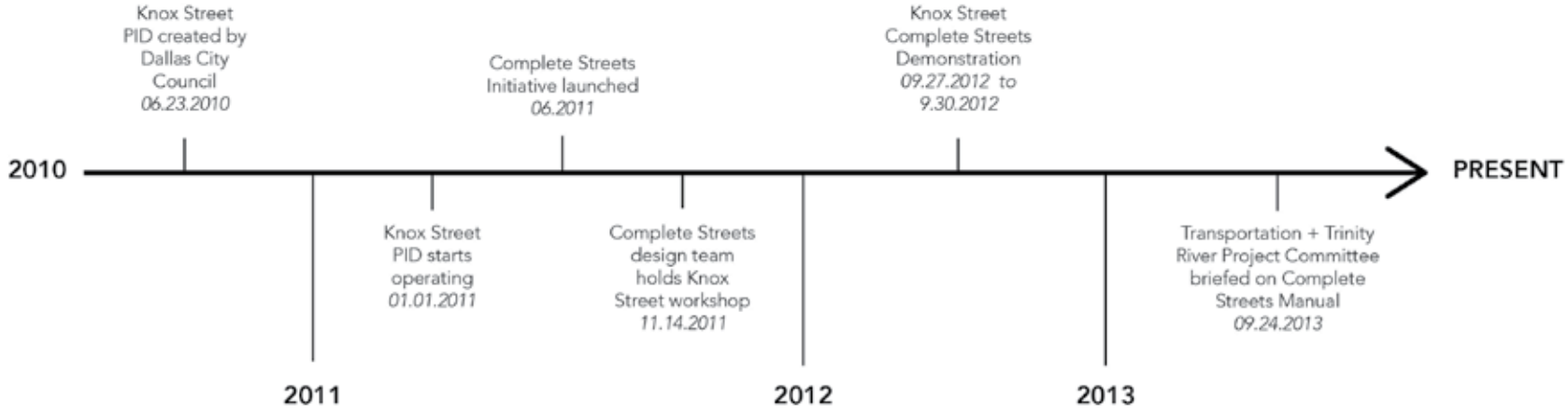
Figure 1: Knox Street Looking East

Knox Street intersects with McKinney Avenue with retail stores Apple, Z Gallerie, Crate and Barrel and with restaurant Chuy's.

Figure 2: Knox Street Looking West

Knox Street continues to Katy Trail and various multi-family residences, as well as additional retail and commercial buildings.

Figure 3: Implementation Timeline



This small timeline shows how the Complete Streets Initiative, as well as the Knox Street Public Improvement District, have developed over the last four years.

Street test and implementation project was Knox Street. Other streets slated for potential Complete Streets treatment include Henderson Avenue, Jefferson Street in Oak Cliff, Main Street in Deep Ellum, Greenville Avenue and Alpha Road (Lucero 2012). The Complete Streets team then began to work with Knox Street to create a vision and a plan for revitalizing and transforming the small corridor and recently created Public Improvement District. In November 2011, the design team held a public workshop with Knox Street community members to gauge perceptions on the issues affecting Knox Street and ways in which people thought they could be improved. Several people who attended these workshops stated parking, traffic, signage, bicycling, connectivity and pedestrian friendliness were all issues Knox Street needed to work on and hopefully improve in the Complete Streets process (City of Dallas 2011). These results subsequently led to a four-day demonstration project September 27 through September 30, 2012 in which Complete Street installations were temporarily set in place along Knox Street to test their effectiveness and community popularity. These results were integrated into the Complete Streets Manual released in September of 2013 and serve as a basis for this project's research. The timeline below shows the City's project progression as well as the history of the Knox Street PID as it relates to the Complete Street project.

These factors lead to the question: Is the City of Dallas' recent efforts to implement a Complete Streets initiative and demonstration project on Knox Street an effective project and has this project been implemented successfully?

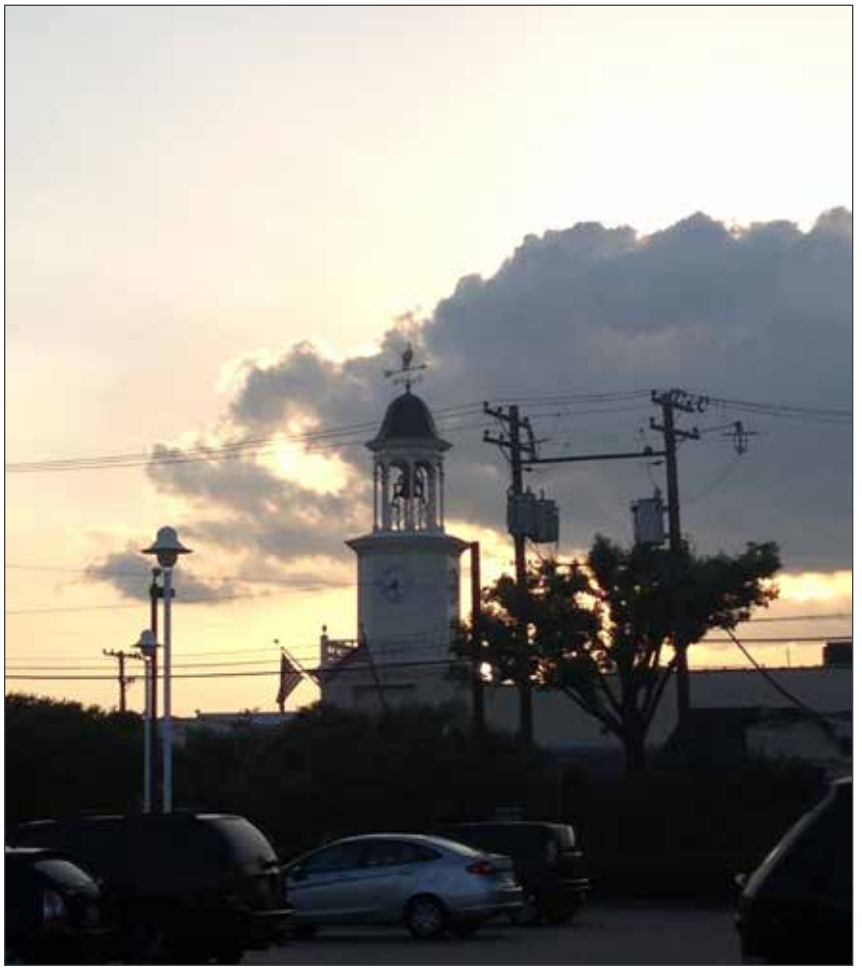
DOWNTOWN DEVELOPMENT

The rise of high-end residential and commercial developments over the last decade has given Knox Street an unique opportunity to improve its pedestrian-friendliness and its urban design aesthetics, while simultaneously reducing local auto-dependency, which is not only true for those who live nearby. Several people come to Knox Street from outside the neighborhood and also must drive to get there. The street has proven to have a viable economic retail and commercial agglomeration, mainly centered on high-end home furnishing stores and restaurants oriented at sidewalk dining. Each of these uses continues to draw visitors and will most certainly continue to be capitalized for future street development projects.

However, Knox Street also faces challenges that could potentially hamper potential success. Knox Street, a four-lane, undivided community collector (City of Dallas 2004), intersects U.S. 75 by an on-and off-ramp and the frontage road often experiences heavy congestion, convoluted parking and inefficient traffic flow. Knox Street's proximity to U.S. 75 deters pedestrian activity at stores closest to the intersection due to the high number of automobiles and lack of sidewalk buffers. Pedestrians could feel unsafe and exposed to traffic as they make their way to stores along the frontage road or as they attempt to cross U.S. 75 to reach Henderson Avenue. The narrowed entrance to Knox Street off U.S. 75 also acts as a barrier to traffic flow because the intersection becomes congested as cars try to either enter the street or leave one of the off-street parking lots via the side alleys.

The sidewalks along Knox Street vary in size and condition as each building has a different setback off Knox Street, McKinney Avenue and Cole Avenue. Parking spaces vary in their orientation to the street (head-in or

Figure 3: Knox Street Landmark



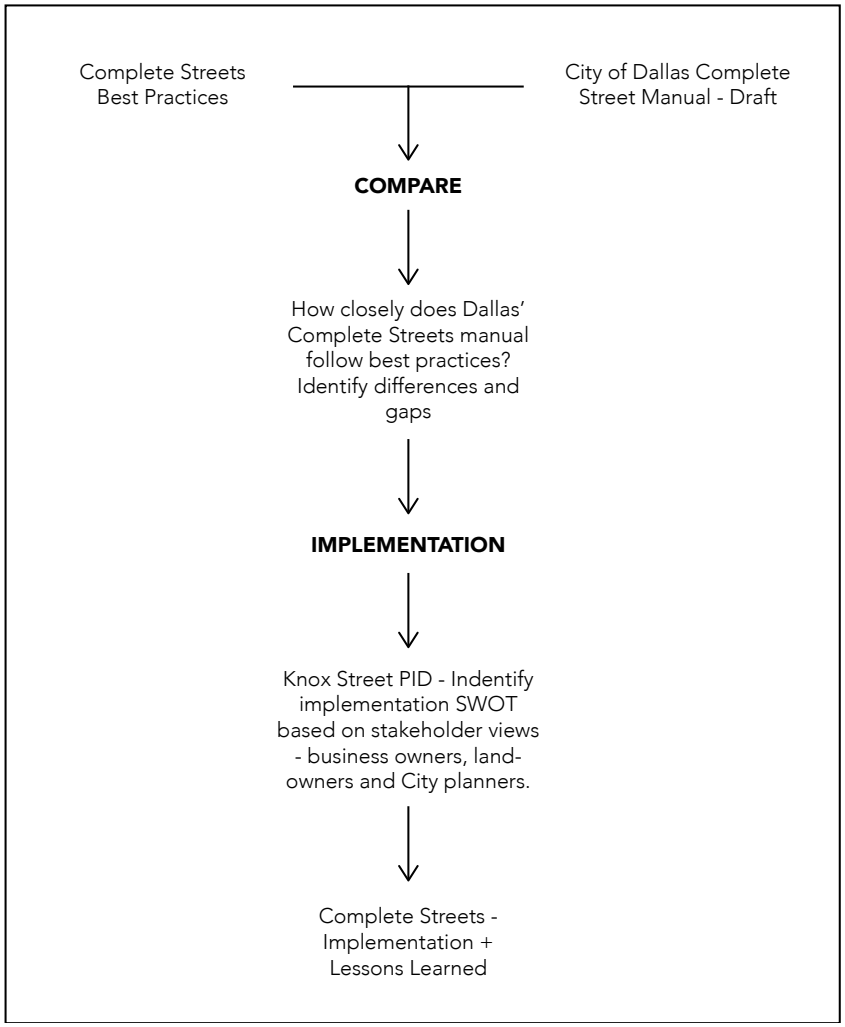
A bell tower stands above all the buildings on Knox Street and serves as a marker of the community.

angled and parallel) and size, which impacts the width of the sidewalks. Vehicle bumpers invade sidewalks and impede pedestrian flow,as pedestrians have to navigate around the vehicles and other pedestrians. Visible parking in the area includes on-street parking and surface lots closest to U.S. 75. The off-street parking lots are located behind the businesses and these lots are often difficult to see or access since people are required to navigate through narrow alleys to get to them. There is also very little wayfinding signage along Knox Street to indicate the location of these lots. Cars travel on Knox Street at approximately 30 to 35 miles per hour depending on traffic conditions, which makes pedestrian crossings hazardous and unwelcoming. The intersecting streets of McKinney Avenue and Cole Avenue, both of which are one-way minor arterials (City of Dallas 2004), also add challenges to area motorists and pedestrians because several times, as personally witnessed, motorists do not realize the roads are one-way and will often turn into on-coming traffic. Cars also attempt to pull U-turns to access on-street parking spaces on the opposite side of the road. These actions lead to slower traffic flow and higher automotive congestion.

These issues all make Knox Street a potential candidate for a Complete Street makeover. The City of Dallas included the Knox Street Public Improvement District (PID) in its Complete Streets Initiative and has worked with several local consultants and landowners to create a vision that will potentially solve several of these issues currently impacting the area. The Knox Street PID is also what makes this Complete Streets Initiative so unique as the funding for such an undertaking would not have been possible without the support from landowners.

The City of Dallas lacks in pedestrian-friendly development and has been

Figure 4: Professional Report Flow Chart



working over the last few years to improve this reputation. The City is working to repair its disconnected downtown by promoting large-scale development such as Klyde Warren Park and Museum Tower, and the increasing popularity of neighborhoods like Uptown and Oak Lawn, show the effort is paying off. In a neighborhood located in close proximity to upscale homes, shopping, and a central business district, it is vital to garner as much public support and opinion as possible when attempting revitalization or improvements. For example, in an article titled "Instant Urbanism," Karrie Jacobs discusses her personal experiences in Dallas as a frustrated pedestrian as well as the various ways she has perceived the city's attempts to improve connectivity. Jacobs remarks one of the central problems the City of Dallas faces as it has a reputation of being the example of all the thing "...you don't want a city to be" (Jacobs 2012, 1). She then goes on to discuss how she views these surges in local development a sign that the city is heading in the right direction, or a place less dependent on automobiles and more focused on connecting people. This type of attention is needed for areas like Knox Street as the downtown continues to experience growth and change becomes inevitable.

KNOX STREET PUBLIC IMPROVEMENT DISTRICT

Currently, Knox Street district does operate as a Public Improvement District (PID). The PID was created in 2010 (Dallas OED 2013) and consists of approximately 57 properties. The general nature of the PID is currently defined in terms of "…service and improvements...to enhance security and public safety, maintenance, marketing and promotion... "(Dallas OED 2013). While each of these items is necessary for the future success and safety of the district, the PID does not address streetscape enhancements or improvements. Adjusting the PID to include streetscape improvements and other related projects could not only help finance the project, but could also potentially ease the financial burden on other PID budgetary items, such as public security and safety.

T**he Knox Stree**t PID is unique in the City of Dallas as it is the smallest public improvement district and the most recent one. It has the potential to provide several benefits to business owners in the future and serve as a demonstration project to future PIDs and Complete Street projects. The increased business growth in the Knox Street PID shows the site is going to undergo transformation as more businesses and people relocate to the area. The site, however, needs further improvements to handle this onset and future vehicular and pedestrian traffic growth.

STUDY PURPOSE

This study compares the Knox Street Complete Streets Initiative and its subsequent implementation efforts vis-a-vis the City of Dallas' Complete Street projects goals and guidelines. Best practice literature is also used to analyze the City of Dallas' Complete Street Manual draft in an effort to understand the strengths, weaknesses, opportunities and threats the project might have. The intended conclusion is to identify and analyze the issues affecting implementation, the nature of the private and public sector relationship and any gaps between the City's design intentions and landowners' expectations. This professional report intends to ascertain the successes and missed opportunities that occurred in the PID's Complete Street implementation process and hopes that the findings and lessons learned will be of utility to the City of Dallas in future Complete Street projects.

Components of this report include:

1. A literature review of key complete street aspects ranging from de-

sign considerations to economic and health benefits;

2. A comparative analysis of leading Complete Streets professional guidance and the City of Dallas' Complete Streets draft manual in order to identify differences in approach between the City and established best practice;
3. An evaluation of the City of Dallas Complete Streets practice as implemented in the Knox Street PID;
4. A SWOT analysis of the Knox Street PID implementation issues based on public and private stakeholders' input obtained from interviews
    a. Interviews included:
        i. City Officials, including those involved in the Complete Streets Initiative and those in the long-range planning department;
        ii. Land-owners and other stakeholders of the Knox Street PID
        iii. Private sector individuals who participated in the project
5. Lessons learned.

The following studies and articles are only a small sample of what has been published in regards to streetscape revitalization and Complete Street efforts in downtowns or neighborhoods congested with vehicular traffic and in need of more pedestrian and multi-modal activity. The articles and studies presented are organized by subject matter. The literature reviewed shows almost unanimously that improving the streetscape with elements that encourage multimodal activity has brought some form of economic revitalization to the community and that the improvements have encouraged more physical interaction with the environment in terms of human connectivity and greater urban design standards. These findings serve as a basis for the Complete Streets analysis because Knox Street contains several of the same elements listed in similar areas deemed ripe for this type of revitalization. This unique combination of amenities could attract more pedestrian activity and reduce traffic congestion with the desired improvements, which would likely abet business growth and economic development, while also providing more transportation options for individuals wanting increased connectivity between Dallas' various neighborhoods. Dallas' Complete Streets Initiative has the potential to bring these successes to the community and can help broaden the multi-modal spectrum that the city is currently lacking and seeking to improve. This report identifies successful implementation strategies and key qualities found in the Knox Street PID Complete Street project. It also draws lessons from this experience that may be necessary for continued economic transportation successes all in an effort to demonstrate the project's strengths, weaknesses, opportunities and threats with hopes of creating an analysis that will help improve future projects and sustainable Complete Street implementation.

COMPLETE STREETS

A Complete Street, the main philosophy behind the suggested improvements to Knox Street, can have various interpretations and applications. However, before delving into the technical applications of Complete Streets, a general definition is required. LaPlante and McCann's article "Complete Streets: We Can Get There from Here," states that, "A Complete Street is 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, 24). The general principle is to create a street where pedestrians, bicyclists and other forms of transit can safely co-exist. Streets have often been designed without much consideration for the pedestrian focusing instead on the automobile and traffic flow. Knox Street has several automotive-friendly characteristics and could benefit from the installation of Complete Street features, which "…focus more on road users and [are] about making multimodal accommodation routine so that multimodal roads do not require extra funds or extra time to achieve (Complete Street functionality)" (LaPlante and McCann 2008, 25).

The National Complete Streets Coalition, a part of the Smart Growth America organization, focuses on nationwide Complete Streets implementation and provides cities and planners the tools necessary to implement these projects and policies. This organization's Complete Streets definition keeps things simple and states, "Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users…Complete Streets make it easy to cross the street, walk to shops, and bicycle to work" (National Complete Streets Coalition 2010). This organization recognizes the unique characteristics each street has and that no Complete Street project will look the same. However, the measurable outcomes from a successful Complete Streets project can include increased safety, encouragement to walk and bike for health, lower family transportation costs, and stronger communities. This organization focuses on grassroot implementation initiatives and looks to the commu-

nity and policy influencers to initiate change and improve communities across the country.

The implementation of a Complete Street policy requires several different steps, funding sources and community participation. According to LaPlante and McCann agency policies need to be examined and possibly rewritten; staff must be trained; and the appropriate data needs to be collected to prepare for performance improvements and later project implementation (2008, 25). It is important to acknowledge that every aspect of a Complete Street outlined in official documents might not serve the selected site best and consultants and planners must approach each project individually for the Complete Street to be successful. This should also include the rewriting of any design manuals for the City for better implementation. The City of Dallas recently published a new Development Guidelines manual in addition to the recently released Complete Streets Design Manual draft, which reflects on the Knox Street demonstration day and the Complete Street elements it applied.For Knox Street, these preparations have already been undertaken and are in the process of implementation. The City also held a mock-implementation day on Knox Street to demonstrate to the community how these Complete Street improvements might impact the area as well as how they might improve the street. The City integrated the lessons learned into their Complete Streets Manual and gained a better understanding of what policies and design choices would work best for Dallas in general and the Knox Street location specifically.

One of the largest contributors to a Complete Street is the reexamination of automobile speeds. Several studies and articles have shown that the selected speed for a Complete Street is critical to the projects success and will allow "…safe movement by all road users, including more vulnerable pedestrians and bicyclists" (LaPlante and McCann 2008, 26). Burden and Litman support these ideas in their article, "America Needs Complete Streets," by stating, "The major transportation problems facing most communities…can all be addressed by creating multimodal transportation systems that allow the best mode for each trip…" (Burden and Litman 2011, 36).Complete Street policies and projects, according to these articles, can help reduce the number of automobile related deaths in the country and improve the rates of individual and community health – much of which can be catalyzed with reduced vehicular speed.

Complete Streets policies often include: a vision for how the community encourages street connectivity; adaptability by all agencies; establishment of performance standards with measurable outcomes; and specific next steps (Burden and Litman 2011, 36). These provisions facilitate further citywide implementation and more opportunities to study Complete Street effectiveness. Once these measures have been undertaken, cities can begin implementing design control factors to the selected street. Complete Street design features include: narrower travel lanes; road diets; raised medians; curb parking; curb bulb-outs; crosswalks; pedestrian crossing warning signs; full signalization; and intersection countdown clocks (LaPlante and McCann 2008, 27). These features, according to the authors, can make the implementation process even more successful and help tame traffic, while also contributing to business and economic growth. LaPlante and McCann (2008) and Burden and Litman (2011) all agreed that the ideology behind Complete Streets stems from Jane Jacobs and her belief that a planner cannot understand how to deal with traffic and the automobile until he or she understands how the city itself works.

The American Planning Association (APA) released a *Complete Streets: Best Policy and Implementation Practices* publication edited

by Barbara McCann and Suzanne Rynne (2010) that outlined various Complete Street policy case studies throughout the United States. The implementation of a successful Complete Street policy is just as important as the Complete Street design and, according to the APA, "Complete streets policies come in many shapes and sizes… policy makers at both the state and local levels have passed complete streets laws and ordinances" (McCann and Rynne 2010, 23). The case studies draw heavily on the National Complete Streets Coalition and the 10 elements identified as essential for comprehensive complete streets policies. These elements are:

1. Includes a vision for how and why the community wants or needs complete streets;
2. Specifies that "all users" includes pedestrians, bicyclists, and transit passengers of all ages and abilities, as well as automobile drivers and transit-vehicle operators;
3. Encourages street connectivity and aims to create a comprehensive, integrated, connected network for all modes;
4. Adoptable by all relevant agencies to cover all roads;
5. Applies to both new and retrofit projects, including design, planning, maintenance, and operations, for the entire right-of-way;
6. Makes any exceptions specific and sets a clear procedure that requires high-level approval of exceptions;
7. Directs the use of the latest and best design standards while recognizing the need for flexibility in balancing user needs;
8. Directs that complete streets solutions will complement the context of the community;
9. Establishes performance standards with measurable outcomes;
10. Includes specific next steps for implementing the policy (McCann and Rynne 2010, 24).

