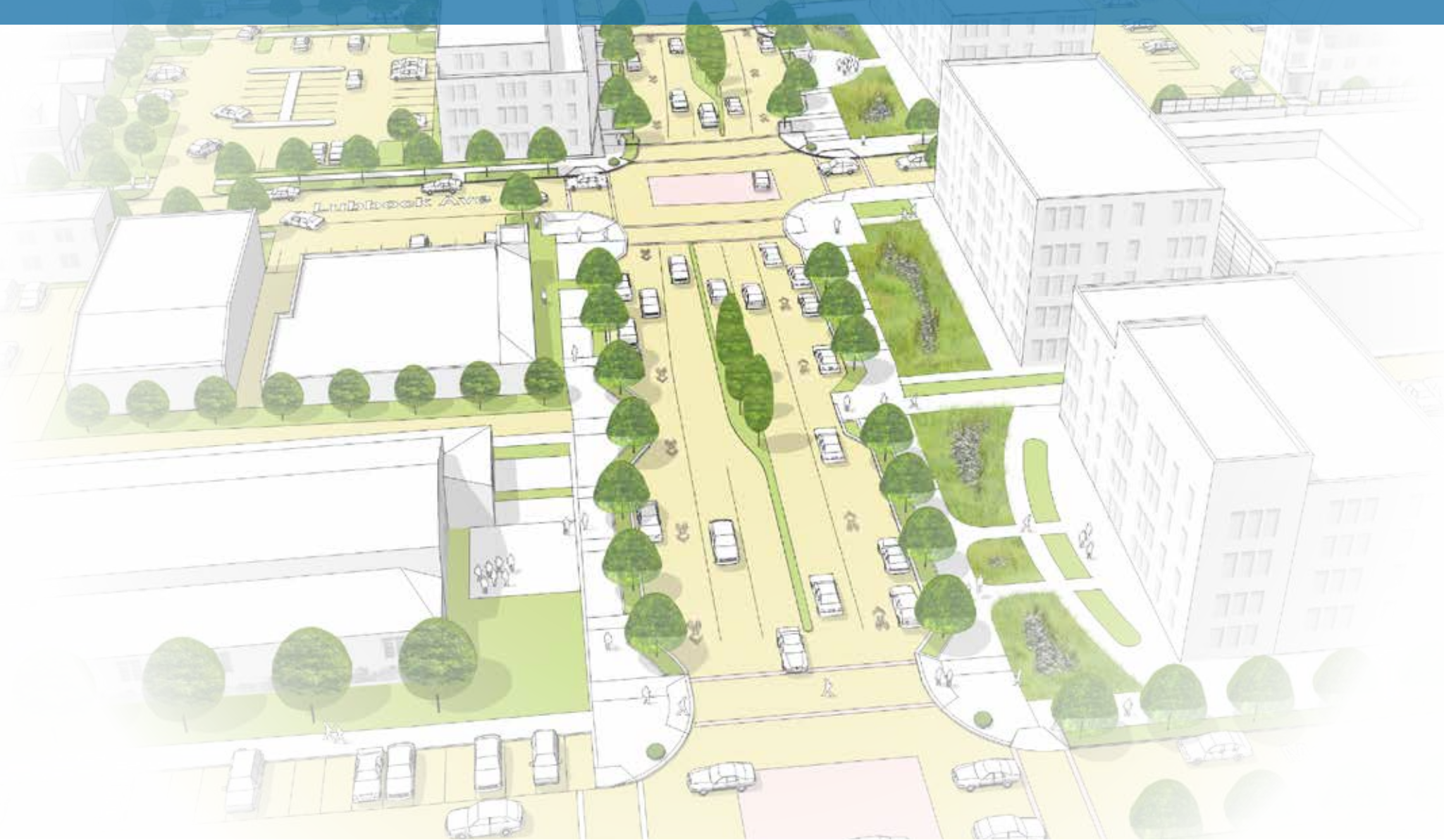


BERRY/UNIVERSITY DEVELOPMENT PLAN



March 29, 2016





The **Berry/University Development Plan** is funded in part by the North Central Texas Council of Governments with additional funding and resources provided by the City of Fort Worth, Fort Worth Transportation Authority (The T), Texas Christian University (TCU) and the Berry Street Initiative.

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City of Fort Worth
Texas Christian University
The T
Berry Street Initiative

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Fort Worth Blue Zones Project
Fort Worth Bike Sharing
University United Methodist Church
Fuzzy's Taco Shop

EXECUTIVE SUMMARY

Since the 1990's, the City and a variety of local stakeholders have worked toward a yet to be solidified common vision for the future of the Berry/University area. The purpose of this document to help to finalize and consolidate that vision. Recently, several recent catalytic events have occurred that make finalizing (and implementing) a common vision for the Berry/University area even more important. First and foremost, significant flooding events have occurred and will continue to occur unless measures are taken to help improve stormwater flow through the area. Secondly, a TEX Rail line to DFW Airport has been announced and a planned TCU/Berry station will generate increased development activity in the area. And finally, TCU has experienced a high rate of growth in recent years and the University continues to be a major contributor to economic and development activity in the area. With this growth comes pressure on the surrounding neighborhoods that must be addressed.

PUBLIC PROCESS

The public input process for this plan was centered around a six-day public participation design charrette, The charrette was held between October 10 and 16, 2014 on the TCU campus at the Brown-Lupton University Student Union. The charrette included the following key public events:

- » Neighborhood Design Workshop
- » Open Design Studio (open to the public all week)
- » Two Lunch & Learns
- » Drop-In Open House
- » Closing Presentation

STRENGTHS AND CHALLENGES

Following the public outreach effort, a set of key strengths and challenges were identified:

Key Strengths

- » The Proposed TCU/Berry Station
- » An Active and Engaged Community
- » A Strong Framework for Connectivity
- » The Growth and Expansion of TCU

Key Challenges

- » Perception Problem: "Scary Berry"
- » Limited Bike and Pedestrian Connectivity
- » Lack of Usable Green Space
- » Aging Stormwater System
- » Weak Market
- » Missing Housing Options

THE PATH FORWARD: KEY RECOMMENDATIONS

In order to best address the challenges and successfully leverage the existing assets of the area, the following key planning and policy recommendations were developed.

1. ACTIVATING BERRY	
1.1: Fill in the Critical Gaps Along Berry	Fill in the gaps with appropriately-scaled infill buildings between TCU and Cleburne.
1.2: Finish the Streetscape	Walkability and bikeability enhancements are needed east along Berry and should include the addition of protected bike lanes. Better infrastructure for accommodating bikes on Berry should be considered.
1.3: Reuse Existing Buildings; Enhance the “Cool” Factor	The area east of Cleburne has the potential to find a niche as a place where creative people and businesses can come to launch innovative endeavors.
1.4: Connect to Nearby Centers	Streetscape improvements along University and extending down to Bluebonnet Circle should include a planted center median as well as street trees to provide shelter from the Texas sun.
2. PRESERVING THE SURROUNDING NEIGHBORHOODS	
2.1: Promote Higher Density Residential Closer to Berry	To support Berry and the future TEX Rail station, and to help promote housing affordability, a more complete set of housing options must be developed.
2.2: Improve Walkability in the Neighborhood	While the block network is well-connected, the lack of sidewalks and street trees can make it difficult to walk from place to place in and around the project area, especially in the summer months.
2.3: Connect to the Trinity Trail	Providing a safe and direct bike and pedestrian route to the Trinity Trail from the Berry/University area should be a priority of this effort.
3. EMBRACING THE STATION	
3.1: Act Tactically Now	Local entrepreneurs, City officials, property owners and local residents should work together to jump-start activity on targeted opportunity sites by initiating a series of low-cost, temporary initiatives.
3.2: Make Targeted Short-Term Improvements	Short-term improvements must look for ways to add density in support of the bus transfer station, and look beyond to the future with an operational TEX Rail station.
3.3: Focus on Long-Term Stormwater Improvements	The long-term plan for the station area must focus on creating an overall system of stormwater detention and conveyance that helps move water through the area in times of heavy rainfall.

FUTURE FORM AND CHARACTER: KEY RECOMMENDATIONS

During the charrette week, a map was prepared that summarized the citizen-derived vision for the future form and character of the Berry/University area. Since the charrette, the map has been refined based on input from City staff and key stakeholder groups. The map, along with its accompanying descriptions, will serve as the basis for implementing new zoning.



Character Area	Building Types	Uses	Maximum Height	Front Setbacks
SHOPFRONT	Mixed use shopfront	Vertical mixed use: retail, office, residential	3-4 stories	Buildings pulled up to sidewalk
INSTITUTIONAL MIXED USE	Civic, mixed use shopfront	Horizontal/vertical mixed use: institutional, retail, office, residential	6 stories (10 stories utilizing bonus)	Flexible
CIVIC	Civic	Public, institutional	2-3 stories	Flexible, buildings primarily set back from sidewalk
COMMERCIAL MIXED USE	Mixed use shopfront, apartment, townhouse	Horizontal/vertical mixed use: retail, office, residential	3-6 stories	Buildings pulled up to sidewalk
RESIDENTIAL MIXED USE	Apartment, townhouse, live-work	Mixed residential with limited retail/office	3-4 stories	Buildings set back from sidewalk
ATTACHED RESIDENTIAL	House, secondary dwelling, duplex, fourplex, cottage court, townhouse, garden apartment	Mixed residential	2-3 stories	Buildings set back from sidewalk

IMPLEMENTATION: KEY RECOMMENDATIONS

Funding Mechanisms

A series of public sector financing implementation mechanisms were identified. The first is Neighborhood Empowerment Zones. A Neighborhood Empowerment Zone incentivizes development by providing benefits directly to property owners. A Neighborhood Empowerment Zone currently encompasses the project area.

Other major financing implementation mechanisms identified included Tax Increment Financing and Public Improvement Districts. Both could provide benefits in the Berry/University area. However, neither program currently exists in the project area and each would have to be studied for feasibility before being created.

Implementation Matrix

A matrix was developed outlining next steps for the key policy implementation. The matrix serves as a guide to help organize and track progress in implementing the plan. It is intended to be used actively and should be updated and amended as key policies and goals are completed. Several high priority action items are identified. These action items are critical steps that would have a significant impact on the study area and should therefore be addressed as soon as possible.

Capacity Analysis

The water and sewer infrastructure necessary to serve the proposed long-term development plan for the area centered around the future TEX Rail station (running from approximately McCart on the west to Gordon on the east and Shaw on the south) will require modest improvement.

A capacity analysis of the existing water and sewer infrastructure was performed to estimate the ability to serve the area centered around the future TEX Rail station after the addition of 1,731 residential connections and approximately 155,000 square feet of commercial space.

The water distribution system is anticipated to require pipelines sized between 8-inches and 12-inches in diameter to accommodate projected future domestic and emergency demands. Approximately 13,000 linear feet of 6-inch diameter or smaller water pipelines will likely require replacement as new development occurs. Additional replacements may be necessary based on the results of a formal hydraulic analysis that will be required during the design phase.

The wastewater collection system is anticipated to require pipelines sized between 8 inches and 21 inches in diameter. Approximately 7,000 linear feet of wastewater pipelines will likely require replacement as new development occurs.

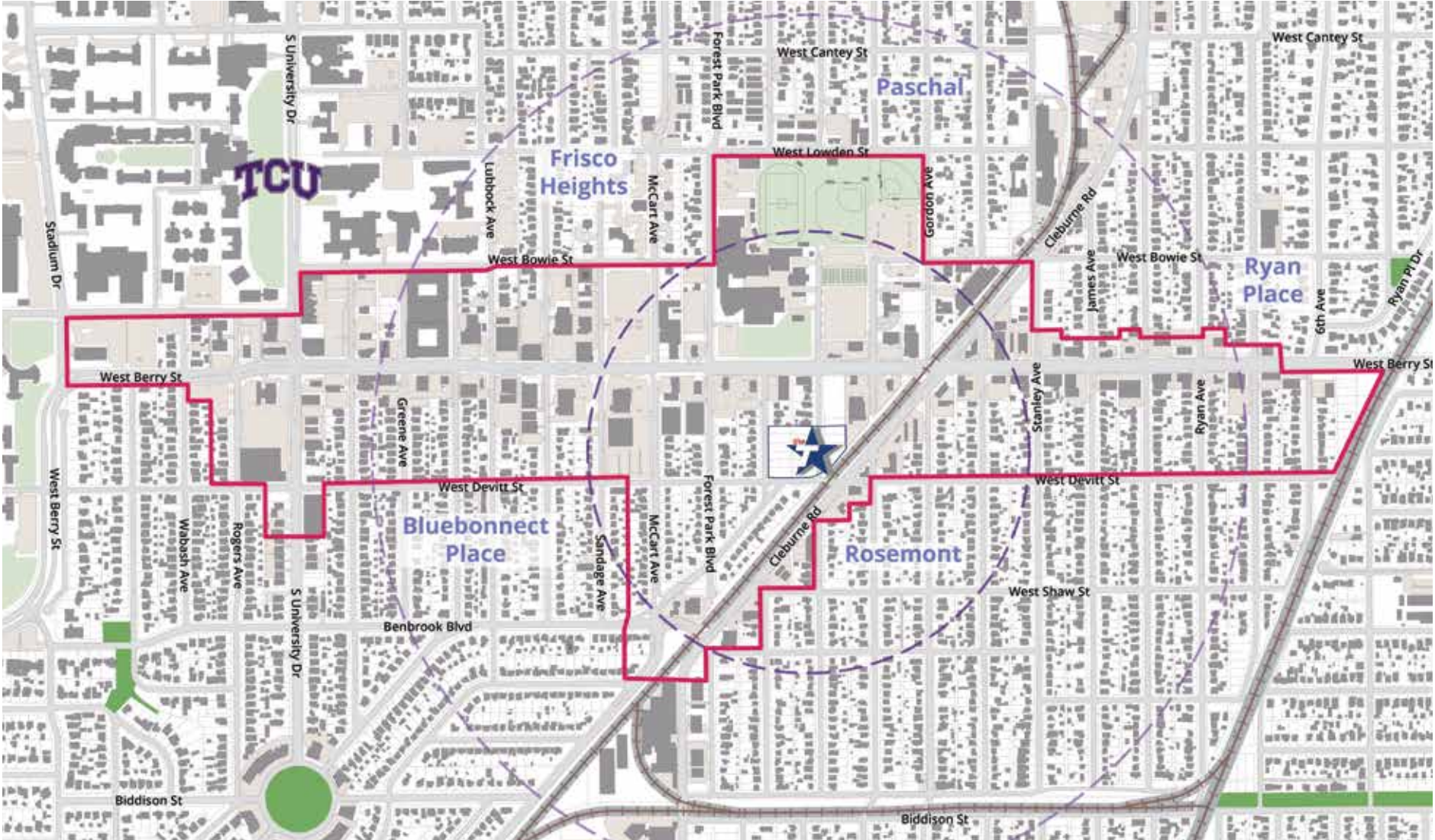
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CHAPTER 1: BACKGROUND



PROJECT BOUNDARY



- Building Footprint
- Surface Parking
- Parcel
- Public Park
- Open Space
- ★ Future TEX Rail Station
- - - 1/4 Mile from the Station
- - - 1/2 Mile from the Station
- TCU/Berry Station Area



INTRODUCTION

Since the 1990's, the City of Fort Worth and local stakeholders such as the Berry Street Initiative and Texas Christian University (TCU) have worked toward the redevelopment of the Berry/University area. Anchored by TCU to the west and a proposed TEX Rail station to the east, the goal for the Berry/University area is to create a mixed income, well-connected, multi-modal and pedestrian-oriented neighborhood, centered around an active and vibrant urban corridor (Berry Street). For over a decade, studies dealing with specific neighborhood issues (including economic and market analysis, stormwater, water/wastewater and transportation) have been completed. As a result, significant milestones toward these goals have been achieved. However, there is still a long way to go.

Several catalytic events have occurred in the last ten years that help to define the work that is yet to be accomplished. First, significant flooding issues throughout the watershed of the area have resulted in the exploration of options to mitigate flooding and flood-related damage. Second, a TEX Rail line to DFW Airport has been proposed near the intersection of Berry and Cleburne (the TCU/Berry Station). The TCU/Berry station is not part of the first phase of the rail line. Phase 1 will run from Downtown Fort Worth to the

DFW Airport. The proposed TCU/Berry station, however, is still an important catalyst for future development activity in the area. Finally, TCU has experienced significant growth and continues to be a significant contributor to economic and development activity in the area.

ABOUT THE PROJECT

The City of Fort Worth was granted funding for the Berry/University Development Plan from the North Central Texas Council of Government's 2009-2010 Sustainable Development Call for Projects. Additional funding and resources have been provided by the City of Fort Worth, Fort Worth Transportation Authority (The T), Texas Christian University and the Berry Street Initiative.

The study area is located just south of the TCU campus in southwest Fort Worth and is bisected by the West Berry Street corridor, which runs for approximately 2.1 miles from Stadium Drive on the west to 6th Avenue on the east. The study area is located in Council District 9 and includes a variety of institutional, commercial, civic and residential uses.

COMMUNITY INITIATIVES

The importance of the Berry/University area has been elevated by some highly successful community initiatives in recent years. These previous and on-going initiatives serve as the foundation for the work on the Development Plan. Below is a summary of these initiatives.

Berry Street Redevelopment Program

The Berry Street Redevelopment Program, completed in 2000, was one of the first planning efforts aimed at improving Berry Street. The redevelopment program coincided with the formation of the Berry Street Initiative, a group that is still active today. The document outlines goals for future residential and commercial development in the area as well as for future streetscape improvements along Berry. The document was the first time a community's vision for Berry Street was formalized.

Berry/University Urban Village

The City of Fort Worth has identified 16 mixed-use growth areas or "urban villages". The urban villages are located along several of the City's primary commercial corridors that have significant investment potential. As a result, area plans for each urban village were developed. The Berry/University area was identified as one of the urban villages. In 2007, work began on the Berry/University Urban Village Plan. The result was a

plan that identified development opportunities, showed alternative development scenarios and explored future transit-oriented development opportunities for land within the Berry/University Urban Village.

TEX Rail

TEX Rail is a 27-mile long commuter rail project that is being developed by The T. It will be completed in phases, with the northeast portion of the line constructed first. Once fully complete, the route will carry passengers from southwest Fort Worth, through Downtown and Grapevine and on to DFW airport, creating an important commuter and passenger rail link. The route will connect with other modes and lines in the region including the Trinity Railway Express, Amtrak and the Fort Worth Inter-modal Transportation Center. The line is expected to have eight stations and 10,000 daily riders at the beginning of service, increasing to approximately 14,000 daily riders and 10 stations by 2035.

The TCU/Berry station, while removed from the first phase of the project, can still be positioned to help spur redevelopment in the area. The T has plans for a bus transfer station and they hope to foster development activity in the area by encouraging higher densities in support of the future TEX Rail station.

Berry/University Urban Village Final Summary Report (2007)



TCU/Berry Station Area Plan (2009)

As part of the TEX Rail project, station area plans for each potential station area site were developed. The TCU/Berry Station Area Plan was finalized in 2009 following the announcement of the proposed TEX Rail station. The TCU/Berry Station Area Plan examines the transit-oriented development potential of the area and provides an illustration of how redevelopment and infill in the station area could occur over time.

Texas Christian University

TCU is a private university located on 272 acres at the western end of the study area. TCU is growing and is currently home to over 10,000 students and 2,000 faculty and staff. The University has existed in its present location since 1910. The University is highly-regarded both academically and athletically, with loyal alumni and fan bases.

While at present about 4,000 students live on campus, the University has a long-term goal to house all students that want to live on campus. Students under 21 who are in their first two academic years and do not live at home with their family are required to live on campus.

Recently, a special residential overlay was adopted for several neighborhoods immediately surrounding TCU. The overlay was created

to ease potential conflicts in zoning between single-family and two-family classifications where either were being used to house multiple unrelated individuals or students. In the overlay, the number of unrelated adults who can live in a house in a neighborhood zoned for single-family, has been reduced from five to three.

TCU is currently in the process of updating its master plan (having already completed the majority of new construction from the previous master plan). This master planning effort will include outreach to the community, and may refine the future land use for University-owned property in the study area.

PHYSICAL ANALYSIS

The Berry/University area has a wealth of physical assets that serve as a basis for its potential growth. Understanding these assets is an important part of formulating the Development Plan. The following summarizes some of the existing physical conditions that make the area what it is today.

Nearby Centers

There are a number of economic centers and attractions with established retail and entertainment activity within a few miles of the study area. Most of these places are located to the north and west of Berry Street.

The Southside Medical District is a significant employment center located only a couple of miles away from Berry. Stonegate, University Park Village and Trinity Commons are all large retail areas with proximity to Berry.

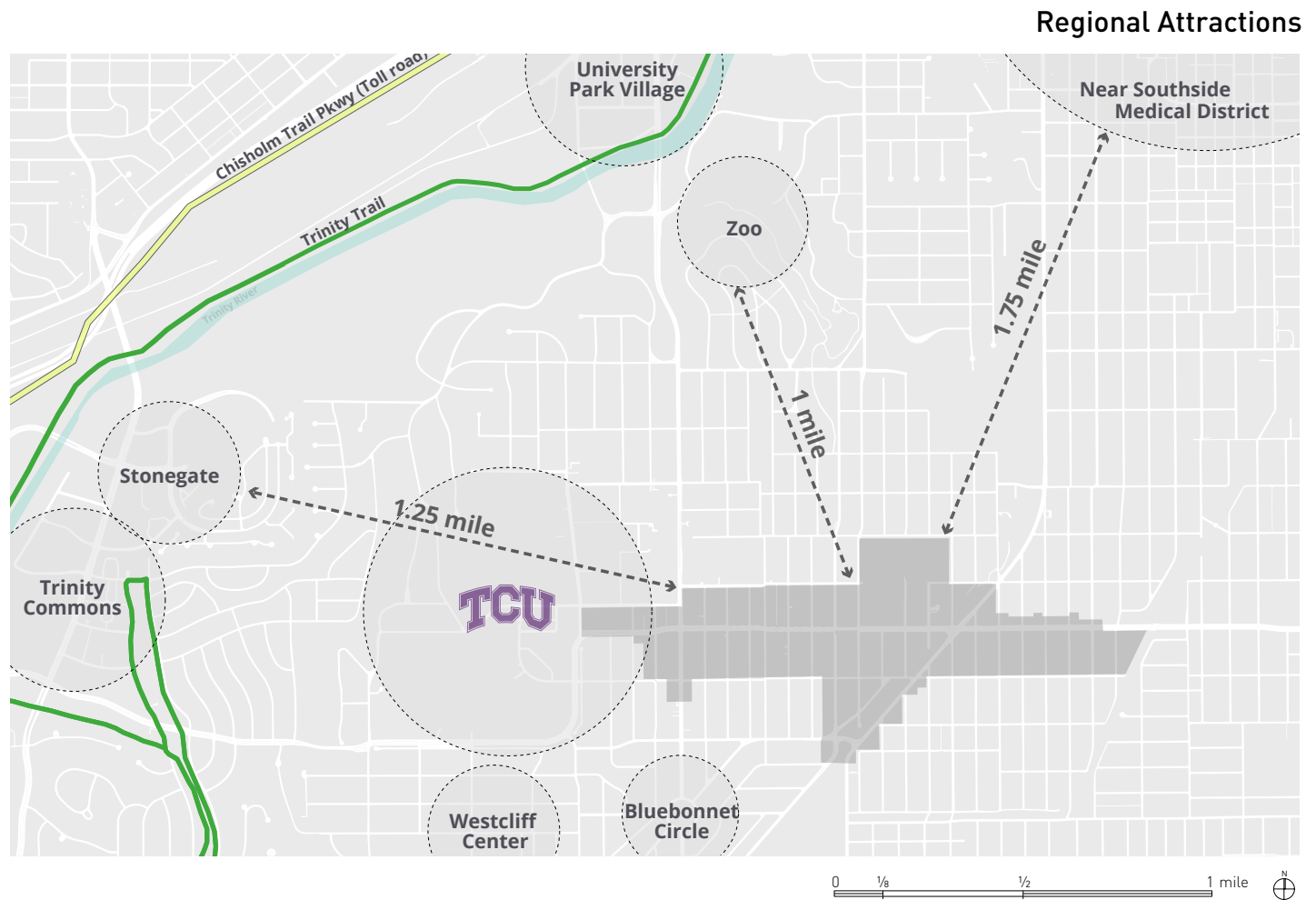
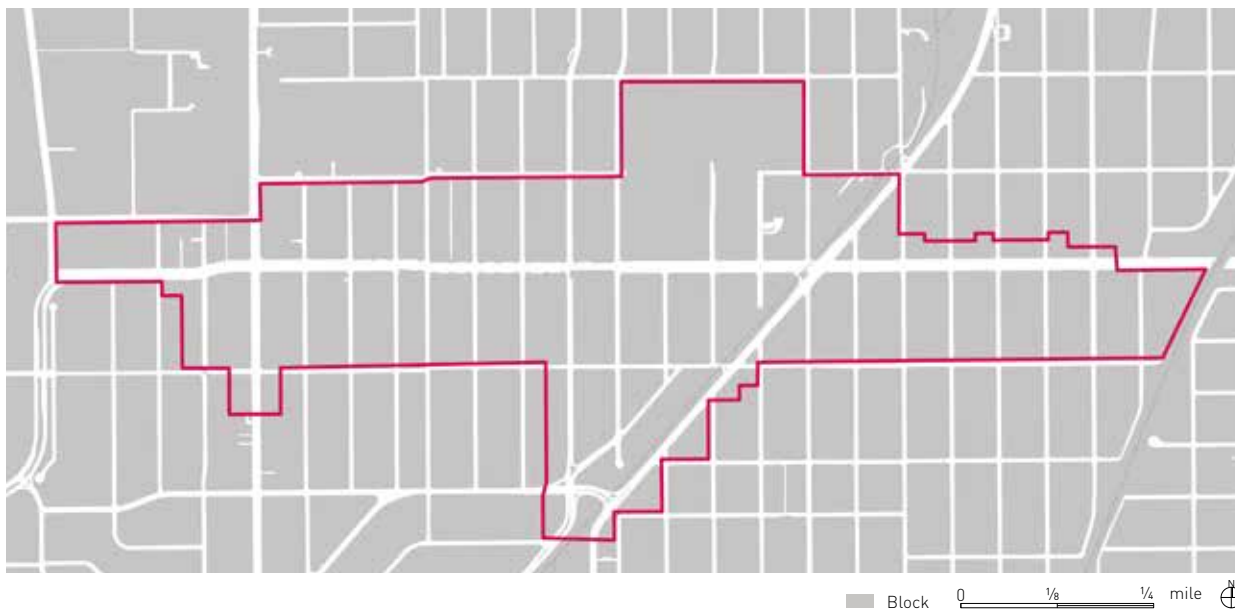




Figure Ground

The figure ground map shows the distribution of existing building footprints across the study area. The neighborhoods to the south and north have remained relatively fine-grained and intact over time. Unfortunately, the areas along the major transportation corridors (Berry and Cleburne) have been eroded overtime through the addition of large parking areas (which take up most of the blank white areas of the map).

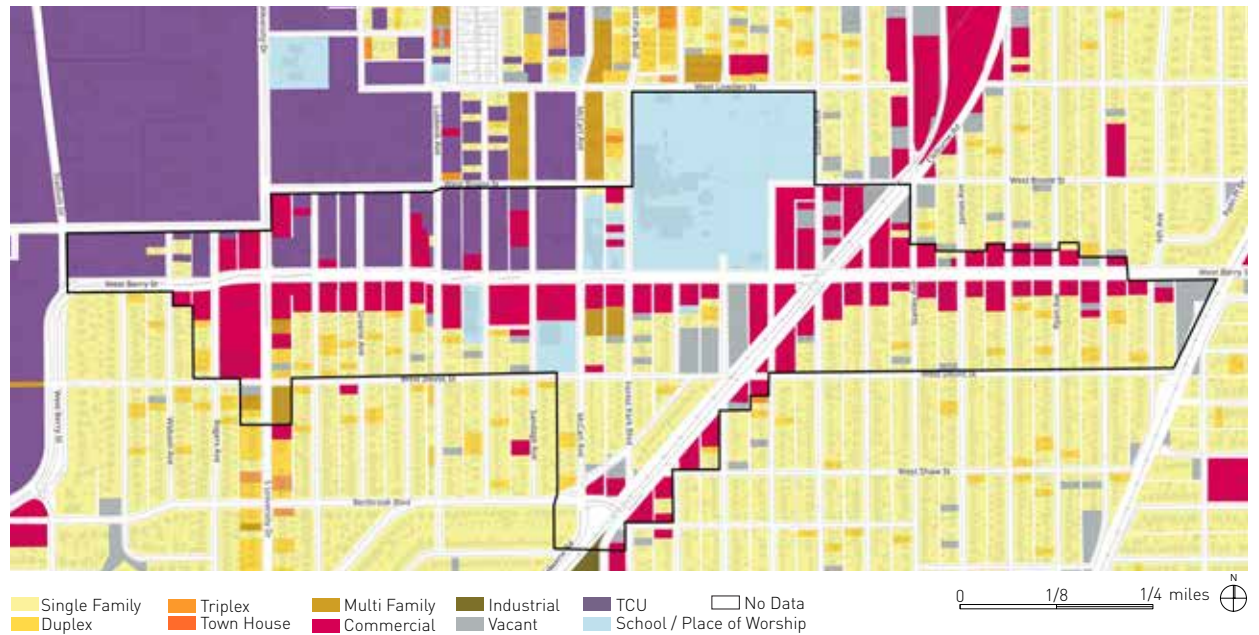


Block Pattern

The block pattern map shows the block structure as defined by the existing street network. For the most part, the existing street network is well-connected, with fairly standard size, rectangular blocks. The University and Paschal High School limit connectivity in the study area.