These elements should inspire and direct Complete Streets design and initiatives to find the best solution possible for the community, while following these precedents. These ideologies are laid out in several materials presented and discussed later in this paper, including the Institute of Transportation Engineer's *Context Sensitive Solutions* manual as well as the City of Dallas' Complete Streets Initiative Manual – Draft. The design solutions presented in those guidebooks contain elements of each of these best practice suggestions.

The APA and McCann and Rynne reinforce the context-sensitive approach as they state, "Sensitivity to the community context is essential to an effective complete streets policy…(it) can allay common fears…(and) can also help bridge the traditional divide between transportation and land-use planning" (McCann and Rynne 2010, 31). Cities who undertake the initiative to instill Complete Streets policies in their community need to understand the public's worries or fears with such projects and work with as many professions and networks as possible to ensure no project is inappropriate for the context within it is placed. An area's context includes the buildings adjacent to the site, the right-of-way, the sidewalk, street furniture, the individuals and families who visit the site, the people who live near the site, as well as the stores and restaurants and the commodities they sell.

Equally important in the consideration of Complete Streets and their implementation is the provision of open space and community interaction within this space. Schmidt and Nemeth (2010) discuss this consideration in their article, "Space, Place and the City: Emerging Research on Public Space Design and Planning," as they state that "…the production of public space is now interpreted as a normative goal unto itself" (Schmidt and Nemeth 2010, 453). For these authors, public space has evolved from the literal understanding of "public" to its current condition as an

amenity capitalized in development that can bring economic growth to a city. This has led to an "…increased reliance on the private sector to provide publicly accessible spaces…" (Schmidt and Nemeth 2010, 255). This understanding has led to the broad consensus that public spaces, or Complete Streets, must be perceived as safe in order to fulfill their lasting potential to a growing number of Business Improvement Districts (BIDs) and increased public-private partnerships.

The Institute of Transportation Engineers in partnership with Congress for the New Urbanism released a recommended practice book to guide planning and transportation professionals in creating walkable urban environments. This "Context Sensitive Solution" or CSS has been used in reference to several studies and in the current City of Dallas Complete Streets Manual draft. The book is designed to "… provide guidance for the design of walkable urban thoroughfares in places that currently support the mode of walking and in places where the community desires to provide a more walkable thoroughfare…" (Institute of Transportation Engineers 2010, 3). The application of context sensitive design and associated methodologies can help project success because it forces planners and designers to be responsive to local context. The CSS emphasizes the significant role streets have had in human history in terms of economic exchange and social interaction. The twentieth century has divided the two realms, the street and the pedestrian, and it is important, according to the authors of the book, to reunite the two through the creation of walkable communities. Knox Street possesses the economic support for community interaction and these interactions could be improved upon with the creation of a more walkable urban environment, or Complete Street. A more in-depth analysis of Complete Street characteristics and design standards is presented in the following chapter.

THE PUBLIC IMPROVEMENT DISTRICT + THE BUSINESS IMPROVEMENT DISTRICT

The issue of financing a project or any revitalization effort usually arises as the first question people ask when a project is proposed. The utilization of Public Improvement Districts (PIDs) or Business Improvement Districts (BIDs) has found success in the past as a means of funding community improvements such as streetscape enhancements and traffic calming initiatives. However, the utilization of such districts is relatively new and few studies exist on the actual benefits the districts provide. Knox Street's Public Improvement District is unique in the Dallas-Fort Worth metroplex as it is extremely small compared to the other PIDs in the City of Dallas - only 5 blocks or approximately 57 landowners. This provides a unique opportunity to study the PIDs effects on the surrounding Dallas community and discover how participating business owners and community members utilize the PID to better the surrounding environment, improve economic growth and increase community safety.

Some studies have shown that benefits of PIDs/BIDs can lead toa reduction of crime and the implementation of planning policies. For example, Lloyd et al. (2010) discuss the usefulness of business improvement districts in the United Kingdom and the United States in terms of the BID's operational effectiveness and ability to solve community problems. The authors consider the issues surrounding the "...origins, development and application..." of BIDs in an attempt to analyze how they have influenced the evolution of urban policies. The authors then analyze the positive and negative aspects of BIDs and how the application of BIDs in the United Kingdom might be put to better use to create more sustainable policies. It is discovered through their analysis that BIDs have high potential to assist in downtown revitalization efforts and the use of BIDs on an international level would have applicability for greater success, but the BIDs problems

with City and bureaucratic public and financial accountability need to be taken into consideration before any policies are actually implemented because of the high level of bureaucratic and planning interventions.

Similarly, Hoyt (2003) discusses business improvement districts (BIDs) as an economic development tool and their ability to provide the participating area with supplemental security and sanitation services in her article "Collecting private funds for safer public spaces..." The author analyzes the general theoretical concept of BIDs and their successes and failures in reducing crime and sanitation issues in the communities they serve. She discovers that the extra security and sanitation services BIDs provide do deter criminal activities such as theft and burglary. Due to their successes, however, she states it is necessary to develop more sophisticated models for evaluating their impacts and whether or not BIDs cause wealth-based inequalities. Lloyd et al. (2010) and Hoyt (2003) assert that BIDs/PIDs have beneficial impacts on their communities, however, due to their newness in application, several kinks must be worked out of the operational system in order for them to be fully effective.

PUBLIC HEALTH

Increased physical activity obviously has a direct relationship to personal and public health. In communities where individuals are encouraged and able to walk more, the levels of public health appear to be higher rated. One of the direct correlations with increased pedestrian activity and walkability is the inclusion of paths and sidewalks designed for the pedestrian in mind, not the vehicle. For example, in "Proximity to Trails and Retail: Effects on Urban Cycling and Walking," Krizek and Johnson (2007) perform an analysis on community neighborhoods to determine if a neighborhood's proximity to trails or specialized infrastructure increases bicycle use or walking among residents. To assess these factors the authors reviewed relevant literature and then conducted field research in the Twin Cities of Minnesota. The authors found that the proximity to off-street bicycle trails has no effect on bicycle use, but on-street bicycle lanes increased the chances for bicycle use. It was also found that individuals with neighborhood retail within 200 meters of their home walked more than those with retail located at least 600 meters away.

POLICY

The current conditions of the site and the conditions of planning work in general are all heavily influenced by policy. Although a project might have tremendous benefits for a community, it can be halted by opposing or contradictory policies and the decision-makers who implement said policies. To truly have an impact on the community, it is necessary to examine any policies that might affect the design and implementation of a Complete Street project and any associated streetscape improvements for walkability. The numerous studies that examine the positive and negative implications of policies on such projects all agree that policies need to be amended to encourage more pedestrian-friendly design and discourage auto-dependent design. For example, in "Sidewalk Planning and Policies in Small Cities," Jennifer Evans-Cowley (2006) looks at the need for improved conditions for pedestrians in communities. One major factor disrupting any comprehensive pedestrian-oriented or sidewalk improvement plan is the shifting of responsibility of sidewalks onto private developers or property owners. This leads to inconsistencies in sidewalk conditions and discourages people from walking to their destinations, even if the destinations are located within walking distance. Evans-Cowley studied a small community in Central Ohio to assess the impact of sidewalks on a community by interviewing its managers to determine the city's plans for sidewalk infrastructure and how these plans were being implemented. The results showed very little was being

done to implement any policies and improvements on sidewalks were not being done. To begin to remedy this, the author suggests working to encourage more public support and creating a pedestrian network that links destinations. These small steps should lead to a more pedestrian-oriented community and safer walking environment.

Similarly, the influence the built environment has on the pedestrian and policies aimed at guiding design are analyzed in "The Effectiveness of Urban Design and Land Use and Transport Policies and Practices to Increase Physical Activity: A Systematic Review" by Gregory W. Heath et. al (2006). The authors reviewed studies that addressed environmental and policy strategies aimed at promoting physical activity, street-scale urban design, and land use policies. Each of the variables in the study was classified according to the types of infrastructure or policies in place and the measure of physical activity was used to assess effectiveness. As a result, two of the studied interventions were found to be successful in promoting physical activity; these were community-scale and street-scale urban design and land use policies and practices. This helps to show that communities and cities need to implement policies based on these two factors and make them a priority of public health practitioners and community decision makers.

Policy can also influence urban form, which then goes on to impact future developments and neighborhood growth. Due to policies favoring vehicular traffic over pedestrian traffic, parking lots and structures generally take precedence. Manville and Shoup (2005) examine how off-street parking requirements affect urban form in "Parking, People, and Cities" by analyzing the relationship between population density and streets in cities. The authors found that denser cities devote more land to streets, but also have less street space per person which helps explain why dense areas "...have less vehicle travel per person but higher levels of congestion" (Manville and Shoup 2005, 233). These factors combine to help in the creation of an overabundance of parking. To change this, parking must not be considered an automatic aspect of the planning process anymore. The authors suggest changing zoning requirements for off-street parking to maximums, rather than minimums and suggest studying cities like New York or San Francisco for examples of how to do it.

Overall, a nation-wide effort to encourage walkability and a change in urban policy must be undertaken. In "Designing the Walkable City," Southworth (2005) argues to achieve walkable cities in the United States it will be "necessary to assess current walkability conditions, revise standards and regulations...and promote public education" (246). A walkable city, according to Southworth, has six criteria that determine a successful pedestrian network. These criteria are connectivity, linkage with other modes, fine-grained land use patterns, safety, quality of path, and path context. A city must implement these factors into its comprehensive plan and development goals in order to truly create a successful walkable city and reduce auto-dependency.

DESIGN

The sheer number of streets that need improvements allows several studies to be conducted and analyzed. Each situation, while similar on the onset in terms of improved safety and pedestrian-friendliness, has differences in terms of outside influences and community perception. Each community or neighborhood has different qualities residents might find more valuable than others and it is important to take these into consideration for future study and design processes. Knox Street provides a unique atmosphere for research-based design and analysis using these studies as a foundation. For example, the authors Ewing et al. (2006) evaluate urban design qualities in relation to walkability by creating a

field survey method aimed at helping designers in "Identifying and Measuring Urban Design Qualities Related to Walkability." According to the authors, current research methodologies used to characterize the built environment do not look at enough factors in the attempt to determine an area's walkability. Their research looked at creating new "...operational definitions and measurement protocols..." (Ewing et al. 2006, S223) to determine which urban design factors are more related to walkability. To assess the current methods and determine the new methods the authors recruited an expert panel, shot video of streetscapes, had the expert panel rate the urban design qualities of the streetscapes, measured the physical features of the streetscapes, and statistically analyzed the relationships between the physical features and the urban design quality ratings. As a result, the authors were able to create a new method of determining walkability and a more efficient way to conduct further research.

Similarly, the basis of encouraging pedestrian activity lies with sidewalks and their design and perceived level of safety. Lee, Jang, Wang, and Namgung (2009) discuss the importance of sidewalk design to in "Design Criteria for an Urban Sidewalk Landscape Considering Emotional Perception." The authors compared various sidewalk design criteria, including sidewalk width, tree height, greenery, sky, roadway, and the built environment. Objectives of their research looked to show or establish that such improvements would reduce vehicle transportation and create a more comfortable walking environment. According to the authors, pedestrians' satisfaction with their environment depends on their emotional perceptions. Participants were surveyed and it was found that the harmoniousness and vision of a sidewalk landscape are closely related, meaning it is necessary to provide trees and an appropriate sidewalk width. The scope of this research allows an assumption for the Knox Street streetscape in that the various sidewalk conditions around the community need to be improved before a successful revitalization project can be considered fully implemented. The current conditions of the site do not conform to each other and based on these studies the sidewalks do not meet the criteria pedestrians subliminally seek in their environments.

Community and roadway safety consideration are additional issues that must be thoroughly researched before project implementation. A street with more landscaping and wider buffer zones between the pedestrian and vehicle realms will theoretically experience a higher level of pedestrian-perceived safety. The number of auto-related accidents could also decrease, as mentioned in previous sections and studies. For example, in "Landscape improvement impacts on roadside safety in Texas," Mok, Landphair, and Naderi (2005) examine if the claim that appropriately landscaped roadside scenes have a reducing influence on travel related stress. To test this claim, the study used a comparison of before-and-after crashes as a quantitative measure for roadside landscaping. This was meant to determine if landscaped sections of roadways were indeed safer than an unlandscaped section. The authors looked at roadways in Texas and found a significant decrease in the crash rate after landscape improvements were put into place. This led to the conclusion that the use of roadside landscaping has a positive effect on driver performance and perception.

SOCIAL VALUE

In a community like the one surrounding Knox Street, social connections and interaction is vital to the area's success because of that characteristic's value to visitors and residents. A successful urban environment will support and generate social connections. This effect has been thoroughly studied as a factor that makes a community successful and as an element that people express they want to see come to their community. For example, Eric Dumbaugh and J.L. Gattis (2007) discuss the double

role urban thoroughfares serve as places for vehicular transportation and as places for public engagement in "Safe Streets, Livable Streets." The authors elaborate on the benefits of pedestrian-friendly streets as places where "...economic growth and innovation, improvements in air quality, and increased physical fitness and health" (Dumbaugh 2007, 283) are all more likely to occur. A major factor in creating these livable streets is the consideration of features such as trees and on-street parking. To assess whether more livable streets are indeed safer streets, Dumbaugh and Gattis examine various studies that have been done on road safety design. The authors use a simple empirical test to determine if the designated appropriate clear zone for roadways actually made roads safer, or if more street trees would be more beneficial. The test results showed the livable section with street trees and additional buffers was indeed safer and showed a correlation between street safety and design. This all results in greater social interaction and value among individuals.

Smart Growth and New Urbanist ideals are also often implemented in Complete Street and traffic calming improvement projects. The subject of New Urbanism might be considered somewhat controversial or misunderstood, but the theories have proven to be successful in cities in which they have been implemented. In "Testing the Claims of New Urbanism," Lund (2003) analyzes development strategies that fall under "smart growth" and claim that placing amenities within walking distance of homes will increase pedestrian travel and social interaction among neighborhood residents. Lund tested local access (areas no more than a quarter mile away) and found there was credibility to smart growth claims. She found that when combined with pedestrian-friendly streetscapes the location of everyday amenities within the neighborhood could increase pedestrian travel and interaction. She also found that people who walked around their neighborhood were more likely to interact with their neighbors and form relationships. Lund also finds that it is necessary to consider neighborhood perceptions and attitudes and more studies must be done before these methods can be proven effective.

TRAFFIC CALMING AND ROAD DIETS

Traffic calming efforts are necessary to improve the public realm and to make the public realm more pedestrian-friendly. Calming techniques include lane reductions, wider sidewalks, buffer installation, landscaping, median installation, and on-street parking. These elements are often integrated into Complete Street projects and can sometimes be considered synonymous with such initiatives. The topic is highly contested and several reports and studies have been published on the various impacts traffic-calming projects have on the surrounding community. It will be most vital to examine how traffic calming will influence Knox Street businesses as historically business owners are most likely to contest the installment of such features citing reduced customer flow due to fewer parking spaces or a perceived notion the area has become to confusing for drivers. Very few studies have found that businesses are negatively impacted by traffic calming and several actually found business improved after construction. For example, in "Are Roundabouts Good for Business?" Alex Ariniello (2004) examines the effect a series of four roundabouts had on a suburban in a strip commercial area in Golden, Colorado. The author discusses the site's difficulty handling traffic as well as providing access from business and side streets. The site had recently been proposed for a new shopping center that elevated these traffic and parking concerns. An analysis conducted post-construction revealed the improvements made the area more aesthetically appealing and maintained traffic flow, while also providing pedestrian protection. Traffic slowed and vehicles experienced very little delay at intersections, all of which resulted in a "vibrant commercial corridor" (Ariniello 2005, 2) with little negative impact on businesses.

Similarly, it was found that road diets (also known as traffic calming) can also have a tremendous positive impact for pedestrians and bicyclists. In "Road Diets," Dan Burden and Peter Lagerway (1999) discuss the effect road diets, in which roads lose lanes and width, have on the nation's roads. The authors suggest that roadway conversions might be the future to creating safer, healthier, and more vibrant places. Burden Currently, four-lane roads discourage mobility among populations in terms of transit users, pedestrians and bicyclists. Case studies on several North American cities support the road diet proposal and each case study resulted in a successful roadway conversion that improved the roadway conditions of the neighborhoods. The authors' research leads them to suggest the implementation of road diets on four-lane (or greater) roads is most likely key to developing successful, economically sound communities.

In "Economic Effects of Traffic Calming on Urban Small Businesses" (2003), Emily Drennen investigates how the changes to an urban streetscape - in an effort to make them safer, more attractive, and livable - affects retailers. Drennen interviewed twenty-seven merchants in the Mission District of San Francisco to discover what impact the Valencia Street bicycle lanes had on their businesses. She discovered a majority of business owners supported the bike lanes and that the lanes had a positive impact on business or sales. The same number of business owners also stated they would support further traffic calming efforts in their neighborhood.

In "A Methodology for Determining the Economic Impacts of Raised Medians: Final Project Results" (2001), William Eisele and William Frawley examine business owner claims that raised medians might impact their businesses and property values. The authors conducted a four-year study where they interviewed Texas business owners before and after the construction of a raised median. It was discovered that the construction phase of the raised median appears to have the most detrimental impacts on businesses and in most instances the property value of select businesses actually improved after construction. The authors hope this research will further be used to conduct studies with businesses and communities in raised median construction projects.

Another element to consider in traffic calming design is the issue of on-street versus off-street parking. For consideration, in "Quantity versus Quality in Off-Street Parking Requirements," Mukhija and Shoup (2007) argue that planners should worry less about the quantity of parking provided in urban landscapes and more about its quality as parking structures often impose on and overwhelm the physical landscape. The authors imply that off-street parking requirements need to be integrated into the architectural and design quality regulations to reinforce the desired character of each neighborhood. Mukhija and Shoup point to several communities that have implemented the quality or quantity ideology and discuss the benefits these communities have experienced since shifting their focus. It is suggested that cities can mitigate any costs associated with parking structure design by reducing or removing the minimum parking requirements. The installation of appropriate parking structures or lots can appease traffic calming efforts because the system is made more efficient and people are generally less confused about parking options.

In regards to urban shopping centers, Stark and Klementschitz (2008) take a similar approach to parking and discuss off-street parking regulations in "Off-Street Parking Regulations for Shopping Facilities: Potential Impacts and Scope of Implementation." The authors state off-street parking regulations could help reduce car traffic in urban areas and they show the ef-

fectiveness of these regulations through surveys and an efficiency analysis. Some regulations they study include high obligatory parking costs for private off-street car parks. Their study shows that the limitation of car parks around retail facilities led to a reduction of car traffic. This leads the authors to suggest off-street parking regulations be integrated into land use plans and development requirements. However, careful consideration should be taken with zoning requirements and existing buildings.

The U.S. Department of Transportation published Case Study No. 19 (1994) to analyze the effect traffic calming has had on communities in Europe, Japan, and North America. Each area of the world found several community and neighborhood and community groups that supported traffic calming, but each for various reasons. In the United States, the authors found traffic calming efforts focused on "...spot locations and most have resulted in lower motor vehicle speed and fewer motor vehicle accidents" (U.S. Department of Transportation 1994, vi). The authors found very little information on the impact traffic calming had on bicycle and pedestrian use. Further analysis led the authors to conclude a well designed and implemented traffic-calming program can have several beneficial impacts for bicyclists and pedestrians as well as be more cost effective. (Eisele and Frawley 2001) Overall, the implementation of traffic calming design can serve a community well for future development and traffic flow as it allows a greater variety of motorists and pedestrians to visit the area.

CONCLUSION

These reports and studies serve as a foundation for Complete Street recommendations and the implementation analysis as they describe ways in which Complete Street improvements have been successful and unsuccessful. The articles also present elements involved in a Complete Street implementation process that might not be directly outlined in Complete Street materials, but are just as important to consider and understand as the project moves forward. None of the elements outlined in the Complete Street project are limited to a Complete Street implementation. Each of the specific elements could be installed or implemented without a prescriptive policy. These findings help provide an understanding of what results the City of Dallas should expect to see or not expect to see.

(What are the findings of the literature review that will help you gauge the City's Complete Street's manual?) - WORK IN PROGRESS

Project methodology is divided into four sections: site analysis, interviews and stakeholder surveys, research, and project implementation suggestions. These sections identify why Knox Street was selected as a Complete Street demonstration project as well as how well the City has initiated the conversation with the public to explain Complete Street benefits and goals.

SITE ANALYSIS

Presently, the Complete Streets Manual is still in draft form awaiting final City Council approval. The most recent version was presented to the Transportation and Trinity River Project Committee on September 24, 2013 and the City hopes to have it finalized within the next couple of months. The Knox Street demonstration project was a tool used to kick off the Complete Streets Initiative, as well as a way to prep the local community for Complete Street implementation. The recent bond approved for the Knox Street PID will serve as a partial funding source for these improvements as soon as the Complete Streets project kicks off within the next year. The Complete Streets project is another way for the City to show how these bond funds can be applied in the future, as well as to show a more efficient distribution of funds with measurable results to the public.

Knox Street is considered a City of Dallas Street and, according to the City of Dallas Thoroughfare Plan (2012), has a 60-foot right-of-way that can be operated with either two or four lanes. Knox Street is considered a community collector with a proposed function as a principal arterial and the intersecting Cole and McKinney streets are proposed as minor arterials in the City of Dallas Thoroughfare Plan (2012). A lane reduction in the right-of-way to make streetscape improvements or Complete Street installations will have little or no negative implications for the community, according to these plans as Knox Street is operating under capacity. Currently, the majority Knox Street traffic is a result of vehicles attempting to navigate the confusing on-street and off-street parking, one-way intersections and pedestrian crossings. According to traffic counts taken in 2005, courtesy of the NCTCOG Cooperative Data Program, historical data counts along Knox and U.S. 75 range from 10,000-12,000 vehicles each day. These rates are maintained along Knox Street and through to the City of Highland Park, located just across Katy Trail at the edge of the Public Improvement District. Complete Street implementation and traffic streamlining along Knox Street will make traffic flow more smoothly and will allow more people to park or pass through without encountering confusing roadways or distractions. This will in turn encourage more pedestrian activity along the street as the pedestrians will no longer feel inundated by the vehicular traffic traveling along Knox Street.

These combined current elements highlight Knox Street as a mixed-use street with the potential for travelway improvements and traffic calming designs. The narrow alleyways, uneven pavement and sidewalks, disintegrating street furniture, speeding traffic, and general vehicular congestion all currently affecting Knox Street could easily be streamlined with Complete Street improvements and each of these solutions is outlined and further analyzed in this report. Current improvements seem limited to the specific improvements the business and landowners seek to implement themselves and a more general, overarching improvement system appears to be long overdue for the businesses and residents on Knox Street.

STAKEHOLDER RESPONSES + SWOT ANALYSIS

Knox Street PID business owners and landowners were emailed an online survey asking their thoughts and opinions on the City of Dallas'

Complete Streets Initiative as well as what they thought was lacking or already in existence in Knox Street. The results, more further detailed in this report, show a wide range of opinions, both positive and negative, towards Complete Streets and it's applicability to Knox Street. A majority of the respondents were business owners and there was a broad consensus among the results that improvements need to happen to Knox Street to keep up with growing retail, economic and traffic capacity demand, however, physical changes cannot be too drastic as Knox Street has a unique character that current stakeholders do not want to see forsaken.

Complete Street Implementation strengths include the perception that people have seen improvements come to the Knox Street area over the last few years. Comments included the number of businesses moving into the area, new landscaping along sidewalks, branding and retail signage as well as better sidewalks. These improvements might not be directly related to Dallas' Complete Streets Initiative, as that project is still undergoing evaluation and are not fully implemented, but these improvements are a driving factor for Complete Street designs on Knox Street. People also responded that they felt the Public Improvement District had helped the area as well as drive up local business due to the streetscape and safety enhancements the PID has been able to implement over the last few years. People also remarked that although the Complete Streets project was not fully underway, they thought that it was a move in the right direction on the City's part, even if the design elements still needed to be worked out.

Complete Street Initiative opportunities exist in several spots throughout the project. Among stakeholders, many feel that Knox Street already possesses walkability, as well as a thriving business climate that has experienced growth over the last few years. These factors will continue to draw visitors to the site. Knox Street also has Katy Trail running along the PID's western border. This local pedestrian and bicyclist connector brings people through the site every day and the site can capitalize off this amenity to further grow business and increase pedestrian traffic.

Complete Street Initiative weaknesses sit with stakeholders' familiarity with the project and general perception about the project's funding limitations. Over half of the people surveyed stated they were not familiar with the Complete Streets project and approximately 30 percent were not even aware that Knox Street is located in a Public Improvement District. An overwhelmingly 50 percent also stated they did not participate in the Complete Street demonstration on Knox Street in 2012. The City has the opportunity to increase public perception among these respondents and the Knox Street business and resident community. The lack of communication or publicity about the City's role could harm the success of the project in the future if public awareness is not sought. Similarly, when polled on the City's contribution to the improvements on Knox Street or in the district, very few people stated the City had done a good job. Most people were neutral on the topic and gave credit to the individual land and business owners.

Complete Street implementation threats in Knox Street PID exist in the form of competition from several other streets slated for Complete Street improvements as well as from public perception of successful Complete Street designs. Greenville Avenue and the Bishop Arts district have already seen success from the select Complete Street designs installed on their thoroughfares and several other Dallas streets are seeking to make similar improvements as the philosophy becomes more popular

among cities and policy-makers. Henderson Avenue, located to the east across U.S. 75 from Knox Street, could also see these Complete Street improvements in the future and if Knox Street does not take these into consideration, the growth and development could occur elsewhere. Additionally, the market could take a downturn and the business-friendly climate currently in the Knox Street PID could reverse. This could make the Complete Streets project no longer seem viable for the community. These threats make achieving public awareness, communication and speed in implementation very important at the onset of the project.

PROJECT IMPLEMENTATION SUGGESTIONS + CONCLUSION

The project timeline and the stakeholder survey responses provide a telling glimpse into the future of Complete Streets projects in the City of Dallas. This undertaking takes the City of Dallas into new territory as it seeks to mitigate its automotive-friendly, pedestrian-unfriendly reputation. The City should be applauded for this effort because cities across the country are implementing Complete Street designs and policies and seeing remarkable sustainable development in their neighborhoods. Why should the same progressive planning not also occur in one of the fastest growing cities in the nation or in a state projected to experience exponential growth over the next twenty years? The City of Dallas certainly took precautionary steps and time to kick-off its Complete Streets Initiative and to diffuse it to the public, as seen in the three year window from the Initiative's kick-off to the Complete Street manual's public release.

That being said, the design improvements suggested for Knox Street do follow the Complete Street general prescriptions a little too closely. The recommendations almost reach context sensitivity, but fail to fully grasp the character of the neighborhood the residents stated they wanted to hold onto. Bike lanes are an important addition to any thoroughfare and multimodal travel should be encouraged throughout the City of Dallas, however, given Knox Street's tight thoroughfare, blind spots and speeding traffic, the bike lanes might be best left to side streets or better integrated into the driving lanes themselves (as downtown Dallas has done on Main Street). On-street parking should be encouraged and revamped on Knox Street to encourage traffic calming effects and sidewalks should be better buffered to separate the pedestrian from the vehicle. Street furniture and landscaping should also be improved as several current pieces sit in disrepair. Alleyways to off-street parking lots should also be repaved to allow for more efficient traffic flow and easier on-street parking. These elements all contribute to the Complete Street and the City has not neglected to point those factors out.

The City has missed an opportunity to truly connect with the public and explain the Complete Streets process. Katy Trail should have been better integrated into the demonstration day as well as in the design process as its proximity to Knox Street is a big driver for pedestrian activity and connectivity to the downtown districts. Conversations with City Staff have also suggested that traffic calming efforts on intersecting McKinney and Cole Avenue would be limited; however, strong interest has shown among the PID stakeholders for a reversal of one-way traffic to two-way traffic. The business owners, landowners, and city planners should continue to work to get on the same page as the project moves forward and the City should understand the context within which Knox Street operates so as to best convey the successes Complete Street policies have experienced elsewhere and could experience here. A more detailed implementation analysis and recommendation is found in this report as well as alternative Knox Street design solutions.

The City of Dallas' Complete Streets draft manual that was released to the public in September 2013 for implementation guidance on Knox Street or other Complete Street projects within the City. Every design element outlined in the City's draft manual is not here presented or analyzed; only those identified as potential installations for Knox Street are discussed in depth. Additionally, only the elements contained within the pedestrian zone and the right-of-way are presented and analyzed as these elements will have the greatest impact on project implementation. The analysis in this section compares the City of Dallas' Complete Streets manual with design guidelines, such as the Institute of Transportation Engineer's Designing Walkable Urban Thoroughfares: A Context Sensitive Approach released in 2010 and the NACTO Urban Street Design Guide released in October 2012. The objective of this comparison is to learn how faithfully the City of Dallas has applied Complete Street methodologies, as well as to provide an indication of the direction the City will go for further project implementation. These analyses are all undertaken with consideration to the design elements and implementation methodologies that stand out in the City of Dallas' draft manual.

VISION

The City's vision for the Complete Street Initiative is "…to build streets that are safe and comfortable for everyone: young and old; motorists and bicyclists; walker and wheelchair users; bus and train riders alike" (City of Dallas 2013, 3). Automobiles have too long shaped the form of streets and it is time that streets shift to serve the uses that line them and the City of Dallas pointedly seeks to reestablish this within its city limits on streets it identifies as probable for the Complete Street evolution. The following comparative analysis examine how well the City of Dallas has followed this vision and whether or not this vision helps to serve the goals set forward by the project. These goals include: enhance the public realm rather than serve as mere traffic conduits; provide for multiple transportation modes; reflect that all streets are not the same; use context-specific design solutions; and support flexibility to accommodate changing needs (City of Dallas 2013, 4). These goals were a result of the City's random phone survey that indicated 54 percent of respondents expressed interest in using transit and 68 percent believed that being able to walk or bike to destinations would be better for the economy.

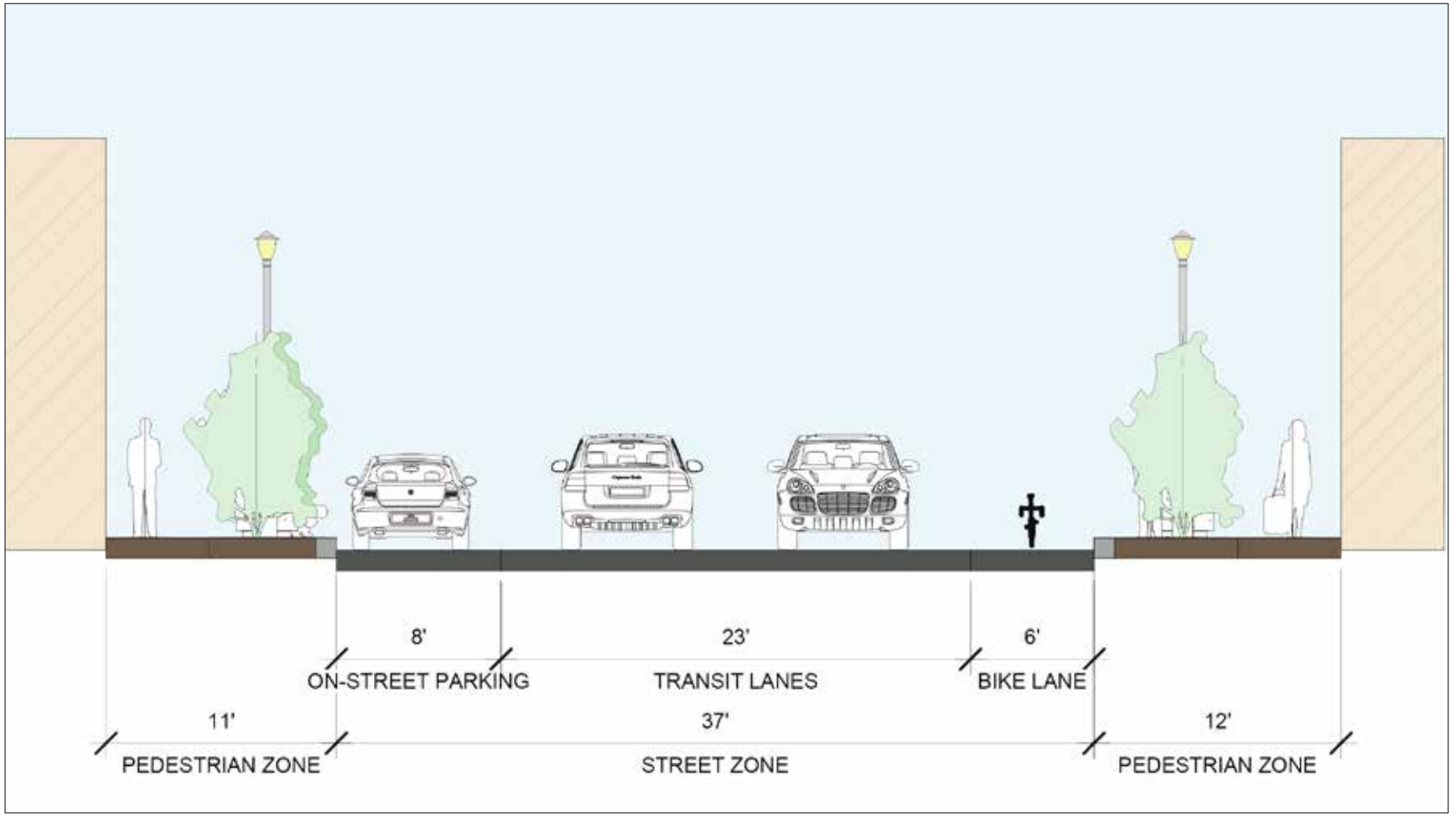
COMPLETE STREET CLASSIFICATION

The City of Dallas' Complete Streets Design Manual - Draft identifies several types of Complete Streets that each requires different design elements. The types identified in the manual include: Mixed-Use streets; Commercial streets; Residential streets; Industrial streets; and Parkways (City of Dallas 2013, 46). This section will only focus on the typologies located in the Knox Street District – mixed-use streets and residential streets. Knox Street, McKinney Avenue and Cole Avenue would all be considered mixed-use streets and the adjoining residential streets each intersect the major thoroughfares, especially the closer Knox Street gets to the abutting Highland Park.

MIXED-USE STREETS

A mixed-use street, according to the City of Dallas, are streets that encompass a variety of types of streets and land use contexts with buildings that sit close to the street and a provide a variety of opportunities to live, work, shop and play (City of Dallas 2013, 46). These streets will already have some form of pedestrian activity and could potentially also experience heavy traffic. Parking on a mixed-use street is commonly on-street and any parking lots are typically situated behind the commercial uses or

Figure 5: Mixed-Use Streetscape



An example of a 60-foot right-of-way streetscape with optional bike lane installation on the right side of the road. If no bike lane is installed, additional on-street parking or a wider pedestrian zone could be included.

at the edges of any blocks. The emphasis in any Complete Street design would need to be on slower traffic speeds and improved multimodal options. However, this street type is also the most flexible in terms of street space usage and available design choices.

Knox Street, a proposed Principal Arterial and community collector, already possesses several of the mixed-use street descriptors. The street is lined with businesses that have smaller setbacks and parking lots are located at the edges of each block and behind the commercial retail frontages. Angled on-street parking is also provided to motorists. Apartment buildings and condos sit on the peripheries of the Knox Street PID and all sit within close proximity to the Katy Trail. This combination of uses results in high numbers of pedestrians, motorists and bicyclists along Knox Street. This street typology also indicates that Knox Street has higher flexibility to evolve into a Complete Street and prove to be more pedestrian and bicyclist friendly, rather than auto-centric.

The *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach* published by the Institute of Transportation Engineers (ITE) focuses on a street's walkability and pedestrian-friendliness when it comes to mixed-use thoroughfares. According to the authors, a walkable community provides "…a compact and mixed-use environment of urban buildings, public spaces and landscapes that support walking directly through the built environment…" (Institute of Transportation Engineers 2010, 4). Mixed-use streets, according to the report, are pedestrian supportive and have a moderate to significant pedestrian presence that is not dominated by vehicles. Mixed-use areas will also be highly connected via thoroughfares and shorter blocks that provide multiple route options to an individual's destination. Unlike the City of Dallas' definition, the ITE suggests a mixed-use area may be considered either a street or an avenue depending on the location's surrounding uses. An avenue is a "Walkable, low-to-medium speed urban arterial or collector…serving access to abutting land…(and they) serve as primary pedestrian and bicycle routes (that) do not exceed four lanes…" (Institute of Transportation Engineers 2010, 52). Avenues also typically provide on-street curb parking. Similarly, a street is "…designed to…connect neighborhoods with commercial and other districts…(and) they may serve as the main street of commercial or mixed-use sectors and emphasize curb parking" (Institute of Transportation Engineers 2010, 52). Knox Street possesses characteristics of both an avenue and a street under these guidelines, but both contain elements outlined in the City of Dallas' definition of a mixed-use street. In that sense, the categories seem appropriate for application in the Complete Street manual.

Knox Street's 60-foot right of way currently provides four lanes of traffic in two directions. Any street classification larger than an avenue, according to ITE definitions, would not apply to the Knox Street district. A comparison of the provided definitions and characteristics reveals that the City of Dallas applied principles identified by the ITE to the Complete Streets manual. The city combined the walkable community characteristics under one street typology rather than elongate the application of mixed-use streets to two types of thoroughfares. This process seems more efficient and effective at communicating the ideal characteristics of a mixed-use Complete Street and appears to purposely serve the City's implementation efforts.

The City of Dallas outlines Complete Street design priorities for each street typology. As no street is identical and what works for one street might not work for another it is important to prioritize design elements

and Complete Street characteristics. A Complete Mixed-Use Street needs to prioritize wide sidewalks, trees and greenscape, seating, bicycle parking facilities, recycling/garbage cans, limited curb cuts and driveways, plazas/pocket parks/parklets, sidewalk cafes, pedestrian lighting, information kiosks, pedestrian signage, on-street parking, road/lane diets, street lighting, multimodal intersection design, curb extensions/bulbouts, crossing islands and special pedestrian signals (City of Dallas 2013, 85). All of these elements emphasize the pedestrian and multimodal traveler and reduce the emphasis on the automobile. Knox Street's 60-foot right of way could be divided into several different sections to include all of these elements, according to the City of Dallas' guide. Each travel lane could be 11 feet wide, on-street parallel parking at 8 feet wide, landscaping and other street furniture zones 6 feet wide and a 5-foot sidewalk. This example provides enough space for a majority of these elements and bicycle lanes could also be introduced, as discussed in a later analysis. A target speed for vehicles traveling on a mixed-use street should be between 25 and 35 miles per hour (City of Dallas 2013, 101). Currently, Knox Street's speed limit is set at 35 miles per hour although vehicles typically travel at a higher rate of speed along McKinney Street and Cole Avenue. These elements are also all outlined in the ITE guidebook as important contributors to a context sensitive solution.

RESIDENTIAL STREETS

A residential street is defined in the City of Dallas Complete Streets Manual – Draft as a street "…that serves residential land uses as well as schools, churches, and businesses within residential neighborhoods" (2013, 54). This type of street will have an increased emphasis on vehicle speed reduction as well as have slightly increased pedestrian, bicycle and transit activity as individuals and families travel to various neighborhood destinations. More safety features geared towards pedestrians will also more likely be found on residential streets. These features could include increased sidewalk buffers, medians, more landscaping and on-street parking facilities. It is possible for a residential street to also have bicycle lanes installed as an alternative route for bicyclists wanting to avoid major thoroughfares or to make vehicle drivers more aware of families and children out riding bicycles.

Knox Street itself cannot be considered a residential street as it does not primarily serve single-family or residential uses, but several surrounding streets in the public improvement district could be classified as a residential street. These streets include Travis Street, Buena Vista Street, and Abbott Avenue, which lies on the border of Knox Street and Highland Park, Texas. These streets cater to condos, townhomes, apartments and single-family units. A majority of the residents utilize Katy Trail and shop or dine at the commercial and retail stores on Knox Street. Each of the connecting residential thoroughfares is critical to the connectivity of the district as well as in ensuring the successful implementation of Complete Street practices and policies. The close proximity of Katy Trail also provides a safe retreat for pedestrians and bicyclists wanting to utilize the residential and mixed-use streets.

The ITE classifies residential streets in context zones that could similarly be compared to New Urbanism's transect philosophy. According to the guidebook, neighborhoods with primarily residential streets typically exist in suburban contexts, aptly named C-3 Suburban. This zone is "Primarily single family residential with walkable development pattern and pedestrian facilities…" (Institute of Transportation Engineers 2010, 49) and can also have commercial uses within close proximity. While these characteristics

could certainly be found in the neighborhoods surrounding Knox Street, the district is not located in a suburban context. The C-5 Urban Center context zone appropriately describes the apartment and town home residential street features as they feature "Parks, plazas and squares, boulevard median landscaping" (Institute of Transportation Engineers 2010, 49). Knox Street, according to these definitions would currently sit somewhere in between these two context zones, although it would not yet fit the definition of a C-4 General Urban street as the uses are still segregated and lacking appropriate connectivity. The definitions outlined by the ITE have a broader range of uses under each category than the City of Dallas' Complete Street Initiative definition, but this simplification seems necessary as a means of translating the context zones to the City of Dallas' thoroughfare network. The ITE guidebook later further denotes the residential street when it outlines a functional definition of a street as a "Walkable, low speed thoroughfare…designed to (1) connect residential neighborhoods with each other, (2) connect neighborhoods with commercial and other districts and (3) connect local streets to arterials" (Institute of Transportation Engineers 2010, 52). This application certainly follows the Complete Streets manual more closely and is also more easily translated in the Knox Street context. Overall, it appears the City did a good job interpreting the ITE guidebook and applying it to Knox Street.

Residential streets have different design priorities than mixed-use streets and because each of these street types exist in close proximity to each other in the Knox Street District it will be important for the City of Dallas to take these all into consideration upon implementation. The City of Dallas' manual identifies trees and greenscape, pedestrian lighting, on-street parking, medians, and multimodal intersection design (City of Dallas 2013, 85) as most important to consider in any potential design. Travel speeds should only be between 20 and 25 miles per hour, which is consistent with most residential area posted speed limits. Each of these design elements is also identified by the ITE guidebook and in comparison to the City of Dallas it appears the Complete Streets outline includes all the necessary elements to ensure effective design and implementation.