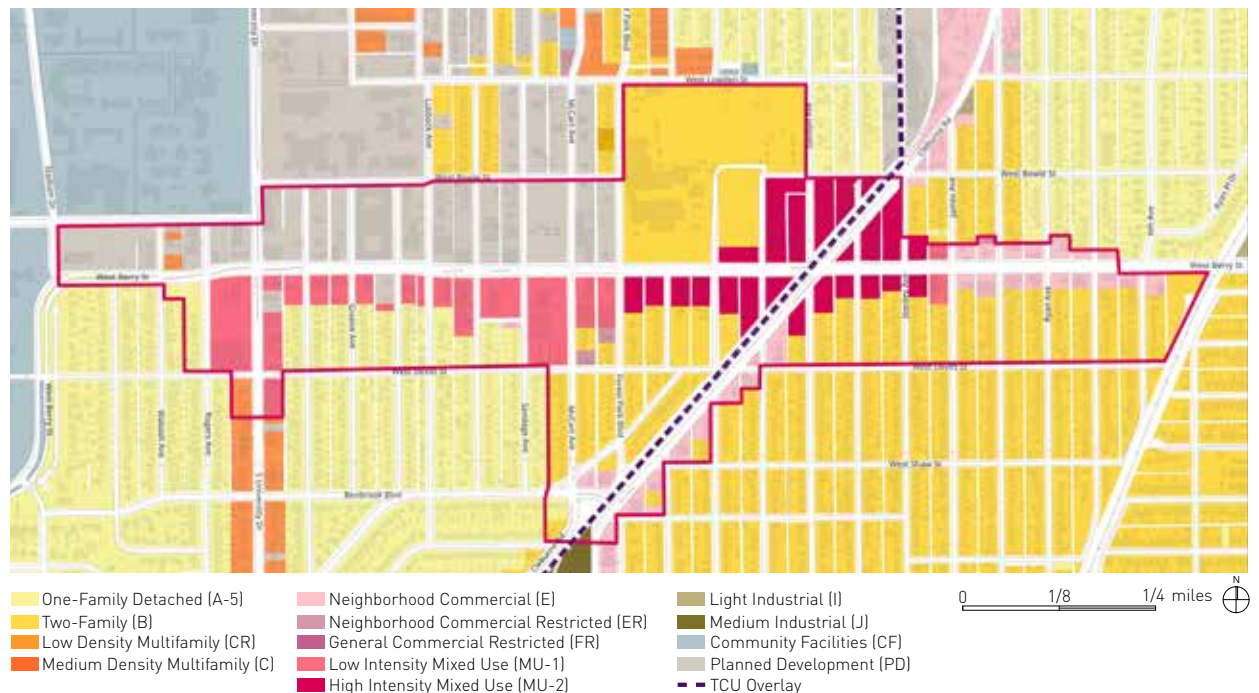
Existing Land Use

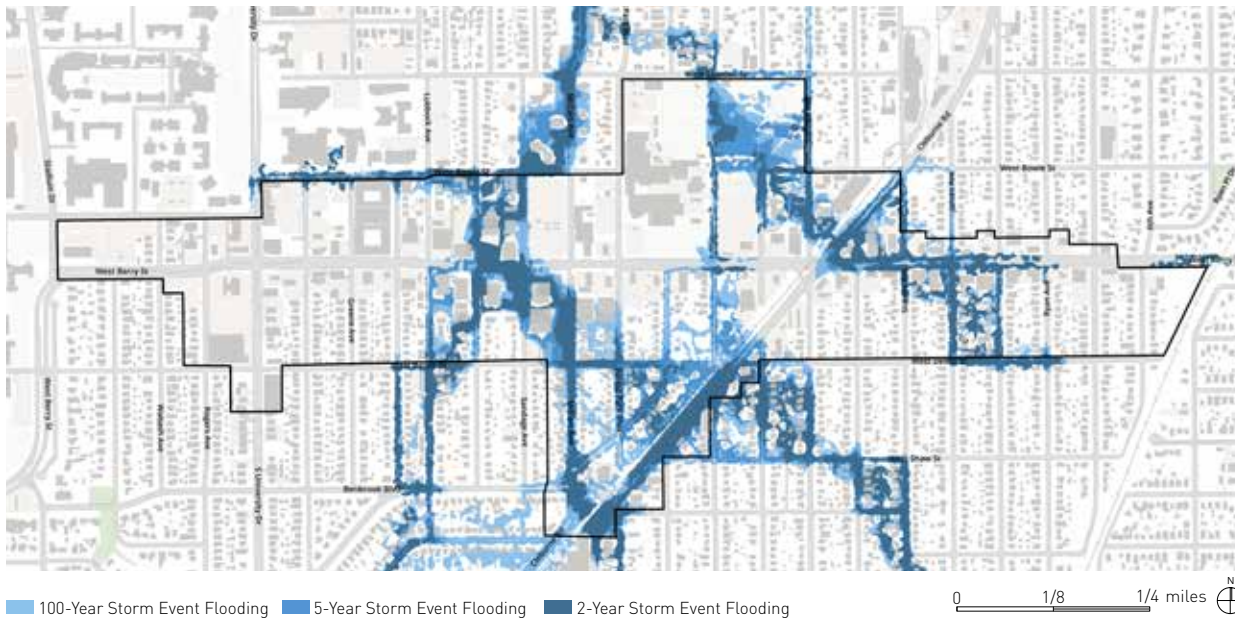
The existing land use map shows how land is currently being used in the study area. The University influence can be seen in the northwest. Corridor commercial areas are strung out along Berry Street as well as Cleburne. To the south of Cleburne, the rail line has kept commercial activity on the east side of the street. The largest commercial parcels are occupied by groceries (Kroger and Fiesta), leaving few opportunities for larger-scale commercial use.



Existing Zoning

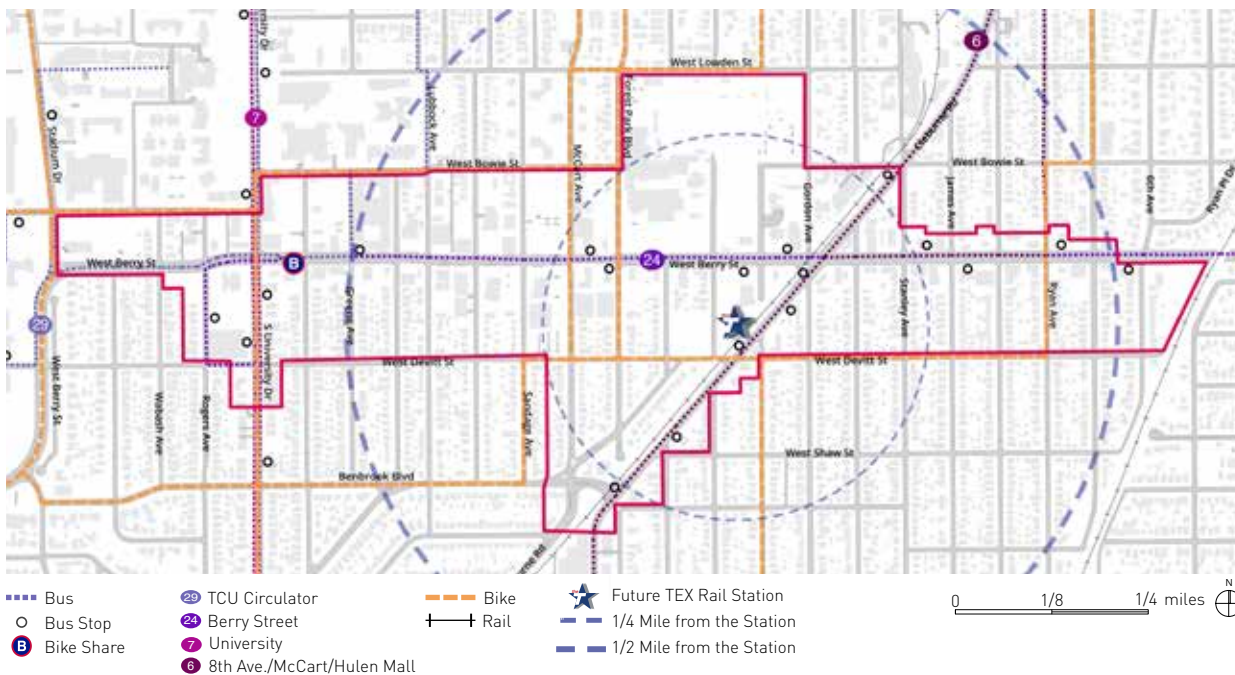
This existing zoning map shows the current zoning districts. The current zoning pattern in the study area parallels the pattern of existing land use, showing the strong relationship between the extent of commercial and residential development based on zoning.





Flooding

This flooding map shows the extent of flooding that happens because the existing underground pipe system is overwhelmed during intense storm events. In many cases, flooding can occur on streets, private property and other low-lying areas, as shown by the darker blue colors on the map. The large upstream area draining through this study area requires solutions that consider the entire watershed to mitigate this flooding. There is limited greenspace in the study area to help absorb rainwater. Conveyance of flood waters is often blocked by human activity such as rail lines (elevated through the study area), major roads and site development.



Mobility

This mobility map shows the major transportation systems that serve the project area. The TEX Rail station has been highlighted, along with a the 1/2-mile and 1/4-mile walking distance (represented by the circles). Bike share stations are strategically located to serve the TCU population. Safe bicycle routes that serve as alternatives to major street through the study area are shown. Bus routes and stops are also depicted.

MARKET ANALYSIS

Understanding the existing market conditions and future opportunities helps the team formulate a plan to meet the unique challenges of the study area. Plans created based on “vision” alone often fail in the implementation phase due to their mismatch with the economic realities of the project area. The findings of the market analysis suggest that with strategic moves, the corridor could better serve the nearby neighborhoods, the University and the broader region.

At its most basic, the market analysis tries to answer the following questions:

- » **Supply:** To what extent are businesses in the study area capturing that spending?
- » **Demand:** What is the total spending by residents in the neighborhoods most directly served by the study area?

A more complete market study has been included as an Appendix on page 106. The following pages highlight key issues that impact the opportunities for development and infill along the corridor.

COMMERCIAL SUPPLY (IN \$ MILLIONS)	
PROJECT STUDY AREA	
Retail	\$67.50
Restaurants and Bars	\$36.00
Total	\$103.50
3-MILE RADIUS	
Retail	\$1,071.51
Restaurants and Bars	\$235.45
Total	\$1,306.96

COMMERCIAL DEMAND (IN \$ MILLIONS)	
1-MILE RADIUS	
Retail	\$132.73
Restaurants and bars	\$40.50
Total	\$173.23
3-MILE RADIUS	
Retail	\$659.30
Restaurants and Bars	\$182.32
Total	\$841.62

There are

110 BUSINESSES

in the study area
including ...

37 Eating & Drinking Establishments

Including 6 Freestanding Fast Food
Restaurants

27 Retail Operations

Including 5 vacant storefronts

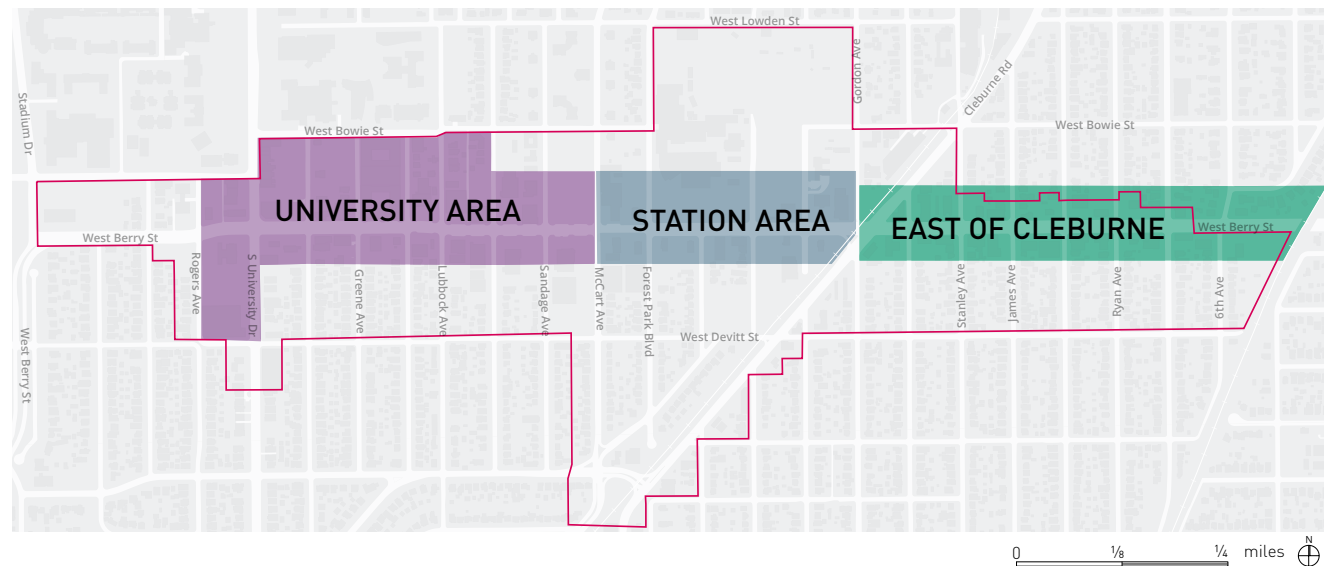
3
Traditional
Finance
Institutions

13 Alternative Finance Institutions

*30 other types of businesses are also located in the study area.

CORRIDOR SUBAREAS

During preliminary market analysis, three distinct areas, with different characteristics and market challenges, became clear. Understanding differences along the corridor is key to leveraging strengths and addressing specific market challenges.



University Area

The western end of the study area (Berry Street from Stadium Drive to Merida Street, including University Drive) features mostly pedestrian-oriented development (although there are some notable auto-oriented exceptions like Kroger). Buildings are pulled up to the street, with windows and doors facing Berry, and in some cases outdoor seating. Walking these blocks is pleasant, with a variety of eating, drinking and shopping opportunities. These blocks cater primarily to the university customer base, and feature both chains and locally-owned businesses.

Station Area

East of Merida, beginning with the CVS and Walgreen's at Sandage, Berry assumes an auto-oriented character, although some storefronts remain at the sidewalk edge. The lack of a consistent street wall at the sidewalk edge makes pedestrian use of these blocks challenging, especially once the recent streetscape improvements end. Cleburne Road north and south of Berry has a similar character. The eastern portions of the station area reflect a noticeable lack of greenspace or landscaping. These blocks, with the exception of fast food outlets, cater less to the university market and more to the nearby neighborhoods. This area remains generally successful.

East of Cleburne

This area reflects the lowest market demand in the study area. Alternative financial services such as title and payday loan stores (13 as of the time of the charrette) are concentrated in the easternmost segment of the study area, with as many as four seemingly independent providers in a single building. The area also contains empty storefronts and some marginal businesses. Walking is uncomfortable and crossing over Cleburne at Berry Street is very challenging for cyclists and pedestrians. Businesses here appear to cater to the nearby neighborhoods, and are not university-related. At the far eastern end of the study area, there are no eating or drinking establishments.

SOURCES OF DEMAND

There are three primary sources of market demand for businesses on Berry.

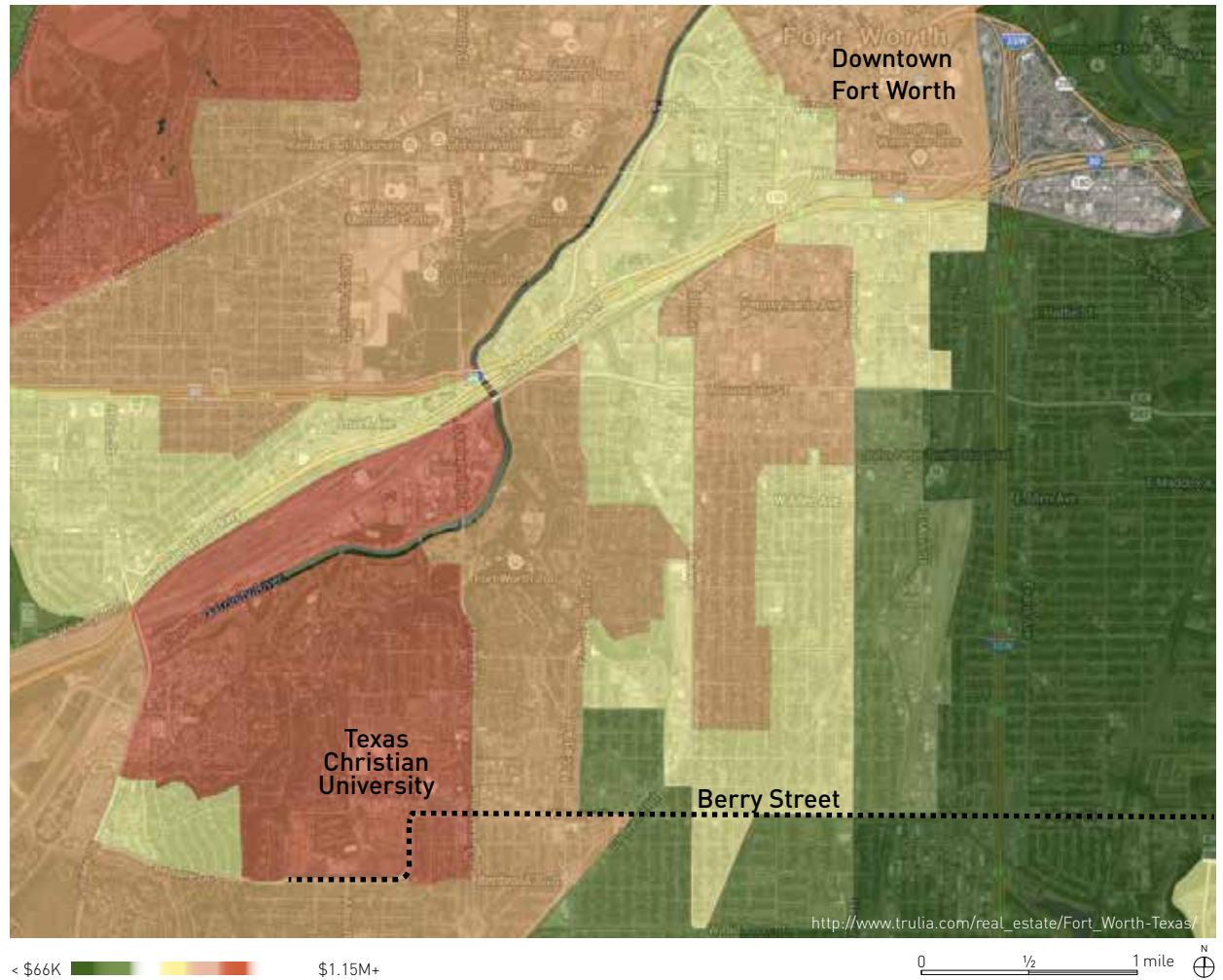
The Neighborhoods

Residents near Berry are one of the key drivers of market demand in the corridor. Berry is the kind of corridor that typically serves the convenience commercial needs of nearby residents. Where home values are higher, the available market demand is also stronger. This pattern can be seen along Berry, where home values are generally higher to the west, and lower as one travels east. One important consideration is whether or not the west end of Berry meets the needs of residents without ties to the University. While there is a grocery and several pharmacies, there is limited retail that is not student-focused.

The University

The University's 10,000 students create a concentrated market at the western end of the corridor, and the healthy state of businesses there reflects a business district that serves the needs of the university community quite well. The University includes faculty and staff that create additional market demand, along with "game day" demand created by alumni and fans.

Median Listing Price



Southwest Fort Worth

Berry may be able to find a niche serving the broader market of southwest Fort Worth. Nearby examples of redevelopment (such as the Fairmount District and Camp Bowie Street) demonstrate a market for urban destinations in the city. Berry Street has the potential to offer an intriguing alternative to these areas, with its diverse resident mix, student population and affordable storefronts. It is clear that opportunities exist in the competitive market of southwestern Fort Worth to draw people to the study area. Most neighborhood level market studies show substantial leakage (dollars spent outside of the neighborhood) for the simple reason that residents of metropolitan markets travel freely in search of what they need or want. Nearby areas such as Magnolia Street and 7th Street capture both retail and entertainment demand originating in the study area. Returning these dollars to Berry would strengthen the corridor.

RESIDENTIAL MARKET

Student Housing

West of Paschal High School, extending to the TCU campus and a block or two south of Berry, extensive housing construction is in progress or has been recently completed. All of that housing is designed and marketed as student housing, including apartment buildings such as the GrandMarc and the loft-style projects south of Berry.

Student housing development in the area includes townhomes - real estate listings suggest that these buildings (with two parking spaces for a three-bedroom unit) are intended for students.

A small number of very large structures that mimic single-family homes are also being built as student rentals. This form is often known as "stealth dorms," where multiple bedrooms are rented separately and minimal living spaces are available.

New Apartments

A large apartment complex has been developed to the north of the study area, behind the Fiesta supermarket. These new apartments are primarily focused on the medical population to the north, but also house a large number of TCU students.

Renovation

Near the study area, early 20th Century homes are being renovated for the non-student market, most notably in Ryan Place, which stretches to the north just east of Cleburne. Also nearby, entire blocks of single-family, one-story homes are being replaced with new multi-story townhomes, including several zero lot-line developments.

BERRY'S OPPORTUNITIES

Eating/Drinking and Retail

The study area is largely meeting local demand for eating and drinking establishments in the neighborhood. However, there is a substantial excess supply of retail and eating/drinking in the broader 3-mile radius, suggesting that other areas such as 7th Street, University Park and Magnolia Street are attracting market activity well beyond the anticipated local market demand.

Expanding retail or eating/drinking in the project area will have to compete with existing Berry businesses as well as region-serving destinations. In spite of this, there is an opportunity along Berry for niche businesses – especially those that would capture student and alumni demand for retail, entertainment and eating/drinking needs currently met outside the study area.

If suitable spaces were available, Berry might also attract additional typical college town retailers like the Gap, American Apparel or local equivalents.

Station Area

While the station area will not be fully developed until the extension of the TEX Rail line from downtown, the bus transfer station offers an opportunity for an interim use that might jump-start other activity in the area. Extending the success of the corridor eastward might include

student-related activity. There are opportunities in the area due to the low cost of rehabilitation of older structures for interesting, edgy new uses as well.

East of Cleburne

The area east of Cleburne has the lowest current market demand, and uses will most likely simply inhabit the existing older buildings. Serving the immediate neighborhoods to the north and south is most likely, although intriguing destination uses could attract an alternate customer from Ryan Place and other nearby neighborhoods. Over the longer term, management of the dominance of alternative financing uses could be achieved through spacing requirements or other approaches to keep from clustering these uses in the future. In many ways, public investment may have to lead the private market in this segment, with a key improvement being the introduction of a new streetscape with better pedestrian and bicycle facilities.

CHAPTER 2: PUBLIC PROCESS



PREPARING FOR THE CHARRETTE

Public Outreach

The public input process for the draft Development Plan was centered around a six-day public participation design charrette. A charrette is a multiple day, collaborative planning and design effort. Charrettes are inclusive by nature and are designed to build consensus from the outset, providing a collaborative forum to bring all parties together and focus on a common goal. The hands-on nature of a charrette, the opportunity to interact with differing perspectives, and the short feedback loops allow issues to be identified early on in the process. In addition, the charrette provides an educational opportunity for all participants. A charrette not only produces invaluable information for the consultant team, but it enables the community to realize how much consensus exists for key issues in a constructive format.

The charrette was held between October 10 and October 16, 2014. To prepare for the charrette, a series of meetings were conducted approximately a month before the start of the charrette.

Project Kick-off Meeting

A first project meeting was held at the University United Methodist Church on September 11th. The purpose of this meeting was to introduce the project, allow residents to ask questions and promote the upcoming charrette.

Stakeholder Interviews

A series of stakeholder meetings were also held before the charrette. The purpose of the meetings was to hear from people familiar with the Berry/University area about their issues and concerns for future development. Over two days, stakeholder meetings were held with representatives from the following:

External

- » Fort Worth Transportation Authority
- » Texas Christian University
- » Area Developers
- » Neighborhood Association Presidents (Bluebonnet Hills, Paschal Heights)

City of Fort Worth

- » Planning and Development
- » Transportation and Public Works
- » Parks and Community Services
- » Code Compliance
- » Fire and Police
- » Council Member Ann Zadeh (District 9)



Project Website

A project website was also established before the charrette (www.fortworth.gov/westberry). The website is used to post documents, drawings and general information before, during and after key public events.

Promotional Materials/Initiatives

Public outreach included the use of a variety of promotional material to solicit public input, such as:

- » All registered property owners received direct mailings notifying them of key meeting dates and times;
- » English and Spanish fliers were distributed at local businesses and community meeting places;
- » Individuals received meeting announcements via emails;
- » Signs with meeting information were posted at various locations throughout the study area;
- » All key meetings were announced via the City's Facebook and Twitter pages; and
- » An online survey was sent to all TCU students to gather their opinions and thoughts about Berry.

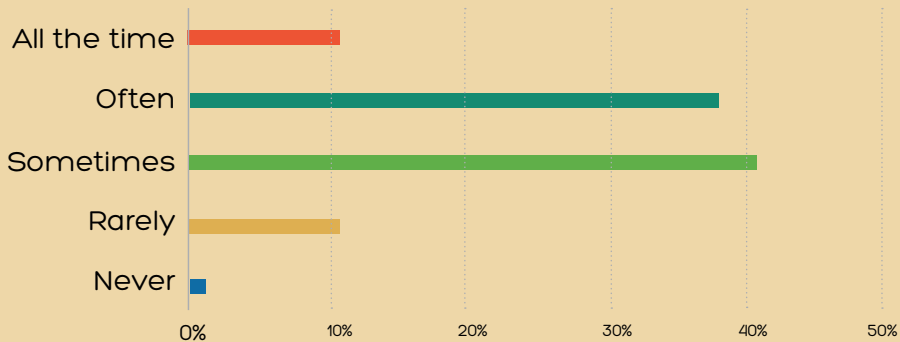


The first public meeting was held on September 11, 2014 at the University United Methodist Church.

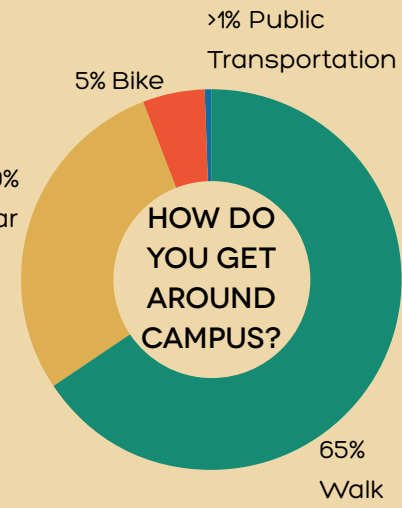
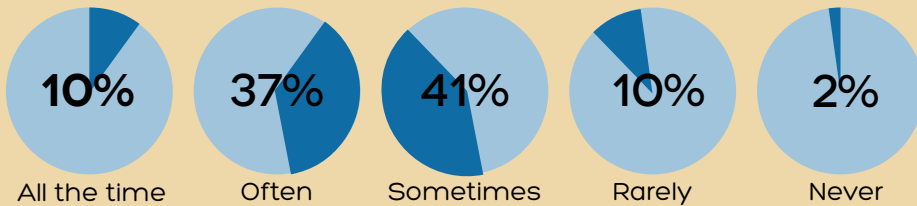
STUDENT SURVEY

Because of their proximity to the study area, an online survey was sent to all TCU students to gather their opinions and thoughts about Berry Street. 212 responses were received and the results provided some interesting insights into the way students use and view Berry. 91% of responders were full-time students. The results are summarized below.

DO YOU SHOP OR DINE OUT ON BERRY STREET?