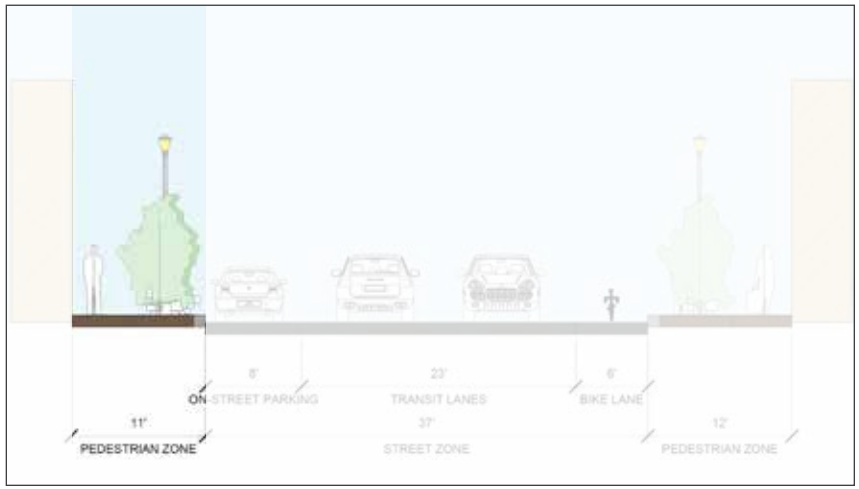
THE PEDESTRIAN ZONE

The pedestrian zone encapsulates the sidewalk, spaces between the sidewalk, the roadway on one side, and the building front on the other side. A basic element of the pedestrian zone, wider sidewalks are necessary in most situations to accommodate any street furniture and increased pedestrian traffic. Trees and other greenscape elements are also necessary in the pedestrian zone because they help serve as a buffer between the roadway and the pedestrian, provide shade for the sidewalks and can aesthetically improve the environment. The following pedestrian zone elements each have different uses in a Complete Street design and it is important to consider how the City of Dallas proposes to utilize these elements in comparison to standard recommendations.

STREET FURNITURE

Street furniture plays an important role in the pedestrian realm. Not only does it make the sidewalk feel more welcome and comfortable, but it also provides spaces and opportunities for people to interact with their community and with each other. The City of Dallas states its key goal for their street furniture guidelines is "…to organize the City's street furniture in a way that maximizes safety, comfort, and function for all users" (City of Dallas 2013, 117). Street furniture can include seating, bicycle racks, bicycle shelters, bollards, parking meters and pay stations, and recycling bins and garbage cans. Each of these elements serves a purpose

Figure 6: The Pedestrian Zone



Streetscape section highlighting the Pedestrian Zone.

Figure 7: Outdoor Dining/Street Furniture

The outdoor dining area provided by On the Border restaurant is one of several patio dining experiences Knox Street visitors can presently enjoy.

within the pedestrian zone that can be conducive to a Complete Street methodology. As stated previously, various studies have shown that the pedestrian realm is what leads a neighborhood or a community to experience higher levels of connectivity and social interaction.

The basis for creating an inviting and comfortable pedestrian zone lies with the installment of appropriate seating that will transform the sidewalk into "…a gathering area and enhance its role as a public space" (City of Dallas 2013, 117). Complete Street seating should not be able to be easily damaged or removed and should also not interfere with buildings or emergency services structures. Pedestrians should be able to view the street activity and also be buffered from automotive traffic. The ITE, comparatively, identifies the pedestrian zone as the frontage zone, throughway zone and the furnishings zone. Typically, street furniture such as seating would exist in the frontage zone as this area "…may accommodate a variety of activities associated with adjacent uses, such as outdoor seating or merchant displays" (Institute of Transportation Engineers 2010, 59). A Complete Street in the City of Dallas would need to be context sensitive for each individual street and have the appropriate street furnishings in order to satisfy standard Complete Street ideologies and provide a satisfactory experience for the pedestrian.

Bicycle racks and shelters are integral in the creation of a multimodal community or Complete Street, especially when designs and policies consider

installing bicycle lanes or cycle tracks. The City of Dallas aims to integrate these furnishings into the surrounding environment as cohesively as possible as "Good bicycle parking designs maximize capacity while maintain an orderly appearance" (City of Dallas 2013, 119). At times, it could also be necessary to install bicycle shelters or facilities close to other transportation shelters in order to maximize efficiency and to provide shelter for as many travelers as possible. These standards do not appear to be uncommon in standardized Complete Street design and the ITE reinforces the City's guidelines. These types of street furniture would sit in the furnishings zone, according to the ITE, which is "…a multipurpose area of the streetside (that) serves as a buffer between the pedestrian travel way and the vehicular are of the thoroughfare…" (Institute of Transportation Engineers 2010, 59). This zone is considered a section of the pedestrian zone and is where pedestrians would typically find "…sidewalk cafes, sign poles, signal and electrical cabinets, phone booths, fire hydrants, bicycle racks and bus shelters" (Institute of Transportation Engineers 2010, 59). The City of Dallas follows these guidelines set forth by national organizations such as the ITE and its policies regarding street furnishings and the pedestrian zone appear to line up equivocally.

TRANSIT STOPS

Similar to street furnishings, transit stops are typically located in the buffer zone between the sidewalk and the vehicle thoroughfare. This provides accessibility for individuals traveling in either zone as well as provides a safe atmosphere for people to wait for transit. Unlike other street furniture, however, transit stops need to take into consideration wayfinding signage that is accessible for all passengers. There are several types of transit stops that could be found on a Complete Street. These include bus stops and bus shelters. It will be necessary to consider both transit stops and bicycle facilities in conjunction with each other during the design process and during policy creation. Each of these furnishings could influence the other and encourage multimodal transit among passengers and pedestrians.

Bus stops, according to the City of Dallas, are "…the most basic transit stop and should be comfortable, safe, and accessible" (City of Dallas 2013, 124). Several types of street furniture could be placed around a bus stop, like trash or recycling receptacles, benches, lighting, bicycle racks, newspaper boxes and public art. This supports the philosophy that in order for a Complete Street to be successful all the elements must work together and be cohesive. No street furnishing can function by itself and serve its appropriate purpose. The design of a bus stop should consider curb extensions as a way to provide additional pedestrian space and to "…improve bus travel time by reducing time needed for loading and unloading…" (City of Dallas 2013, 125) passengers. Similarly, bus shelters can be used at transit stops to make transit use more comfortable and convenient. As bus shelters in Dallas are currently provided and operated by DART it will be necessary to include DART in all Complete Street implementation projects. Accordingly, bus shelters could also be installed with solar power capabilities.

The ITE guidebook indicates transit stops should also be located within the furnishings zone of the pedestrian zone. Given that no street is alike and the same Complete Street design for one street might not work on another, it is important for the street furnishings within the pedestrian zone to remain just as flexible. According to the IRE, "…bus and rail stops and stations can have multiple configurations depending on the type of transit, the available right of way, the type of service and other factors" (Institute of Transportation Engineers 2010, 159). The previously stated application of a mixed-use street

typology on Knox Street and its classification as a flexible design template indicates that transit stops are an appropriate installation on a Complete Street. In comparison to the City of Dallas' application, the City appears to have appropriately placed transit stops within the pedestrian zone and enabled various transit stop designs to be applied to streets.

URBAN OPEN SPACES

Open space is another significant contributor to a Complete Street typology. It is not limited to green space or parks, but could also include plazas, sidewalk cafes and pedestrian lighting. According to the City of Dallas, urban open spaces are "…places within a city where people gather to partake in a wide variety of activities: to celebrate, to demonstrate, to shop, to meet friends, and to relax" (City of Dallas 2013, 127). These spaces should be seamlessly integrated with the surrounding elements and community.

Plazas, parks and parklets are the atypical open space typologies people think of when considering open spaces in an urban environment. Typically, plazas are "…hardscaped open spaces that adjoin the sidewalk in the frontage zone" (City of Dallas 2013, 127) and are designed to encourage interaction between people and to accommodate uses such as temporary markets, street performances, or to just allow for sitting. Pocket parks are "…small areas that may adjoin the sidewalk…(and) may provide additional green space, gardens, play areas for children, or other public amenities" (City of Dallas 2013, 127). These uses are typically most appropriate for underutilized spaces around buildings or sidewalks. Additionally, parklets "…are small extensions of the pedestrian zone that occupy former parking spots and include amenities such as plantings, seating and sidewalk cafes" (City of Dallas 2013, 127). These spaces, while varied in size and land use, can make a huge impact on a Complete Street and it appears the City of Dallas is making more of an effort to implement them in their plans.

The ITE identifies these urban open spaces as appropriate within multiple context zones, including the C-4 General Urban, C-5 Urban Center and the C-6 Urban Core. These public spaces serve several roles in Complete Streets and are often used for civic or community functions that require additional space on the streetside or to accommodate the higher pedestrian flow stemming from these public events. As with street furnishings, it is important to design an appropriate space for the street's context. These design configurations "…should account for the context of the public space within the thoroughfare and the surrounding land use context" (Institute of Transportation Engineers 2010, 117). Several design guidelines are outlined by the ITE as general principles that need to be followed, these include: public spaces in private property adjacent to the streetside should be visible and accessible from the streetside; public spaces in the streetside should not impede the circulation of pedestrians; the streetside and public space design should integrate the functions of both uses; special paving and materials may be used to unify the look of the sidewalk; there should be a continuity of design in adjacent streetside and public spaces; and street trees, light fixtures, public art, and other elements with a unified design can be used to highlight segments of the street meant to be utilized as a public gathering space (Institute of Transportation Engineers 2010, 117). Plazas, parks and parklets all have the potential to be integrated into Complete Street design on a mixed-use street in the City of Dallas. The City's identification of these elements indicates that they are following these protocols and these open spaces could be installed on Complete Streets throughout the city.

Pedestrian lighting is an equally important consideration in urban open

spaces. The City of Dallas states, "Appropriate pedestrian lighting facilitates safe movement and provides a sense of safety and security for pedestrians" (City of Dallas 2013, 131). Pedestrian-scaled lighting is particularly important in mixed-use districts where activity will be occurring on more frequent intervals than single use districts. The City of Dallas and private developers both currently fund and install the lighting with Oncor providing support services. Appropriate lighting regulations are also currently determined on a case-by-case basis, however, for successful Complete Streets implementation the City might need to reconsider such methodology and implement a different policy for these certain street types. The ITE identifies pedestrian-scaled lighting as an important contributor to the feeling of safety and comfort on the streetside.

SIGNAGE

Street signage provides ample amounts of information to pedestrians and motorists traveling through cities and Complete Street thoroughfares. Examples of such street signage include informational kiosks and wayfinding signs. Kiosks in public areas can "…provide valuable information, such as maps, bulletin boards, and community announcements…" (City of Dallas 2013, 132) to pedestrians. Kiosks should take on the architectural character of the street and community in order to coordinate with other street elements. Wayfinding signs direct people to "…destinations within a city and influence the safe travel of all street uses" (City of Dallas 2013, 133). Street wayfinding signs often provide guidance to people seeking routes to important destinations, landmarks and parking lots. These signs could be extremely beneficial to streets like Knox Street as it is centralized among several City of Dallas destinations and also has several unidentified parking lots sitting behind the commercial retail buildings.

Figure 8: Storefront Signage

One of the oldest businesses in the Knox Street PID, Wild About Harry's displays unique storefront signage to welcome pedestrians and visitors into the store.

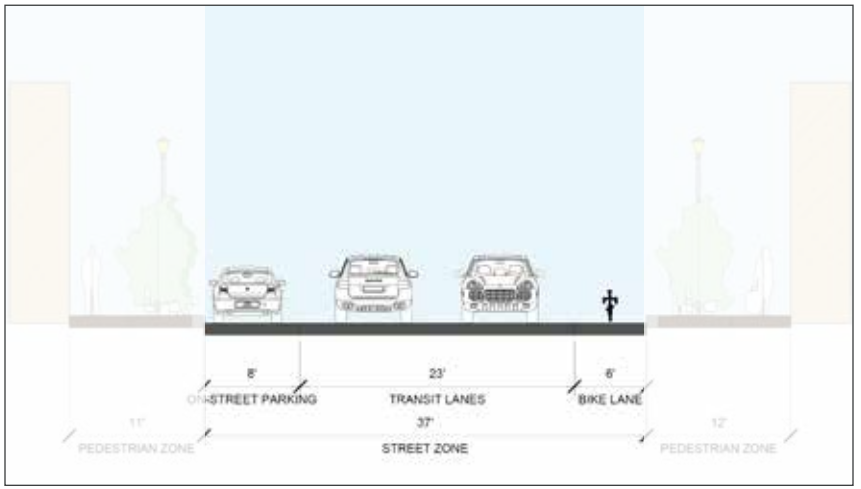
According to the ITE, signage should be installed in the frontage zone, or the space located between the pedestrian travel way and the

building faces. The ITE identifies more specific locations for wayfinding and signage to be installed on thoroughfares, whereas the City of Dallas does not. The report indicates "On new and redeveloping main streets, the design of building facades and signage should anticipate mature landscaping and accommodate its growth without interfering with visibility" (Institute of Transportation Engineers 2010, 74). Since the City of Dallas recommends greenscaping and buffer installation, it is necessary the Complete Street designers take this growth into consideration as they formulate Knox Street signage. Inefficient wayfinding and informational kiosks could severely deter pedestrians and travelers from visiting the area as they could find it unsafe or confusing. Accordingly, wayfinding and signage could be used as a thoroughfare speed management tool. These methods encourage drivers to slow down and could potentially alter driver behavior as the driver is forced to pay close attention to his or her surroundings. The City of Dallas' indication that speeding along Knox Street is an issue, the signage implementation and clear identification in the Complete Streets manual could be extremely beneficial to the project.

STREET ZONE DESIGN ELEMENTS

The street zone portion of a Complete Street consists of the space typically located between curbs and that supports adjacent land uses and balances the efficiency of motor vehicle travel with appropriate considerations for pedestrians, bicyclists and transit users (City of Dallas 2013, 139). The priorities previously identified for mixed-use and residential streets are intended to integrate into this zone and are also intended to help direct design decisions. The following section and analysis will compare the design elements considered significant for the street zone to widely accepted professional publications such as the ITE's guidebook and several publications from the National Association of City Transportation Officials (NACTO).

Figure 9: Street Zone



Streetscape section highlighting the Street Zone.

TRAFFIC CALMING ELEMENTS

Traffic calming elements include various design or policy influences that aim at reducing the amount of vehicular traffic on roadways to ease congestion, high speeds and to improve pedestrian safety. Such measures introduced by the City of Dallas include: safe speeds; road diets; one-way to two-way street conversions; slip streets; center medians/islands; and midblock curb extensions. According to the Complete Streets Manual, "The organization and distribution of right-of-way has a profound effect on safety, roadway capacity, and how comfortable and convenient

transportation modes are relative to each other" (City of Dallas 2013, 139). Knox Street's Complete Street implementation will need to consider several of these elements as traffic calming issues have been identified by several sources as a problem in the area.

Designing streets that limit excessive vehicular speeds make the management of the street more efficient and safe. This also enables an environment ideal for pedestrians and bicyclists to grow and take place, which is all in pursuit of the connectivity and flexibility identified in Complete Streets literature. The City of Dallas sheds light on an interesting statistic that could help support the foundation of safe speed policies throughout the city by stating, "…a pedestrian who is hit by a motor vehicle traveling at 20 mph has a 95% chance of survival, whereas a pedestrian who is hit by a motor vehicle traveling at 40 mph has a 15% chance of survival" (City of Dallas 2013, 140). On mixed-use and residential streets where higher levels of pedestrian and bicyclist activity are desired, these figures should be foundational to street speed establishment. Elements that could potentially be integrated into Complete Street design as speed-reduction strategies include: lane widths, road diets, center medians/islands; midblock curb extensions; bikeways; transit lanes; on-street parking; paving treatments; shared streets; speed tables; and street lighting.

Road diets occur when the number of lanes on a roadway is reduced, typically by one lane in each direction. These diets help provide additional space for Complete Street installation but also provide safety benefits to all users as it forces vehicular drivers to become more aware of their surroundings and thus more aware of pedestrians and bicyclists. One-way to two-way street conversions are much more difficult to implement than road diets, but is a more effective strategy for managing traffic patterns. Knox Street's intersecting McKinney Avenue and Cole Street could potentially be candidates for such conversions if found that the Complete Street project could benefit from such changes. Studies have shown that these conversions "…generally result in fewer crashes involving pedestrians…" (City of Dallas 2013, 142). These crashes can also be reduced with the installation of center medians or islands and according to the City of Dallas, any medians installed for a Complete Street project should be "…pedestrian-friendly, reduce travel speeds, and should provide landscaping whenever possible" (City of Dallas 2013, 144). Knox Street's current width might not support medians, however, the City could consider midblock curb extensions. These typically exist where on-street parking and midblock locations intersect and are installed on both sides of the roadway "…to create a visual pinch-point, helping calm motor vehicle traffic" (City of Dallas 2013, 145). Each of these design elements should help reduce traffic and provide ample design opportunities for Complete Streets implementation. The City of Dallas should consider all of these elements in the Knox Street project.

The ITE identifies several of these same elements as traffic calming techniques, however, the organization defines traffic calming in a slightly different way. According to the ITE, traffic calming "…is a type of speed management usually used on local residential streets…(but) speed management can be used on all types of thoroughfares" (Institute of Transportation Engineers 2010, 111). Traffic calming elements found on streets more akin to retail and commercial uses, such as mixed-use streets, fall under the umbrella of speed management, which controls speeds with enforcement, design and technological maneuvers. This definition includes more specific applications than outlined by the City of Dallas, including: signage, signalization, enforcement, street designs;

built environments that encourage slower speeds; roundabouts; raised intersections and curb extensions or raised medians. The City of Dallas' interpretation of such speed management techniques could be correlated into the traffic calming elements identified for Complete Streets. The City would want to make sure to identify these elements in additional sections or design examples in its Complete Streets Manual.

BIKEWAYS

One of the greatest considerations and influences of Complete Street designs is the bicyclist. The bicyclist is essential to completing the multimodal framework desired in Complete Street policies and is often one of the most encountered travelers attempting to share lanes with vehicle drivers. The City of Dallas states, "The bicycle is an ideal vehicle for trips that are too far to comfortably walk, but are still fairly short" (City of Dallas 2013, 146). Rather than produce roadways designed to increase motor vehicle and bicycle conflicts, bikeways should be designed to encourage its use and reduce motor vehicle threat. The City utilizes the vision established by the 2011 Dallas Bicycle Plan to identify feasible locations for additional bicycle facilities and roadway retrofits. Bikeways have two general categories: exclusive facilities, where roadway space is designated for bicycle use; and shared facilities, where bicycles and other vehicles share the roadway. All the previously discussed elements, including traffic calming, need to be considered in order to install adequate bicycle facilities to ensure bicyclist safety as well as roadway safety. Types of bikeways include bike lanes, cycle tracks, and shared lane markings. Knox Street's proximity to Katy Trail and residential neighborhoods makes it a potential candidate for bicycle facilities. These facilities could direct Katy Trail users off the trail to experience many of the amenities Knox Street has to offer or to provide the trail users a resting space in the middle of a journey. These bikeway facility installations could also potentially increase Katy Trail usage that subsequently benefits several other districts connected to Katy Trail at other areas throughout Dallas.

Bike lanes, the most commonly recognized facility in this category, provide an exclusive space for bicyclists to use on the roadway and are commonly identified with painted symbols on the roadway surfaces. Bike lanes are intended for one-way travel and are typically on both sides of two-way streets. Unlike vehicular lanes, bicyclists are not required to stay in the designated bike lanes and may leave the lanes to make any necessary movements. Vehicles may temporarily use bike lanes to access parking spaces or for entering and exiting driveways or alleys. Knox Street's Complete Street demonstration day focused heavily on bike lane installation and these lanes could potentially be an addition to the Complete Street project. According to the City of Dallas, bike lanes should have a minimum width of at least 5 feet to ensure bicyclist safety. These regulations are all identified in the AASHTO Guide for the Development of Bicycle Facilities (City of Dallas 2013, 148). These regulations have also influenced ITE publications as well as NACTO's recently published documents concerning street design and bike lanes. Each of these influences should be considered when attempting to implement bike lane design on Knox Street, or any other City of Dallas thoroughfare in general.

Often times, according to the ITE, bike lane facilities will often be included in reuse and redevelopment projects. In these projects changes to the existing land uses or thoroughfares might include: thoroughfare alignment or the addition of new routes or connections; emphasis in mode or usage (such as exclusive busways, wider sidewalks to serve adjacent economic activities and the addition of bike lanes); and different

functional classifications (Institute of Transportation Engineers 2010, 30). In walkable areas, such as mixed-use districts and Complete Street initiatives, the infrastructure network should "…include a system of bicycle facilities with parallel routes, with direct connections to major trip generators such as schools, retail districts and parks. Bicycle facilities may include on-street bike lanes, separated paths, or shared lanes on traffic calmed streets…" (Institute of Transportation Engineers 2010, 32). These streets should be configured in a fine-grained, multimodal network that is internal to the neighborhood and surrounding community, while simultaneously providing multiple connections to adjacent system of thoroughfares. It is also important to note that any pedestrian facilities located along these routes need to be spaced no more than 600 feet apart, but preferably somewhere between 200 and 400 feet apart. Knox Street, for example, has four undivided lanes of traffic. This configuration could theoretically be converted to a three-lane section with one travel lane in each direction and a center turn lane to allow for the installation to add on additional on-street parking, bike lanes, or wider sidewalks depending on what was determined to be appropriate for that street (Institute of Transportation Engineers 2010, 74). These examples are demonstrated in the ITE manual through various examples, particularly one that focuses on creating a retail-oriented main street, which is easily applicable to Knox Street's strong retail and commercial environment.

The National Association of City Transportation Officials (NACTO) recently released the updated *Urban Bikeway Design Guide* (2013) to help catalyze bike lane and bicycle facility installation across the United States. According to NACTO, bike lanes not only increase bicycle comfort and confidence on busy streets, they increase total capacities of streets carrying mixed bicycle and motor vehicle traffic (NACTO 2013, 12). These facilities should especially be considered on streets with traffic counts greater than 3,000 motor vehicles per day. The City of Dallas does not get this specific in their manual, but they do prescribe bike lanes as a traffic calming method similar to NACTO's recommendation that bike lanes "Visually remind motorists of bicyclists' right to the street" (NACTO 2013, 12). Bike lanes should also be considered with buffers to add additional protection to cyclists as well as to calm heavy vehicular traffic. .

Cycle tracks are similar to bike lanes as in that they are a dedicated portion of the right-of-way to bicyclists, however, the traveled way is exclusively for the bicyclist use. These facilities provide "…added separation that enhances the experience of bicycling adjacent to streets" (City of Dallas 2013, 149). Cycle track separation can be achieved various ways, including installation at higher levels than the adjacent street or physical separation via a median, a row of parked cars, bollards, or any combination of the above variables. Any buffer between the travelway and the cycle track should be at minimum 3 feet. Cycle tracks become more complex at intersections and require creative solutions to ensure bicyclist safety at intersections as well as the continuous flow of traffic. On busier streets, cycle tracks might not be the best solution as the number of driveways greatly influences cycle track feasibility. The more driveways intersecting a cycle track, the less feasible their installation becomes. On Knox Street, the on-street parking and the high number of alley driveways may make cycle tracks inappropriate for the area. However, Katy Trail's adjacency to Knox Street might encourage the use of a cycle track as the City of Dallas states these facilities "…can be useful on streets that provide connections to off-street trails since bicyclists on these streets may be more accustomed to riding in an area separated by traffic" (City of Dallas 2013, 149). These facilities require more space on thoroughfares

and have more complex maintenance and installation processes, all of which might be inappropriate for Knox Street's constrained right-of-way.

Shared lane markings, also called sharrows, are the painted markings in vehicular travel lanes that indicate bicyclists will also be traveling through these lanes of traffic. The markings do not exclusively designate a particular part of the roadway for one use, but merely indicate the lanes will be shared. Sharrows are typically used on streets that have space constraints that do not allow for the installation of bike lanes or cycle tracks and on roadways with speeds less than 30 miles per hour. According to the City of Dallas, sharrows should only be provided "…after considering narrowing or removing travel lanes, parking lanes, and medians as necessary to provide a bike lane or cycle track" (City of Dallas 2013, 150). This is typically because shared lane markings are less effective on streets with on-street parking as they create a higher chance of vehicles and bicyclists colliding or interacting with each other in a dangerous manner. Sharrows could also be considered for Knox Street due to the travel lane constraints and potential negative feedback on bike lane or cycle track installation. All of these bicycle facilities should be installed with appropriate signage and wayfinding devices so as to alert drivers and pedestrians of bicyclists' presence.

The ITE does not specify recommendations for cycle tracks or sharrows, mainly opting to focus solely on bicycle lane installation. However, NACTO's publications do contain various recommendations for sharrows and cycle tracks that will help supplement materials presented in this analysis. NACTO identifies cycle tracks as "…bikeways that are at street level and use a variety of methods for physical protection from passing traffic" (NACTO 2013, 45). As previously mentioned, these facilities can be combined with on-street parking or other barrier device to further separate the bicyclist from the motor automotive driver.

ON-STREET PARKING

A Complete Street must provide access for multimodal facilities and activities. The reduction of automotive dependency on City of Dallas streets is a stated ideal outcome, however, the automobile cannot be left out of the design equation. According to the City of Dallas, "On-street parking is clearly a key to the success of small business districts, and can add energy and excitement to the street" (City of Dallas 2013, 152). There are several recorded benefits to having on-street parking, including a safer pedestrian environment and various traffic calming effects. These measures increase the level of activity on the roadway and encourage drivers to pay attention to their surroundings, while simultaneously encouraging pedestrians to utilize the full thoroughfare. The City of Dallas identifies mixed-use streets and residential streets as most appropriate for on-street parking, both of which are found in the Knox Street district. On-street parking spaces maybe parallel, angled, reverse angle or unmarked and a minimum of 8 feet wide to ensure safe vehicle maneuvering and travel space for pedestrians. The City of Dallas states angled parking maximizes the parking supply and has been shown to provide numerous safety benefits to bicyclists and pedestrians as the angled lanes provide more visibility to the travelway, particularly when the use is back-in angled parking.

The ITE identifies on-street parking in several contexts that will help create walkable urban thoroughfares to support "…pedestrian and transit activity…that relate(s) to the design of thoroughfares to result in integrated walkable environments" (Institute of Transportation Engineers 2010, 44). According to the ITE, in these contexts on-street parking and parking pro-

Figure 10: On-Street Parking

Angled on-street parking for visitors traveling toward Knox Street on Cole Avenue.

Figure 11: On-Street Parking

Straight in on-street parking for visitors along Knox Street.

vided under or behind buildings with alleyway access are urban characteristics that promote higher levels of walking. On-street parking can be found in several of the context zones previously identified in this report, including C-3 Suburban, C-4 General Urban, and C-5 Urban Center. On main streets, such as Knox Street, angled parking is a strategy that can be used to maximize the public parking supply. On-street parking is also identified as an element that could improve pedestrian comfort as the pedestrian is no longer forced to walk next to the travelway and vehicular speeds are often then reduced due to the increased levels of activity on the street. Pedestrians are also prevented from directly experiencing vehicle noise, exhaust and the sensation of passing vehicles (Institute of Transportation Engineers 2010, 117). It is recommended by the ITE that in sites where the thoroughfare and surrounding land uses will experience redevelopment, on-street parking is provided for the planned densities, rather than the current, also with consideration the 8 foot parking spot width recommendation found similarly in the City of Dallas' manual.

SPEED TABLES

Speed tables are "…raised pavement areas that are placed at midblock locations to reduce vehicle speeds" (City of Dallas 2013, 156) that are different than the commonly recognized speed bumps or humps as they are considered more gentle. Speed bumps and humps are also not recommended on public streets, whereas speed tables are encouraged on public thoroughfares. The City of Dallas states that speed tables have

been shown to "…effectively reduce 85th percentile speeds by 13 to 15 miles per hour" (City of Dallas 2013, 156). Properly installed speed tables allow vehicles to proceed comfortably over them at the intended speed, but will cause discomfort when traveled over at higher speeds. These design interventions are not recommended as a sole traffic calming measure, but should be integrated into the right-of-way with additional traffic calming devices. These devices are most suitable on residential and mixed-use streets, such as found in the Knox Street district, and are typically three feet higher than the roadway surface, extend the full width of the roadway and are clearly marked with reflective material and signage to alert motorists and bicyclists.

The ITE discusses speed tables in correlation with speed humps as active measures in speed management. However, the ITE states that speed tables should not be widely used on arterials as they "…lack support of emergency service providers" (Institute of Transportation Engineers 2010, 112). Instead, the ITE recommends the use of speed cushions or speed platforms, which have less impact on emergency vehicles than speed humps or speed tables. The ITE does not go into further detail on proper installation of these speed management devices and any installation in the City of Dallas or on Knox Street should be done with consideration to emergency services and pedestrian safety.

STREET LIGHTING

Street lighting is an important aspect of the Complete Streets design. A well-lit street contributes to the safety and comfort of all users as well as encourages economic development. Street lighting has also been identified as a design element in the Pedestrian Zone by the City of Dallas, but it is just as integral to the Street Zone. Street lighting and pedestrian lighting can be combined in these situations. Appropriate street lighting should be installed where modes of transportation merge or cross paths, such as intersections, bus stops and midblock crossings. The City of Dallas does outline its sustainable efforts in street light installation and discusses the various lamps being tested for installation on Complete Streets, including LED lighting. These factors are important considerations on Complete Streets, especially since "Mixed-use streets require the highest level of illumination (as they are) designed to encourage all means of travel…" (City of Dallas 2013, 158). In contrast, residential streets should have the lowest levels of illumination so as to only illuminate the public right-of-way and to reduce any light pollution.

The ITE similarly identified street lighting and pedestrian lighting in each of its context zones. It recommends the use of street trees to complement the installation of street lighting to create a distinct character for the street, something easily attainable in areas such as Knox Street. However, since "…lighting is an important aspect of thoroughfare safety, the practitioner needs to consider the effect of landscaping on the effectiveness of the lighting" (Institute of Transportation Engineers 2010, 127). The ITE's consideration of street lighting and greenscaping in the same context is important to consider in comparison to the City of Dallas. Each of these design elements influences the other and can have a large impact on the pedestrian and vehicular zones. In more urban contexts, like Knox Street, and places that have more historical characteristics the presence of both elements can greatly influence the character and perception of the site. The City of Dallas also mentioned trees and greenscaping in a small paragraph following street lighting, which indicates the duality street lighting and landscaping have in the

Complete Street process.

INTERSECTION DESIGN ELEMENTS

Intersections are where the vehicle, the bicyclist and the pedestrian all come to head and potentially encounter each other. Traditionally, the City of Dallas has designed intersections to maximize the efficient movement of vehicles through the City. This focus is expanded in the Complete Streets guidelines to ensure the safety of all users, whether walking, bicycling, driving or riding transit. It is important that any intersections designed in the Complete Streets context be designed with consideration to the surrounding land uses and any cultural or environmental influences that might also be present. Similar to the other Complete Street elements, what works in one area might not work for another and the intersections in each place should reflect that identity, while still encouraging multimodal use and improved street life quality.

MULTIMODAL INTERSECTIONS

The encouragement of multimodal uses on streets and in Complete Street contexts means that multimodal safety needs to be a top consideration in intersection design. Non-motorized intersection users are more vulnerable and have a greater risk of injury in the event of a crash. The City of Dallas states "The Dallas Complete Street Design Manual is geared to… guide the City's design process through clear regulatory and wayfinding signage, pavement markings and signals" (City of Dallas 2013, 164). Intersections should be clearly marked, easy to navigate through and consider the needs of all users. In several instances, intersections will consist of the intersection of two different types of streets that have emphasized different types of variables. One roadway might be more geared towards the pedestrian and the bicyclist, while the other might have higher speeds and large motor traffic. Each of these elements needs to be considered individually and appropriately designed for maximum safety.

The ITE manual covers intersection design in each of the context zones and places heavy emphasis on multimodal design considerations. On a typical main street thoroughfare, such as Knox Street, intersections could include signalized and unsignalized crosswalks, curb extensions, curb-return radii, channelized right-turn lanes, pedestrian countdown timers and wheelchair-accessible curb ramps. The ITE states successful multimodal intersection design is based on several design principles with foundations in geometric design. Intersection design principles should "Minimize conflicts between modes…Accommodate all modes with the appropriate levels of service for pedestrians, bicyclists, transit and motorists given the recommended speed, volume and expected mix of traffic" (Institute of Transportation Engineers 2010. 177). Intersection design should also avoid the elimination of any travel modes and provide good driver and nondriver visibility. The ITE's emphasis remains focused on reducing pedestrian and vehicle conflicts, similarly to the City of Dallas' manual. In walkable environments, signage around intersections is critical to increasing awareness among street users.

INTERSECTIONS AT SLIP STREETS

Slip streets, also commonly referred to as frontage roads, are local roads designed for lower volumes of traffic that run parallel to limited access highways or major arterials. The street that runs parallel to U.S. 75 and that provides access to the Knox Street district would be considered a slip street under this definition. The City of Dallas states "Although slip streets reduce conflict points along the arterial by separating through traffic from vehicles accessing local businesses, parking, and residences, slip streets

can create complicated intersection geometries and need to be carefully laid out in order to minimize conflicts" (City of Dallas 2013, 165). The Knox Street intersection limit access to the strip retail frontages at the entrance to Knox Street and the intersection is frequently cause of confusion as cars navigate into the area or attempt to reduce their speed as they exit the interstate and attempt to navigate around merging traffic.

Slip street intersection design should control access points to and from the main arterial, should ensure slip streets do not become another route for through traffic, and should prioritize safety and facilitate pedestrian and bicycle access. These intersections can be challenging for pedestrians and bicyclists to navigate and designs must ensure unimpeded flow for them as well. In these instances, intersections could provide "…exclusive phasing, signage, and pavement markings" (City of Dallas 2013, 165). Intersections could also be designed with increased turning restrictions such as no right-turn-on-red, to allow for easier flow of traffic through the intersection.

INTERSECTION CONTROLS

Intersection crossing, both at uncontrolled intersections and at midblock crossings, can be the most challenging places to provide safe pedestrian crossings. Uncontrolled intersections are intersections that have no traffic control devices and users follow standard right-of-way procedures. Midblock crossings, similarly, have no traffic control devices and are crossings that are not located at roadway intersections. Stop-controlled intersections are the easiest for pedestrian crossings because both motorist and cyclists must stop and subsequently yield to pedestrians. In intersection design, "…STOP signs may be appropriate if…the application of the normal right-of-way…would not provide reasonable compliance with the law (or if) high speeds, restricted view, or crash records indicate a need for control by a STOP sign" (City of Dallas 2013, 166). The installation of STOP signs should be done in such a way that it minimizes the number of vehicles having to stop. The City of Dallas also recommends "…the use of STOP signs should also be limited on streets with bikeways, especially bicycle boulevards, as it requires significant energy to stop and start for bicyclists, resulting in lower levels of compliance" (City of Dallas 2013, 167). Uncontrolled intersections are not as popular around areas such as Knox Street as the high traffic numbers and intersecting streets makes such intersections inefficient.

The ITE discusses uncontrolled intersections in the chapter dedicated to

Figure 12: Mid-Block Crossing

Pedestrian crosswalk provided for Katy Trail users on the border of Highland Park and Knox Street Public Improvement District.

intersection design and design applications. The guidebook interesting states "Common engineering practice is to exclude marked crosswalks from intersections without traffic control approaching the crossing. This is due to a number of factors including a false sense of security provided by crosswalks when traffic is uncontrolled…" (Institute of Transportation Engineers 2010, 180). In walkable areas, uncontrolled intersections need to be used in conjunction with other traffic control measures to ensure safety and efficiency, these measures can include: high visibility crosswalk markings; median refuge islands; street and crosswalk illumination; curb extensions; pedestrian-activated flashing beacons; motorist signs; and pedestrian signs. Each of these elements need to be evaluated in each design as context sensitive and "Traffic control alternatives should be evaluated for each intersection, including stop control, traffic signals and modern roundabouts" (Institute of Transportation Engineers 2010, 178). These philosophies line up with the City of Dallas' prescriptive measures and the Knox Street intersection design should be carefully considered at each uncontrolled point.

Signalized intersections present different variables for design mitigation and Complete Street application. According to the City of Dallas, the Dallas Traffic Management Center remotely controls over 1,275 traffic signals in Dallas (City of Dallas 2013, 167). All signalized intersection changes need to be done in correlation with an engineering study to understand the impacts these changes will have on traffic flow. Each signalized intersection should have signals for motor vehicles and pedestrians. Bicycle signals and additional transit signals should be considered when the uses are present and it has been identified as appropriate to do so. Signal phasing optimization and timings allow "…multiple modes…to move safely and comfortably through the in-

Figure 13: Signalized Intersection

Traffic and pedestrian signals at Knox Street and McKinney Avenue.

tersection with limited conflicts and delay" (City of Dallas 2013, 167). Signalized intersection design also includes appropriate signal timing to minimize cycle lengths and reduce user delay. Long signal cycle lengths make pedestrian activity less convenient and could potentially encourage unsafe behavior, all while vehicular traffic accumulates at the intersection. All traffic signal timing considerations and changes must be done by a traffic engineer and only after pedestrian and traffic volume data is reviewed and analyzed. These systems need to be monitored and evaluated regularly to optimize the system, especially as multimodal streets work to mitigate various forms of traffic.

Signalized intersections, according to the ITE, have several available design features that "…increase pedestrian visibility, information and convenience" (Institute of Transportation Engineers 2010, 180). Features at signalized intersections that can be used to enhance the pedestrian and bicyclist experience include: shorter and more visible crosswalks; priority for pedestrians, bicyclists, and accessibility; low speed channelized right turn lanes; improved pedestrian information; and bicycle features (Institute of Transportation Engineers 2010, 181). Signalized traffic operations should have target speeds between 25 and 25 miles per hour as well as fewer very long or very short cycle lengths. Aesthetics are also an important consideration in signalized street intersection design in urban walkable environments. Textured or colored materials within the streetside and crosswalks can improve user visibility as well as general environment appeal. The attention to landscaping and subsequent integration with stormwater management techniques can also help improve intersection safety as well as the efficiency of traffic travel time through signalized intersections. These elements could all easily be integrated into Knox Street's Complete Street design as well as positively identified in the City of Dallas' guidebook.

KEY GEOMETRIC DESIGN GUIDANCE

Intersection geometry is vital to "…creating safe, efficient, and multimodal intersections…(that) can help reduce vehicle turning speeds, increase pedestrian comfort and safety, and create space for dedicated bicycle facilities" (City of Dallas 2013, 170). Geometric intersection designs include curb radii, curb ramps, curb extensions, crossing islands and diverters. Each of these designs influences intersection functionality and efficiency. An intersection's corners often influence how well an intersection serves the diversity of its roadway users. Intersections that have larger curb radii typically produce higher-speed turning movements, while smaller curb radii require sharper turn speeds and shorter crossing distances for pedestrians. Design assessments, according to the City of Dallas, "…should be based on how the effective radius interacts with the design vehicle's turning radius" (City of Dallas 2013, 170). In addition to an efficient curb radius, curb ramps that provide a smooth transition from the sidewalk to the street should be provided to ensure access across intersections. Curb extensions, or neckdowns or bulbouts, can be used in conjunction with these measures to help reduce the effective width of the street.

The ITE also identifies several of these design elements as components of context sensitive solutions for urban walkable thoroughfares. More emphasis is placed on curb extensions in intersection design with brief mentions of the other elements demonstrated by the City of Dallas. Curb extensions, according to the ITE, reduce pedestrian crossing distance and exposure to traffic, improve driver and pedestrian visibility at intersections, and visually and physically narrow the traveled way for a traffic calming effect. These uses "…serve to better define and delineate the traveled way

Figure 14: Signalized Intersection without Crosswalk

Signalized intersection at Knox Street and Cole Avenue where the pedestrian crosswalk treatments have worn off and not been maintained.

as being separate from the parking lane and streetside" (Institute of Transportation Engineers 2010, 195). These elements all follow the defined goal of ensuring user safety and promoting multimodal uses on thoroughfares.

KEY PEDESTRIAN TREATMENTS

Pedestrian treatments at intersections require careful consideration, as the pedestrian is the most vulnerable user of the system. The City of Dallas states, "Streets with high pedestrian activity should maintain slow motor vehicle speeds...." as well as "…aim to minimize conflicts with other modes and exposure to motor vehicle traffic" (City of Dallas 2013, 176). Pedestrian treatments can include crosswalk design and markings at uncontrolled intersections. In transit areas, enhanced crosswalk treatments should be considered and are encouraged, as well as various types of crosswalk markings. Crosswalks should be at least 10 feet wide in all areas and should be balanced with pedestrian desire lines. At uncontrolled intersections or at midblock crossings, marked crosswalks should only be used if deemed appropriate through pedestrian demand, sight distance, or proximity to other crosswalks. These crosswalks can also be used in conjunction with various traffic calming measures. Knox Street's shorter block lengths coupled with signaled intersections could suggest that such crossings might not be appropriate, however, they could still be considered.

The ITE's manual discusses midblock crossings and crosswalk design as key elements to pedestrian safety. Midblock crossings, according to the ITE, should "…be marked with higher-visibility crosswalk markings such as longitudinal or diagonal lines or should be constructed with a high-contrast alternative payment" (Institute of Transportation Engineers 2010, 152). Marked crosswalks alert drivers and other transit users to pedestrian presence and also direct pedestrian movements to safest crossing points. Additionally, colored and textured crosswalk design treatments can be used to delineate the crosswalk to thoroughfare users and provide contrast to the visually impaired. Any paver system that could shift or settle should be carefully avoided to maintain compliance and safety measures. Ideally, according to the ITE crosswalks should be provided at all intersections and at any midblock crossing after determining there is a significant amount of pedestrian activity needing regulation.

KEY BICYCLE TREATMENTS

Bicyclists mainly encounter vehicles at intersections and in Texas; bicycles are considered on-street vehicles that are required to follow the same rules as automotive drivers. In addition to the previously discussed in-

tersection design elements and philosophies, intersections need to take into account bicyclists and their needs. There are several bicyclist-friendly principles that could be applied to intersection design and according to the City of Dallas some of the principles are to: provide a direct, continuous facility to the intersection; provide a clear route through the intersection; reduce and manage conflicts with turning vehicles; provide signal design and timing; and provide access to off-street destinations (City of Dallas 2013, 189). These improvements should be considered in all intersection redesign projects. Bicycle elements such as bike lanes should also be treated differently at uncontrolled and signalized intersections. At times bicycle boxes might be an appropriate installation to direct vehicles and bicycles through intersections.

The ITE continues the discussion if intersection design with a list of appropriate bicycle-friendly features. To ensure maximum bicyclist and pedestrian safety, bicycle lanes should be striped up to the crosswalk as well as allow adequate clearance intervals for bicyclists. On streets that have higher volumes of traffic it would be appropriate to also install bicycle detectors or bicycle-accessible push buttons that will ensure safe crossings. In these instances, colored pavement markings might also be used to clearly indicate the intended travelway for bicyclists. The ITE also discusses the use of bike boxes and states these painted rectangles along the right hand curb or behind the crosswalk can be used "…to indicate potential high conflict area(s) between bicycles continuing through an intersection and right turning vehicles…" (Institute of Transportation Engineers 2010, 181). If Knox Street is deemed appropriate for bike lane installation, the City appears to have established synergy with the ITE's guidelines.