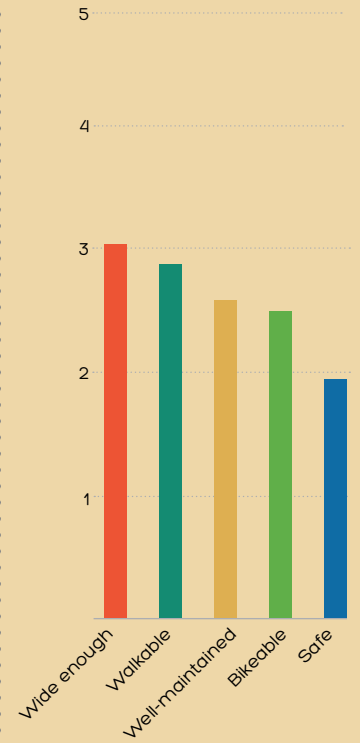


HOW OFTEN DO YOU FREQUENT BUSINESSES IN THE AREA NOT ON BERRY STREET?



66 %
of students surveyed do not like the current look and feel of Berry Street

BERRY STREET IS..... (AVERAGE RATING OUT OF 5)



TO BECOME A DESTINATION WHERE PEOPLE CAN LIVE, WORK, SHOP AND PLAY, BERRY STREET NEEDS MORE....

Public Transportation
Mixed Use Development **Culture**
Safety Measures Housing Options
Bike Lanes Landscaping and Greenspace

45 %
of students surveyed think sidewalks on Berry Street are well maintained

THE CHARRETTE WEEK

The Berry/University Charrette was held between Friday, October 10 and Thursday, October 16, 2014 at the Brown-Lupton University Student Union. The charrette week included the following key public events:

- » **NEIGHBORHOOD DESIGN WORKSHOP**
Sat, October 11, 9 am to 12 pm
- » **DAN BURDEN WALKING TOUR**
Sat, October 11, 1:30 to 3:30 pm
- » **OPEN DESIGN STUDIO**
Sun, October 12 through Tue, October 14
9 am to 7 pm, daily
- » **LUNCH & LEARNS**
Mon, October 13, 12 to 1 pm (Economics)
Tue, October 14, 12 to 1 pm (Stormwater)
- » **DROP-IN OPEN HOUSE**
Mon, October 13, 6 to 8 pm
- » **FINAL PRESENTATION**
Wed, October 15, 6 pm

BERRY/UNIVERSITY INTERNAL CHARRETTE SCHEDULE										
TIME	FRIDAY OCTOBER 10 DAY 1	SATURDAY OCTOBER 11 DAY 2	SUNDAY OCTOBER 12 DAY 3	MONDAY OCTOBER 13 DAY 4	TUESDAY OCTOBER 14 DAY 5	WEDNESDAY OCTOBER 15 DAY 6	THURSDAY OCTOBER 16 DAY 7			
9:00 AM		NEIGHBORHOOD DESIGN WORKSHOP 9:00 AM - 12:00 PM @ AUDITORIUM	OPEN DESIGN STUDIO		OPEN DESIGN STUDIO	STAKEHOLDER DISCUSSION	OPEN DESIGN STUDIO	STAKEHOLDER DISCUSSION		
10:00 AM										
11:00 AM										
12:00 PM		LUNCH	LUNCH		LUNCH & LEARN	LUNCH & LEARN	CLOSED DESIGN STUDIO	STAFF DEBRIEF 10:00 AM - 12:00 PM		
1:00 PM	TEAM ARRIVES		OPEN DESIGN STUDIO	KEY STAKEHOLDER / MAJOR LANDOWNER DISCUSSION	OPEN DESIGN STUDIO	STAKEHOLDER DISCUSSION		OPEN DESIGN STUDIO	STAKEHOLDER DISCUSSION	TEAM DEPARTS
2:00 PM		1:30PM - 3:30PM DAN BURDEN WALKING TOUR								
3:00 PM										
3:00 PM	STAFF MEETING 3:00 PM - 5:00 PM									
4:00 PM		WORKSHOP RECAP/ BRAINSTORMING 3:30 PM - 7:00 PM			OPEN HOUSE PREPARATION					
5:00 PM										
6:00 PM	TEAM TOUR				DROP-IN OPEN HOUSE 6:00 PM - 8:00 PM @ AUDITORIUM			FINAL PRESENTATION 6:00 PM - 8:00 PM @ AUDITORIUM		
7:00 PM	TEAM MEETING (DINNER)	DINNER	DINNER			DINNER				
8:00 PM				DINNER			STUDIO BREAKDOWN			
9:00 PM			CLOSED DESIGN STUDIO			CLOSED DESIGN STUDIO				
10:00 PM				CLOSED DESIGN STUDIO						

The Berry/University Charrette was held between Friday, October 10 and Thursday, October 16, 2014.

BICYCLE TOUR

A team tour on Friday, October 10 officially kicked-off the charrette week. The consultant team and members of City staff set out to explore Berry Street and the surrounding area on bicycles, taking photographs and noting existing conditions. The tour made a lasting impression; some of the things that stood out included:

- » The striking difference in character between the western and eastern portions of the study area;
- » The lack of street trees and greenery along the entire length of Berry;
- » Nobody felt comfortable riding on Berry and the team didn't even try to cross Cleburne;
- » How easy it was riding around using the side streets;
- » The tremendous influence TCU has on Berry and the surrounding neighborhoods;
- » The sheer size and scale of the GrandMarc; and
- » Pedestrian wait times at intersections seemed excessive.



The consultant team and members of City staff set out to explore Berry Street and the surrounding area on bicycles, taking photographs and noting existing conditions

NEIGHBORHOOD DESIGN WORKSHOP

The public portion of the charrette week began Saturday morning when approximately 40 community members gathered at the TCU Student Union Auditorium to roll up their sleeves and become planners and designers for the morning.

The workshop began with a presentation that outlined the goals for the project, introduced the team and walked through the charrette process. Also presented were some of the team's initial analysis work and key portions of previous planning work done for the area.

Following the presentation, participants divided into smaller groups around tables facilitated by a design professional. Each table worked on a large map of the study area, drawing diagrams and sketches of problems within the study area as well as providing some ideas of the desired future form and character of Berry Street and the surrounding neighborhoods.



The public portion of the charrette week began Saturday morning when approximately 40 community members gathered at the TCU Student Union Auditorium to roll up their sleeves and become planners and designers for the morning.

To conclude the design workshop, each table selected a spokesperson who presented the table's ideas to the larger group. Some of the common ideas and themes discussed included:

West Berry

- » Improve walkability, wider sidewalks, more pedestrian crossings
- » Enhance streetscape east of Forest Park
- » Embrace / connect to University
- » Perception of crime: safety, lighting, uses
- » Need more convenient parking

Residential

- » Preserve adjacent neighborhoods
- » Preserve scale and lot size in residential areas
- » Missing sidewalk connections
- » "Stealth Dorms"
- » Over-parking in the neighborhood

Greenspace

- » Few or no parks in the area
- » Connect to existing parks, trails

Mobility

- » Slow cars down
- » Reclaim alleys
- » Improve pedestrian connections
- » Need better bike facilities

Flooding

- » Reduce hardscape/impervious surface
- » More landscaping/open space
- » "Daylight" (bring to the surface) streams previously diverted into underground pipes



To conclude the design workshop, each table selected a spokesperson who presented the table's ideas to the larger group.



DAN BURDEN WALKING TOUR

On Saturday afternoon, team members, as well as members of the public, took part on a walking tour with Dan Burden, one of the country’s most respected speakers on rebuilding cities for people, as part the City’s Blue Zones Project.

The Blue Zones Project is a community-wide well-being improvement initiative to help make healthy choices easier for everyone in Fort Worth. Fort Worth is a Blue Zones Demonstration city and is the largest city in the United States to ever partner with the Blue Zones project.

The tour covered Berry and the immediately abutting neighborhoods, and it entailed measuring streets and sidewalks, pointing out pedestrian barriers, and in general discussing walkability improvements. Highlights included making a human curb bump and traffic circle to slow an oncoming car.



On Saturday afternoon, team members as well as members of the public took part in a walking tour with Dan Burden, one of the country’s most respected speakers on rebuilding cities for people, as part of the City’s Blue Zones Project.

OPEN DESIGN STUDIO

A temporary design studio was set up in the 3rd floor of the TCU Student Union for the duration of the charrette week. The design studio served as an on-site working space where consultant team members could analyze information, refine ideas and test conceptual scenarios. Working on-site throughout the week gave the consultant team easy access to the study area. The team was able to observe day-to-day activity, visit local businesses and generally experience everyday life in the area.

The studio was open to the public each day from 9 am to 7 pm, offering community members the flexibility to stop in when they were available to see how the project was progressing and to bring new ideas for the consultant team to consider.

In addition to drop-in visitors, the consultant team met with a series of stakeholders in order to gather specific information, ask questions and discuss proposed concepts. Stakeholders included Council Member Zadeh, City staff, TCU officials and local developers. The knowledge gained during these meetings was incorporated into the overall planning process.

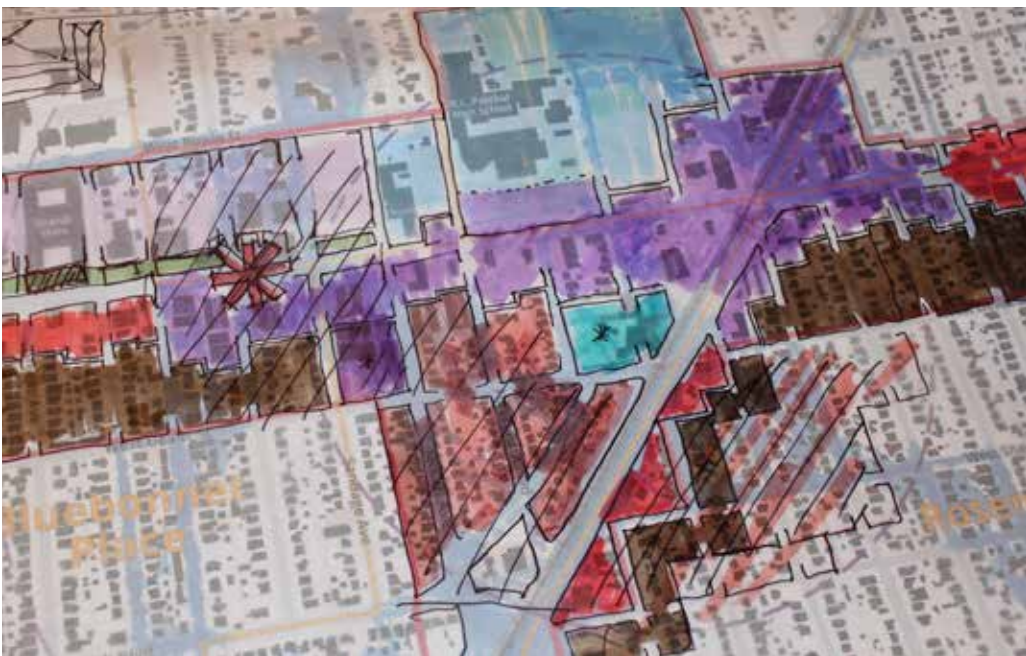
On Monday and Tuesday, “lunch and learn” presentations were given by consultant team members. On Monday, the topic was economics and on Tuesday, the topic was stormwater. The presentations were open to the general public and served as a valuable educational opportunity, allowing attendees to have an informal discussion on the topic and question the team’s experts.



A temporary design studio was set up on the 3rd floor of the TCU Student Union. The studio was open to the public each day from 9 am to 7 pm, offering community members the flexibility to stop in when they were available.



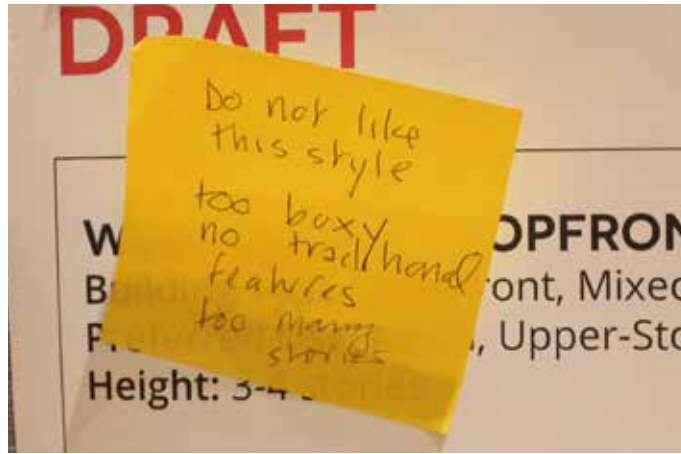
The design studio served as an on-site working space where team members could analyze information, refine ideas and test conceptual scenarios.



During the week, a number of designs and concepts were developed and considered. Pictured above are just some of the initial concepts prepared by the consultant team in the design studio.

DROP-IN OPEN HOUSE

On Monday evening, the general public was invited to a drop-in open house at the TCU Student Union Auditorium. Preliminary designs and drawings were pinned up around the room. The purpose of the open house was to receive feedback on initial concepts and ideas. No formal presentation was given; participants could stop in at any time between 6 pm and 8 pm to view the work on display, meet with members of the consultant team, ask questions and offer additional ideas. Approximately 30 people stopped through and participated at the open house.



On Monday evening, the general public was invited to a drop-in open house at the TCU Student Union Auditorium to view preliminary designs and drawings that were pinned up around the room.

FINAL PRESENTATION

On Wednesday evening, approximately 45 people gathered at the TCU Student Union Auditorium to watch the closing presentation of the charrette.

Council Member Ann Zadeh welcomed everyone and thanked them for their continued input throughout the week.

A summary of the week's work was presented, which included:

- » Market opportunities;
- » Proposed streetscape improvements;
- » Future character areas;
- » Conceptual illustrations of the future TEX Rail station area;
- » Residential transition ideas; and
- » A redevelopment scenario of the Kroger site.

Attendees were reminded that the work presented was a draft and that they must continue to offer input on the concepts and ideas. Everyone was encouraged to continue to send comments and to follow the project online. After the presentation, participants were able to review the week's work that was on display throughout the room.



On Wednesday evening, approximately 45 people gathered at the TCU Student Union Auditorium to watch the closing presentation of the charrette.

STRENGTHS AND WEAKNESSES

Following the charrette, a set of key strengths and planning challenges were identified.

KEY STRENGTHS

The Proposed TCU/Berry Station

One of the key strengths of the area is the existing public ownership of land for the future TEX Rail station. As soon as the rail line is extended and funding for construction of the station is secured, work can begin without the hurdle of acquiring land.

In the short-term, the land presents an opportunity for use as a bus transfer station. A bus transfer station would help serve the community by making bus transfers safer and more convenient, and also get more users accustomed to taking transit from the area.

Immediately, the land is an opportunity for community members to use the space for events and much-needed green space. Ideas of ways to temporarily use the station area land are provided on page 58.

An Active and Engaged Community

Residents who deeply care about their community and its improvement provide an important foundation for the area. The Berry Street Initiative, along with some long-standing neighborhood associations, have been advocating for neighborhood improvements since the early 90's.

Additionally, strong public involvement, as this project has had, indicates the community cares. An engaged and informed community is a key strength of this project and can be expected to generate advocates for positive change.

A Strong Framework for Connectivity

A series of well-connected streets is an important existing characteristic of the study area and serves as good framework for improved bike and pedestrian facilities. For the most part, the existing street network is well-connected, with fairly standard size, rectangular blocks. TCU and Paschal High School serve as the only major barriers to connectivity.

The Growth and Expansion of TCU

TCU brings activity and visitors to the project area, supports cultural and arts events and provides local jobs. Special and sports events are important to nearby residents, encouraging community engagement and togetherness. The institution's location in the project area is an asset that brings activity and resources that the area would not normally see with such an institutional presence.



Engaged residents and the already-purchased land for the Tex Rail stations are key existing strengths that the area can use to build on.

KEY CHALLENGES

Perception Problem “Scary Berry”

One of the biggest challenges facing the study area is the perception of Berry Street itself. Although recent streetscape improvements have helped walkability and safety close to TCU, comments collected during the charrette and from the student survey indicate that a negative impression still exists. Poor perception has earned the corridor the widely-used nickname “Scary Berry.”

This perception problem can make it difficult to attract investment, especially in the eastern portion of the study area. This lack of investment can cause students, visitors and residents to go elsewhere for shopping and entertainment, and as a result, spend income in other parts of the City. Improving the perception of Berry represents an opportunity to enhance the feel of the area with the hope of eventually creating a destination.

Limited Bike and Pedestrian Connectivity

One major reoccurring theme of the charrette was the degree of difficulty to safely walk and bike around the study area. The majority of Berry does not feel safe for pedestrians and there are no real accommodations for bicycles. In the neighborhoods, sidewalks often start and stop abruptly. Crossing Cleburne on foot or by bike is nearly impossible.

While Cleburne and Berry are large roads that pose many challenges, the existing block system is favorable for pedestrian and bike activity. Recent streetscape upgrades on Berry near TCU were mentioned multiple times at the charrette as helping Berry feel more comfortable. The Development Plan must encourage and promote the importance of developing a safe and connected bicycle and pedestrian network that serves users of all ages and abilities.

Lack of Usable Green Space

The lack of usable greenspace in the study area is a major challenge. Parents spoke of the desire to walk with their children to a neighborhood park and residents lamented the lack of outdoor gathering space for community events.

The lack of greenspace is also contributing to the stormwater issue. Large amounts of impervious surface increase the amount of runoff and slow absorption. The lack of usable greenspace also means that residents have limited outdoor space to gather for socialization, exercise or to play. Creating usable greenspace and ensuring it is included as part of new development should be a priority for the future.

Aging Stormwater System

Over the years, flooding and the conveyance of stormwater has been a persistent problem for the area. Early on, stormwater was managed by surface swales and ravines that directed water to the then informally-known as Zoo Creek. As population increased, parts of the Creek were replaced with underground pipes. Eventually, the volume of stormwater became more than the pipes could handle and flooding steadily increased during intense rainfall events.

Residents and business owners have expressed concern and a desire to find a solution. The cost of a complete overhaul of the underground stormwater system is unfeasible at this time, therefore, a staged approach and more creative solutions are needed— that focus on using natural landscape features to manage stormwater as close to its source as possible. Addressing the stormwater issue must be a critical component of the Development Plan.

FLOODING ISSUES IN THE BERRY/UNIVERSITY AREA

Berry and Sandage, 2007



Lubbock and Devitt, 2004



Sandage and Bowie, 2004



Berry and Sandage, 2004



Berry and Sandage, 2004



Over the years, flooding and stormwater has been a persistent problem for the area. Even smaller storms produce flooding and property damage along in the area .

Weak Market

Another challenge facing the Berry/University area, is the lack of market opportunities. As discussed previously in the market summary, there are distinct market areas along Berry that cater to different types of businesses.

The eastern-end of the study area contains neighborhood-serving businesses that cater to residents in the nearby neighborhoods. While there appears to be significant demand for “alternative” financial solutions and auto repair, there is not enough pedestrian activity to sustain many other types of businesses at this time.

The area around the future TEX Rail station, is perhaps slowly transitioning from an area dominated by fast food restaurants and neighborhood pharmacies to an area that supports more student-oriented development. The western end of the study area, near TCU, contains perhaps the strongest market potential along Berry, due to its proximity to TCU and recently-constructed streetscape improvements.

How can the healthier market that exists near TCU be extended down Berry so that it embraces pedestrian and bike activity, and in particular, provides the additional density to support the future TEX Rail station? It is important that market potential grow and diversify throughout the study area. Investment in public improvements, better zoning and a streamlined approval process that

is more transparent and predictable, will help raise the profile of the Berry/University area, and help to encourage the right type of new development.

Missing Housing Options

Another challenge facing the Berry/University area is the lack of housing choices. The two dominant housing types are single-family and apartments. A characteristic of a great neighborhood is presence of a variety of people— young and old, rich and poor. Neighborhoods should be places where people of all ages and abilities can live as long as they’d like. As the study area continues to mature, a broader array of housing options that serves a greater mix of incomes will be needed.

Currently, few housing options exist for young professionals, seniors or post-graduate students. Missing options include smaller housing types that can achieve medium-density yields and provide high-quality, marketable options between single-family homes and mid-rise apartments. These options include: secondary dwelling units, duplexes, fourplexes, cottages courts, townhouses, garden apartments and live-work units. These housing options are designed to meet the needs of shifting demographics and are a key component to a diverse neighborhood. And they can meet the market demand for walkable urban living.



Another challenge facing the Berry/University area is the lack of housing choices. The two dominant housing types are single-family homes and apartments.

CHAPTER 3: THE PATH FORWARD



SUMMARY OF KEY STEPS

This chapter details key strategies for enhancing Berry Street itself, supporting and protecting adjacent neighborhoods and supporting the future TEX Rail station area. Within each of these keys steps there are intermediate concepts that contain specific ways to achieve the larger goal.

1. ACTIVATING BERRY

1.1: Fill in the Critical Gaps Along Berry

Fill in the gaps with appropriately-scaled infill buildings between TCU and Cleburne.

1.2: Finish the Streetscape

Walkability and bikeability enhancements are needed east along Berry and should include the addition of protected bike lanes. Better bike accommodating infrastructure on Berry should be considered.

1.3: Reuse Existing Buildings; Enhance the “Cool” Factor

The area east of Cleburne has the potential to find a niche as a place where creative people and businesses can come to launch innovative endeavors.

1.4: Connect to Nearby Centers

Streetscape improvements along University, extending down to Bluebonnet Circle, should include a planted center median as well as street trees to provide shelter from the Texas sun.

2. PRESERVING THE SURROUNDING NEIGHBORHOODS

2.1: Promote Higher Density Residential Closer to Berry

To support Berry and the future TEX Rail station, and to help promote housing affordability, a more complete set of housing options must be developed.

2.2: Improve Walkability in the Neighborhood

While the block network is well-connected, the lack of sidewalks and street trees can make it difficult to walk from place to place in and around the project area.

2.3: Connect to the Trinity Trail

Providing a safe and direct bike and pedestrian route to the Trinity Trail from the Berry/University area should be a priority of this effort.

3. EMBRACING THE STATION

3.1: Act Tactically Now

Local entrepreneurs, city officials, property owners and local residents should work together to jump-start activity on targeted opportunity sites by initiating a series of low-cost, temporary initiatives.

3.2: Make Targeted Short-Term Improvements

Short-term improvements must look for ways to add density in support of the bus transfer station, and look beyond to the future with an operational TEX Rail station.

3.3: Focus on Long-Term Stormwater Improvements

The long-term plan for the station area must focus on creating an overall system of stormwater detention and conveyance that helps move water through the area in times of heavy rainfall.

1. ACTIVATING BERRY



1.1: FILL IN THE CRITICAL GAPS ALONG BERRY

Noticeable gaps exist between buildings along Berry. These gaps are caused primarily by surface parking lots and their associated curb-cuts. These gaps are often perceived as unsafe and can have a tendency to inhibit walking and cycling. Filling in the gaps with active buildings and uses will make Berry a more inviting place to be, and will help encourage cycling and walking.

The western end of Berry currently generates the most economic activity and serves as the key pedestrian connection between TCU and the future TEX Rail station. The west end should, therefore, be the primary focus of any infilling activity along the corridor.

The southside of Berry should provide a consistent street wall with buildings pulled up to the sidewalk with active ground-floor uses (retail/commercial uses with large windows, pedestrian-scaled signs and street-facing entrances).

Building placement on the northside of Berry should be more flexible. Institutional uses within the study area desire flexibility to consider development of a campus-like green edge as seen on University Drive. This green edge would help buffer institutional uses from commercial activity along Berry and could contain stormwater features, helping to ensure a active and park-like environment on the campus-side of the corridor.

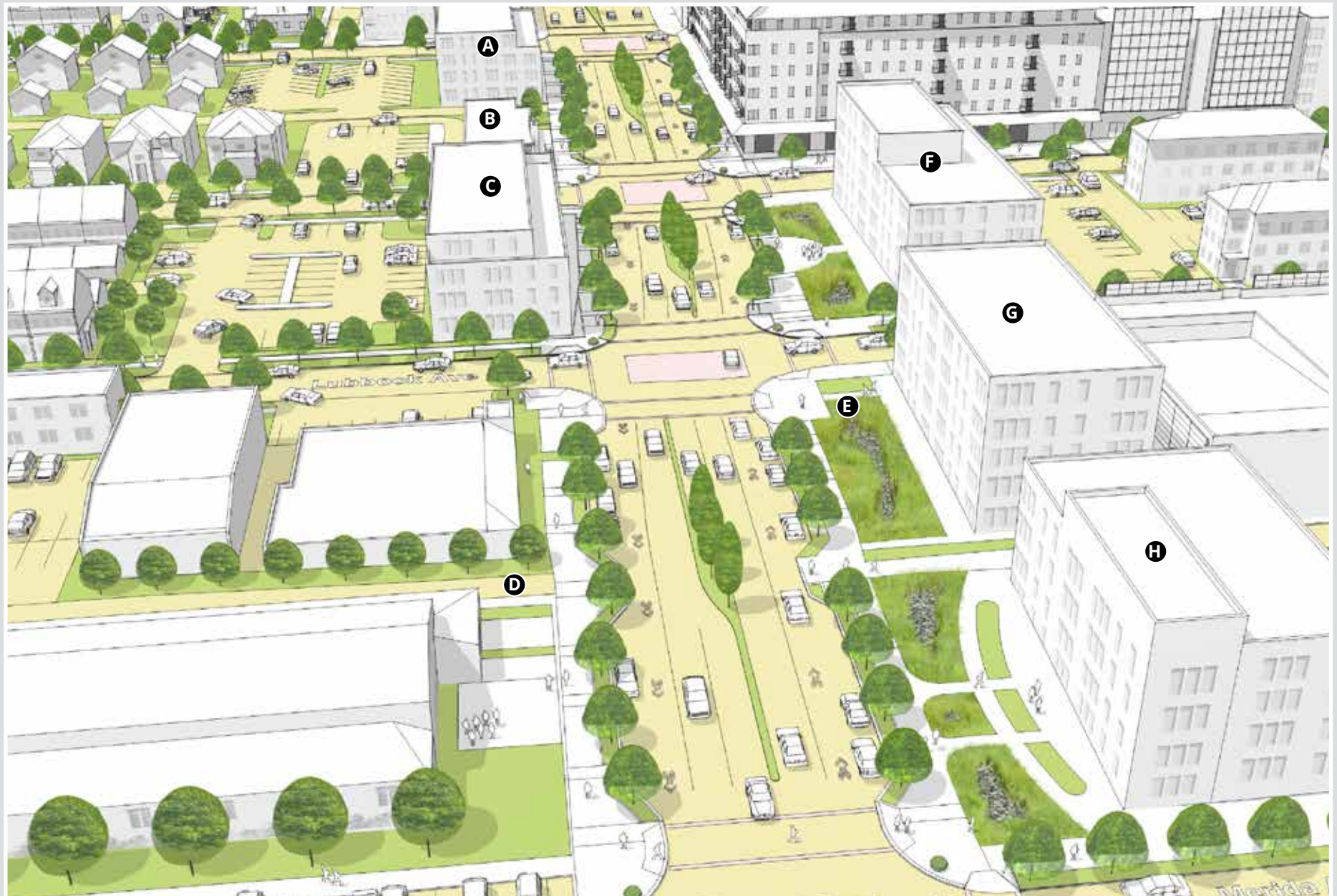
Filling in these gaps is imperative to the long-term viability of Berry to help ensure a more 24-hour, live, work and play environment.



Noticeable gaps exist between buildings along Berry. These gaps are often perceived as unsafe and can have a tendency to inhibit walking and cycling in the area

- A RadioShack/Subway Site.** New 4-story mixed-use building pulled up to Berry replaces existing building and surface parking lot.
- B Jack in the Box Site.** Existing building retained.
- C Dominos/Gamestop Site.** New 4-story mixed-use building pulled up to Berry replaces existing building and surface parking lot.
- D Dental/La Mancha Sites.** Existing buildings retained.
- E Green Edge.** A flexible green edge serves as a gateway for the institutional uses. The green edge could help buffer institutional uses from the vehicular traffic along Berry and could contain stormwater features.
- F King Liquor Site.** New 4/5-story mixed-use building replaces existing building and surface parking lot.
- G TCU Interior Design Site.** New institutional building fronts green stormwater edge.
- H Jewelers Site.** New 4/5-story mixed-use building replaces existing building.

*Legend corresponds with image on pg. 37.



Isometric view looking west along Berry showing how key blocks could be infilled with new buildings. Concept depicts potential development patterns that could occur in the future based on market feasibility.

Filling in gaps with buildings on the southside of Berry will help enhance walkability and provide economic support for new businesses.



📍 Aerial view of the green edge along University today.



TCU would like the flexibility to create a green edge along the north side of Berry similar to the one along University today. The images above show other universities that incorporate green edges and stormwater features along major campus corridors. Clockwise from top, University of San Diego, Portland Community College and Kansas Wesleyan University.

1.2: FINISH THE STREETScape

Currently, the streetscape (sidewalk and landscape planting area) on Berry east of Forest Park does not do a good job of accommodating pedestrian or bike activity. It is very auto-oriented and walking or biking is unappealing. The lack of pedestrian amenities and bike facilities makes pedestrians and cyclists feel uncomfortable.