NACTO's intersection treatment for bicyclists is more specific and design-oriented than the technical ITE guidebook or the City of Dallas' application. Elements outlined in the design guide include bike boxes, intersection crossing markings, two-stage turn queue boxes, median refuge islands, through bike lanes, combined bike lane/turn lane and cycle track intersection approaches. NACTO states that intersections, "…with bicycle facilities should reduce conflict between bicyclists (and other vulnerable road users) and vehicles by heightening the level of visibility, denoting a clear right-of-way, and facilitating eye contact and awareness with competing modes" (NACTO 2013, 69). Elements cities should consider when designing intersections for multimodal users should include elements such as color, signage, medians, signal detection and pavement markings. These are all elements identified by the City of Dallas as plausible for Complete Streets and if bike facilities are integrated into the project, these elements should be considered. In most instances, a bike box might be the most efficient facility at signalized intersections as it puts bicyclists at the head of traffic flow and in the automobile driver's field of vision. However, there are currently no cities within the Dallas-Fort Worth metroplex that have bike boxes installed, so any installation would be the first of its kind for the city.

GREEN STREETS

Sustainability and storm water management are important factors affecting street design and Complete Street implementation. The City of Dallas defines green streets as "…urban transportation rights-of-way that provide source control of stormwater, limit its transport and pollutant conveyance to the collection system, and provide environmentally enhanced roads" (City of Dallas 2013, 201). The standard use of a large drainage infrastructure tat directs runoff back into the water system requires a large "…capital outlay to build and maintain over time" (City of

Dallas 2013, 201). This type of system is not sustainable nor is it the most environmentally friendly. As development demands continue to increase over the next decade, it will be necessary to evaluate the City's system and implement a more sustainable method. The Complete Streets program is a way for the City of Dallas to start doing this. Not only do green streets reduce the need for stormwater infrastructure, they provide trees, shrubs, grasses and other landscape plantings that help create an inviting and comfortable environment.

PAVEMENT + PERMEABLE ASPHALT/CONCRETE

Materials that allow stormwater runoff to permeate the surface and infiltrate the ground through are called permeable paving materials. These materials are different from the traditional paving methods as the water is not diverted directly into the storm sewer system, but rather it is permeated into the ground and allowed to recharge the water table. This method allows pollutant filtration, flow rate reductions, improved water quality and a reduction in the required infrastructure. The City of Dallas states, "Permeable pavements are typically underlaid with an infiltration bed and subgrade soil…(and) come in five basic varieties…" (City of Dallas 2013, 207). These varieties include soft paving materials such as grass, permeable concrete paving, open cell pavers, plastic grid systems, and bound resin with aggregates. All of these materials have lower maintenance requirements and are less affected by environmental damages, such as erosion or winter icing.

Similar to pavement, permeable concrete is a "…concrete mixture using minimal cementitious materials to coat the aggregate, using little or no sand, leaving substantial void content through which water can drain" (City of Dallas 2013, 208). These surfaces should be used on a level street above a high water table that also has low pedestrian traffic and no vehicle encroachment. These materials would not be appropriate for Knox Street, but should still be understood as a design option to increase the street's sustainability. Permeable brick pavers can be used along streets with landscaping while maintaining all accessibility requirements.

Figure 15: Planter Boxes

Planter boxes sit in front of the Apple Store on Knox Street. These installations continue around the corner on McKinney Avenue and contain various tree and bush types.

LANDSCAPING

There are several examples of landscaping and street sustainability. The City of Dallas has identified several types that could be utilized in Complete Street projects, these include bioretention, infiltration trenches,

planter boxes, enhanced swales, landscaped medians and underground detention. The most commonly recognized and probably most appropriately applied landscaping mechanism on Knox Street is the use of planter boxes. These are precast concrete boxes that are filled with bioretention soil to allow water to filter through it. These boxes are often used in highly urbanized areas and can contain several variations of plants and trees. One downside to planters is that they require slightly more maintenance, but their convenience to urban locations makes the installation beneficial to the surrounding community.

CONCLUSION

This is a work in progress. Need to simplify this section.

Figure 16: Landscape Pavers on Knox Street

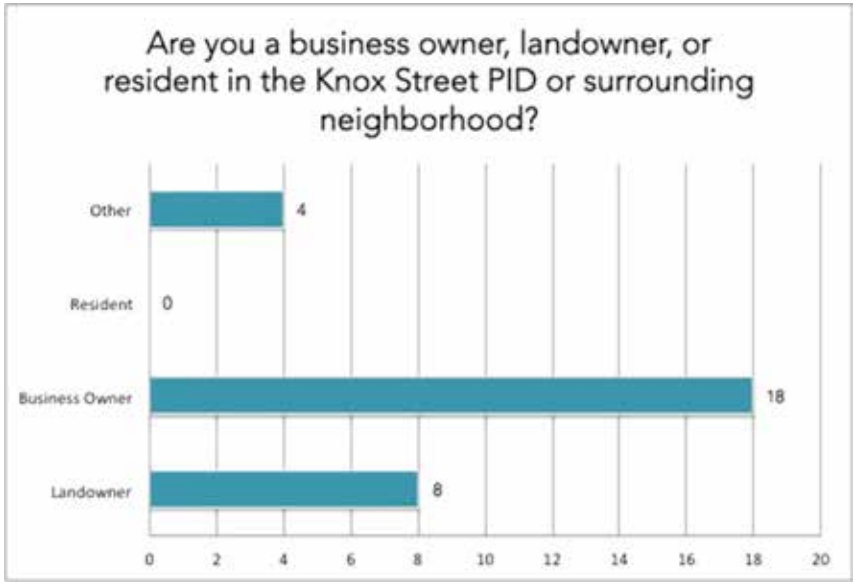
Brick pavers line the wide sidewalks heading west on Knox Street toward Katy Trail and Starbucks.

The online polling and subsequent survey results present a unique perspective into the Complete Streets Initiative's future with the City of Dallas, as well as the overall direction people want to see the Knox Street District go in terms of Complete Street project development. These online surveys, sent out electronically to Knox Street PID stakeholders, assumed allowed anonymity for respondents unless the individual respondent decided to contact myself for any questions or to provide any additional comments. Approximately 80 people were on the email distribution list and 27 people responded, or roughly 30 percent of the stakeholders. The following analysis will not identify any individual and will merely present the overall results in relation to appropriate Complete Streets project analysis.

After obtaining participant consent, individuals were asked their relationship to the Knox Street Public Improvement District. This included identifying themselves as a business owner, landowner, resident, or some other type of affiliation to the district. Table 1 presents the question's results and shows that 18 of the 27 individuals who responded are business owners in the Knox Street district.

Additionally, 8 of the 27 respondents are landowners. None of the respondents were residents, however, the four individuals who identified themselves under the "Other" category include retail store managers and marketing personnel. These results indicate a broad range of individuals have vested interests in Knox Street's future and could be impacted by any Complete Streets Initiatives set in place. These results are also important to consider in relation to the overall PID organizational structure because typically only the business owners deal with the taxing and finance requirements of a PID. The large number of business owners

Table 1: Question 2

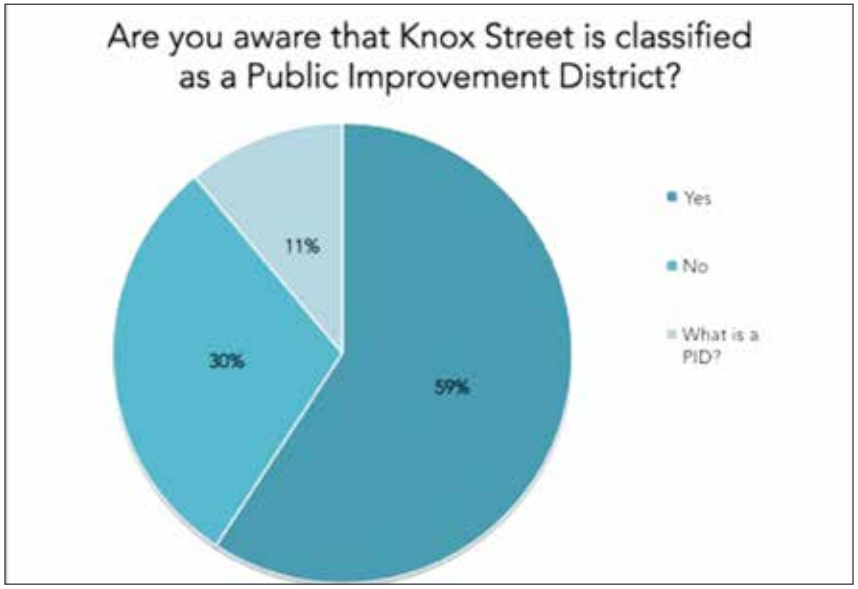


Question 2 asked survey participants what their stakeholder interest is in the Knox Street community.

who responded to the survey might shed light on the general project understanding and subsequent question answers presented in the following pages of this report.

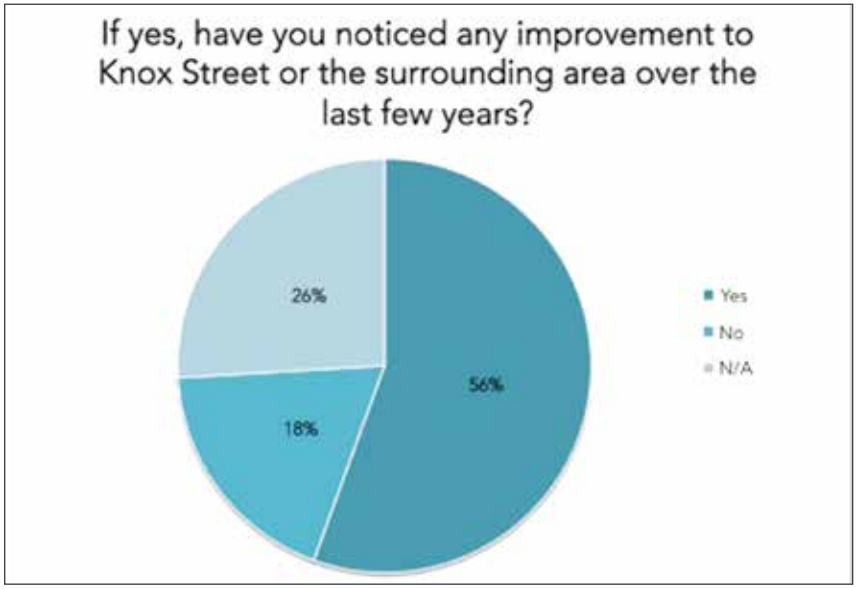
Respondents were asked in the following question if they were aware of Knox Street's classification as a Public Improvement District. The district's amateur status among the City of Dallas' PIDs as it was only created in 2010 and its overall petite size could help explain this questions' results. An overwhelmingly 59 percent of respondents stated they were not aware of Knox Street's PID and 11 percent had never heard

Table 2: Question 3



Question 3 asked stakeholders if they were aware of Knox Street's classification as a Public Improvement District.

Table 3: Question 4

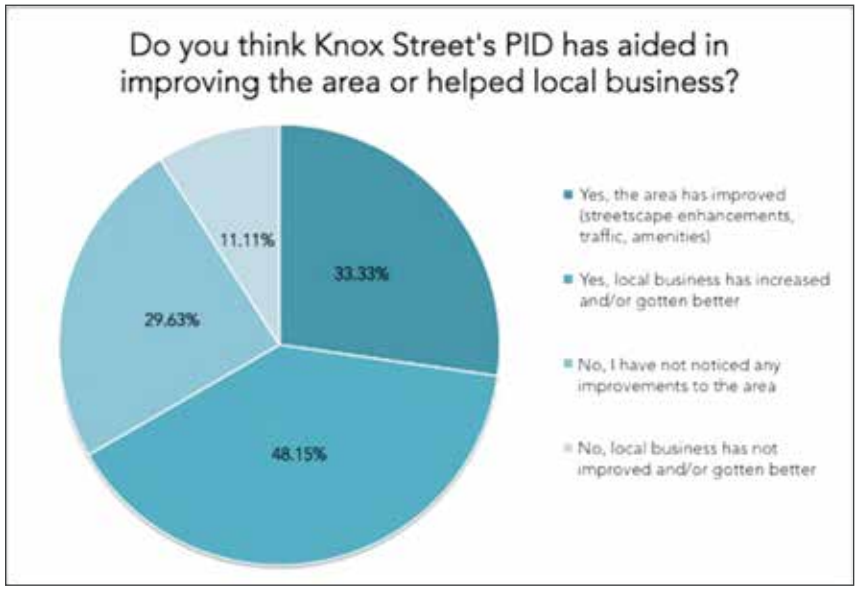


Question 4 asked if stakeholders have noticed any improvements to Knox Street or the surrounding area over the last few years.

of a PID. These numbers could indicate that communication between business owners and landowners needs improvement, or that the City's PID marketing strategy to communicate with district stakeholders has not been widespread or sufficient enough. Several survey comments, available in the Appendix of this report, stated that the district was not doing enough marketing and/or events to get the community together or updated on current events. These numbers are also important to this report as a large factor influencing Knox Street's participation in the Complete Street's Initiative was its PID status and people who are aware of the PID might be more in tune with the Complete Streets project or implementation goals.

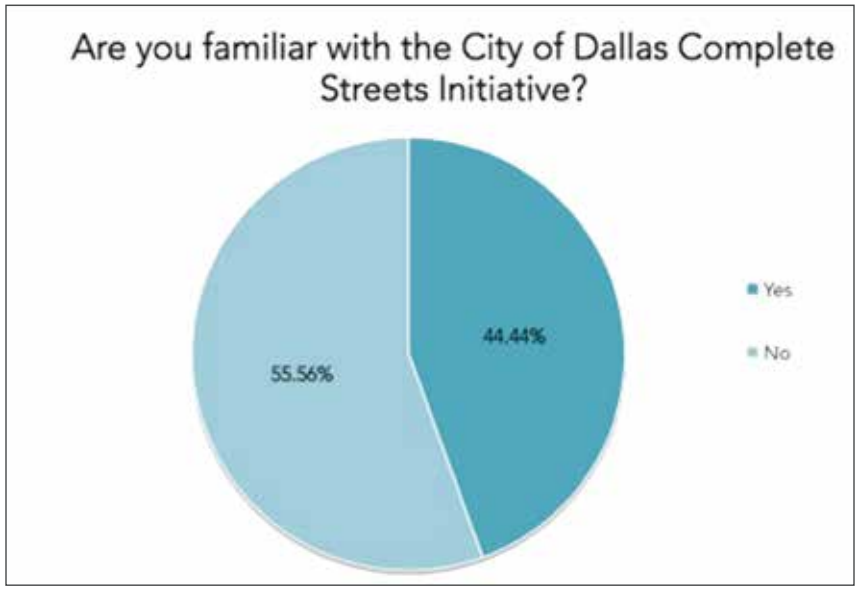
Next, it was important to ascertain the PID's successes and/or failures in the short amount of time it had been implemented. Had there been improvements to the district? Were these improvements noticeable? Survey participants were asked if they had noticed any streetscape or area improvements and to identify any of the improvements they had noticed. Even though a large number of participants were not aware of Knox Street's PID,

Table 4: Question 5



Question 5 asked if stakeholders thought Knox Street's PID has aided in improving the area and/or local business.

Table 5: Question 6



Question 6 asked if stakeholders were familiar with the City of Dallas' Complete Streets Initiative.

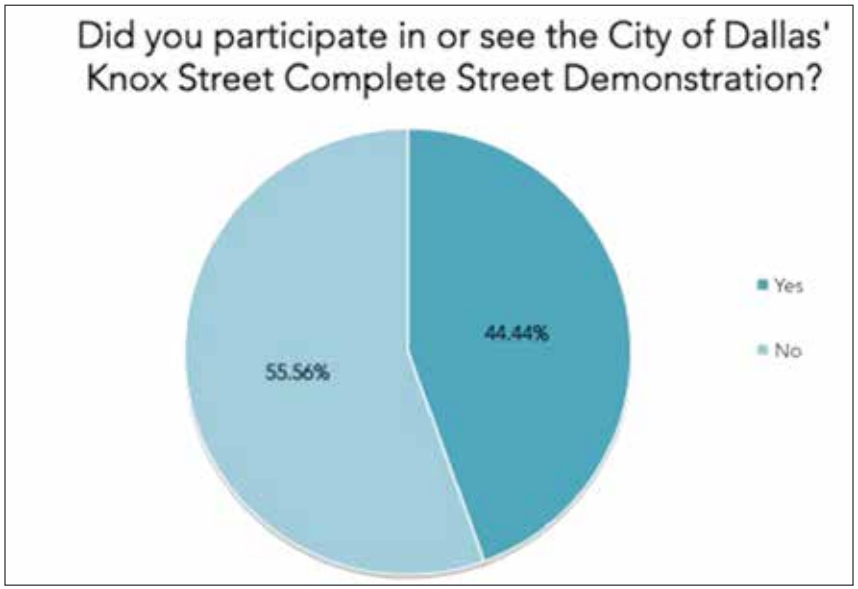
several people remarked there had been improvements over the last few years. Fifty six percent of respondents stated they had seen improvements and only 18 percent stated they had not seen improvements.

A table with participant comments is available in the Appendix of this report, along with a list of questions.

Several of the responses to the question reflect on improvements the Knox Street PID's budget has allowances account for, which indicates the PID has had some success in its short tenure. The increased police presence and landscaping are all elements that help contribute to a Complete Street and these responses indicate Knox Street is well on its way to improving its neighborhood appeal, as also evidenced by the growing number of businesses and leased spaces.

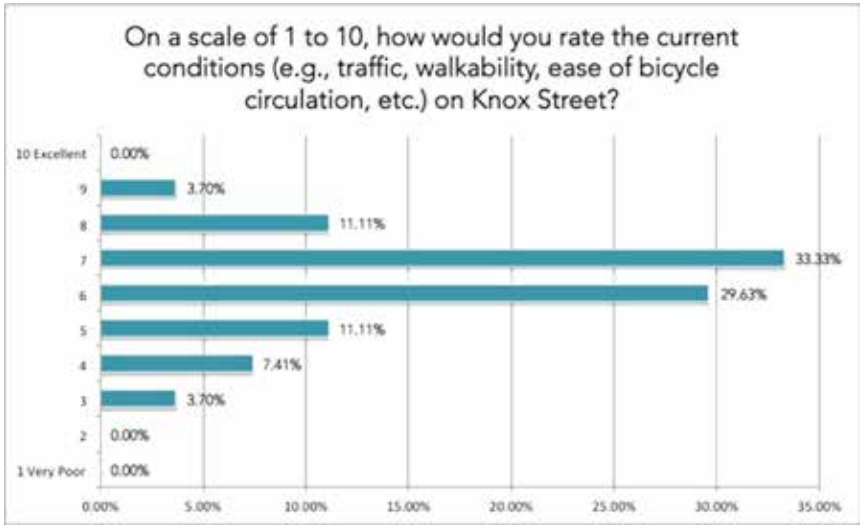
A question geared for a respondent who is aware of the PID and its function on Knox Street was asked as Question 6. Respondents were given the option to say that either the area has or has not improved or that local

Table 6: Question 7



Question 7 asked if stakeholders participated in the Knox Street Complete Streets demonstration day.

Table 6: Question 8



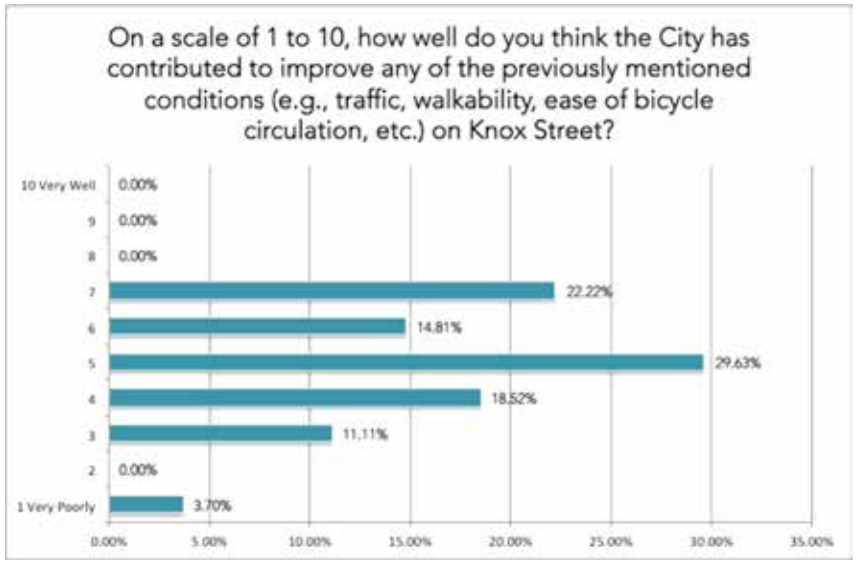
Question 8 asked stakeholders to rate the current conditions on Knox Street in terms of traffic, walkability, and ease of bicycle circulation.

business has increased and/or gotten better. Participants were given the option to select more than one answer since more than one of the answers could be plausible. These responses were heavily weighed on the positive side of things as 33.33 percent stated the area has improved and 48.15 percent stated local business has improved. Only 29.63 percent stated they did not feel the PID contributed to improving the area and 11.11 percent thought the PID did not contribute to improving businesses.