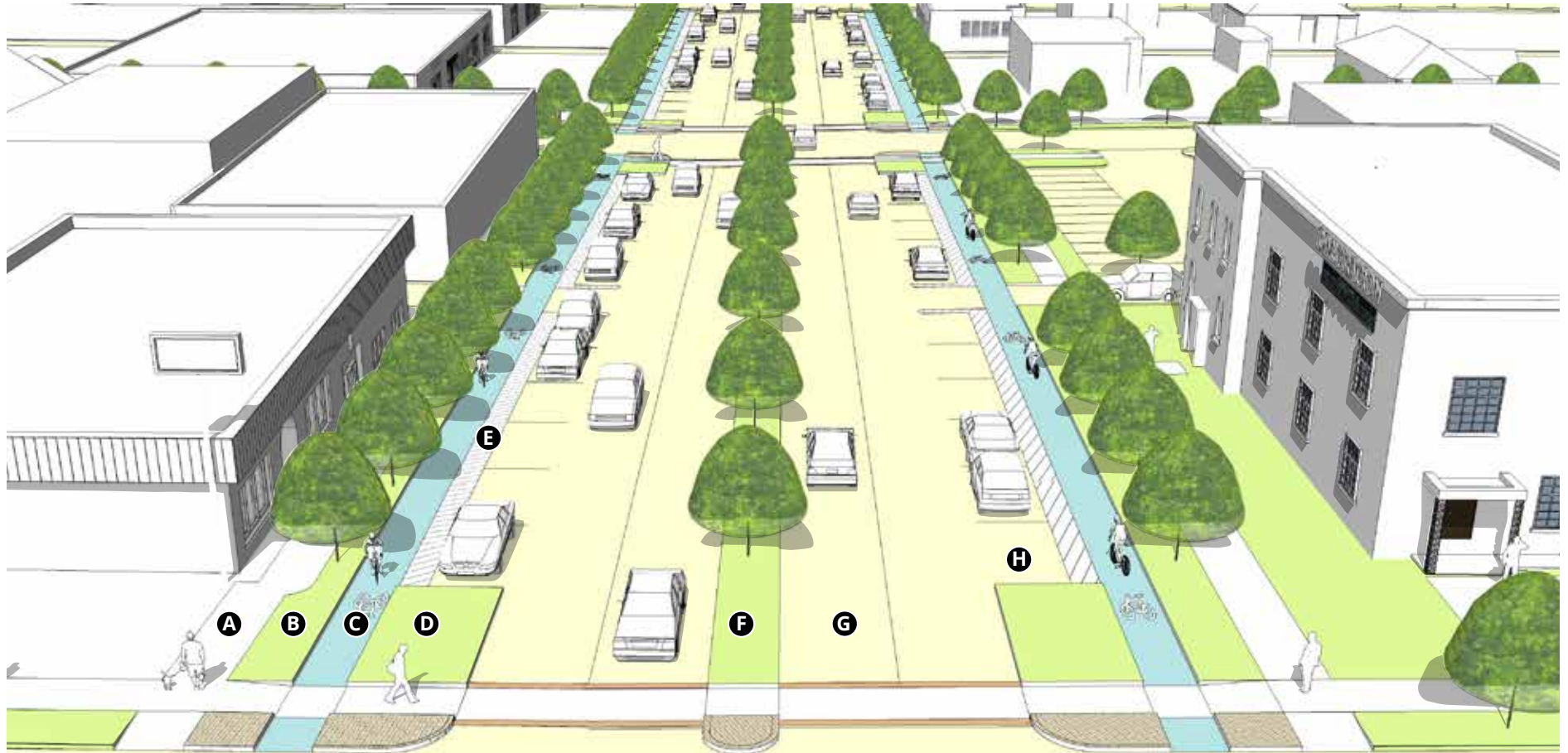
To the west of Forest Park, new sidewalks, street trees and bumpouts have helped improve walkability and safety closer to TCU. Walkability and bikeability enhancements are needed to the east of the new improvements along Berry and should include the addition of protected bike lanes on both sides of the street. Sharrows should be painted in the street west of Forest Park.

A sharrow is a marking on a shared lane of a paved road's surface indicating that bicyclists may use any portion of the full width of the lane. These markings assist cyclists with positioning, alert motorists to bicycle presence and encourage safe passing of cyclists. There are no striped bicycle lanes on streets marked with sharrows



The streetscape on Berry east of Forest Park doesn't do a good job of accommodating pedestrian or bike activity (top left). To the west of the Forest Park, new sidewalks, street trees and bumpouts have helped improve walkability (bottom left). The rendering to the right shows how bike facilities could be added to the existing streetscape to increase mobility.

BERRY: EAST OF FOREST PARK - LONG-TERM VISION



- A** 5- to 10-foot sidewalk.
- B** 6-foot depressed planting strip for street trees allows for capture of stormwater runoff.
- C** 5-foot protected bike lane runs between parked cars and planting strip. Bike lane is painted to increase visibility.
- D** Bumpout extends sidewalk and reduces pedestrian crossing distance. Planted area can be depressed to allow for the capture of stormwater runoff.
- E** 3-foot striped area separates parking from bike lane. Provides buffer for passenger loading and to help prevent door collisions.
- F** 6-foot median replaces center turn lane. Median could be depressed to allow for the capture of stormwater runoff.
- G** 11-foot travel lanes.
- H** 8-foot parallel parking lane.

The image above shows a conceptual street cross-section for Berry that extends east from Forest Park, across Cleburne, to the eastern edge of the project boundary. The improvements include a buffered bike lane on each side of the street within the existing curb to curb dimension, which is approximately 82 feet.

SEPARATED BIKE FACILITIES

Buffered bike lanes are conventional bicycle lanes paired with a designated buffer space separating the bicycle lane from the adjacent motor vehicle travel lane or parking lane. Buffered bike lanes provide a greater space for cycling without making the bike lane appear so wide that it might be mistaken for a travel lane or a parking lane. This type of approach appeals to a wider cross-section of riders. It also encourages cycling by contributing to the perception of safety among users of the bicycle network.

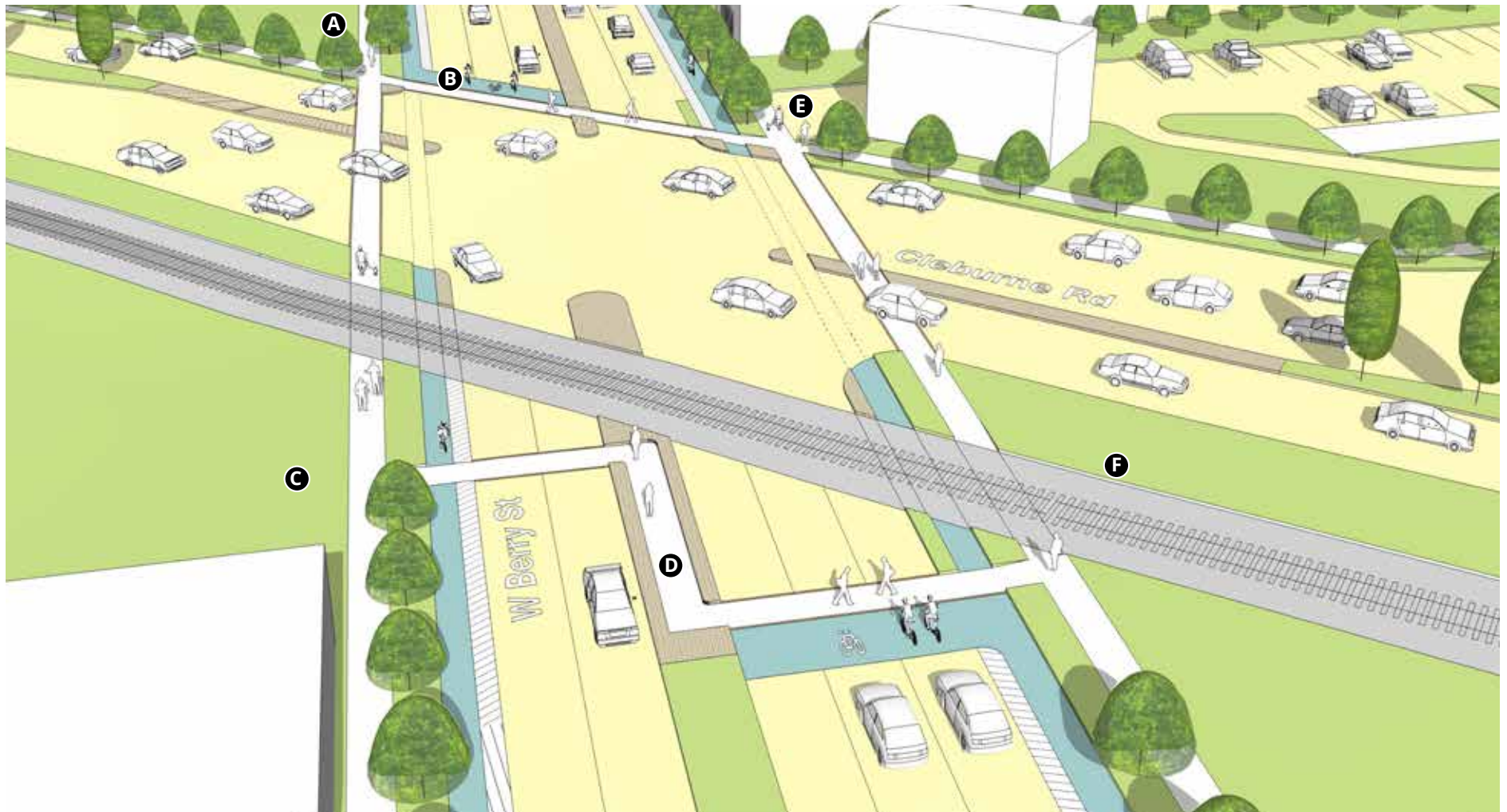
A bike box is a designated area at the head of a traffic lane at a signalized intersection that provides cyclists with a safer and more visible way to get ahead of queuing traffic at a red light.

These types of treatments could be considered for Berry east of Forest Park.



Separated bike facilities increase bike use by protecting cyclists and making it more comfortable to ride on streets that are shared with cars.

BERRY/CLEBURNE INTERSECTION - LONG-TERM VISION



- A** Livingston Ave closed at Berry to improve traffic flow at the intersection.
- B** Bike box provides cyclists with a safer and more visible way to get ahead of queuing traffic at a red light.

- C** Gordon Ave closed at Berry to improve traffic flow at the intersection.
- D** Staggered crosswalks split by median reduces crossing distance in the road and forces pedestrian to face oncoming traffic before turning again to cross the second half of crosswalk.

- E** Taco Bell exit closed at Berry to improve traffic flow at the intersection.
- F** Free-flow right lane eliminated.

The proposed long-term changes shown above are intended to help improve pedestrian and bicycle connections across Cleburne. This view looks east down Berry across Cleburne.

1.3: REUSE EXISTING BUILDINGS; ENHANCE THE “COOL” FACTOR

Berry east of Cleburne once served as a thriving retail district. Today, many of these former storefronts are vacant or underutilized. The result is pleasing to no one, sidewalks are drained of life. There is also a heavy concentration of pay-day loans and other non-traditional financial institutions on this part of Berry.

Cities across the country have experienced artists, musicians and other creative types moving into less expensive areas, and in turn, making these areas more lively and attractive. The area east of Cleburne has the potential to find a niche as a place where creative people and businesses can come to launch innovative endeavors. Artist activity is often a first sign of the resurgence of an area, attracting attention to potential market opportunities, especially given the proximity of the future TEX Rail station.

Ryan Place residents were enthusiastic during the charrette about having a reason to walk to Berry. Additionally, there is the potential to pull in TCU students interested in the arts, who typically have to travel to the cultural district or elsewhere for their creative activities.

Ideas for the conversion of storefronts include artists' galleries, studios, and live-work space. Organized events such as, neighborhood meetings could be held in the spaces. Evening meetings would help increase activity at night. Some



Artist's galleries or studios, thrift stores with community space and community events are just some of the ways to reuse existing buildings while adding activity and buzz to the area.

communities have opened temporary internet cafes, encouraging nearby residents to bring their laptops or books and work or socialize together. In some cases community-serving businesses, such as thrift stores, have used corners of their stores as community coffee houses. Others have bartered with building owners to exchange maintenance work, painting or other assistance in order to hold community art events in spaces on the weekends or in the evenings. Building owners often realize how effective a fresh coat of paint and activating the storefront with more than one use can be.

A frequent barrier to opening any new business is the permanence of signing a long-term lease. Working with building owners to offer short or temporary leases could help existing buildings to become business incubators. Encouraging the sharing of a lease is an emerging trend that enables multiple startup businesses to share space when the other business would typically not be open. For example, an art studio that is open during the day may share space with a craft beer establishment that is open in the evening. This practice also condenses activity near the businesses, helping add as many people as possible to an area. Another useful idea is creating a system of revolving store fronts, where on

consecutive weekends local craftsmen and artists set up mobile storefronts in buildings whose owners have volunteered, or charge a small fee, to let them take over a few square feet of space for the day.

Another way to bring activity to the area would be to use vacant sites and surface parking lots to host temporary outdoor events or public art installations, as is being done in the Race Street area.



Race Street is an example of once under-appreciated areas that are experiencing an influx of creative energy.

1.4: CONNECT TO NEARBY CENTERS

Bluebonnet Circle, just a short walk from Berry, offers a variety of restaurants and one of the few public open spaces within close proximity of the project area. University Drive provides an important connection from Berry to Bluebonnet Circle. Improving the overall pedestrian and bike experience from Berry to Bluebonnet Circle should be a priority of the City.

Streetscape improvements along University, extending down to Bluebonnet Circle, should include a planted center median (similar to the median on University north of Berry) as well as street trees to provide shelter from the Texas sun.



The median north of Berry on University should be extended down to Bluebonnet Circle.



Streetscape improvements on University starting near the Kroger and extending south to Bluebonnet Circle. 14-foot center median replaces continuous center turn lane and street trees provide shelter from the Texas sun.

KROGER/BANK OF AMERICA SITE - LONG-TERM VISION

Recent development proposals on University south of Berry have been contentious. Stakeholders would like to see new development south of Devitt retain its single-family character. In general, neighborhood residents would prefer not to see anything in the future that resembles the recently-built University House at University and Devitt in either form or character. In this area, single-family and townhouses are seen by many as the appropriate future development pattern south of Devitt.

On the other hand, the block North of Devitt (the Kroger and Bank of America site) could redevelop into something more substantial, more pedestrian-friendly and contain a variety of uses. While local residents enjoy having a large grocery store and bank located close to their neighborhood, the placement and form, with the large parking lot and drive-thru lanes out front, is not ideal. Grocery stores and their parking can exist in a pedestrian-friendly environment. The block study to the right shows one way the Kroger/Bank of America site could redevelop to include a residential component, do a better job of addressing Berry, all while keeping the grocery store and its required parking.



Existing Building New Building Private Property

0 150 300 feet



- A** 2- to 3-story buildings front Berry with ground floor retail and upper-story office/residential, replaces surface parking lot.
- B** 2- to 3-story liner building activates street edge and screens new grocery store.
- C** New multi-story building with ground floor grocery pulled up to Berry.
- D** 2 stories of residential above grocery transitions to neighborhood.
- E** 3 to 4 stories of residential above grocery. Ground floor lined with active street edge along University.
- F** Zoning change allows for integration of small offices into the existing residential fabric.
- G** 4-story parking structure serves grocery and surrounding residential units.
- H** 2- to 3-story residential liner transitions to neighborhood.
- I** 3- to 4-story residential liner fronts University and screens parking structure
- J** 2-story residential liner transitions to neighborhood.
- K** Rogers reconnected to Devitt. Traffic circle added to calm traffic and discourage trucks.
- L** 2- to 3-story townhouses set the character for new buildings south of Devitt.
- M** New median installed to improve connection to Bluebonnet Circle.



New residential buildings behind Kroger and near existing neighborhoods should be sensitive to form and intensity.



Multi-story grocery stores can exist in a pedestrian-friendly environment (the example shown above is the newly constructed Whole Foods near downtown Dallas). Where active uses are not possible along all street fronts, public art can be a good substitute.

2. PRESERVING THE SURROUNDING NEIGHBORHOODS

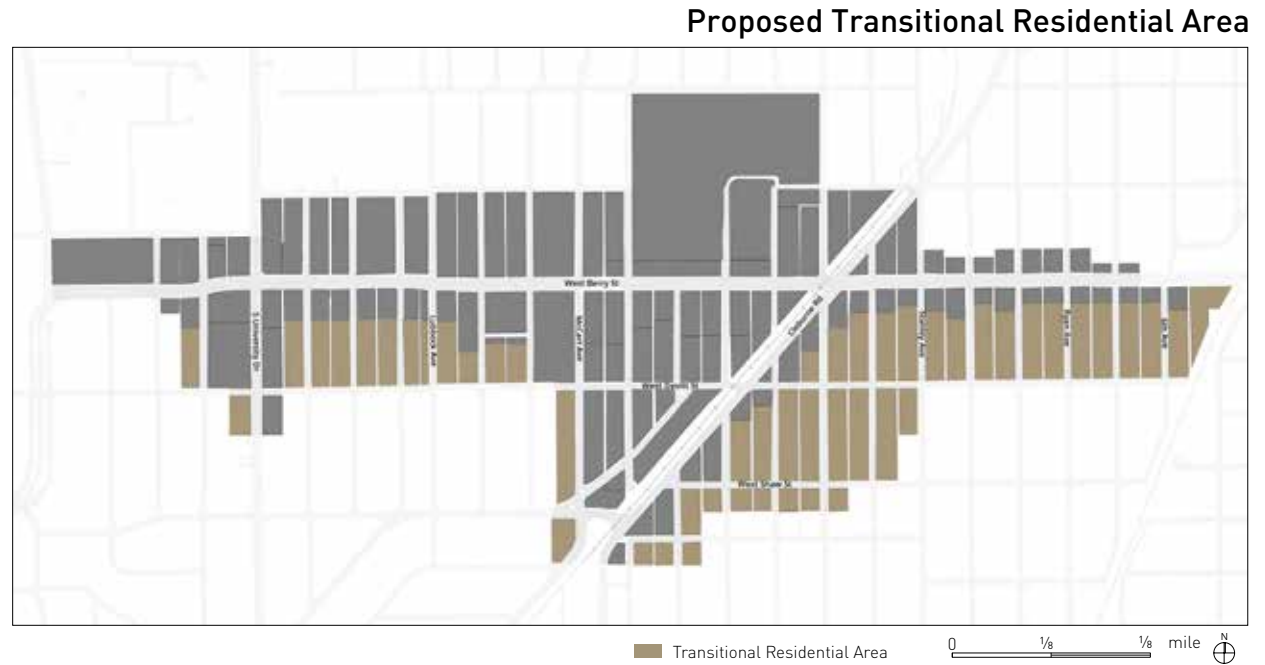


2.1: PROMOTE HIGHER DENSITY RESIDENTIAL CLOSER TO BERRY

To support Berry and the future TEX Rail station, and to help promote housing affordability and more complete housing options for local residents, the neighborhoods closest to the south side of Berry, as shown on the map to the right, should be considered for rezoning. These neighborhoods are currently zoned either One-Family Detached (A-5) or Two-Family (B).

In the project area, housing options are mostly limited to single-family housing or student apartments, leaving no option for other populations, such as seniors who would like to downsize yet stay in the neighborhood or young adults hoping to live near the future transit stop. One characteristic of a great neighborhood is the inclusion of a variety of people— young and old, rich and poor— and the lack of housing options in the study area is limiting its potential to be a great place.

Housing options that are integrated into single-family neighborhoods in the form of secondary and multi-unit structures that fit into the form of the existing neighborhood through elements like height, setback and facade width often provide an increase in housing options. Those seeking a smaller place or less yard work can relocate within the neighborhood, retaining social ties and links to local institutions such as



To support Berry and the future TEX rail station, and to help promote housing affordability and more complete housing options, the neighborhoods closest to the south side of Berry should be considered for rezoning.

churches and schools. These housing options are also typically more affordable than a larger single-family home, since they share parking and outdoor space, giving young people or those who work lower-paying jobs options for living close to their work.

The lack of diverse housing options also hurts the corridor economically because increasing residential density also increases the local

economic base available to support existing and new businesses. These smaller-scale housing types also meet the rising demand for diverse and walkable living. Because the block network along Berry is largely intact, the corridor has the potential to be known as a great diverse, walkable community, increasing property values while offering housing for a variety of income levels.



Currently, student apartments and single-family structures are the predominant forms of housing in the study area.



Missing options include smaller housing types that can achieve medium-density yields and provide high-quality, marketable options between single-family homes and mid-rise apartments and include: secondary dwelling units, duplexes, fourplexes, cottage courts, townhouses, garden apartments and live-work units.

HOUSING DIVERSITY IN THE NEIGHBORHOOD

In addition to offering housing for a diverse range of residents and supporting economic activity on Berry Street, encouraging housing diversity also helps relieve development pressure on single-family neighborhoods further from the corridor. Today, increased diversity near the corridor is happening only by increasing student housing (often in “stealth dorms”), resulting in sometimes out of scale and short-sighted solutions that remove existing single-family homes. Zoning for slightly increased density, especially in places where there are already out-of-scale structures, will take pressure off more secluded single-family areas by offering a designated location for properties to be developed with increased density.

While increasing diversity, adding new housing options will also buffer single-family neighborhoods from more intense uses located along Berry. These single-family neighborhoods will be close enough to take advantage and support economic activity on Berry, yet will be separated from the corridor by a land use transition offered by more moderate density housing.

Increasing housing options also offers homeowners ways to supplement their income on their own property. Zoning that allows secondary units in single-family areas is great way to take advantage of the university presence, and use small properties rented to graduate students or young professors to increase property value and help pay the mortgage.

- A Secondary Dwelling Unit.** A small, self-contained secondary dwelling unit located on the same lot as a detached house but physically separated.
- B Duplex: Side by Side.** A building type that accommodates two dwelling units side by side on an individual lot separated vertically by a shared common wall.
- C Duplex: Back to Back.** A building type that accommodates two attached dwelling units on an individual lot with one unit located directly behind the other unit.
- D Fourplex.** A building type that accommodates 3 to 4 dwelling units vertically or horizontally integrated.
- E Cottage Court.** A building type that accommodates 5 to 9 detached dwelling units organized around an internal shared courtyard.
- F Townhouse.** A building type that accommodates 3 to 8 dwelling units where each unit is separated vertically by a common side wall. Units are not vertically mixed.
- G Garden Apartment.** A building type that accommodates 5 to 8 dwelling units vertically and horizontally integrated.



POTENTIAL HOUSING OPTIONS



- A** Secondary Dwelling Unit
- B** Duplex: Side by Side
- C** Duplex: Back to Back
- D** Fourplex
- E** Cottage Court
- F** Townhouse
- G** Garden Apartment
- H** Single-family House

2.2: IMPROVE WALKABILITY IN THE NEIGHBORHOOD

The lack of a complete sidewalk system in the neighborhoods surrounding Berry is a problem. While the block network is well-connected, the lack of sidewalks and street trees can make it difficult to walk from place to place in and around the project area. The map to the right identifies gaps in the existing sidewalk system. Missing sidewalks are shown in red.

New development fronting a local street should be required to install a minimum 5-foot wide sidewalk with street trees for the entire length of their frontage, and this should also include sidewalks and street trees on side streets on corner lots (see photo at the bottom left).

The City should prioritize missing sidewalk connections. A fund should be established that helps pay to fill in key gaps in the sidewalk system that will inevitably be created as new sidewalks are constructed on a case-by-case basis. A good example of this is shown in the image on the bottom right.

Missing Sidewalks



The lack of a complete sidewalk system in the neighborhoods surrounding Berry is a problem. Missing sidewalks are shown in red. Substantial portions of Devitt and Benbrook are missing key sidewalk connections.



New development fronting a local street should be required to install a 5-foot wide sidewalk with street trees, and this should also include side streets on corner lots.



A sidewalk was installed as part of new construction. Putting in sidewalks on either side of the new house would have completed the sidewalk network on the west side of the street for the block. This was a missed opportunity.

One area to focus on should be the future TEX Rail station. Important sidewalk connections to the site are missing and should be created. Particular importance should be paid to ensuring people can safely walk from Berry down to the proposed station site. Also, substantial portions or key east/west connections (Devitt and Benbrook) are missing sidewalks.

Alleys serve an important role in any neighborhood. Tucked away behind houses, alleys allow for physical services such as trash collection and utilities lines to be separated from the street, but also provide access for parking, which reduces the number of curb-cuts along the street, dramatically improving the walkability of a block. The study area has a number of alleys, many of which are unimproved and overgrown, and some have even been intentionally blocked off. When an alley exists, new development should be required to take vehicular access from the alley, and improve that portion of the alley that abuts their property.

The City should also consider starting an initiative that seeks to reclaim alleys, and where possible improve and pave key alley connections.

Missing Sidewalks



Missing sidewalk connections around the future TEX Rail site are shown in red above.



The study area has a number of alleys, many of which are unimproved and overgrown.

CASE STUDY: Green Alley Program, South Los Angeles. New initiative that seeks to transform abandoned and overgrown alleys into safe, green, community spaces.

www.tpl.org/green-alleys



2.3: CONNECT TO THE TRINITY TRAIL

Trinity Trail Connections



The Trinity Trail is a system of trails along or near the Trinity River. There are over 40 miles of trails along the Trinity River and its tributaries for walking, running, cycling or on horseback. The trail network connects with 21 parks, the Fort Worth Botanic Garden and Japanese Garden, Log Cabin Village, Fort Worth Zoo, the historic Stockyards and downtown Fort Worth. Providing a safe and direct bike and pedestrian route to the Trinity Trail from the Berry/University area should be a priority of this effort. Provid-

ing a safe and direct way to get to and from the Trinity Trail would make cycling or walking an attractive alternative to driving and would help reduce local traffic.

From the Berry/University area, a cyclist has a number of options to connect to the Trinity Trail using the vast network of existing and proposed bicycle facilities. The most direct route being Benbrook Boulevard to Bellaire Drive South at the southern end of the study area. To complete this connection to the Trail, a sidewalk and a

bike lane (or a multi-purpose path or trail) would have to be installed on Bellaire Drive South for approximately 1/2-mile between Bellaire Drive West and Overton Park Drive.

The City has plans to install sidewalks on the north side of Bellaire Dr. South between Bellaire Dr. West and Hulen St., offering a potential connection to Overton Park and the Trinity Trail network.

3. EMBRACING THE STATION



3.1: ACT TACTICALLY NOW

There are many opportunity sites in the study area that might benefit from short-term, temporary interventions. Local entrepreneurs, city officials, property owners and local residents should work together to jump-start activity on targeted opportunity sites by initiating a series of low-cost, temporary initiatives that could generate local support and positive community activity in places that need it. The area around the future TEX Rail station should be considered a prime candidate for this type of targeted intervention. Following are a few strategies that might work well in area.



Food Trucks/Trailers: Food trucks or trailers could be moved onto the site on temporary basis.



Movie in the Park. Family movie nights could be organized in the evenings during summer months.



Open Air Market. A market, selling crafts, food or other goods, could activate the site on weekends or on evenings and provide a place to sell local goods or produce.



Pop Up Art. A temporary art installation could be created to generate activity and discussion. The example above is a temporary gathering space created out of old shipping pallets.



Pop Up Swimming Pool. A temporary swimming pool would be a great place to cool off in the summer.



Urban Garden. A temporary community garden could provide space to grow fresh produce and plants.



Pop Up Park. Temporary park elements could bring activity to the neighborhood and provide much-needed green and park space.



Exercise. As already happens in many City parks, local residents could organize temporary meet up events such as morning yoga classes.

CASE STUDY: Five Points Alley (Walnut Hills, Cincinnati) Five alleys intersecting in the heart of a busy block were a safety concern. They were a dumping ground, a source of drug dealing and prostitution.

Neighborhood residents came up with a plan to activate the alley as a public space: community cleanup days followed by pop-up beer gardens. The project has been a huge success, revitalizing a once forgotten space.

www.walnuthillsrf.org/fivepoints/



3.2: MAKE TARGETED SHORT-TERM IMPROVEMENTS

The area centered around the future TEX Rail station (running from approximately Merida on the west to Livingston on the east and Shaw on the south) is one of the most affected portions of the project area during periods of heavy rain. Short-term improvements must focus on efficient stormwater conveyance through the study area, while concurrently using detention strategies to ensure flooding is not increased in other locations.

The Fort Worth Transportation Authority (FWTA/The-T) has proposed using the TEX Rail station site for bus transfer until the rail system is extended to Berry. Short-term improvements surrounding this site must look for ways to add density in support of the bus transfer station, and look beyond to the future with an operational TEX Rail station.

Drainage throughout the study area currently occurs through a system of pipes. During larger rainfall events, streets serve as the primary path for runoff overflow conveyance because of inadequate pipe capacity. The goal of the recommended stormwater control measures is to detain runoff, encourage infiltration, and to provide an alternative flow path, with stormwater facilities serving as an amenity. New stormwater controls will not eliminate the conveyance of stormwater along streets, but will help lower flood levels during small (2 to 5-year) flood events.

The block study to the right, shows a series of conceptual public and private stormwater improvements that would help reduce the flooding in the area. This would enable the development community to meet the T's goal of dense development near the station area.

The City's current stormwater policies do not allow new construction when the development will increase runoff from the site. This effectively means that no additional intensity or impervious area is allowed until compensating measures are installed on- or off-site.

The block study illustrates improvements to the system of conveyance through the station area, and improvements related to slowing the flow of water with retention. Proposed concepts include small-scale improvements such as a variety of on- and off-site bioswales and other conveyance options (likely built by new development). These individual improvements may resolve the concerns for a specific site, but do not reduce the overall impact of flooding in the area.

In order to unlock the future development potential of the station area, larger stormwater solutions are also proposed, but these would likely occur only through intervention by the City or the T, or through public private partnerships. These could include a soccer field or community park that doubles as dry detention, and public open spaces that provide for additional water storage during periods of heavy rain.

- A** Existing FWISD building re-purposed as creative office space. Bioswale (to store and convey stormwater runoff) replaces a portion of the parking lot.
- B** Turn lane closed from McCart to Benbrook, creates area for a small-scale stormwater bioswale. Cottages face newly created green space.
- C** Stormwater bioswale reduces amount of impervious surface along key portions of McCart, Forest Park and Benbrook, helps to convey, store and slow down stormwater through the area.
- D** School expansion, additional parking and vehicle circulation fills in a land in front of the high school.
- E** Initial phase of park and stormwater bioswale provides recreational area and water storage during periods of heavy rain while draining the site in anticipation of future higher density development. Existing houses front park with parking to rear.
- F** Temporary bus transfer station at site of future TEX Rail stop allows for easier transfers between Berry and Cleburne bus routes. Open space to the west could be used for temporary events, such as a farmer's market or "movies in the park."
- G** 2- to 3-story buildings with ground floor retail and upper-story office/residential front Berry and extend down Frazier on currently vacant site.
- H** 2- to 3- story building with ground floor retail and upper-story office/residential replaces abandoned Ewell Fuel site.
- I** Soccer field and dry detention facility provides an area for active recreation and to accept and store stormwater runoff during periods of heavy rainfall.

*Legend corresponds with image on pg. 61.

Short-Term Block Study

Short term block study concept depicts modest redevelopment and stormwater solutions that serve as recreational amenities for the area.



3.3: FOCUS ON LONG-TERM STORMWATER IMPROVEMENTS

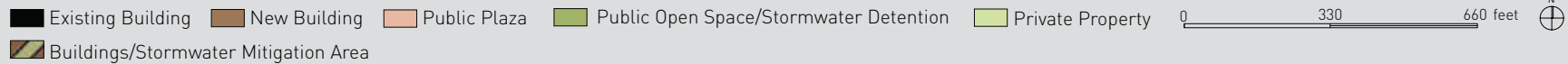
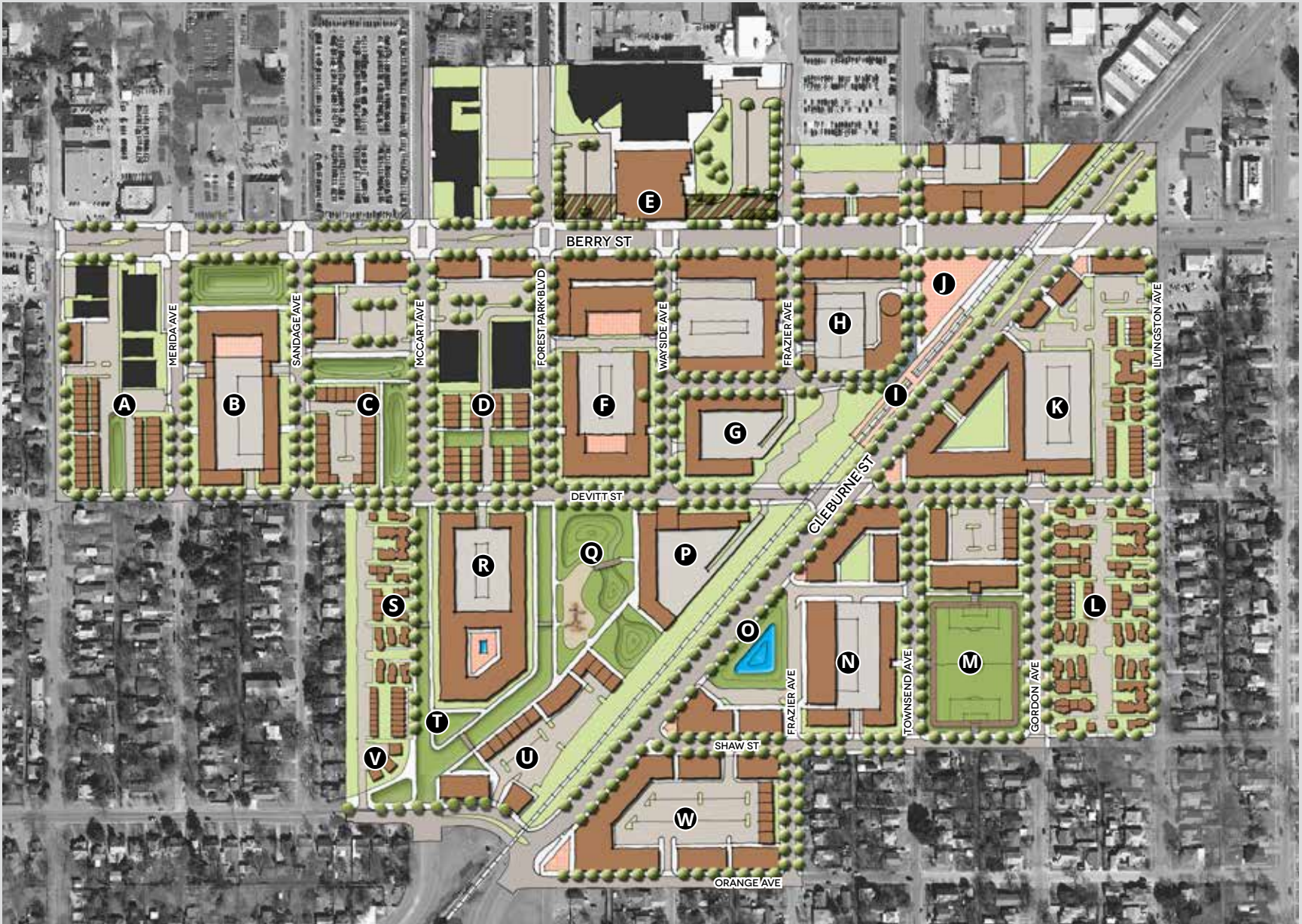
The long-term plan shown in the block study to the right indicates how development might respond to both stormwater improvements and the TEX Rail station over a longer period of time. While the proposed character areas (see Chapter 4) may suggest taller buildings than are shown, market realities, parcel size and parking may limit the height of buildings shown in the block study. Additional stormwater measures are included in this block study, creating an overall system of conveyance and detention.

Individual sites will continue to ensure new development does not exacerbate the flooding situation, but the majority of the reduction in flood threat will come from the larger stormwater elements that serve as shared facilities improving the situation for many surrounding properties. Only through this shared strategy will the intense station area development potential be unlocked.

- A** 2- to 3-story townhouses intensify block and provide transition. Parking in rear contains bioswale with daylighted stream to slow flow of water during periods of heavy rain and create amenity.
- B** Park with bioswale creates gathering space along Berry that also helps capture stormwater runoff. 3- to 4-story building with ground floor retail and upper-story office/residential fronts newly created gathering space. Development transitions to neighborhood with 2- to 3-story apartments. Parking deck services the project and provides additional parking for businesses along Berry.
- C** 2- to 3-story residential buildings replace FWISD building. 2-story units front Devitt and provide transition to neighborhood to the south. 2- to 3-story buildings with ground floor retail and upper-story office/residential front Berry replacing Walgreens.
- D** 2- to 3-story townhouses intensify block and provide a neighborhood transition. 2- to 3-story buildings with ground floor retail and upper-story office/residential front Berry with parking to rear.
- E** Future buildings could be developed along the Paschal High School Berry Street frontage, either for FWISD use or under revenue generating land or structure leases. Such buildings could improve the pedestrian-friendliness of the street by creating a comfortable sense of enclosure. In the absence of such buildings, green spaces with stormwater mitigation elements along the Paschal frontage could also support a successful Berry Street corridor.
- F** 2- to 3-story buildings with ground floor retail and upper-story office/residential front Berry. 3- to 4-story apartments provide a high density housing option close to the TEX Rail stop. Two parking decks service the development and provide parking for nearby businesses and TEX Rail riders.
- G** As TEX Rail stop becomes operational, bus transfer station replaced with a 4- to 5 story mixed use development to accommodate TEX Rail riders.
- H** 2- to 3-story buildings with ground floor retail and upper-story office/residential front Berry and extend down Frazier and Townsend towards operational TEX Rail stop. Parking deck services the development and provides dedicated parking for TEX Rail riders.
- I** Station platform added as TEX Rail stop becomes operational. Pedestrian walkway raised to sidewalk level is part of street system but uses removable bollards for pedestrian protection as is necessary.
- J** Public plaza provides a neighborhood focal point at key intersection. Serves as an important pedestrian connection from Berry to the station platform.
- K** Segments of Townsend and Gordon closed to accommodate a 3- to 4-story development with ground floor retail and upper-story office/residential fronting Cleburne. Project transitions to neighborhood with a variety of lower intensity housing options (cottages, townhouses, small apartments).
- L** A variety of lower intensity housing options (cottages, townhouses, small apartments) provide transition to neighborhood.
- M** Soccer field and dry detention facility provides area for active recreation and to store and convey stormwater runoff during periods of heavy rainfall.
- N** 2- to 3-story apartments provide transition to neighborhood.
- O** Wayside closed and natural stormwater detention facility added. 2- to 3-story buildings with ground floor retail and upper-story office/residential front Cleburne. 2- to 3-story apartments provide a transition to the neighborhood.
- P** 3- to 4-story apartments provide a high density housing option close to the TEX Rail stop. Parking deck services the project and provides parking for nearby businesses and TEX Rail riders.
- Q** Park and stormwater bioswale provides for recreational area and for water storage during periods of heavy rain.
- R** 3- to 4-story apartments provide a high density housing option close to the TEX Rail stop.
- S** A variety of lower intensity housing options (cottages, townhouses, small apartments) provide transition to the neighborhood.
- T** Stormwater bioswale completely replaces portions of McCart, Forest Park and Benbrook with imperviousness limited to sidewalks. Bioswale system links with other stormwater improvements.
- U** 2- to 3-story apartments front stormwater bioswale with parking in rear. Single-story retail buildings front street.
- V** Turn lane closed from McCart to Benbrook, creates area for a small-scale stormwater bioswale. Cottages face newly created green space.
- W** 2- to 3-story buildings with ground floor retail and upper-story office/residential front Cleburne, closing Wayside. 2- to 3-story apartments extend down Orange and Shaw and townhouses front Frazier, providing transition to the neighborhood.

Long-Term Block Study

Long term block study concept relies on the implementation of the TEX Rail station in order to support the mixed-use and residential development intensity shown.



DESCRIPTION OF STORMWATER CONTROL MEASURES

Stormwater is both a regional and site-specific concern. When addressing stormwater comprehensively for a neighborhood, it provides the opportunity to enhance the overall quality of life for a community. For example, many stormwater control measures require open space including conveyance corridors. Conscientiously planned, they provide the opportunity for amenities like parks and trails, and the establishment of wildlife habitat, while adding beauty to a neighborhood.

STORMWATER GOALS

Specific short- and long-term stormwater associated goals as part of the Berry/University Development Plan, include the following:

1. Protecting People and Property

Avoid development in flood prone areas and reduce flooding frequency along streets

2. Transit Ready Development

Take advantage of stormwater conveyance and open space needs to promote connectivity from the neighborhood to the transit station

3. Neighborhood Resiliency

Reducing flooding with low impact development solutions, improves stormwater quality and preserves the integrity of the neighborhood

4. Form-Based Code Encourages Positive Urban Experiences

Integrate stormwater control measures to showcase stormwater as a key component of the built environment; use it as a tool to create urban amenities, while setting an example for the surrounding area and educating people about water as an essential component of life

5. Rethink Stormwater Management

Be attentive to more frequent rainfall patterns and “small” floods, and focus on incremental improvements applied throughout the watershed.

ISWM MANUAL

The City requires adherence to streambank protection and flood control criteria specified in the City’s iSWM manual. While not a requirement, the City strongly encourages development to consider implementation of iSWM as it relates to the enhancement of water quality protection. The City provides an incentive for voluntary compliance with water quality protection through a stormwater fee credit (or fee reduction).

The following stormwater controls and descriptions are based on the NCTCOG iSWM Technical Manual for Site Development Controls. Bioretention, Enhanced Swales, and Multi-purpose

Detention Areas / Dry Detention are recommended as part of the short- and the long-term stormwater improvements. It is anticipated that these regionally-focused stormwater controls will involve the City and private partnerships for future implementation. The Zoo Creek Storm Drain Study will identify potential regional stormwater solutions and evaluate their effectiveness within the overall Zoo Creek Storm Drain watershed, which encompasses much of the study area. Underground detention, modular porous paver systems, proprietary structural controls, rain harvesting and green roofs has also been included to provide additional options for private development stormwater mitigation.

1. BIORETENTION

Bioretention areas (also referred to as bioretention filters or rain gardens) are structural stormwater controls that capture and temporarily store stormwater using engineered soils, underdrains and vegetation in shallow basins or landscaped areas to remove pollutants from stormwater runoff. In these engineered facilities, runoff is conveyed as sheet flow to the “treatment area” which consists of a grass buffer strip, ponding area, organic or mulch layer, planting soil, and vegetation. The filtered runoff is typically collected and returned to the conveyance system, though it can also infiltrate into the surrounding soil in areas with porous soils.

There are numerous design applications, both on- and off-line, for bioretention areas. Examples include rain gardens on single-family residential lots; within larger landscaped pervious areas; landscaped islands in impervious or high-density environments; off-line facilities adjacent to parking lots; and along highway and road drainage swales.



Bioretention: (clockwise from top left) Rosedale Street, Fort Worth, Texas; Denton County, Texas; Stacy Park, Austin, Texas; and Dickinson Library, Dickson, Texas.



Enhanced Swale: Central Park, Grand Prairie, Texas (left); Cinco Ranch, Katy, Texas (right).

2. BIOSWALES

Enhanced swales (also referred to as vegetated open channels or water quality swales) are conveyance channels engineered to capture and treat stormwater for a drainage area. They differ from a normal drainage channel or swale through the incorporation of specific features that enhance stormwater pollutant removal effectiveness. Enhanced swales are designed with limited longitudinal slopes to force the flow to be slow and shallow, thus allowing for particulates to settle and limiting the effects of erosion. Berms and/or check dams installed perpendicular to the flow path promote settling and infiltration.

There are two primary enhanced swale designs, the dry swale and the wet swale. Below are descriptions of these two applications:

- » Dry swales are vegetated conveyance channels designed to include a filter bed of prepared soil that overlays an underdrain system. Because they are dry most of the time, they are often the preferred option in residential settings.
- » Wet swales (also called wetland channels) are vegetated channels designed to retain water or marshy conditions that support wetland vegetation. A high water table or poorly drained soils are necessary to retain water. The wet swale essentially acts as a linear shallow wetland treatment system.



Above Ground Detention: Brevard County, Florida (left); Eastern Hills High School, Fort Worth, Texas (center and right).

3. ABOVE GROUND DETENTION

Above ground detention basins are surface facilities intended to provide for the temporary storage of stormwater runoff to reduce downstream water quantity impacts. These facilities temporarily detain stormwater runoff, releasing the flow over a period of time. Resulting in peak flow reduction, they are intended to provide on-site flood control. However, they can also be designed to help control extreme flood events. Dry detention facilities completely drain and empty following a storm event. Wet detention facilities do not drain completely, but contain water after a flood event and the detention value is limited to the capacity above the permanent water level. Both dry and wet detention facilities may be designed to serve more than one purpose.

Compatible multi-objective use of dry detention facilities is preferred where feasible. Examples of multi-use at dry detention areas could include:

- » Sports Fields
- » Recessed Plazas
- » Parks and Open Space
- » Trail Systems
- » Wildlife Habitat

By its very nature, multi-purpose dry detention must be usable for their primary function the majority of the time, and as such, should not be used for extended detention. The multi-purpose value of wet detention includes the provision of wildlife habitat and amenities for water sports and aesthetics.

Above ground detention basins can be designed with water quality/pollutant reduction features, but without these, they provide limited pollutant removal benefits and are not intended for water quality treatment. Both dry and wet detention facilities may be designed to serve more than one purpose and can be constructed with low-flow pilot channels to more easily facilitate multi-use during minor rain events. The detention basin shown above, in Eastern Hills, is constructed with a low-flow pilot channel.



Underground Detention Facility: Tradepoint Business Park, Coppell, Texas (left); University Blvd, Dallas, Texas (right).

4. UNDERGROUND DETENTION

Detention vaults and pipe/tank systems are underground stormwater storage facilities that serve as an alternative to surface detention for stormwater quantity control, particularly for space-limited areas and/or expensive land. Underground detention facilities are often located beneath buildings, parking, and even sports fields where dry detention may not be feasible. These underground detention facilities are not intended for water quality treatment and must be used in a treatment train approach with other structural controls in order to provide water quality benefits. Such structural water quality controls will also prevent the underground vault or tank from becoming clogged with trash or

sediment and significantly reduce the maintenance requirements for an underground detention system.

Prefabricated concrete vaults are available from commercial vendors. In addition, several pipe manufacturers have developed packaged detention systems.



source: gulfcoastpavers.com

5. MODULAR POROUS PAVER SYSTEMS

Modular porous pavers are structural units, such as concrete blocks, bricks, or reinforced plastic mats, with regularly interspersed void areas used to create a load-bearing pavement surface. The void areas are filled with pervious materials (gravel, sand, or grass turf) to create a system that allows for the infiltration of stormwater runoff. Porous paver systems provide water quality benefits in addition to groundwater recharge and a reduction in stormwater volume. The use of porous paver systems results in a reduction of the effective impervious area on a site.



source: gulfcoastpavers.com

There are many different types of modular porous pavers available from different manufacturers, including both pre-cast and mold in-place concrete blocks, concrete grids, interlocking bricks, and plastic mats with hollow rings or hexagonal cells.

Modular porous paver systems are typically used in low-traffic areas such as the following types of applications:

- » Parking pads in parking lots
- » Overflow parking areas
- » Residential driveways
- » Residential street parking lanes
- » Emergency vehicle and fire access lanes

A major drawback is the cost and complexity of modular porous paver systems compared to conventional pavements. Porous paver systems require a very high level of construction workmanship to ensure that they function as designed and do not settle unevenly. In addition, there is the difficulty and cost of rehabilitating the surfaces should they become clogged. Therefore, consideration of porous paver systems should include the construction and maintenance requirements and costs.

Modular Porous Paver Systems: Cliff Tuttle park, Houston, Texas (top); Houston, Texas (bottom).

6. PROPRIETARY STRUCTURAL CONTROLS

There are many types of commercially-available proprietary stormwater structural controls available for water quality treatment. These systems include:

- » Hydrodynamic systems such as gravity and vortex separators
- » Filtration systems
- » Catch basin media inserts
- » Chemical treatment systems
- » Package treatment plants

Many proprietary systems are useful on small sites and space-limited areas where there is not enough land or room for other structural control alternatives. Proprietary systems can often be used in pretreatment applications in a treatment train. However, proprietary systems are often more costly than other alternatives and may have high maintenance requirements. Perhaps the largest difficulty in using a proprietary system is the lack of adequate independent performance data, particularly for use in North Central Texas conditions.



6. Proprietary Structural Controls: (clockwise from top left) Catch basin media insert, vortex separator, package treatment plant, filtration system.



7. Rainwater Harvesting: (clockwise from top left) Denton County, Texas; Texas A & M University, Lubbock, Texas; Tarrant Regional water District, Fort Worth, Texas; and Hutto Lake Park, Hutto, Texas.

7. RAINWATER HARVESTING

Rain harvesting is mostly used as a water conservation practice and to some degree as a stormwater management strategy. Capturing water in a rain tank/barrel prevents runoff from flowing down a driveway or across a parking lot and picking up soil, pesticides, and other pollutants before entering the storm sewer system. However, the primary intent of harvested rainwater is its re-use and availability on demand. This reduces the capacity for absorbing stormwater and therefore its value as a stormwater control measure. Even though regional stormwater benefits are minimal, the site-specific benefits may be justifiable and be an option to be considered by private developers.

Harvested rainwater tends to have fewer sediments and dissolved salts than municipal water; it is therefore ideal for a multitude of applications, including organic vegetable gardens, planter beds for botanicals, indoor plants, automobile washing, and cleaning household windows. Saving water in this manner will reduce the demand for treated tap water, and save money by lowering the home-owner's monthly bill. Rain water diversion will also help decrease the burden on water treatment facilities and to some degree municipal drainage systems during storm events.

8. GREEN ROOF

Green roofs are vegetated roofs used in place of conventional roofing, such as gravel-ballasted roofs. They are designed to control low-intensity storms by intercepting and retaining water until the peak storm event has passed. The plants intercept and delay runoff by capturing and holding precipitation in the foliage, absorbing water in the root zone, and slowing the velocity of direct runoff by increasing retardance to flow and extending the flow path through the vegetation. Water is also stored and evaporated from the growing media.

Green roofs are very expensive which often preclude its specific use for stormwater flow reduction in larger study area. They are typically used as part of an overall sustainable approach to development where green roofs also:

- » Reduce the temperature of runoff,
- » Reduce the “heat island” effect of urban buildings,
- » Help insulate the building,
- » Improve visual aesthetics,
- » Protect roofs from weather,
- » Improve building insulation,
- » Reduce noise, and
- » Provide habitat for wildlife.



8. Green Roof: (clockwise from top left) Chicago City Hall; Circle C Ranch, Austin, Texas; Botanical Research Institute of Texas, Fort Worth, Texas.

STORMWATER CONTROL MEASURE	STORMWATER QUANTITY/FLOOD CONTROL	STORMWATER QUALITY CONTROL	CAPITAL COST	MAINTENANCE BURDEN
1. BIORETENTION	S	P	M	L
2. ENHANCED SWALES	N	P	H	L
3. ABOVE-GROUND DETENTION	P	S ³	M-H ⁵	L
4. UNDERGROUND DETENTION	P	S ³	H	M
5. MODULAR POROUS PAVER SYSTEMS	S ¹	S	M	M
6. PROPRIETARY STRUCTURAL CONTROLS	N/A ²	Varies	Varies	Varies
7. RAINWATER HARVESTING	N	S ⁴	L	H
8. GREEN ROOF	N	S ⁴	H	H
	P - Primary Control S - Secondary Control N - Negligible N/A - Not Applicable		H - High M - Moderate L - Low	

¹ Retention is a factor of the depth of porous base material

² Water quality treatment is the primary purpose of most proprietary controls

³ Pretreatment, which is highly recommended for these controls, would provide the stormwater quality benefit

⁴ Captures rainwater before it becomes stormwater runoff; does not remove pollutants per se

⁵ Cost depends on property acquisition costs

Capital cost estimates are informed by the iSWM manual.

CHAPTER 4: FUTURE FORM AND CHARACTER



CHARACTER AREAS

During the charrette week, a Future Form and Character Map was prepared based on input from citizens and analysis by the team. The Future Form and Character Map identifies areas that will form the basis for new zoning.

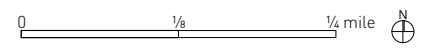
For each character area identified allowed building types, generalized uses, height and setbacks were developed. The following pages illustrate each character area and explain in text and pictures the form and character of each area.

Character Area	Building Type	Use	Max Height	Setback
SHOPFRONT	Mixed use shopfront	Vertical mixed use: retail, office, residential	3-4 stories	Buildings pulled up to sidewalk
INSTITUTIONAL MIXED USE	Civic, mixed use shopfront	Horizontal/vertical mixed use: institutional, retail, office, residential	6 stories [10 stories with bonus]	Flexible
CIVIC	Civic	Public, institutional	2-3 stories	Flexible, buildings primarily set back from sidewalk
COMMERCIAL MIXED USE	Mixed use shopfront, apartment, townhouse	Horizontal/vertical mixed use: retail, office, residential	3-6 stories	Buildings pulled up to sidewalk
RESIDENTIAL MIXED USE	Apartment, townhouse, live-work	Mixed residential with limited retail/office	3-4 stories	Buildings set back from sidewalk
RESIDENTIAL ATTACHED	House, secondary dwelling, duplex, fourplex, cottage court, townhouse, garden apartment	Mixed residential	2-3 stories	Buildings set back from sidewalk

FUTURE FORM AND CHARACTER MAP



- Option for Green Edge
- Project Boundary
- Shopfront
- Institutional Mixed Use
- Civic
- Commercial Mixed Use
- Residential Mixed Use
- Residential Attached



SHOPFRONT

The Shopfront character area is intended to have multi-story mixed-use buildings with retail on the ground floor and residential or office uses above. The retail or offices serve as an amenity for nearby residents and students, while residential spaces help reduce pressure for student housing in surrounding residential neighborhoods, while encouraging walking or biking to campus.

- Building Type:** Mixed use shopfront
- Use:** Vertical mixed use: retail, office, residential
- Max Height:** 3-4 stories
- Setback:** Buildings pulled up to sidewalk

Key Map



INSTITUTIONAL MIXED USE

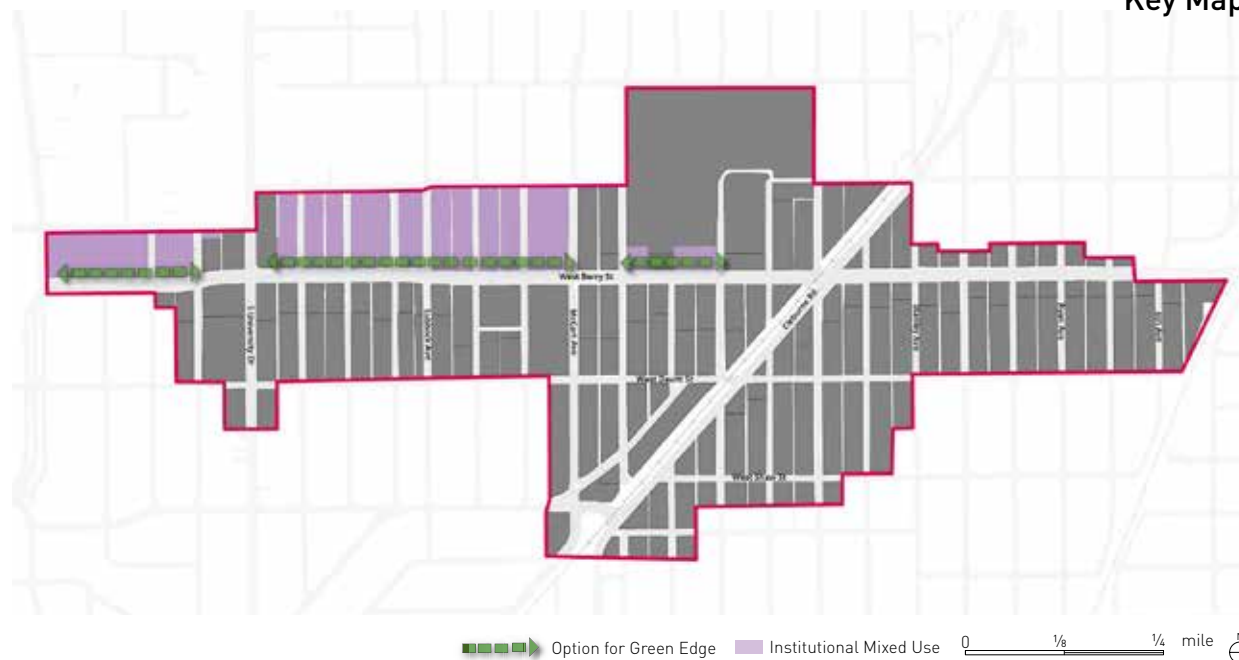
The Institutional Mixed Use character area is intended to contain University-related buildings and businesses. Buildings may be pulled up to the street, with ground floor retail activating the street; or buildings may be set back from the street to create a green edge along Berry, like on University. The green edge provides stormwater improvements that act as an educational opportunity and provide community greenspace. Upper story office and residential uses may provide ways to house students closer to campus.

Building Type: Civic, mixed use shopfront
Use: Horizontal/vertical mixed use: institutional, retail, office, residential

Max Height: 6 stories
[4 additional stories for providing additional stormwater features on-site]

Setback: Flexible to allow adequate space for infrastructure and streetscape furnishings including landscape.