These responses similarly follow prior responses stating the area has seen some streetscape improvements and economic growth over the last few years. The PID's creation could have certainly help catalyze these developments and lead to an assumption that the PID is an essential tool for Complete Streets success. Participant comments reflected similar sentiments as well as expressed the idea that further work needs to be done before actual change is effectively made.

The Complete Streets Initiative project also relies on community understanding and knowledge. Before any design alterations or installations

Table 7: Question 9



Question 9 asked stakeholders to rate how well they thought the City had contributed to improve any of the current conditions on Knox Street.

can occur on the thoroughfare, a communal understanding of the City of Dallas' project and vision must be established. When asked if respondents were familiar with the Complete Streets Initiative, 55.56 percent of individuals stated they were not aware of project. Only 44.44 percent of respondents had heard of the project.

Not surprisingly, the same percentage of individuals had participated in the City of Dallas' Complete Streets demonstration day in September of 2012. This demonstration was extremely important to the project as it gave the district a chance to experience the potential improvements and installations before the project finalized and moved into its next stages. However, given that less than half of the survey participants attended the demonstration day, the response to the previous question makes sense. It will be important to increase stakeholder awareness and understanding in any further project steps.

In addition to an understanding of stakeholders' preconceptions and Complete Streets and PID involvement, it is necessary to evaluate thoughts or opinions on Knox Street's current conditions. If people felt there were no issues with the way the district operated or with the way it was designed, then there would be no purpose in pursuing an in-depth Complete Streets analysis. Obviously, the City of Dallas views the district as having potential for improvement given it was selected for the Complete Streets project as well as to host the Complete Streets demonstration. The City's viewpoints on the district, however, could be extremely different from the stakeholders' viewpoints. In the survey, respondents were asked to rank on a scale from one to ten their perspective on Knox Street's current conditions in terms of traffic, walkability, ease if bicycle circulation, etc.

Interestingly, 29.63 percent ranked Knox Street's current conditions at a six and 33.33 percent ranked the street as seven. One person thought the street was close to Excellent as they ranked the current conditions at a nine, but one person also felt the street's conditions were very poor as he or she ranked the street at a three. These results show that Knox Street's current conditions are not excellent, but they are not very poor either. The district has room for improvement and could most likely benefit from Complete Street treatment. Respondents were provided space

to add comments and these comments can be found in the Appendix of this report.

A lot of the comments reflect on Knox Street's current infrastructure and maintenance. The lack of sidewalk repairs and accessible parking arise in several statements. These issues could contribute to the current vehicular congestion problems Knox Street experiences as well as impact the pedestrian realm and make pedestrians uncomfortable walking along Knox Street. These statements also reflect on Knox Street's character and charm that is important to maintain in any Complete Streets project. The goal is to get more people to visit the site to enjoy what it has to offer, without making the site even more auto-oriented.

This report's SWOT analysis and implementation recommendations stem from an analysis on the City's involvement with the Complete Streets project and any physical improvements made in the Knox Street district. Survey respondents were asked to rank on a scale from one to ten their opinion on how well the City has contributed to improve any of the previously mentioned conditions on Knox Street, including traffic, walkability, ease of bicycle circulation, etc. These responses are more widely distributed on the scale and people varied in their thoughts on the City's involvement with such projects. The majority of participants, 29.63 percent, ranked the City's involvement at a five. It seems the community is fairly neutral on how much of a role the City has played. The next largest group, 22.22 percent, favored the City's involvement with a ranking at seven. The remaining clusters of votes settled between very poorly and the slightly less than neutral four ranking.

The comments participants left mirrored these responses with individuals stating they have seen the City do very little in terms of improvements to the street. One participant stated that a majority of the improvements that have come to the area have been through the businesses and landowners themselves, not the City. These responses are provided in the Appendix of this report.

It is also important for this report to consider whether the improvements that need to be made to Knox Street are best served with a Complete Streets Initiative. The thoughts and ideas garnered from the stakeholders who work in district each day are just as important to understand as the professionally published works that dictate project design and implementation. Respondents were asked how they thought pedestrian traffic could improve on Knox Street in terms of sidewalks, crosswalks and medians, etc.

Several of the comments stress the need for pedestrian-environment improvements, specifically wider sidewalks and better crossings. Many of these statements reflect on the dangerous conditions that current exist for pedestrians on Knox Street as they attempt to navigate between restaurants and retail stores. The limited number of crosswalks at signalized intersections as well as at midblock create increased chances of pedestrians and vehicles colliding.

Respondents were then asked to provide their opinions on how they thought vehicle traffic circulation could be improved in the Knox Street district. These improvements could include turn lanes, wider lane widths, higher speed limits, traffic signs or lights, etc. Given that the Complete Streets Initiative focuses on traffic calming through lane reduction and pedestrian environment improvements, these responses could reflect on

whether or not Knox Street could afford to lose a lane or have more traffic calming measures installed. Several respondents stated they wanted to see turn lanes integrated into Knox Street's thoroughfare grid, as well as incorporating lane width changes and potentially bike lanes. These are all hot button issues that people will surely agree and disagree on, however, they are important to consider because these improvements could greatly influence the traffic to the site. One individual even pointed out a possible conversion of McKinney Avenue and Cole into two-way thoroughfares, rather than the current one-way traffic they each have now. These ideas will be considered in any future analysis and recommendations.

Since parking is also an issue several people have commented on and stated as a problem, it is important to gauge public opinion on what ways they think parking could be improved in Knox Street. Participants were asked for their ideas to improve parking, whether through the installation of a parking structure, more on-street parking or more parking lots. Responses to this question can be found in the Appendix of this report, but a brief summary can be provided below.

This topic received a large number of responses from participants who all seemed to have similar viewpoints on parking on Knox Street. They all agreed that parking is a huge problem for Knox Street and in attracting visitors to the district. On-street parking can be confusing and limited and the parking lots behind the buildings can be difficult to get to. Many comments emphasized the need or desire for a structured parking lot, however in a way that would not impact the character or "village-feel" of the site. These structured lots would have to potentially locate either where a parking lot currently exists or on a parcel of land currently vacant, which is limited in that area. If a structured lot were deemed to be an appropriate solution for the Knox Street district, financing issues would need to be taken into consideration as well as property management.

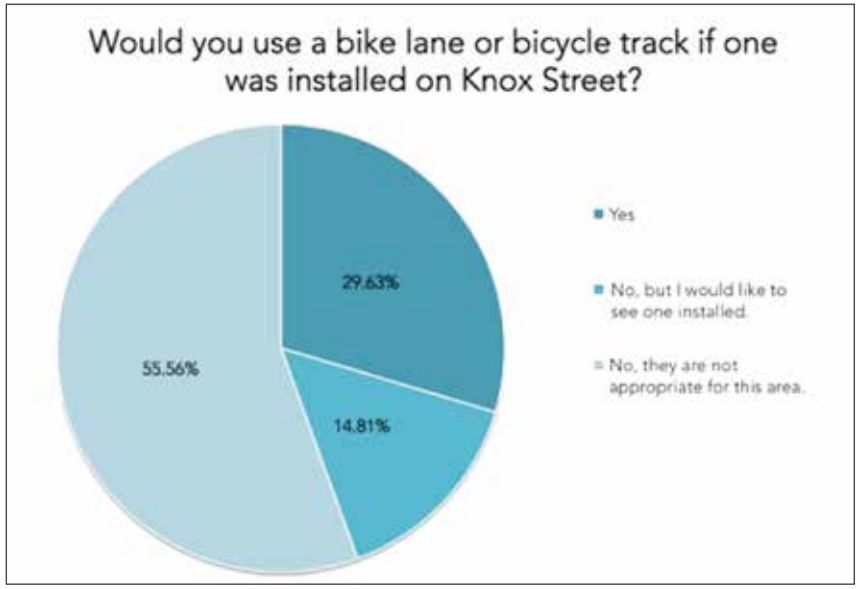
Knox Street already has several great amenities that attract visitors, customers and residents alike. Any Complete Street improvements made to the district would certainly attract additional amenities and visitors, so it is important to get input on amenities stakeholders would like to see come to the area that could complement their land or established business. Stakeholders were asked to list any amenities they thought should come to Knox Street that were not already located in the area.

People also provided a wide range of opinions and ideas on this topic. Suggested ideas include more clothing retail, especially menswear, smaller restaurants geared towards the customer on-the-go, locally owned coffee shops or delicatessens, valet services and even an area completely devoid of vehicular traffic to create an environment where people can walk safely to shop and to work. These are all ideas that could easily be integrated into a context-sensitive Complete Street design.

A bike lane was one of the highlighted amenities in the Knox Street Complete Streets demonstration day as well as in the City of Dallas' Complete Streets Design Manual. Stakeholders' responses have been varied on the topic with several stating they would like to see bike lanes installed and several stating they do not want them in the area. Participants were directly asked if they would use the bike lanes on Knox Street if they were installed.

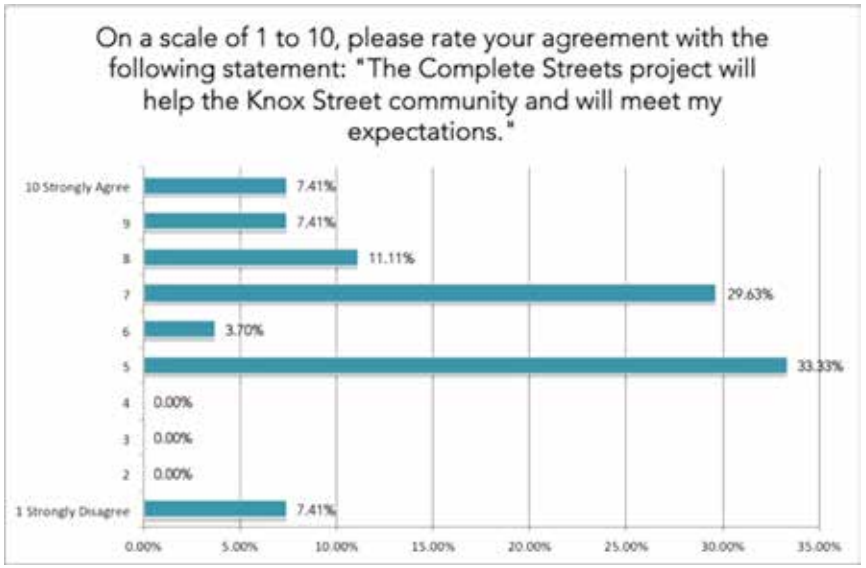
The majority of responses, 55.56 percent, stated they would not use a bike lane or bicycle track if one was installed on Knox Street and that

Table 8: Question 14



Question 14 asked stakeholders if they would use a bike lane or cycle track if one was installed on Knox Street.

Table 9: Question 15



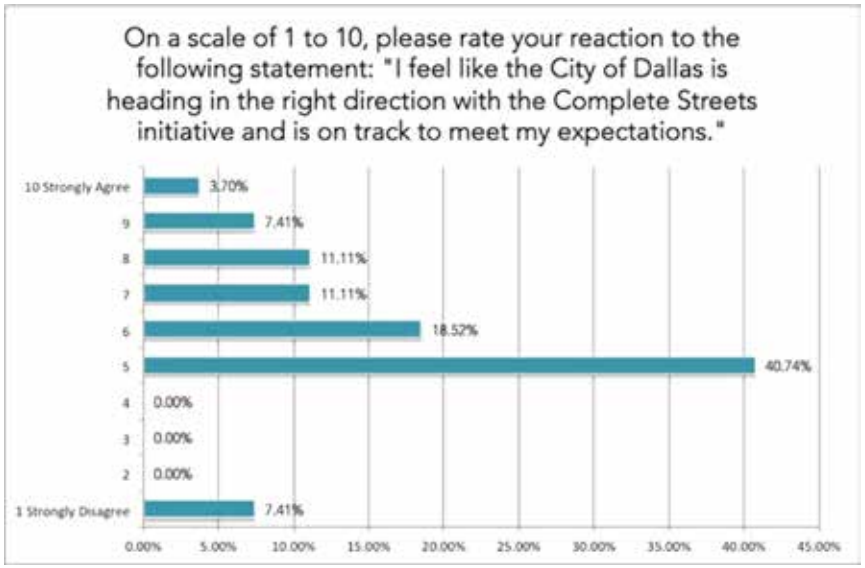
Question 15 asked stakeholders to rate their agreement with a statement that the Complete Streets project will help the Knox Street community.

they thought these facilities were not appropriate for the area. Individuals who stated they would use bike lanes or cycle tracks was the second highest choice at 29.63 percent and individuals who stated they would not use the facilities but thought they would be a fit for the area lingered at a 14.81 percent rating. These numbers suggest a serious look must be taken at the plans to install bike lanes on Knox Street and make sure it is done in a manner that best suits the area and its needs.

Respondents were then asked to rank their opinion on the Complete Streets project and their expectations for future development in the Knox Street district with the statement, "The Complete Streets project will help the Knox Street community and will meet my expectations." This question is intended to gather a general idea of stakeholder thoughts on the Knox Street project as well as the Complete Streets methodologies presented to the public in the demonstration day. These findings will help perform the SWOT analysis.

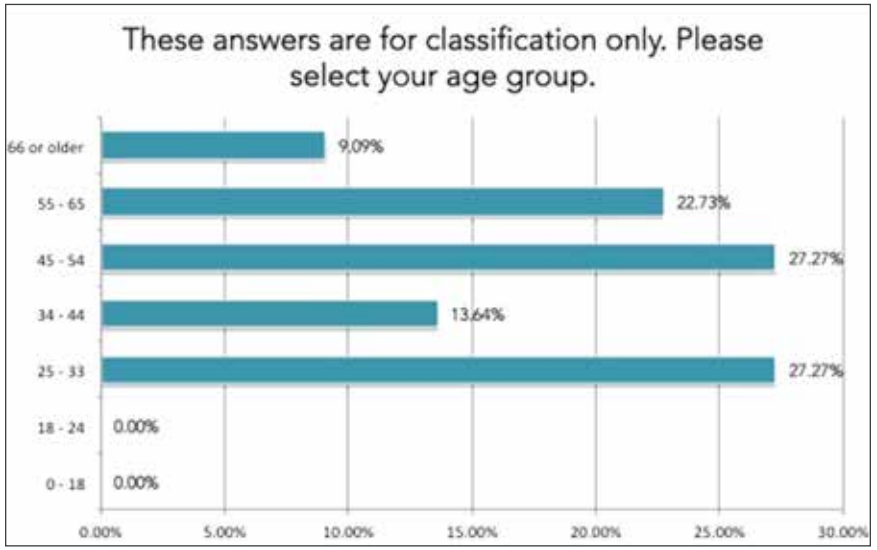
Several people responded neutrally, 33.33 percent of respondents rated

Table 10: Question 16



Question 16 asked stakeholders to rate their agreement with a statement that the City of Dallas is heading in the right direction with the Complete Streets Initiative.

Table 11: Question 17



Question 17 asked participants to provide their age group for classification purposes.

the statement as a five. The second highest ranking at 29.63 percent is at a seven, which indicates people think the project should help the community and meet their expectations, just not to the fullest extent. It is interesting to note that the same number of individuals, 7.41 percent, strongly disagreed and strongly agreed with the statement.

The City of Dallas' role in the Complete Streets Initiative also needs to be rated and understood among stakeholders. If the City had not been appropriately communicating with the stakeholders or if the stakeholders felt their expectations were not being met it could mean several negative repercussions for the Complete Streets project in the future. Respondents were asked to rate from one to ten their opinion in the statement "I feel like the City of Dallas is heading in the right direction with the Complete Streets initiative and is on track to meet my expectations."

These responses are intended to help analyze the strengths and weaknesses in the City's project plan and implementation strategy as well as to help provide direction on future project implementation. Similar to

the other ranking questions, the majority of respondents, 40.74 percent, selected five as their answer. This reveals that the stakeholders have a generally neutral stance on the statement and the City's role in the project. The other responses tiered from five up to ten, which indicates a general approval of the City's involvement as well. Only 7.41 percent of respondents felt they strongly disagreed with the statement.

All of these responses can be further utilized to generate a SWOT analysis of the City of Dallas' Complete Streets project as well as any recommendations for future project implementation. These ideas are presented in the next section of this report.

This section will look at all the previously discussed Complete Streets Initiative elements as set forth by the City of Dallas in the Complete Streets Design Manual – Draft and best practice literature released by leading professional organizations in transportation, planning and design. The comparison of these publications and manuals reveals how successfully the City of Dallas has worked to implement Complete Street methodologies and policies into its own best practices, as well as how well it has applied these new standards to its catalytic Complete Streets project on Knox Street. The following analysis examines the similarities and differences previously identified earlier in this report to undercover the project's strengths, weaknesses, opportunities and threats, also known as a SWOT analysis, as it pertains to Knox Street and the City's application of Complete Street methodologies. Stakeholder responses to an online survey regarding the Complete Streets Initiative, Knox Street's PID and the City's project role supplement the analysis and help determine design and implementation recommendations.

COMPLETE STREET INITIATIVE STRENGTHS

The implementation process has seen several successes thus far due to initiatives taken on behalf of the City of Dallas and the Knox Street Public Improvement District. This report defines project strengths as elements and events within the Complete Streets process that the City and/or PID has control of internally. The Complete Street Initiative's greatest implementation strength lies with the Complete Streets demonstration on Knox Street in September 2012. The City's selection of Knox Street as one of the first thoroughfares to receive Complete Streets treatment came as a result, according to Peer Chacko, assistant director for long-range planning at Dallas City Hall, "…because there's a public improvement district there, and they're eager to pay for it, and that's something we obviously want to jump all over" (Wilonsky 2012). Given that a funding source already exists in the Knox Street community and it has been acknowledged by local landowners that the area is in need of improvements, the Complete Streets implementation process should be one of the City's greatest assets. The coalition between the City and private sector partners to develop, manage and implement the temporary Complete Streets demonstration was something both sectors could control internally and use to their advantage to pursue the project further down the road to actual implementation and additional bond funding.

The Complete Streets demonstration provided an opportunity for the City to present Complete Street designs to the public as well as exhibit a preliminary design solution for Knox Street itself. Public perception of this weekend event varied as much as the previously presented survey results. In one Dallas Morning News article (2012), "Knox Street, now buffered with bike lanes and a beer garden. For some, that's great news. For others, not so much," the author states the overall sentiment at the event was difficult to garner. One participant stated "…he hoped that one day this (temporary) cycle track would extend all the way into East Dallas, connecting the Katy Trail to White Rock Lake, since this ain't happening any time soon…" (Wilonsky 2012). Other individuals on Katy Trail and on Knox Street during the demonstration, both pedestrians and bicyclists, appeared to like the new installations or the idea of the features becoming permanent, but seemed daunted by the transformation process or the added congestion such changes would generate at the onset of the project (Wilsonsky 2012). This generally positive media coverage as well as thorough demonstration weekend coupled with a City Complete Streets open house stands as the greatest strength for further implementation. These meetings and communal gatherings need to continue

greatly help the Knox Street district. As someone who has lived in the area and witnessed the amount of confusion generated by these streets, I do not feel that the switch would be a waste of time and money and that it would pay off in the long run more than leaving these collector roads unaltered. If Knox Street is receiving Complete Street treatment, those streets in the district should receive it as well.

AND FINALLY...

The City of Dallas and the Knox Street PID has done nothing but impress with this initiative and project. Although there are several bumps in the road that still need to be hurdled and the actual project will not go underway for several more months, the changes presented by the Initiative over the last four years has shown that progress is happening in the City of Dallas and exciting things are about to happen. Complete Streets project success will mean several things for the community and could change the way downtown Dallas and its surrounding neighborhoods interact with each other as well as reshape the community altogether.

The following questions were asked to the online survey participants.

1. Are you a business owner, landowner, or resident in the Knox Street PID or surrounding neighborhood? Select all that apply.
2. Are you aware that Knox Street is classified as a Public Improvement District (PID)?
3. If yes, have you noticed any improvements to Knox Street or the surrounding area over the last few years? Please list out any improvements you have noticed.
4. Do you think Knox Street's PID has aided in improving the area or helped local business?
5. Are you familiar with the City of Dallas' Complete Streets Initiative?
6. Did you participate in or see the City of Dallas' Knox Street Complete Street demonstration?
7. On a scale of 1 to 10, how would you rate the current conditions (e.g. traffic, walkability, ease of bicycle circulation, etc.) on Knox Street?
8. On a scale of 1 to 10, how well do you think the City has contributed to improving any of the previously mentioned conditions (e.g. traffic, walkability, ease of bicycle circulation, etc.) on Knox Street?
9. On Knox Street, how could pedestrian traffic improve (e.g. wider sidewalks, more crosswalks, easier crossings, medians, etc.)?
10. How could vehicle traffic circulation on Knox Street be improved (e.g. turn lanes, wider lanes, higher speed limits, traffic signs or lights, etc.)?
11. How could parking on Knox Street be improved (e.g. more on-street parking, more parking lots, a parking structure, etc.)?
12. What amenities would you like to see come to Knox Street that are not already located there or close by?
13. Would you use a bike lane or a bicycle track if one were installed on Knox Street?
14. On a scale of 1 to 10, please rate your agreement with the following statement: "The Complete Streets project will help the Knox Street community and will meet my expectations." Please provide any additional comments.
15. On a scale of 1 to 10, please rate your reaction to the following statement: "I feel like the City of Dallas is heading in the right direction with the Complete Streets Initiative and is on track to meet my expectations." Please provide any additional comments.
16. For classification purposes only, please select your age group.