Key Map

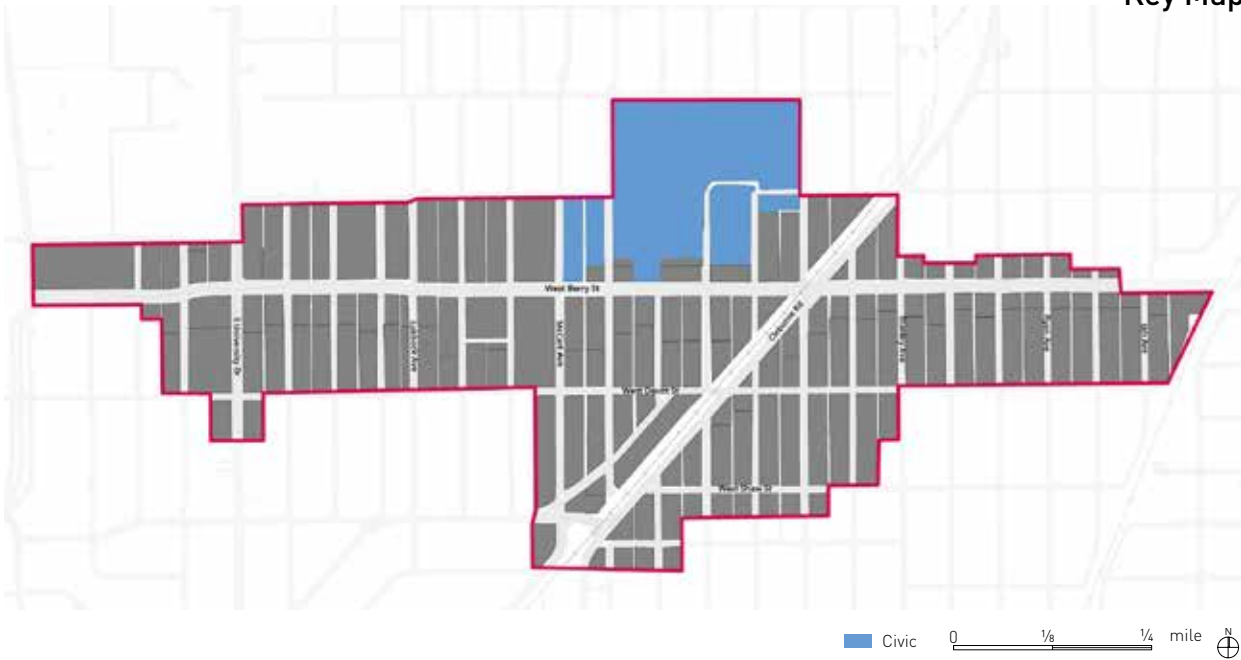


CIVIC

Key Map

The Civic character area is intended to contain civic buildings such as schools and churches. Buildings would be set back a moderate distance from the street and lower than the University buildings to the west. Civic buildings enhance the area through their building placement and iconic architecture. The substantial greenspace on these parcels provides an opportunity for future stormwater management, such as multi-purpose detention, or additional bioswales.

- Building Type:** Civic
- Use:** Public, institutional
- Max Height:** 2-3 stories
- Setback:** Flexible, buildings primarily set back from sidewalk to allow for greenspaces for community gatherings and to make connections to existing public corridors.



COMMERCIAL MIXED USE

The Commercial Mixed Use character area is intended to create a higher density, mixed-use district. The mix of uses will support the residents housed on the upper floors of buildings and nearby and create an amenity for visiting transit riders. Retail and office uses on the bottom floors, would be pulled up to the street, activate the street and support the pedestrian environment. Buildings vary in height in this district to address changing conditions.

- Building Type:** Mixed use shopfront, apartment, townhouse
- Use:** Horizontal/vertical mixed use: retail, office, residential
- Max Height:** 3-6 stories
- Setback:** Buildings pulled up to sidewalk

Key Map



RESIDENTIAL MIXED USE

The Residential Mixed Use character area is intended to provide a denser residential area near the train stop with very limited low intensity commercial activity. The district would act as a land use transition to nearby slow-density residential areas. Buildings would be close to the street with 3-4 stories of residential units. Small scale neighborhood-supporting retail and uses associated with live/work are allowed on the ground floor.

- Building Type:** Apartment, townhouse, live-work
- Use:** Mixed residential with limited retail/office
- Max Height:** 3-4 stories
- Setback:** Buildings set back from the sidewalk

Key Map



RESIDENTIAL ATTACHED

The Residential Attached character area is intended to provide multi-family residential and student housing, while respecting and mimicking the scale of a single-family residential neighborhood. The district would serve as a transition between low-density residential and nearby commercial activity. It would also provide a broader mix of housing types. Parking would be behind the buildings, accessed from the alley.

Building Type: House, secondary dwelling, duplex, fourplex, cottage court, townhouse, garden apartment

Use: Mixed residential

Max Height: 2-3 stories

Setback: Buildings set back from sidewalk

Key Map



CHAPTER 5: IMPLEMENTATION



FUNDING MECHANISMS

The following explores public sector financing mechanisms that could be used to implement elements of this development plan.

The first of the major financing mechanisms, Neighborhood Empowerment Zone, incentivize development by providing benefits directly to property owners. A Neighborhood Empowerment Zones currently encompasses the project area.

Other major financing mechanisms include Tax Increment Financing and Public Improvement Districts. Both could provide benefits in the Berry/University area. However, neither program currently exists in the Berry/University area and each would have to be studied for feasibility before being created.

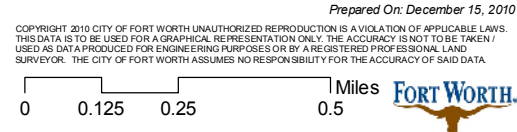
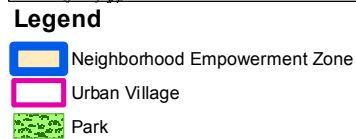
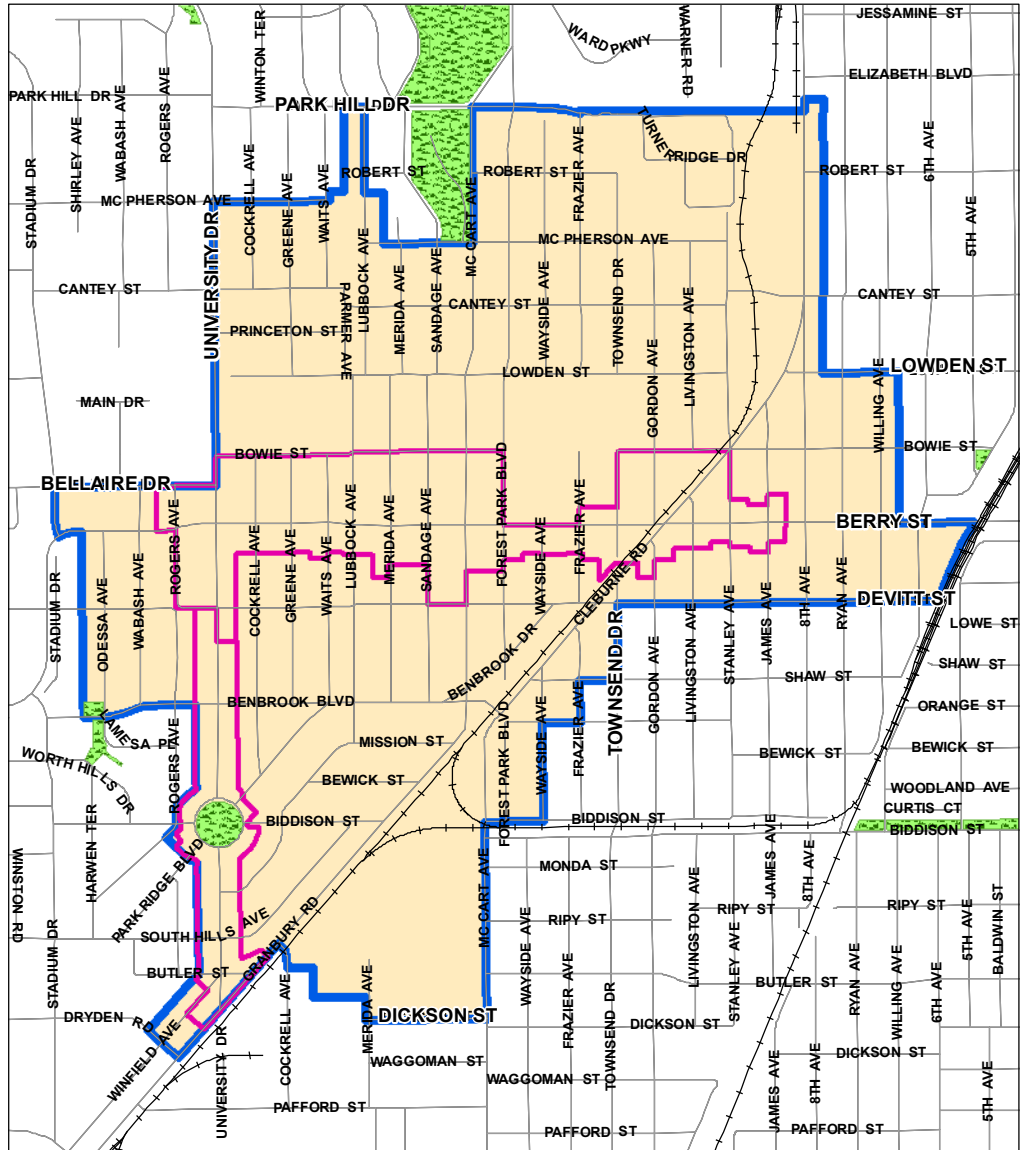
Neighborhood Empowerment Zones – Benefits to Property Owners

The Berry/University Neighborhood Empowerment Zone encompasses the project area. Neighborhood Empowerment Zone designation provides a suite of incentives to “promote affordable housing and economic development, and improve the quality of social services, education, or public safety to residents of the Neighborhood Empowerment Zone.”

Neighborhood Empowerment Zone incentives include the following benefits for property owners:

- » Tax Abatement – For commercial as well as single- and multi-family residential construction and rehabilitation, owners can receive a full abatement of municipal property taxes on those improvements for a period of five years. Multi-family, commercial, and industrial projects may be granted a 10-year abatement if they meet conditions set out by City policy.

Berry/University Neighborhood Empowerment Zone



- » Fee Waivers – A host of City fees related to planning and development may be waived in a Neighborhood Empowerment Zone.
- » Release of City Liens – Properties encumbered by liens held by the City may have them released.

The Grandmarc, for example, received a 100% abatement of municipal property taxes for 10 years.

Facade Improvements

The City conducts a facade improvement grant program that provides 1/3 of the cost (up to \$30,000) for improvements to the exterior of buildings in specified Urban Villages. The Berry/University Urban Village is currently not among those included; neighboring Hemphill/Berry to the east is included. Inclusion of Berry/University Urban Village among the eligible districts would provide an opportunity for modest enhancements to storefronts along Berry Street. All of the study area can be included except for the south side of the blocks along Berry between University and Lubbock (that stretch cannot be included because it is not Community Development Block Grant eligible).

Tax Increment Financing – Benefits District-wide

A potentially more powerful incentive program involves designation as a Tax Increment Financing (TIF) District. TIF Districts, widely practiced around the nation, are designed to promote a circle of improvement and investment in a designated area. In a TIF District, incremental property tax revenue otherwise due to the city and other participating tax entities is made available for a host of improvements within the district.

Where a Neighborhood Empowerment Zone and a TIF District overlap, however, TIF revenues will be substantially limited by concurrent municipal abatements associated with the Neighborhood Empowerment Zone. Only after those abatements expire (in 5-10 years) will the TIF capture associated revenues.

Nonetheless, designation of a TIF District that encompasses the Berry/University Urban Village (and possibly additional adjacent areas) would provide substantial funds for investment in the district, including extended streets, sidewalks, and most importantly drainage.

Example: Urban Village/NEZ/TIF Overlap

A useful example can be found on East Berry Street, where Berry meets US 287 in southeast Fort Worth. There, the Berryhill/Mason Heights NEZ overlaps with City of Fort Worth TIF #12: East Berry Renaissance. This area includ-

ed substantial vacant land when created, and since that time a Wal-Mart and the neighboring Renaissance Square shopping center have been constructed. A number of additional projects have been completed, as well. While the most substantial development in TIRZ #12 has occurred on that prime site, the reinvestment zone includes all of the East Berry Street corridor from I-35W to US 287.

What makes this a relevant example for consideration is the overlap between the NEZ and the TIF District. The City levies more than half of all property taxes within the District, so concurrent NEZ abatements on new developments substantially limit the revenue available to the TIF District. In 2013, revenue to the TIF district totaled \$147,602.

However, a total of more than \$85 million is planned to be invested in the Renaissance Square development alone, so revenues will surge when NEZ abatements end. From that date through the year 2027, the TIF will have the ability to invest in East Berry corridor improvements, public infrastructure associated with the Sierra Vista development and redevelopment of the former Masonic Home of Texas School property, and Berry Street gateway enhancements.

Establishing a TIF District is a substantial undertaking. City staff and/or specialized consulting firms will need to estimate potential tax increment revenues bearing in mind the concurrent NEZ abatements and potential expansion by TCU. Potential revenue must then be compared to desired investments in the District. The City must be convinced of the utility of the TIF District not only within the district but for the broader community. Additionally, in the example of Berry-US 287 project, additional government funding was needed to make improvements to the street network and intersection to support the development. The City may need to plan for infrastructure support funds through future bond programs or by partnering with other government agencies.

Public Improvement Districts – Benefits District-wide

Public Improvement Districts (PID), like Empowerment Zones and TIF Districts, are a widely implemented tool for location-specific economic development. However, rather than reducing the tax bill of property owners or redirecting that tax revenue to localized improvements, a PID actually adds to the tax bill.

Designation of a PID begins with a petition signed by any number of property owners in the proposed district. If the district is approved and established by the City Council, property owners

will see an additional millage that will be used to fund the PID. Using the additional funds collected from the district, the PID provides agreed upon services in the district. Those services typically involve the maintenance of a clean, safe, and inviting commercial district. It is also permissible for the district to finance drainage improvements.

Sources:

Neighborhood Empowerment Zones

<http://fortworthtexas.gov/planninganddevelopment/dev.aspx?id=43192>

Facade Improvements

<http://fortworthtexas.gov/facadeimprovement/>

Tax-Increment Financing

<http://fortworthtexas.gov/EcoDev/tif/>

Public Improvement Districts

<http://fortworthtexas.gov/neighborhoods/PID/>

IMPLEMENTATION MATRIX

Below is an implementation matrix that outlines the timeframe and next steps for the key policies and goals presented in the plan. The matrix is intended to serve as a guide to help organize and track the progress in implementing the plan. It should be used actively, updated and amended as key policies and goals are completed. While the matrix addresses all the

identified policies and goals, discussions with the City staff and public officials have identified a number of high priority action items. These high priority action items are defined as critical steps that could have a significant impact on the study area.

ACTION ITEM		TIMEFRAME	NEXT STEPS
WHAT THE CITY OF FORT WORTH SHOULD DO FIRST			
!	Distribute the Development Plan and continue public discussion and outreach.	ongoing	Finalize plan, post on web, solicit public feedback.
!	Submit the Development Plan for adoption by the City Council.	first 6 months	Revise plan as needed based on public input. Send to City Plan Commission and City Council.
!	Prepare and adopt implementing zoning regulations (Form-Based Code).	first 6 months	Prepare zoning, revise as needed based on public input. Send to City Plan Commission and City Council.
1. ACTIVATING BERRY			
1.1 Fill in the Critical Gaps Along Berry			
!	1.1.1 Talk to property owners along Berry about closing duplicate and redundant driveways.	first 2 years	Conduct study to identify duplicate and redundant driveways.
!	1.1.2 Coordinate with TCU as they update their Campus Master Plan.	first 2 years	Designate City staff liaison(s).
1.2 Finish the Streetscape			
!	1.2.1 Add sharrows west of Forest Park.	first 2 years	During next restriping of Berry Street add sharrows.
!	1.2.2 Investigate opportunities for stormwater features in the right-of-way.	first 2 years	Planning and Development Department to engage Stormwater and Transportation/Public Works.

! High Priority Item

ACTION ITEM		TIMEFRAME	NEXT STEPS
1.2.3	Install streetscape improvements east of Forest Park including street trees, wide sidewalks, bulb-outs, parallel parking and protected bike lanes.	2 to 5 years	Investigate funding options (including TIF or PID), prepare construction drawings.
1.2.4	Make Berry/Cleburne intersection improvements: a. Close Livingston at Berry. b. Install bike boxes. c. Close Gordon at Berry. d. Install new crosswalks. e. Close Taco Bell driveway. f. Close free-flow right turn lane.	5+ years	Investigate funding options (including TIF or PID), prepare construction drawings.
1.3 Reuse Existing Buildings; Enhance the “Cool” Factor			
!	1.3.1	Encourage galleries for local artists, coordinate with TCU to fund student temporary art shows in vacant storefronts.	first 2 years
!	1.3.2	Work with commercial business owners to host temporary outdoor events on vacant land or in parking lots.	first 2 years http://sjdowntown.com/popup/
!	1.3.3	Work with commercial business owners to install temporary or permanent art installations on private property. Work with Fort Worth Public Art to fund and install public art within the public right-of-way.	first 2 years http://www.austintexas.gov/TEMPO
	1.3.4	Work with building owners to establish a program that offers short or temporary leases, including the sharing of leases, for new startup businesses.	first 2 years https://www.thestorefront.com http://www.retailadvisor.com/2014/03/05/pop-up-retail/
	1.3.5	Work with commercial property owners to convert underutilized or vacant storefront space into artist live-work spaces or community-serving businesses.	2 to 5 years http://www.cementloop.com
	1.3.6	Encourage establishment of a PID that could promote Berry Street and sponsor events, similar to Fort Worth South’s “Arts Goggle” or Camp Bowie District’s Jazz Festival.	first 2 years Investigate funding options

! High Priority Item

ACTION ITEM		TIMEFRAME	NEXT STEPS
1.4 Connect to Nearby Centers			
1.4.1	Work with the owners of Kroger/Bank of America site to repurpose the site for additional intensity.	5+ years	City staff to contact Kroger/Bank of America site owners
1.4.2	Install median, street trees and new sidewalks between Berry and Bluebonnet Circle.	5+ years	Investigate funding options (including TIF or PID), prepare construction drawings. Consider implementing a program like Dallas' State Thomas TIF.
2. PRESERVING THE SURROUNDING NEIGHBORHOODS			
2.1 Promote High Density Residential Closer to Berry			
❗ 2.1.1	Rezone the neighborhoods south of Berry to accommodate a broader range of housing options, with improved design standards.	first 6 months	Include on proposed zoning map.
2.2 Improve Walkability in the Neighborhood			
❗ 2.2.1	Develop a priority list for future sidewalk improvements.	first 2 years	
❗ 2.2.2	Establish a fund to help pay for strategic sidewalk improvements.	first 2 years	Investigate funding options (including TIF or PID).
❗ 2.2.3	Identify opportunities and resources to clean up, strategically pave and reuse existing alleys.	first 2 years	Investigate funding options (including TIF or PID). Possibly also use Cowtown Cleanup and Keep Forth Worth Beautiful.
❗ 2.2.4	Complete sidewalks on Frazier and Wayside between the future TEX Rail site and Berry.	first 2 years	Investigate funding options (including Federal Transit Administration), as well as TIF or PID.
2.3 Connect to the Trinity Trail			
2.3.1	Complete sidewalks on Devitt and Benbrook between Cleburne and Berry.	5+ years	Investigate funding options (including TIF or PID).
2.3.2	Install dedicated bike and pedestrian facilities along Bellaire Drive South between Bellaire Drive West to Overton Park Drive.	5+ years	Investigate funding options (including TIF).

❗ High Priority Item

ACTION ITEM		TIMEFRAME	NEXT STEPS	
3. EMBRACING THE STATION				
3.1 Act Now Tactically				
!	3.1.1	Work with The T, local business owners, outside organizations and residents to fund a series of temporary events on the future TEX Rail site.	first 2 years	Investigate funding options (including PID).
3.2 Make Targeted Short-Term Improvements				
	3.2.1	Work with The T to fund and construct the bus transfer station.	2 to 5 years	Investigate funding options (including Federal Transit Administration).
!	3.2.2	Study the applicability of options for implementing proposed stormwater improvements, such as bioretention, enhanced swales, multi-purpose/dry retention, underground detention, porous paving, rainwater harvesting and green roofs.	first 2 years	Identify stormwater management concepts and implementation options as part of Zoo Creek Stormwater Study.
!	3.2.3	Examine the effectiveness of installing stormwater bioswales in the travel lanes of McCart and Forest Park.	first 2 years	Study concepts as part of Zoo Creek Stormwater Study.
	3.2.4	Work with The T to fund and construct future stormwater improvements in the area.	2 to 5 years	Investigate funding options (including Federal Transit Administration and the Federal Sustainability Partnership).
	3.2.5	Work with FWISD to develop the vacant land in front of the high school with active buildings and uses. Until buildings are warranted, or if green space is preferred, design and install a linear system of bioswales and rain gardens in front of the High School.	2 to 5 years	Designate a Planning and Development Department liaison.

! High Priority Item

ACTION ITEM		TIMEFRAME	NEXT STEPS
3.2.6	Work with TCU to develop their vacant land active buildings and uses. Until buildings are warranted, or if green space is preferred, design and install a linear system of bioswales and rain gardens in along Berry Street.	2 to 5 years	Designate a Planning Department and Development liaison.
3.3 Focus on Long-Term Stormwater Improvements			
3.3.1	Identify opportunity sites for regional detention facilities.	first 2 years	Study concepts as part of the Zoo Creek Stormwater Study.
3.3.2	Work with The T to fund and construct the TEX Rail station and the surrounding improvements.	5+ years	Investigate funding options (including Federal Transit Administration).



High Priority Item

CAPACITY ANALYSIS

This section summarizes the water and sewer infrastructure necessary to serve the proposed long-term development plan for the area centered around the future TEX Rail station running from approximately McCart on the west to Gordon on the east and Shaw on the south. A capacity analysis of the existing infrastructure was performed to estimate its ability to serve the area after the addition of 1,731 residential connections and approximately 155,000 square feet of commercial space as summarized below (see table on following page). These numbers are an approximate maximum as shown in the illustrated build-out scenario.

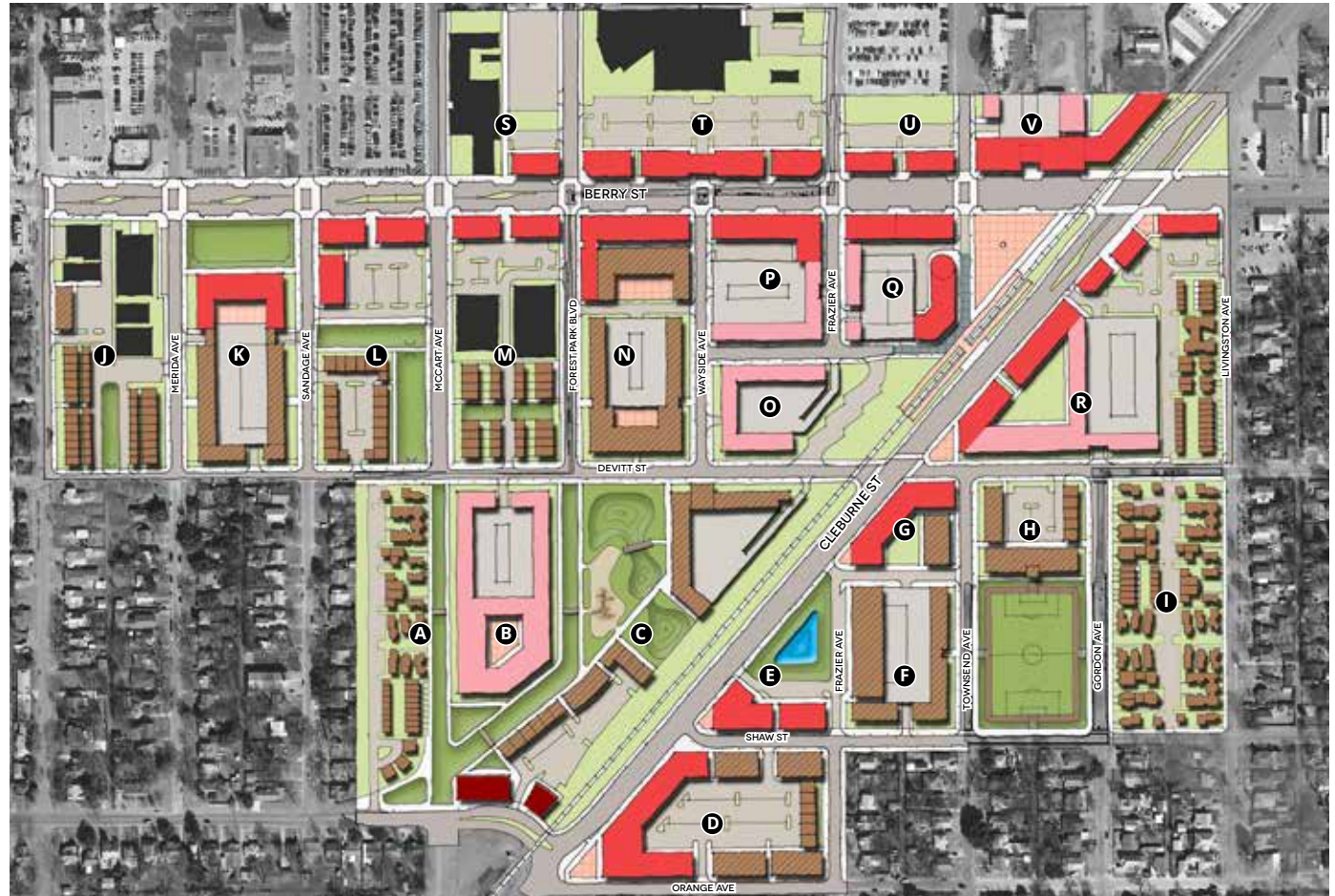
Residential:

Existing	173 units
Proposed	1,904 units
Change	1,731 units

Commercial:

Existing	224,333 SF
Proposed	378,606 SF
Change	154,273 SF

Capacity Key Map



KEY:

- All commercial
- Ground floor: commercial
Upper stories: residential
- Ground floor: 75% residential, 25% commercial
Upper stories: residential
- All residential (assuming 1,000 sf/unit, 15% area for hallways/stairs/elevators)
- All residential

CALCULATIONS

BLOCK	A		B		C		D		E		F		G		H	
USE	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C
METRIC	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF
EXISTING	17	0	20	0	22	63,890	14	4,728	3	9,108	15	0	2	5,269	7	0
PROPOSED	30	0	217	0	136	12,444	137	33,924	37	11,665	108	0	56	20,689	56	0
CHANGE	13	0	197	0	114	(51,446)	123	29,197	34	2,557	93	0	54	15,420	49	0

BLOCK	I		J		K		L		M		N		O		P	
USE	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C
METRIC	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF
EXISTING	2	0	10	0	12	16,865	0	38,645	10	10,861	11	5,310	0	-	8	13,022
PROPOSED	48	0	34	0	123	21,003	57	20,344	31	15,000	225	20,944	93	5,778	139	24,007
CHANGE	46	0	24	0	111	4,137	57	(18,301)	21	4,139	214	15,635	93	5,778	131	10,985

BLOCK	Q		R		S		T		U		V		TOTAL	
USE	R	C	R	C	R	C	R	C	R	C	R	C	R	C
METRIC	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF	Unit	SF
EXISTING	0	17,359	20	24,537	0	2,343	0	-	-	6,069	0	6,327	173	224,333
PROPOSED	68	31,726	247	52,264	0	3,3000	45	29,000	17	10,348	120	36,468	1,904	378,606
CHANGE	68	14,367	227	27,727	0	30,657	45	29,000	17	4,279	120	30,142	1,731	154,273

Assumptions: Residential unit = 1,000 sf/unit 15% area for multifamily hallways/stairs/elevators

The following results were developed from the infrastructure evaluations presented in this section.

1. The water distribution system within the redevelopment area is anticipated to require pipelines sized between 8-inches and 12-inches in diameter to accommodate projected future domestic and emergency demands. Approximately 13,000 linear feet of 6-inch diameter or smaller water pipelines will likely require replacement. Additional replacements may be necessary based on the results of a formal hydraulic analysis that will be required during the design phase.
2. The wastewater collection system within the redevelopment area is anticipated to require pipelines sized 8-inches and 21-inches in diameter. Approximately 7,000 linear feet of wastewater pipelines will likely require replacement.

These evaluations are contingent upon the assumptions presented in this report. Included is a preliminary capacity evaluation. Other variables such as offsite impacts, the age and condition of the existing pipelines, and changes to the existing topographical conditions may necessitate additional pipeline replacements that are not otherwise required due to a lack of capacity.

WATER

The future water demands were calculated to evaluate if pipe capacity upgrades will be necessary to service the site after it is redeveloped. The anticipated domestic water demands resulting from the redevelopment are shown in Table 1.

The water demands are based on the following Fort Worth water design criteria:

Residential:

- » Average Day Water Use: 215 gallons per capita day (GPCD)
- » Maximum Day: For “Maximum Day” unrestricted use, multiply the annual average day by 2.25
- » Maximum Hour: For the “Maximum Hour” unrestricted use, multiply the maximum day by 2.00. This multiplier is intended to capture the 1 or 2 hours of the day with the highest usage.
- » Persons per Residential Connection: 3.5 people/connection

Commercial:

- » Average Day Water Use: 50 gallons per employee capita day
- » Maximum Day: For “Maximum Day” unrestricted use, multiply the annual average day by 2.25
- » Maximum Hour: For the “Maximum Hour” unrestricted use, multiply the maximum day by 2.00. This multiplier is intended to capture the 1 or 2 hours of the day with the highest usage.

Table 1: Projected Water Demands

Block Number	Average Day Water Use (MGD)	Maximum Day Water Use (MGD)	Peak Hour Water Use (GPM)
A	0.02	0.05	71
B	0.16	0.37	510
C	0.10	0.23	325
D	0.11	0.24	335
E	0.03	0.07	92
F	0.08	0.18	254
G	0.04	0.10	140
H	0.04	0.09	132
I	0.04	0.08	113
J	0.03	0.06	80
K	0.10	0.21	297
L	0.05	0.10	142
M	0.03	0.06	79
N	0.17	0.39	537
O	0.07	0.16	221
P	0.11	0.24	336
Q	0.06	0.12	172
R	0.19	0.43	601
S	0.00	0.01	13
T	0.04	0.08	117
U	0.01	0.03	44
V	0.09	0.21	296
Total	1.57	3.53	4,907

Peak hour water use reflects the daily fluctuation in water usage. Residential water usage is typically elevated during the morning before residents leave for work and during the evening after they return home. The peak hour is intended to capture that one to two hour time in which domestic flow through the system is highest. The water infrastructure should be sized in order to flow the peak domestic demand and the emergency demand (independently) and still meet minimum pressure requirements.

- » Persons per Commercial Area: 1 person per 400 SF of building

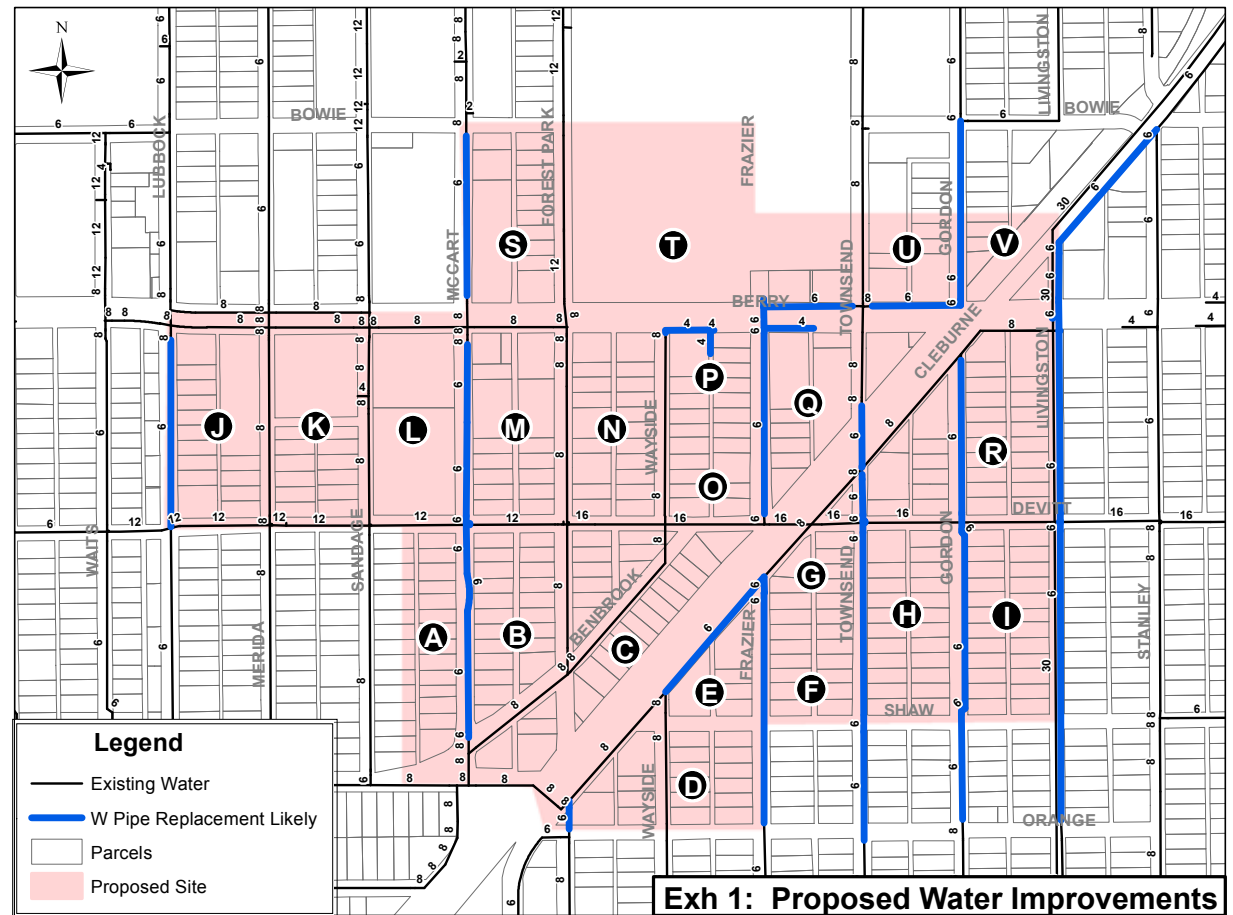
Emergency fire demands can have a greater impact on individual pipes than domestic water demands. Per the Fort Worth water design criteria:

- » Fire Flow: Fire flow should be rated at 1,000 gallons per minute (GPM) in residential areas. Fire flow for commercial and industrial areas should be a minimum of 1,500 GPM or per current Fire Code requirements.

The current Fire Code requirements are based on the numerous variables that are unavailable at this time. The assumed fire flow for the redevelopment at the time of this plan is 1,000 gpm for blocks containing only residential development and 1,500 gpm for all mixed-use or commercial development.

The mixed-use redevelopment will require some additional capacity to accommodate future domestic and emergency demands. Generally, pipes with a minimum diameter of 8-inches to 12-inches are anticipated to be necessary throughout the proposed site. Therefore, all pipelines directly serving the site with diameters of 6 inches or smaller should be replaced. Exhibit 1 identifies the approximate limits of 13,000 linear feet of waterline replacement assumed to be necessary.

Proposed Water Improvements



The general review of pipe capacities and flowrates developed in this plan does not consider offsite storage and delivery capacity. The analysis of the water system did not include hydraulic modeling to verify if the proposed pipe sizes are sufficient for delivering water to the system during domestic or emergency conditions. A model of the entire pressure plane will be required by the City to evaluate actual impacts to the storage, pumping, transmission, and delivery infrastructure resulting from the redevelopment prior to beginning any construction. The future water model should include actual Fire Code requirements for emergency demands in order to finalize the pipe size requirements.

SEWER

The wastewater system was evaluated for needed improvements as a result of the additional flow from redeveloping the existing site. The anticipated wastewater flowrates resulting from the redevelopment are shown in Table 2. The sewer flowrates are based on the following Fort Worth sewer design criteria:

- » Average load per person per day: 80 GPCD
- » Average load per employee per day: 40 GPCD
- » Ratio of design load to average load:

$$M = 1 + \frac{14}{4 + \sqrt{P}}$$

Where:

M = Ratio of Design Load to Average Load

P = Population in thousands

- » Inflow and Infiltration Peaking Factor: 2.17

Table 2: Projected Wastewater Flowrates

Block Number	Total Average Daily Flow (GPD)	Ratio of Design Load to Average Load, M	Total Design Load (MGD)	Total Design Load, including I/I (MGD)
A	8,400	4.24	0.04	0.08
B	60,800	3.87	0.24	0.51
C	39,300	3.97	0.16	0.34
D	41,800	3.95	0.16	0.36
E	11,500	4.18	0.05	0.10
F	30,200	4.03	0.12	0.26
G	17,700	4.11	0.07	0.16
H	15,700	4.15	0.07	0.14
I	13,400	4.17	0.06	0.12
J	9,500	4.22	0.04	0.09
K	36,500	3.98	0.15	0.32
L	18,000	4.11	0.07	0.16
M	10,200	4.19	0.04	0.09
N	65,100	3.85	0.25	0.54
O	26,600	4.05	0.11	0.23
P	41,300	3.95	0.16	0.35
Q	22,200	4.07	0.09	0.20
R	74,400	3.80	0.28	0.61
S	3,300	4.27	0.01	0.03
T	15,500	4.13	0.06	0.14
U	5,800	4.26	0.02	0.05
V	37,200	3.97	0.15	0.32
Total	604,000	N/A	2.40	5.22

The existing gravity sewer mains in the project area range in size from 6-inches to 18-inches in diameter on slopes as low as 0.33%. The majority of the wastewater generated in the area flows to the northwest, while a smaller area is served by pipe flowing northeast.

Offsite flows from outside the planned development area also utilize the existing infrastructure, which will likely continue in the future. Approximately 2,000 offsite connections utilize the existing infrastructure within the project area, accounting for about 25% to 30% of the projected flow.

Table 3 compares the existing pipeline diameters to the pipe diameters needed to convey the projected flowrates assuming no change in pipe slope. Table 3 also identifies proposed pipe sizes for the main branch. Table 4 identifies proposed pipe sizes of collector mains for the individual blocks.

Table 3: Cumulative Flow and Branch Pipeline Diameters

Northwest Branch							
Block Insertion Point	On-Site Design Load (MGD)	Off-Site Design Load (MGD)	Total Design Load (MGD)	Cumulative Design Load (MGD)	Existing Pipe Diameter (inches)	Minimum Required Pipe Diameter (inches)	Length (feet)
I,H,R	0.47	0.27	0.74	0.74	10	10	350
E,F,G	0.53	0.03	0.56	1.30	12	12	350
O	0.12	0.00	0.12	1.42	12	12	350
C,T,N	0.95	0.00	0.95	2.37	12	15	350
B,S,M	0.62	0.00	0.62	2.99	16	18	350
D,A	0.44	0.47	0.91	3.90	15	18	600
K,L	0.48	0.04	0.52	4.42	15	18	450
J	0.09	0.10	0.19	4.61	18	18	650
Total	3.70	0.91	4.61	4.61	18	18	3,450
Northeast Branch							
New Block Number	Total Design Load (MGD)	Off-Site Design Load (MGD)	Total Design Load (MGD)	Cumulative Design Load (MGD)	Existing Pipe Diameter (inches)	Minimum Required Pipe Diameter (inches)	Length (feet)
P,T	0.42	0.00	0.42	0.42	8	8	350
O,Q	0.32	0.00	0.32	0.74	8	10	150
U,V	0.24	0.00	0.24	0.98	8	12	400
R,V	0.53	0.42	0.95	0.95	10	10	200
Total	1.51	0.42	1.93	1.93	18	15	1,100

Highlighted cells include pipelines assumed to be under capacity including future flowrates.

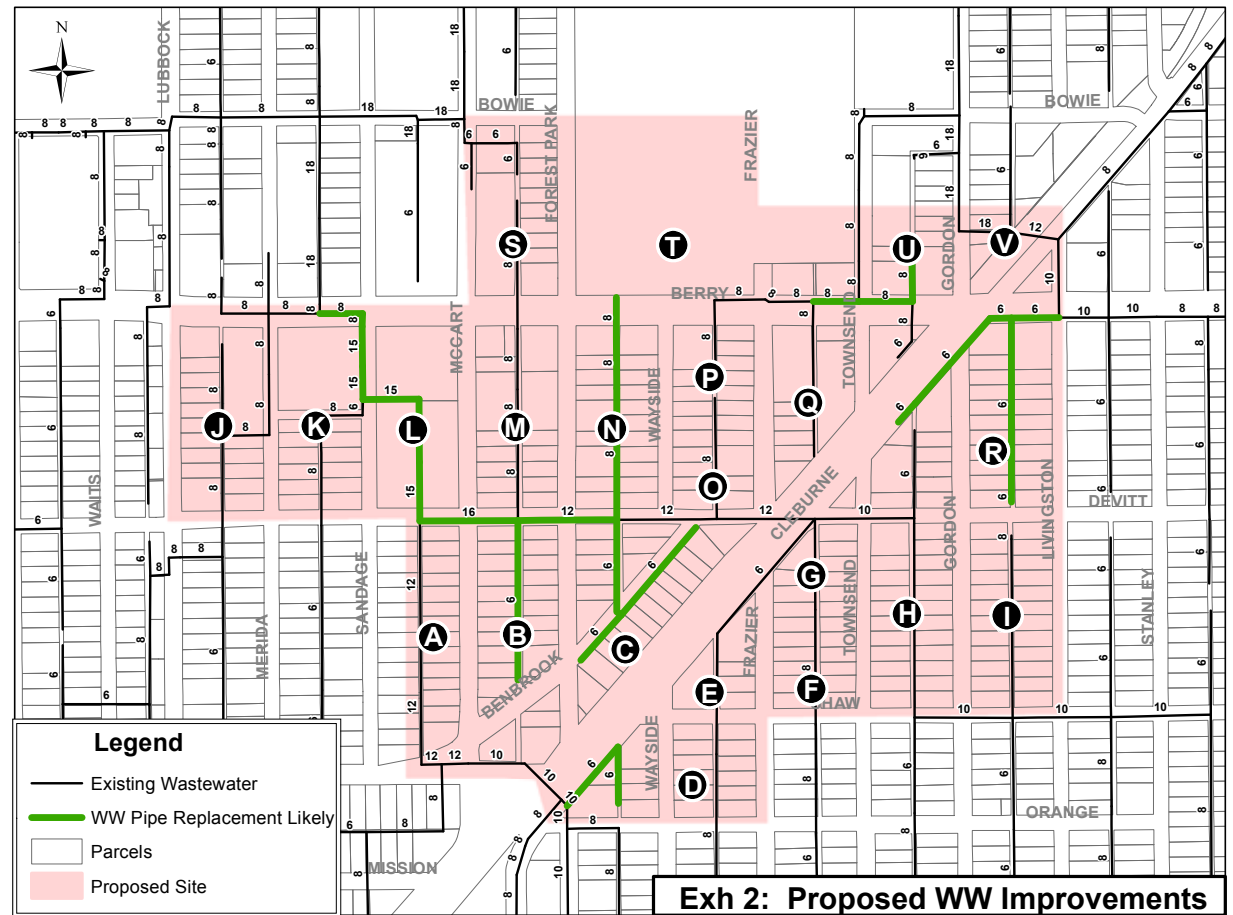
Table 4: Stem Pipeline Diameters

Northwest Branch						
Block Insertion Point	On-Site Design Load (MGD)	Off-Site Design Load (MGD)	Total Design Load (MGD)	Existing Pipe Diameter (inches)	Minimum Required Pipe Diameter (inches)	Length (feet)
A	0.08	0.45	0.53	12	10	900
B	0.51	0.00	0.51	6	10	550
C	0.34	0.00	0.34	6	8	900
D	0.36	0.02	0.38	6	8	450
E	0.10	0.00	0.10	8	6	900
F	0.26	0.03	0.29	8	8	400
G	0.16	0.00	0.16	8	6	300
H	0.14	0.00	0.14	10	6	650
I	0.12	0.27	0.39	8	8	600
J	0.09	0.10	0.19	8	6	1,250
K	0.32	0.04	0.36	8	8	550
L	0.16	0.00	0.16	15	8	600
M	0.09	0.00	0.09	8	6	650
N	0.54	0.00	0.54	8	10	750
O	0.12	0.00	0.12	8	6	400
R	0.20	0.00	0.20	6	6	290
S	0.02	0.00	0.02	8	6	450
T	0.07	0.00	0.07	8	6	200
Northeast Branch						
New Block Number	Total Design Load (MGD)	Off-Site Design Load (MGD)	Total Design Load (MGD)	Existing Pipe Diameter (inches)	Minimum Required Pipe Diameter (inches)	Length (feet)
O	0.12	0.00	0.12	8	6	450
P	0.35	0.00	0.35	8	8	250
Q	0.20	0.00	0.20	8	6	50
R	0.41	0.00	0.41	6	8	1,350
T	0.07	0.00	0.07	8	6	50
U	0.05	0.00	0.05	8	6	50
V	0.32	0.00	0.32	6	8	550

Highlighted cells include pipelines assumed to be under capacity including future flowrates.

Proposed Water Improvements

The proposed pipe sizes are approximate based on the existing topography of the site. Exhibit 2 shows the approximate limits of 7,000 linear feet of wastewater pipeline assumed to be necessary. Field verifications were not performed to evaluate the actual slope of the pipe. These anticipated pipe sizes evaluated in this plan did not consider site regrading or redirection of flows within the project area. Likewise, the pipeline capacity of the interceptor system downstream of the site was not evaluated.



APPENDIX



KICK-OFF STAKEHOLDER MEETING NOTES

KICK-OFF TRIP: 9/11/14 – 9/12/14

THE T

9/11/14: 9:30 a.m.

- » What's the timeframe for expansion of TEX Rail?
 - » No immediate timeframe. Phase one is from downtown to airport (Terminal B). Next phase for rail expansion that will affect this project will be second station south. Land has been purchased in the station area.
- » Transfer station has been mentioned; it is on hold. Considered nice to have- since they have the land, but hit some obstacles.
- » New CEO wants to include BUUV area in master plan; wants feedback on what the community wants them to do with the area since a rail station is not imminent.
- » What is the land plan? Mixed use like Mockingbird Station or with development adjacent?
 - » There is a parking issue which is necessary for rail. Only surface parking is in the budget. Looking at 150-200 parking spaces out front; park and ride set-up (not definitive, but maybe overnight).

- » The T does not own the Berry frontage.
- » Downtown station doesn't have parking like the one being proposed but most do have parking.
- » Joint development?
 - » The T is pretty new to rail station development. They can only afford to buy land for parking and want to be partners with TAD and see development around it.
- » How is transit operating that would affect the planning?
 - » Nothing starts or ends in that area. People are trying to make connections there; TCU brings a lot of ridership. Especially on-campus transit system partially because of rules against freshman and sophomore students parking cars on campus.
- » Route 29 is run by the T on campus; from commuter lots and for moving throughout campus. University gives students free passes and pays the T for their service on campus. The passes are good for the entire system.
- » Route 7 runs every hour. Route 24 runs every 30 minutes. Route 29 runs every 10 minutes. Master plan includes increasing frequencies.

- » Technology or digital improvements on deck?
 - » Gone to board to approve expansion of real-time bus arrival time systems on entire fleet. Some money has been budgeted, but asking for approval for whole fleet.
- » Better info at bus stops is necessary. Bus system already has Next Bus web-enabled and with an app so that people can see Spur Line with runs along E. Lancaster.
- » Currently no close option to get to DART from the T.

TCU

9/11/14: 10:30 a.m.

- » TCU used to be 70-80% from Texas, but is now 40%. We're likely to see people who are more familiar with public transit.
- » TCU has a lot of property in this area and some of it is inside the project boundary so this project will affect TCU. They do follow zoning.
- » The Grand Marc:
 - » Residential occupancy has been fine, but retail hasn't been great. Maybe has been because parking isn't super convenient and the campus is very mobile.

- › Plus, there's another competitive shopping center close by with restaurants, etc. that are more appealing to students. (Research shows that the dining options aren't in the students' top 20.)
- » Students clearly don't mind walking. Illustrated on the map the distances that students walk from residences and to bars, etc., doesn't think proximity is the issue for the retail development.
- » TCU can provide good site map with parking, pedestrian system, etc.
- » Issues for events- no hotels within walking distance or good restaurants. If this becomes pre- and post-event spot, how could someone have a nice meal and walk over to the game?
- » Trying to create the residential experience- moving from parking lot surrounded by campus to campus surrounded by parking lots.
- » Thinking about faculty being able to move in 10-15 years from now and live close by. They take pride in their grounds.
- » Berry Street Initiative was intended to strengthen the streets around Berry so that Berry can be a strong street.
- » Key redevelopment sites- why hasn't there been much done privately?
 - › Safety issues are major. Kroger parking lot particularly bad and these aren't just perception issues. It has been improved especially because brick fences have been installed around parking, campus is lit and entrances/exits are controlled. Visiting students are encouraged to take a different route, rather than traveling down Berry.
- » Berry Street Initiative started at the same time as the Montgomery Plaza development. Formula has worked in other places where there are academic buildings and green space on one side and then great retail space on the other side.
- » Project shouldn't seek to duplicate 7th street and the two sides of Berry don't have to have the same rules. And the area shouldn't be a shopping mall rather than interaction with various communities.
- » Area will be a flexible urban development.

CITY OF FORT WORTH TRAFFIC, TPW, STORMWATER, WATER, PACS

9/11/14: 2:30 p.m.

- » Schedule:
 - › Mid-October charrette (week long)
 - › Development plan (basically report based on feedback from charrette)
 - › Form-based code
- » What are Parks' needs?
 - › Needs are probably met acreage-wise. Parks interest is probably more on the maintenance end and if it goes beyond more than standard things like grass ROW.
- » Need to consider things like the planters that are not there anymore.
 - › Code will address this and streetscape will be discussed during charrette.
- » Maybe some options for "greening up" alleys, etc. that would address stormwater issues.
- » Would parks end up maintaining those things?
 - › Current project moving forward that sets precedent.

- » What about standards for trimming out edges and canopy cover for parking lots?
 - › New standards for mixed-use development; new developers would have to have enhanced landscaping on stand-alone lots.
 - › Existing parking lots, even if it was being resurfaced, would fall under old rules. Only if the “use” changes and becomes more “intense.” Or if owners are adding more square footage.
- » Other than this study, what conversations have been had dealing with flooding in project area?
 - › Some big picture solutions have been discussed. Past studies looked at entire watershed. One solution that has been discussed is building a tunnel, but that’s not as cost-effective.
 - › Looked at regional storage/detention to accommodate regular storms that create the bulk of the damage.
 - › Attenuation may be most useful thing to change the timing that water is reaching the pipes. Peak intensity about four inches an hour; we’ve had several such storms lately and there’s been flooding.
- » Pieces to the puzzle include bioretention, detention, etc.
 - » Helpful to treat the problems where they are. From a pure Stormwater standpoint, take pipes out and let the streams do the work.
 - › Could be part of the option, but maybe not cost-effective on a wider-scale.
 - » “No adverse impact” rules, which means that developers can’t improve their property at the detriment of others.
 - › Seems to be region-wide problem; no broader regulations or higher standard.
 - › Arlington is piloting some stronger performance-driven standards.
 - › Without performance measure, the development has to act like natural environment under “no adverse impact.”
 - » Would preferences be quantity versus quality?
 - › The goal is to decrease flooding in the area. Solutions in MC/B project will have some water quality benefits. Stormwater as a department needs water quality improvements partially because of permit requirements.
 - » Streetscape on Berry was built to TXDOT standards; second phase was COG-funded to replicate what was already done.
 - › 1st phase was Forest Park to Waits then 2nd phase was Waits to University. Pres-
- » Best functioning scenario are simple performance measures with guidance on BMPs. That makes engineers and planners happy.
 - » As it’s the first time it’s being done, how do you attract people and keep them from going someplace else without standards?
 - › Incentivize.
 - › Multiple density creates benefits to larger group.
 - » Bike Routes:
 - › Bike routes were chosen to maximize connections and minimize interactions with traffic. Design is trying to move more family-friendly.
 - › Concerns in BUUV with University and Berry; on a bike, you’ll end up on these main streets.
 - › People would have to plan pretty carefully to get to Berry or University without actually having to travel on them and most people are likely to elect to drive rather than making those preparations.
 - » Pedestrian:
 - › Want to see connectivity. Environment is pretty rich with the exception of big streets and the rail.
- » sure has been brought to bear to continue east, but funding isn’t there. Flooding isn’t an issue, so that feels less urgent.

- › Game days do have some additional police presence. Street is un-walkable on major game days and traffic goes down to two center lanes.
- › If it is just for a few days a year that there's major event needs, less formal solutions are maybe more cost-effective.

NEIGHBORHOOD ASSOCIATIONS

9/11/14: 7:15 p.m.

- » Need bike trails and green space.
- » Stormwater will be a continuing challenge and conversation, but we'll know more about it in the charrette process.
- » What else would be helpful to promote charrette?
 - › Nextdoor site- will send to NA.
 - › City's email newsletter (goes to NA and individuals).
 - › N-hood education specialists.
 - › Post signs- churches, dental clinic by Paschal, Fiesta and Westcliff shopping center, door-to-door, Paschal High PTA site, businesses, Kroger, pharmacy, restaurants.
 - › Neighborhood Association meetings.
 - › Media outreach including city channel.
 - › City advisory emails and texts.

DEVELOPERS

9/12/14: 9:00 a.m.

- » How can we incent development if we end up having to make stormwater a big focus in terms of regulations and money?
- » What's the character of the area- especially mid-section near transit station?
- » Tenants really need off-street parking. Parking is major.
- » Wanted to do something more dense that would be low-impact and create a walkable area. It was strictly residential.
- » GrandMarc:
 - › Developers speculated with no parking, no selling points with outdoor area.
 - › Overbuilding retail on the ground floor; maybe 80,000 square feet of empty space.
 - › Maybe small offices would be good options.
- » TCU students are going to Magnolia. What is the barrier to them coming to Berry instead?
 - › Streets are the problem.
 - › Parking is an issue.
 - › Ryan Place is another place that identifies more with Magnolia. They have an interest in something closer.

- › Around Pascal- the mid-section- doesn't have any activity at night. Chik-fil-A or something else on the edge of Pascal's property could be a good infusion.
- › Berry was developed at a time when the goal was to get people through via car. Magnolia is older and was developed when people still walked or took street-cars/public transit.
- » What can the corridor do for game/event days?
 - › Tailgating scene is so entrenched at the stadium; Berry may be too far away. Maybe spillover after the game.
- » Does a non-university targeted residential project have the potential to work here?
 - › The developers think it's possible. The community would be more accepting if it was accepted that it would address existing community.
- » There is a major difference in traffic from one end of Berry to the other. Traffic count would give you a distorted picture, but it hasn't been studied really. Needs to have pedestrian considerations.

CITY OF FORT WORTH PLANNING AND DEVELOPMENT, WATER PLANNING AND DEVELOPMENT, FIRE POLICE

9/11/14: 2:00 p.m.

- » Pumps (flooding):
 - › They aren't generally cost-effective, but might be something to revisit.
 - › Will be looking at the performance standards that will operate more like the Tampa example that was raised.
- » Safety and crime:
 - › Not crime free by any means, but it's not what the police consider to be a "crime hot-spot." Just individual incidences that occur.
 - › Police and Fire are very active on game and event days. There are about 4 marquee games, so it's not all the time, but it is quite labor-intensive to cover at least six-block radius. Basketball won't be as big an issue ever because the arena just won't hold as many people.
- » Fire access:
 - › Streets and parking are a concern for Fire. When there's an incident late at night when people are parking on the street, it's difficult to get Fire or EMS through.
- › Some streets that have been redone, but still didn't get the width that is needed for access.
- » TCU Overlay:
 - › Possibility raised again about small lots for A zoning. Might need to make modification to subdivision regulations in that case.
- » Water conducted sewer assessment and received Water Sewer Model. Model shows that more robust systems are not in project area. Concrete may be the reason why improvements didn't go here.
- » Predevelopment meeting will assess Tap Fee for development. CoFW doesn't include pipelines in impact fees. Things that are included are more facility-related.
- » Sewer placement needs to be considered in development. In some places, alleys have been vacated but then remain as sewer easement. Alleys may be safety issues and Fire does not consider them as Fire access.
- » How many stories are being proposed?
 - › Zoning capacity will be higher than market capacity.
- » Bike lanes:
 - › Streetscape model that was used in first phases isn't very accommodating.
- › Talk about connecting to trail system from neighborhoods.
- › There don't seem to be many on-street bike lane solutions in Fort Worth; project will at least look at the idea of this for complete streets.
- » School districts are pretty separate from City. Partnerships are being developed.
- » Pascal is doing some work now; that's the area within Fisd that is affected. Development and hard corner was proposed by CoFW to the district.
- » Students don't stay on-campus for lunch so their patronage of Berry street restaurants should be a consideration.
- » Downtown functions as a FBC. Four other locations have FBC as well.