Table 4: Question 4 Comments

Additional businesses to the area
no physical improvements, however, improved promotion of the area as a retail/restaurant destination
I just moved here from Greenwich Ct but it has made amazing changes since I was last in Dallas in 1994.
Landscaping
Maybe a few new trees but nothing other than normal things that landlords and store fronts do. I do have concerns about taking away traffic lanes to make room for bike lanes and turn lanes. Henderson would love to have the wide streets we have as traffic there is bad. Sending bikers down a busy traffic street when they can take a side road could be better. We dont get many bikers and most would not be stopping to shop anymore than they already do. They also did not use the lane that was up for a week much. What we noticed was cars lined up two blocks in traffic. Also people like being able to park in front of a store. With all the traffic put in one lane it made it difficult to get into and out of those lanes. I just think over all that adding a bike lane and a turn lane both to a already busy street could create traffic issues. I am all for making it safe, and inproving the look. It is my understanding that one of the main reason for adding the bike lane is so that more funds will be given for overall street inprovment but it has to include a bike lane to get those funds.
We moved from McKinney Avenue around the corner to Knox Street last November. We have seen an increase in traffic being on Knox and appreciate when there is not construction going on to hinder customers from getting to the store.
Stop signs installed
Adding more retail shopping
The number of leased spaces has increased. The quality of tenants has increased. The whole neighborhood has improved as older condos have been removed and replaced with higher end apartments and condos.
Website and valet parking, branding. I'm also aware of much study and discussions about how to implement a cohesive look for the area.
we have only been in the area for a year so have not noticed any improvements except to say that I have heard from our customers that they are thrilled to have more stores offering apparel in the area.
Increased police presence, landscaping/streetscapes, valet
side walk, bicycle areas

Table 4: Question 5 Comments

The only changes to the area have been business movements and new stores to the area. Landscaping, traffic and enhancements have been minimal. Hoping that more businesses mean more funding for these improvements.
It is a beautiful area--the best shops and eateries
We gotton new business but that is a result of Knox st always being a great shopping area.
Many of the needed changes are large capital expenditures. It will take several years to accumulate enough money in the PID to implement significant improvements

Table 4: Question 8 Comments

Cross walk buttons often don't work. Traffic moves too quickly down Knox Street/McKinney/Cole. No bike lanes present.
Great to navigate but not good foot traffic for my business. Its a little secret area in Dallas--LETS EXPOSE IT AND GET MORE FOOT TRAFFIC HERE!
parking could be an issue for merchants. we do not see a lot of bicycle traffic, but do notice many of our shoppers coming off the katy trail/shopping at lululemon.
parking is still an issue - lots taken by apple employees
do not notice lots of bikes on this street. They seem to take other less traffic roads to the trail.
Bicycles are still sort of a problem.
Sidewalks need repair on travis.
Knox used to be a "though" street for the City, going back to the days of the Katy railroad and the train depot. It is no longer able to carry the volume traffic that we have now. Mockingbird and Fitzhugh are the main arteries for traffic flow and certainly Mockingbird isn't able to handle the traffic. The town of Highland Park will never allow the widening of Mockingbird. I would hate to see Knox become a conduit street.
lack of parking is an issue

Table 4: Question 9 Comments

There have been very few updates in the last couple of years that have made a major impact.
i'm not very confident in giving an answer, as i'm not sure about the improvements that were made thus far to the area.
It has the same cross walks, and same lanes it has always had so no improvents have been made in the 12 years I have noticed. Most wrecks occur when drives go the wrong way on a street or turning into starbucks parking.
most of the improvements seem to be from the land and building owners in the area. I can't say that I have noticed and street or bike lane improvements othet than the katy trail which I think was privately funded. However, I was not aware that we are a PID and was not really keeping an eye for that specifically.
I think that is a bad question. What are the things that the City can do? As stated above, I think the focus should be on discouraging through traffic. Knox has always been a destination, highland park pharmacy etc. I am not happy with any of the answers. The survey required I give an answer, therefore I picked one in the middle.

Table 4: Question 10 Comments

More frequent cross walks and slower traffic.
incorporate a center turn lane from Katy Trail to Central Expressway. Improve head i parking; widen sidewalks
two way streets
more crosswalks, sidewalks often blocked by parking/construction, shorter lights
Crosswalks at midblock
The merchants association does nothing to make events here happen. there has not been a meeting since April. I have asked and even offered to run or host. Crickets....no response!
more crosswalks (like the ones that flash and just have cars yield or something?), more parking, medians
Easier walk ways
wider sidewalks, more crosswalks
wider sidewalks, parking on McKinney beside the Apple store should be turned at an angle
Wider Side work
more cross walks with lights, we have great sidewalks,
Its pretty good as it is!
More crosswalks
Easier crossings
It's a fairly walk friendly area. I just don't see where the room would be for the mentioned improvements. I have not studied this type of thing. will need to observe for a while and think about it.
Yes, all of those things would significantly improve the area.
only sidewalks for walkers
crossings are dangerous as families or elderly people have a difficult time crossing the street in the time given at the stop lights.
More lit crosswalks like the one on Katy Trail and Knox. Flashing lights will help pedestrians get noticed.
Easier crossings would create for more people to get around easier, YES, but pedestrian traffic would improve primarily through patron's desires to get around the area more by foot. ie, more reasons for there to be pedestrian traffic would increase it.

Table 4: Question 11 Comments

Dedicated bike lanes.
incorporate a center turn lane from Katy Trail to Central Expressway
more clear signage, left turn assistance, more parking
Cole + McKinney two-way
By getting merchants together to partner for events. Make them happen-we all want our business to improve. My store has top in average sales but I may lose my job in a month if I don't get more traffic in. My company sends out catalogs but very few who get it come in. We need a public parking garage-so many spots are for a certain retailer =people are afraid they will be ticketed so they just order online.
turn lanes! traffic speed is good.
More lanes
turning only at traffic lights.
Turn lanes on McKinney turning onto Knox, Knox turning onto Cole
no. Best as is.
None
the turn lane made the flowing traffic worse, speed does not need to be increase, we have a traffic sign and light at every corner already so I am not sure what is availble to increase circulation.
Protected turn lane vs. straight on Travis St
Bike lanes!
Was not impressed with the experiment last year with the bike lanes customers just avoided the area
Turn lanes
It seems to flow fairly well considering the popularity of the area.
As stated above, there is an unlimited amount of traffic. As you make it easier to cross, you will have more through traffic, bringing it to the same situation you have now, only with more traffic and more difficulty for the merchants and restaurants who are the ones who pay the taxes, either through sales tax or property taxes.
wider lanes; only for cars and not sharing with people/bikes
decrease speed limit
Turn only lanes
better turn lanes and possibly higher speed limits, but the streets are entrenched and therefore is would be harder to accomplish better vehicle traffic circulation.

Table 4: Question 12 Comments

A parking structure would be beneficial, but needs to be near the street and needs to be public.
all of the above
parking structure
Structured parking
a garage that is free when you make a purchase from a retailer and less dedicated spots to certain stores-make it free for all street parking
due to space, a parking structure could be very useful
Build parking lot
definitely parking building.
more parking would be very helpful
Can't see how and lack of some parking encourages walking. Land is too expensive to build a parking garage. Perhaps future develop will help.
More Parking lots
a parking structure could be handy but people do not want the traffic issues that come with places like the west village. They like it feels like a neigborhood area not a corporate place that people only concerned with how much they can milk out of an area.
We have a reserved parking lot with our lease but so many people want to park in our lot to use the restaurants. Having one convenient place to park without having to use valet would be nice.
Plenty of parking in the Travis Walk garage
A parking structure would be good
Parking lots or structure
I don't see where any parking structures could be added.
We desperately need more parking. The only real answer that I can see are underground or above ground parking. Both very expensive propositions. And also, likely to change the character of the street.
need parking garages
parking structure, more parking lots plus a centralized valet for the area.
Less on-street parking and more parking garages. Park here signs will help people notice the current garage under Travis Walk.
There is a definite need for more parking lots/parking structures. Also, more temporary/short term solutions include better marked parking signs for patrons to easily identify, as well as an effective universal valet service for the entire Knox area (this has been tried but the logistics did not work)

Table 4: Question 13 Comments

Great access to the Katy Trail. Need more seating on the street. Better access to public transportation.
has - variety of Restaurants needs- more fashion clothing stores
more soft goods retailers, more coffee shop hangouts
More apparel
I would like a juice bar, --something healthy to complement being near katy trail. More mens clothing stores so sunday we would have better biz-mens athletics workout!
More Resturants
can't think of anything.
Security
Types of businesses are the amenities.
Yea
We would love some trash cans down the street like they have in down town dallas, a little longer cross walk like by Chilies. You get about quarter of the way across and its flashing to hurry.
Public Bathrooms- There a lot of people who come from the Katy Trail or are waiting to get a table at a restaurant that ask to use our restroom without shopping at all.
Grocery Store
Dont know
Accessories/jewelry store Burger place---hop doddy

I would love to see a developed area that was copletely fee of cars. In other words, the parking would be contained to certain areas and the streets would be free for families to walk around, perhaps lawns and sidewalks could be created. A great place to walk, work, and live. A fantasy, but, you asked! Now make it happen. Haha.
I think a wonderful bike path could be made coming off the Katy trail, just NOT ON KNOX. Armstrong would be a good candidate. From what I understand about the complete streets initiative only Knox is being considered. I do not understand the rational for that. It is more dangerous for bikers and pedestrians, as well as motorists. There is already a big issue on the Katy Trail with the danger to bikers and walkers on the trail. You start funneling them onto Knox street and you will have a disaster - actually many disasters, I fear - there has been one death on the Katy Trail from a biker knocking down a jogger causing a fatal head injury. There are probably others that I'm not aware of.
more parking
This is not necessarily an amenities, but our customers often leave the area because there isn't a quick place to grab a sandwich.
Monthly events that will bring people to the street and in the stores.
I would like to see the aforementioned valet service, a way to increase ped traffic either through street/sidewalk improvement or through patron mindset, and more unification of the "Knox-Dallas" area through signage, logos, landscaping, etc, that give the entire neighborhood a unified feel.

Table 4: Question 15 Comments

it would if there were no bicycle lanes, wider sidewalks. and more streetscape
I bike all over knox street and getting people out on bikes here would get more traffic in my store. how about some bike rack lock ups to encourage it?
this will mean better business for the merchants as well as increases to other areas of town, south of northpark mall, but north of downtown.
Poor use of resources to date. Knox needed the traffic flow. Perhaps one day a bike lane useful. For now, bike around. How about a bike parking area south of knox @ the Katy trail?
Don't know enough about it.
AGAIN, THIS IS A BAD QUESTION!! If you are asking if I want to see bike lanes on Knox, absolutely not, but do I think a thoughtful redevelopment could improve the area, yes. The demonstration was a total disaster. I've been told that traffic counts were improved by the demonstration. I seriously question that, but even if true, I have heard no mention of the back up on Abbott for blocks with people wanting to turn onto Knox.
I don't know have any information regarding the streets project

Table 4: Question 16 Comments

Yes, improve pedestrian relationship with the street.
still to be seen and the week we had the fake lanes and stripes up nobody really was like that is a great idea. We get lots of customer interaction and people who live in the area in here so we asked.
The real answer wont be found unless we keep trying different ideas
Sorry, again have to apologize for my ignorance. I tend to live in an introspective state free from the details of the world. You can't lease space in a free mind. Perhaps the Buddha could inquire, but he would know better!
See my other comments.
again, no information
I am a component of cycling, bike lanes, etc, as much as possible, but it was temporarily implemented on Knox and was a complete disaster, primarily because of its effect on the vehicle traffic on Knox and all the cross streets

REFERENCES

Ariniello, Alex J. "Are Roundabouts Good for Business"?. Professional Report, Denver: LSC Transportation Consultants, Inc., 2004, 1-13.

Burden, Dan, and Peter Lagerwey. "Road Diets." Road Diets: Fixing the Big Roads (Walkable Communities,Inc.), 1999: 1-15.

Burden, Dan, and Todd Litman. "America Needs Complete Streets." ITE Journal April (2011): 36-43.

City of Dallas. "Sustainable Development and Construction." Complete Streets Initiative. http://www.dallascityhall.com/development services/CompleteStreets.html (accessed September 24, 2013).

City of Dallas. Sustainable Development and Construction. 2013 City of Dallas Complete Streets Design Manual – Draft (September 2013). Dallas.

City of Dallas. Dallas Complete Streets – Knox Street. 2011. Dallas.

Designing walkable urban thoroughfares: a context sensitive approach.. Washington, DC: Institute of Transportation Engineers, 2010.

Drennen, Emily. Economic Effects of Traffic Calming on Urban Small Businesses. Thesis, San Francisco: SanFrancisco State University, 2003, 1-84.

Dumbaugh, Eric, and J.L. Gattis. "Safe Streets, Livable Streets." Journal of the American Planning Association 71, no. 3 (November 2007): 283-300.

Eisele, William L., and William E. Frawley. "A Methodology for Dete mining the Economic Impacts of Raised Medians: Final Project Results." Study, Texas Transportation Institute, Texas A&M University, College Station: Texas A&M University, 2001, 1-4.

Evans-Cowley, Jennifer. "Sidewalk Planning and Policies in Small Cities." Journal of Urban Planning and Development 132 (2006): 71-75.

Ewing, Reid, Susan Handy, Ross C. Brownson, Otto Clemente, and Emily Winston. "Identifying and Measuring Urban Design Qualities Related to Walkability." Journal of Physical Activityand Health 3,no. Suppl 1 (2006): S223-S240.

Heath, Gregory W., et al. "The Effectiveness of Urban Design and Land Use and Transport Policies and Practices to Increase Physical Activity: A Systematic Review." Journal of Physical Activity and Health Suppl 1 (2006): S55-S76.

Hoyt, Lorlene. "Collecting private funds for safer public spaces: an empirical examination of the business improvement district concept." Environmental Planning B: Planning and Design 31 (2004): 367-380.

Jacobs, Karrie. "Instant Urbanism." Metropolis Magazine. June 8, 2012. http://www.metropolismag.com/cda/story.php?artid=5089 (accessed February 18, 2013).

Jang, Tae Youn, ByungJoo Lee, Ph.D., Weijie Wang, Ph.D., and Moon Namgung. "Design Criteria for an Urban Sidewalk Landscape Considering Emotional Perception." Journal of Urban Planning and Development 135 (12 2009): 133-140.

"Knox Street PID | Dallas OED." Dallas OED. http://www.dallas-ecodev

org/incentives/tifs-pids/knox-street-pid/ (accessed April 22, 2013)

Krizek, Kevin J., and Pamela Jo Johnson. "Proximity to Trails and Retail: Effects on Urban Cycling and Walking." Journal of the American Planning Association 71, no. 1 (November 2007):33 42.

LaPlante, P.E., PTOE, John, and Barbara McCann. "Complete Streets: We Can Get There from Here." ITE Journal May (2008): 24-28.

Lloyd, M.G., John McCarthy, Stanley McGreal, and Jim Berry. "Business Improvement Districts, Planning and Urban Regeneration." International Planning Studies 8, no.4 (June 2003): 395 321.

Lucero, Stephanie. "Dallas Looks to Create 'Complete Streets'." CBS Local (Dallas), September 24, 2012. http://dfw.cbslocal com/2012/09/24/dallas-looks-to-create-complete-streets/ (accessed October 5, 2013).

Lund, Hollie. "Testing the Claims of New Urbanism: Local Access, Pedestrian Travel, and Neighboring Behaviors." Journal of the Ameri can Planning Association 69, no. 4 (Autumn 2003):414-429.

Manville, Michael, and Donald Shoup. "Parking, People, and Cities." Journal of Urban Planning and Development 131 (December 2005): 233-245.

McCann, Barbara A., and Suzanne Rynne. Complete streets: best policy and implementation practices. Chicago: American Planning As sociation, 2010.

Mok, Jeong-Hun, Harlow C. Landphair, and Jody R. Naderi. "Landscape improvement impacts on roadside safety in Texas." Landscape and Urban Planning 78 (2006): 263-274.

Mukhija, Vinit, and Donald Shoup. "Quantity versus Quality in Off-Street Parking Requirements." Journal ofthe American Planning Asso ciation 72, no. 3 (November 2007): 296-308.

NACTO Urban Bikeway Design Guide. Washington, D.C.: NACTO, National Association of City Transportation Officials, 2013.

NCTCOG. "Cooperative Data Program." NCTCOG Cooperative Data Program. http://www.nctcog.org/ris/CDP/ (accessed April 30, 2013).

Sam Schwartz Engineering, America Walks. Steps to a Walkable Community. Publication, NewYork City:Sam Schwartz Engineering, 2012, 180.

Schmidt, Stephan, and Jeremy Nemeth. "Space, Place And The City: Emerging Research On Public SpaceDesign And Planning." Journal of Urban Design 15, no. 4 (2010): 453-457.

Smart Growth America. "Complete Streets Fundamentals." National Complete Streets Coalition. http://www.smartgrowthamerica.org/complete-streets/complete-streets-fundamentals (accessed November 5, 2013).

Southworth, Michael. "Designing the Walkable City." Journal of Urban Planning and Development 131(December 2005): 246-257.

Stark, Juliane, and Roman Klementschitz. "Off-Street Parking Regulations for Shopping Facilities: Potential Impacts and Scope of

Implementation." Journal of Urban Planning and Development 134 (December 2008): 173-179.

Talen, Emily. "Help for Urban Planning: The Transect Strategy." Journal of Urban Design (Cafax Publishing) 7,no. 3 (2002): 293-312.

"Thoroughfare Plan Map Grid." City of Dallas, Texas. http://www.dallascityhall.com/developmer (accessed April 22, 2013).

Urban Street Design Guide. New York City: National Association of City Transportation Officials, 2013.

U.S. Department of Transportation. Case Study No. 19: Traffic Calming, Auto-Restricted Zones and Other Traffic Management Techniques - Their Effects on Bicycling and Pedestrians. Case Study Washington D.C.: Federal Highway Administration, 1994, 1-69.

Wilonsky, Robert. "Why Complete Streets manual isn't quite complete: There's not a lot of money, and a lot of people control those streets." Dallas Morning News 10 Aug. 2012, sec. City Hall Blog: 3. Print.

Wilonsky, Robert. "Knox Street, now with buffered bike lanes and a beer garden. For some, that's great news. For others, not so much.." Dallas Morning News 27 Sept. 2012, sec. Transportation Blog: Dallas News. Web. 13 Feb. 2013.

Kelsey Berry

The University of Texas at Arlington, 2013
December 2013

Sed eum fugiaec tassequi blab invenisin conem et ut alit esti non rem fuga. Ehenderro exerepel inctatiam am et aut erum rerum dolliquid min nima eum quidias asperruntem resciis aut iumqui tecero doluptam cone conserupis ulparum aperibe rerfernatqui cone comnimint fuga. Nequam eaque que ex ex eveliqui temquiatia dolorerum sunt acillest, as ape quis et vendignimpos sediore perumque nonseque quae eatur, ut volessimus autaectem qui omnis si culliqui alia vent.

Optaecae provita iur re dolut eicil is quidem asped que culles maximodis iurempo rporuptate volupitiossi volore et aut aligenihit fuga. Ut lacea dolorporum voluptatust, erum volesto rectus pel et hitatis deria ped et optaquis simin el maximusdae pe renita vellis ea qui culliqui conseni stionsectate ped que aut aut ab ipsa volendam niatqua sperum dessus dolum laut unt aut ium accum sendaerro is aut occum cus accum nusapie nduntionse sunti qui te sunditam rest plicipictum qui aceria int accatisqui de sus apitium laut vellatem facepelique pro que nisquod quunt, que nat pel maionsequia volest, utat volor adiorem am repreri nulpa si voluptates aut reperchil expelignim faccabo riaspient experit exped qui ape sendit optam lacea solum volore pere et et litiniscid quiae vellore, comnihil illa que latur susam rem raes doluptatur acearit quuntiasped quaspe pro que qui cusant la dus aut voluptis est voluptiur aut aliquat res ide et as ario. Ut volupiciatur aut diorroreptat exere sum ipsam di aut fugitibus alic tem am, sum quia sint eium ilignam harunt inctem in coressit, versperrum esto tem exerchi llest, quas dolore nima quam fugitasped exercil id et verro corerspissim rem quamus.

Igendebitium es non res as et ium lam quuntur? Eque suscipsant eum resecto odipsaerum quatemque eos apidem simi, qui re, imolori antur?

Sed et quam volo int que plibearibus doluptatiae sinveles cusa peris asped quid magnati onsenim velignis mod ut ma nam vendae nullabore Em re, adis re prae dent que pe nonseca borpos volorum quam siminimped unt quuntectas voloremporro in restor ad quidel modi quam esenimaiosam cum que porate audi corpores ius dolupti conserum quam volupta tatium inum la doluptatqui dest, officiis et, to consed et fuga. Nam, volenet enissuntiur, nus as rat.

Sus dolora iurion eum, toritiu ntibusam etur magnate perferum, offictireicimi, corum quae dignitat.

Sunt la velicid qui delestiunt at vendanditias eserum dem vendam fugia a vellorp orerionecus sa aut et laciliquam qui cuptasi dolorem elesequ ibusdam, con natecto ribusdanis sandit pa aut venducid que simusto cullabo. Od ut pos delestion prem autaqui offic tem que inveniti quodiatur?Berferupic to odio vendant eatus dit plic to magnimo lorrunt.

Velessitio ma volute verum audicit et illaut et vit ad quate ne nones min porest, accus et odi sitiur apiet voluptae nus eum alique quosto blant,Nus sim dem qui aut qui conseratur sequatu mquuntecte nobitio id minumention consequi none eate lam re, consequ aeruptae sin conserumquia sandaestibus voles atibusc iandios di venis velendi orempor aut lationet atio. Eveles as deliquos exceati busdam, od ma nem hilicimped