PRELIMINARY MARKET ANALYSIS



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DATE: August 29, 2014

IN RE: Berry Corridor Preliminary Market Analysis

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INTRODUCTION

Civic Economics was retained to provide economic analysis services as part of a Berry Street project team led by Code Studio. At the outset, we have set out to understand the current market dynamics of the study area and to communicate that understanding to Code Studio. In the coming days, in consultation with Code Studio, we will adapt this information to any format needed.

BUSINESS INVENTORY

Dan Houston spent two days in Fort Worth in mid-August, walking the study area to complete the Business Inventory described below and to gain a sense of where Berry Street fits into the fabric of Central Fort Worth.

A spreadsheet was produced that contains information that may be useful to Code Studio at a later point (building size, type, signage, etc.). We focused on identifying and mapping retail, food and beverage, and service businesses in the study area. We also estimated total revenue for retail and food and service businesses in the study area.

The inventory found a total of 110 individual businesses in the study area, Berry and adjacent side streets (to one block out). Of those, 37 are primarily eating and drinking places (of which 6 are freestanding fast food outlets), 27 are primarily retailers, 5 buildings or lots are vacant, and the remainder are offices and service providers. Particularly noteworthy is the presence of 13 storefronts offering pawn, payday, and title loans, treated here as Alternative Financial Services.

Business Locations

The maps provided in the Lunch & Learn presentation depict the locations of three business types:

1. Retailers
2. Eating and Drinking Places
3. Alternative Financial Services

A few items emerge from these maps:

- The western end of the study area, including University Drive and Berry Street to Merida, features pedestrian oriented developments with limited parking opportunities.
 - Walking these twelve or so block fronts is pleasant, with a variety of eating, drinking, and shopping opportunities.
 - These blocks appear to cater to the university customer base.
- East of Merida, beginning with the CVS/Walgreen's pairing at Sandage, Berry Street assumes an automotive oriented character, though many storefronts remain at the sidewalk.
 - Walking these blocks becomes unpleasant, in part because pedestrians seem unexpected.

- These blocks, with the exception of fast food outlets, seem to cater less to the university market and more to the nearby residential market.
- Alternative financial services businesses, 13 in all as of this month, are concentrated in the easternmost segment of the study area, with as many as four ostensibly independent providers in a single building.
 - All three identifiable auto title loan businesses occupy freestanding buildings, which may reflect local zoning requirements.
- Recent streetscape improvements stretch from University to Forest Park, which provides pedestrian access to Paschal High School.
- Further context is provided by the discussion of residential real estate, below.

BERRY AREA COMMERCIAL MARKET

Civic Economics was tasked primarily with understanding the commercial development market in the study area. That market is generally understood in terms of supply and demand, though across variations from formulaic incomes are wide across metropolitan areas.

Generally, when analyzing a larger study area, we rely heavily on estimates of retail and restaurant supply and demand procured from Nielsen Claritas. Supply here refers to the total sales of businesses within the study area across retail and food and beverage classifications. Demand, produced by Nielsen Claritas, is based on household demographics and estimates to the total purchasing of goods and services both within and beyond the study area.

Data Sources and Adjustment

The firm subscribes to the SiteReports service, which allows us to study the market characteristics of areas including polygons, radii, and drive time. However, it is essential to understand the limitations of this data before proceeding.

Nielsen Claritas data is built from both public and proprietary sources. Because these sources generally use Census defined geographies, so does Nielsen Claritas. As a result, our experience is that estimates of retail supply and demand are most reliable at broader geographic scales, and less so as the study area narrows. As a result, original research may be necessary to develop more reasonable estimates of supply and demand in a given study area.

In the present case, we have adopted a hybrid approach. For supply, Civic Economics has estimated sales for all of the retail and eating and drinking businesses identified in the Business Inventory. These estimates are based on adjustments up or down from the local or national sales average for businesses in each classification, and those adjustments are informed by our look at each business.

For demand, which quantifies the spending of area residents and thus extends beyond the narrow boundaries of this study area, we will use Nielsen Claritas estimates for radii of one and three miles.

Note: Data from Nielsen Claritas is updated on a rolling basis with their own proprietary methodology, and is intended to be current. This data was produced in late summer 2014. Nielsen Claritas uses Block Groups. If a defined study area receives 20% of a particular block group, then the study area will get 20% of the relevant values from that Block Group.

MARKET SUPPLY AND DEMAND

Commercial Market Supply

As described above, Civic Economics identified each individual business in the study area. For this analysis, we are only concerned with retailers and eating and drinking establishments.

We began by estimating sales at each business in the study area. For well understood businesses like supermarkets, restaurants, and fast food outlets, we estimated sales based on the average of that category in Fort Worth. Having looked at every business (and entered many), we then adjusted up or down our estimate of sales at each to reflect the characteristics of the establishment.

For a Whataburger, Kroger, or Jamba Juice, for example, our estimate is based on average performing locations. For independent businesses, our estimate is based on the segment average across the city and our sense of how each establishment likely performs. In this case, for example, we estimated that the Barnes & Noble at University and Berry substantially outperforms a typical B&N outlet.

Civic Economics estimated retail and eating and drinking supply in the Study Area:

COMMERCIAL SUPPLY Berry Street Study Area (\$ millions)
--

Civic Economics estimate of study area sales:

Motor vehicle parts dealers	\$2.5
Furniture and home furnishings stores	\$2.5
Electronics and appliance stores	\$1.5
Building material and garden equipment and supplies dealers	\$0.0
Food and beverage stores	\$26.0
Health and personal care stores	\$17.5
Convenience Stores	\$2.0
Clothing and clothing accessories stores	\$6.5
Sporting goods, hobby, musical instrument, and book stores	\$4.0
General merchandise stores	\$3.5
Miscellaneous store retailers	\$1.5
Retail Total	\$67.5
Restaurants and Bars	\$36.0
Total	\$103.5

** All Retail excludes motor vehicle sales, gasoline stations, and general merchandise stores
Source: Nielsen Claritas, Civic Economics*

For the broader area beyond the study area, we will rely on Nielsen Claritas to estimate total retail and eating and drinking sales out to three miles from the corner of Berry and McCart. That includes several clusters of commercial activity, with a substantial groupings on University Drive south of Chisholm Trail Parkway and a smaller one north of Berry along Cleburne Road/8th Avenue.

COMMERCIAL SUPPLY Three Mile Radius (\$ millions)
--

All Retail *	\$	1,071.51
Restaurants and Bars	\$	235.45
Total	\$	1,306.96

** All Retail excludes motor vehicle sales, gasoline stations, and general merchandise stores
Source: Nielsen Claritas, Civic Economics*

Note: Counts of businesses were done on foot in summer of 2014. Estimates of sales by sector were compiled by building up or down from an estimate of average sales per outlet in each sector. The averages we built from the 2007 economic census (2012 was not complete at the time) and inflated into 2014 dollars.

Commercial Market Demand

As described above, Civic Economics believes the Nielsen Claritas estimates of spending power for nearby residential areas to be reasonable, providing a fair understanding of the potential for business districts in southwest Fort Worth to serve the local market.

Nielsen Claritas estimated retail and eating and drinking **demand**:

**COMMERCIAL DEMAND
One Mile Radius (\$ millions)**

All Retail *	\$	132.73
Restaurants and Bars	\$	40.50
Total	\$	173.23

** All Retail excludes motor vehicle sales, gasoline stations, and general merchandise stores*

Source: Nielsen Claritas, Civic Economics

**COMMERCIAL DEMAND
Three Mile Radius (\$ millions)**

All Retail *	\$	659.30
Restaurants and Bars	\$	182.32
Total	\$	841.62

** All Retail excludes motor vehicle sales, gasoline stations, and general merchandise stores*

Source: Nielsen Claritas, Civic Economics

Supply and Demand in the Region

Based on the estimates above, it is clear that opportunities exist in the competitive market of Greater Fort Worth. Most neighborhood level analyses show a substantial retail gap, known as leakage, for the simple reason that residents of metropolitan markets travel freely in search of what they want. What results is agglomerations; restaurants here, boutiques there, and big boxes over there.

The study area is largely meeting demand for eating and drinking establishments in the neighborhood (one mile radius). While likely driven by the presence of students, it may point to an opportunity to expand upon a niche.

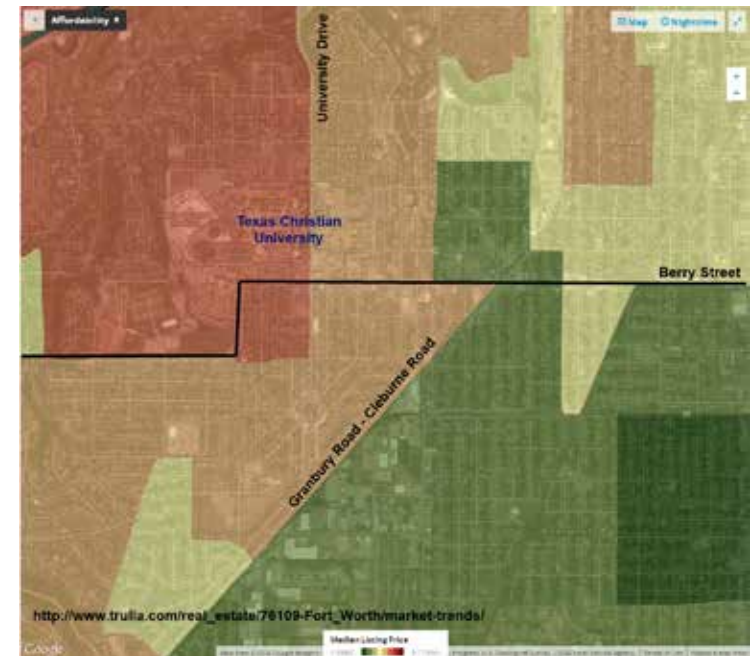
That regional opportunities are constrained, though, is demonstrated by the substantial excess supply in the broader three mile radius encompassing much of southwest Fort Worth. This tightness highlights the importance in metropolitan markets of cultivating both neighborhood serving business and niches that attract a wider clientele.

RESIDENTIAL REAL ESTATE MARKET

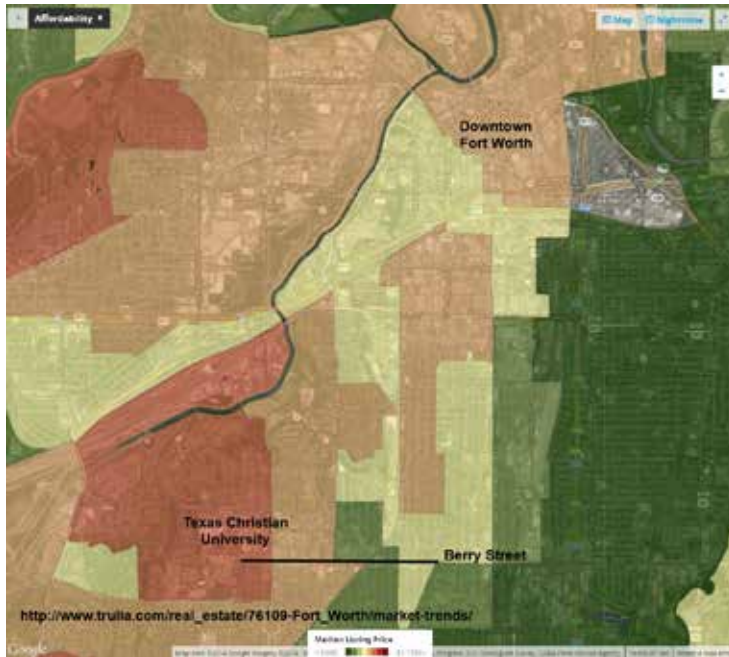
Civic Economics does not specialize in residential real estate, but has sought out a variety of data sources to help us to understand the market around the study area.

Dan Houston spent two days in Fort Worth, a portion of which was spent viewing residential areas in all directions. The maps below show median residential listing prices from the region in the last year, as tracked by Trulia. They confirm what is evident to the visitor, that residential areas generally north and west of the Berry corridor are more costly than those generally to the south and east.

Nearby residential listing prices:



Southwest Fort Worth residential listing prices:



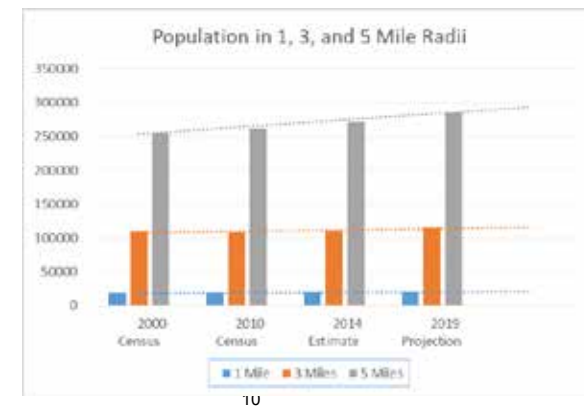
9

Next, we reviewed trends in sales prices in the area, using Zip Codes 78709 (largely west of Paschal High School) and 78710 (largely east) as a proxy for our study area. Median Sales Prices, 76109 and 76110, as tracked by Zillow:



These trends demonstrate an underlying strength to the market at all price levels. In Fort Worth, as in other Texas cities, central city real estate is performing well. These trends bode well for the potential of the market around the Berry Street corridor to support additional or improved commercial activity in the years ahead.

As would be expected in a fully developed region, the Census predicts very modest population growth in and around the study area:

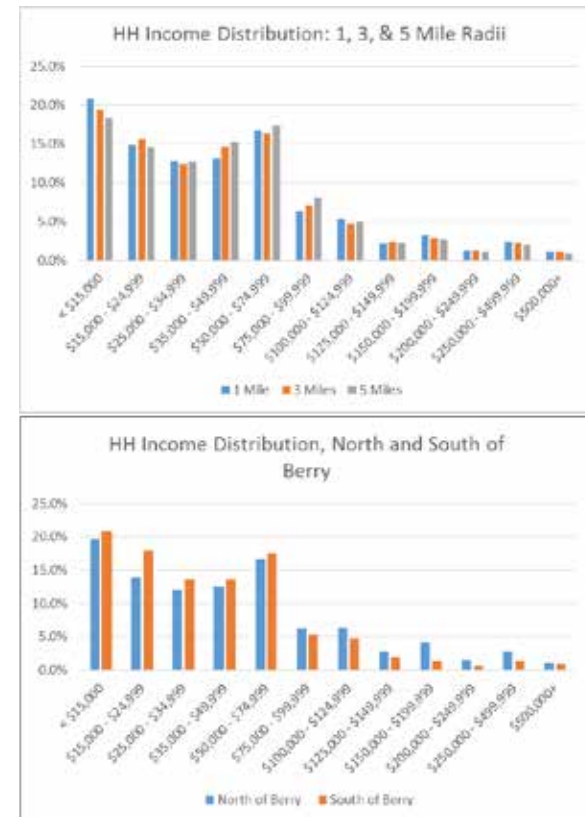


10

[The radii can be seen in the map below:](#)

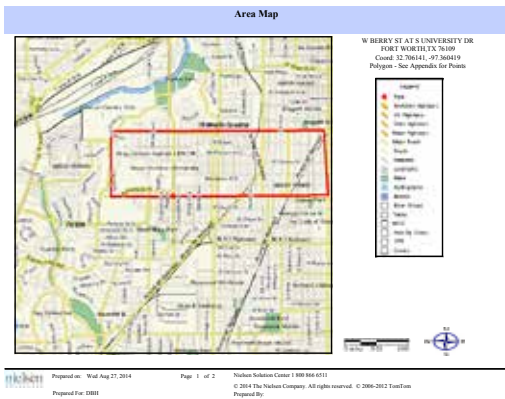


The same radii was used to show census data on income distribution, providing further information about the real estate market in the study area:



[Note: Nielsen Claritas also allocates shares of Block Group data using their updated estimates from Census data. In the case of Household Income, those numbers are estimates for 2014 using 2000 and 2010 Census data as a starting point.](#)

The north and south geographics can be seen in the maps below:



Housing Development in the Region

Civic Economics observed two distinctly different housing markets producing new construction and renovation in and around the study area.

New Construction for Students: West of Paschal High School, extending to the TCU campus and perhaps a block or two south of Berry, extensive construction appeared to be either recently or nearly completed in mid-August. All of that housing looks to Civic Economics to be designed and marketed as student accommodation. Large apartment buildings such as the Grandmarc and two loft-style projects south of Berry, are clearly intended as student housing. Additional new developments had produced a sizeable row of townhomes and a smattering of very large single-family homes. In the case of the townhomes, real estate listings suggest that these buildings, with only two parking spaces for three bedrooms, are intended for students. The large new homes, on the other hand, are rentals. It is only the extensive parking on the alley side of each that suggests student housing, not unlike the "stealth dorms" in central Austin.

Renovation for Adults: Elsewhere in the neighborhood, early 20th Century homes are being renovated for a non-student market, most notably in Ryan Place, which stretches to the north just east of Cleburne.

In addition, a large new apartment complex has been developed to the north, behind the Fiesta supermarket. Civic Economics did not observe any other sizeable housing developments in the neighborhood.

COMMERCIAL MARKET PROSPECTS

Civic Economics sees three distinct markets that might be served within the Berry Street corridor:

University Community

The healthy state of business at the western end of the study area reflects a business district that well serves the needs of students, faculty, and visitors to TCU. Opportunities may exist, though, to further capitalize on the presence of the university.

- Locals in the service industry report that students typically travel out of the neighborhood to Downtown and the Cultural District for nightlife. As TCU continues to grow and to attract more visitors for sporting and cultural events, it may be possible for local businesses to capture more of that market.
- University expansion between University and Forest Park points to a growing market of students with needs to serve. Today, the CVS/Walgreen's pairing is the end of the line for streetscape improvements and most student oriented businesses other than fast food.

Immediate Neighborhood Residents

On two very hot weekdays when TCU was out of session, Dan Houston noted little pedestrian activity at the western end of the corridor, and virtually none to the east. Future visits will confirm whether that is the typical pattern, as will feedback from area residents and business owners.

An important question is whether businesses in the study area are meeting the needs of those who reside within walking distance. These older neighborhoods with sidewalks were built for walking to Berry for everyday goods and services, and it is not entirely clear that the street currently offers what is needed nearby.

The extensive presence of alternative financial services businesses to the east suggests an agglomeration effect that may be less than desirable for the neighbors. To the east of Cleburne, the presence of Berry Street appears to hold down property values within two or so blocks of the street.

Through interaction with residents and businesses, we expect that opportunities for neighborhood-serving business will become clearer.

Broader Southwest Fort Worth Area

It is also possible that Berry Street might find a niche serving the broader market in this region of the city, though what that might entail is not yet clear. Recent redevelopment in the historic Fairmount District (<http://www.fortworthsouth.org/>), new developments in the Cultural District (<http://cdfaw.org/>), and small businesses along Camp Bowie (<http://campbowiedistrict.com/>) demonstrate a market for urban destinations in the city.

Berry Street might offer an intriguing alternative to those districts, with its diverse resident mix and affordable storefront spaces.

CONCLUSION

In sum, this preliminary analysis of the commercial market in and around the study area indicates to Civic Economics that the area is not without potential to grow beyond its current niches, to better serve the neighborhood, the University, and the broader region.

In the coming weeks, leading up to both the open house and charrette, Civic Economics will coordinate with Code Studio to package these analyses and preliminary findings for further use.

As plans develop thereafter, Civic Economics will revisit these analyses to incorporate proposals for additional development in the study area.

CHARRETTE WORKSHOP TABLE DRAWINGS



Table 1

- » Flexibility as Berry is developed
- » Embrace university-not hide, think about skill
- » Walkability on Berry and in neighborhoods
- » Safety and security: lighting, sidewalks, etc.
- » Transition between retail and university and neighborhoods



Table 2

- » Preserve adjacent neighborhoods as residential (transitions)
- » Honor urban village plans w/ walkability, mixed uses
- » Retain affordable housing E of Cleburne, add affordable housing



Table 3

- » Crime
- » Traffic in neighborhoods
- » Transitions-townhouse, single-family, park as transitions
- » More single-family
- » Overlay questions taken care of



Table 4

- » Sidewalks: accessibility and parking
- » Design of homes and sustainability
- » Reducing hardscape

BERRY CORRIDOR PRELIMINARY MARKET ANALYSIS

October 2014

Our Work

- Current Market Conditions
 - Leakage analysis
 - Business inventory
 - Development trends with no substantial changes
 - Residential
- Looking Forward
 - We will evaluate the prospects for additional commercial development in scenarios as they develop

Leakage Analysis

- Demand
 - What is the total spending on retail and eating & drinking by residents in the neighborhoods most directly served by the study area?
- Supply
 - To what extent are businesses in the study area capturing that spending?

RETAIL LEAKAGE

Measurements

- DEMAND:
 - NielsenClaritas
 - Utilizes census data, so ...
 - Useful only at larger geographies
 - We looked at 1 and 3 mile radii
 - Immediate neighborhood can't be measured well
- SUPPLY:
 - Civic Economics
 - We developed our own estimate of sales at each
 - Chain store averages
 - Sector averages psf
 - Eyeball test

Demand

COMMERCIAL DEMAND One Mile Radius (\$ millions)

All Retail *	\$	132.73
Restaurants and Bars	\$	40.50
Total	\$	173.23

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Total	\$	841.62

* All Retail excludes motor vehicle sales, gasoline stations, and general merchandise stores

Source: Nielsen Claritas, Civic Economics

Eating & Drinking Market

- Berry Street fares well in eating & drinking, as would be expected
 - College and urban
- The broader area does as well, though, which limits expansion opportunities in the study area
- Strong, very different clusters at University Park and South Side

Supply

COMMERCIAL SUPPLY Berry Street Study Area (\$ millions)

Civic Economics estimate of study area sales:

Motor vehicle parts dealers	\$2.5
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* All Retail excludes motor vehicle sales, gasoline stations, and general merchandise stores

Source: Nielsen Claritas, Civic Economics

Retail Market

- Few urban neighborhoods are in surplus for retail
 - Residents have ample opportunities and attractions by car
 - University Park, West 7th compete strongly, as well

Market Opportunities

- Eating & Drinking
 - Better opportunities than the numbers might indicate
 - Agglomeration effect is strong, which implies niche markets
 - Built in student base that currently drives off to eat and drink
- Retail
 - Data indicate opportunities to stop leakage
 - Leakage likely to suburban shopping centers, University Park
 - Local-serving to include students

Business Inventory

- 110 Individual Businesses
 - 37 Eating & Drinking establishments
 - Of which 6 are freestanding fast food
 - 27 Retail Stores in operation, +5 vacant
 - “13” alternative financial institutions
 - Payday and title loans
- Let’s see how it maps out:
 - Subject to my GIS ineptitude ...

BUSINESS INVENTORY

Retail



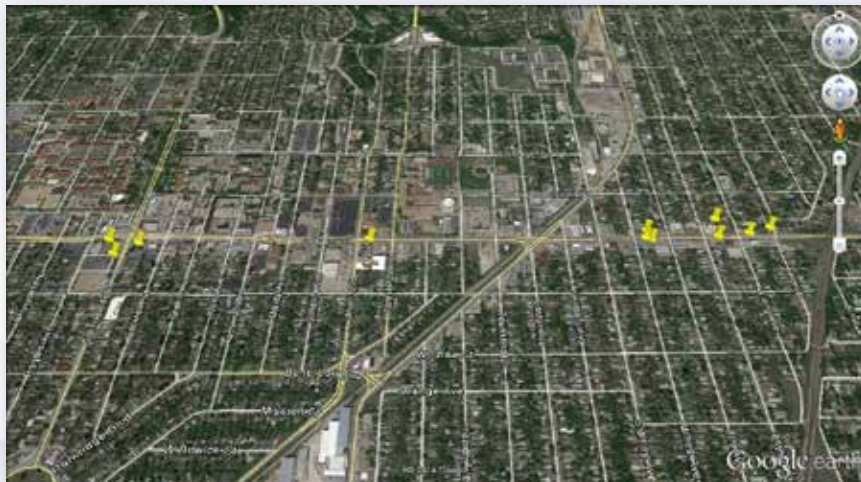
Eating & Drinking



Three Identifiable Zones



Banking and Alternative Finance



College Town Today

- Generally successful as a traditional college district
 - Pedestrian friendly with shopping, eating and drinking, and services
 - Bluebonnet Circle is closely related as a destination

College Town Opportunities

- With suitable spaces, might attract additional typical college town retailers
 - Gap, American Apparel
 - Preppy or fashionable independents
- Limited opportunities for development
 - Small parcels on south side of Berry
 - University control on north side of Berry
- Potential for growth
 - Side streets
 - To the east ...

Paschal/Transitional Zone

- Auto driven with weakening pedestrian environment
 - It may not be pretty, but it is generally successful in serving the local market
 - Drug stores, fast food, services
- Pedestrian amenities probably cannot draw foot traffic beyond surface lots and driveways after Merida

College Town



Paschal Transitional Zone

- Strong potential for redevelopment with some challenges
 - University PAC will attract new visitors to the area
 - Dueling drug stores – something's got to give and likely will from market to market
- Transit and stormwater improvements would jumpstart development

Paschal Transitional Zone

- Chance to out-funk Magnolia at low cost



Financial District

- Gentrification in Ryan Place may present an opportunity for a small move upmarket
- Larger parcels can be assembled
- Substantial redevelopment will likely require strong intervention
 - Rail, stormwater mitigation, neighborhood amenities

Financial District

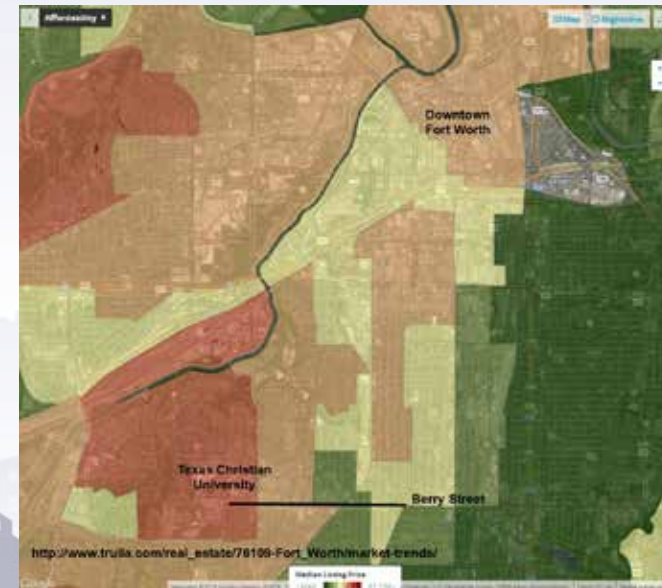
- Entirely auto driven and only slightly neighborhood-serving
 - Laundry, convenience stores, dollar and thrift
 - Payday and title loan agglomeration functions as a regional draw for its customers
 - These businesses cluster naturally, but many communities are working to break that up
- We would love more input from neighbors in this stretch – What do they want to see?

Current Opportunity Summary

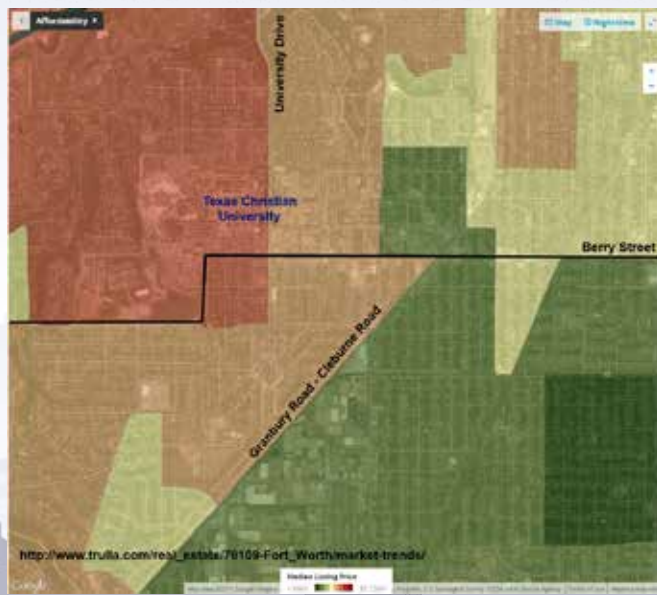


RESIDENTIAL REAL ESTATE

Residential Values - Wider



Residential Values - Local



Residential Considerations

- Study area connects some of the lowest- and highest- value neighborhoods in FTW
 - East-West trends on the street reflect that clearly
 - Issues of gentrification and affordability merit attention
- Will students will long remain the dominant market opportunity/curse?
 - TCU clearly building alternatives to bring more on campus

What's Next?

- I will be at my desk tomorrow to think through evolving plans from the studio
- Discussions with developers to understand:
 - Cost-sensitivity and interest by segment
 - Competitive areas for investment

For follow up:

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Civic Economics
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dhouston@civiceconomics.com
www.CivicEconomics.com

STORMWATER LUNCH AND LEARN PRESENTATION

Berry / University Urban Village Development Plan & Form Based Code

Stormwater Workshop

October 14, 2014

Why are we here?

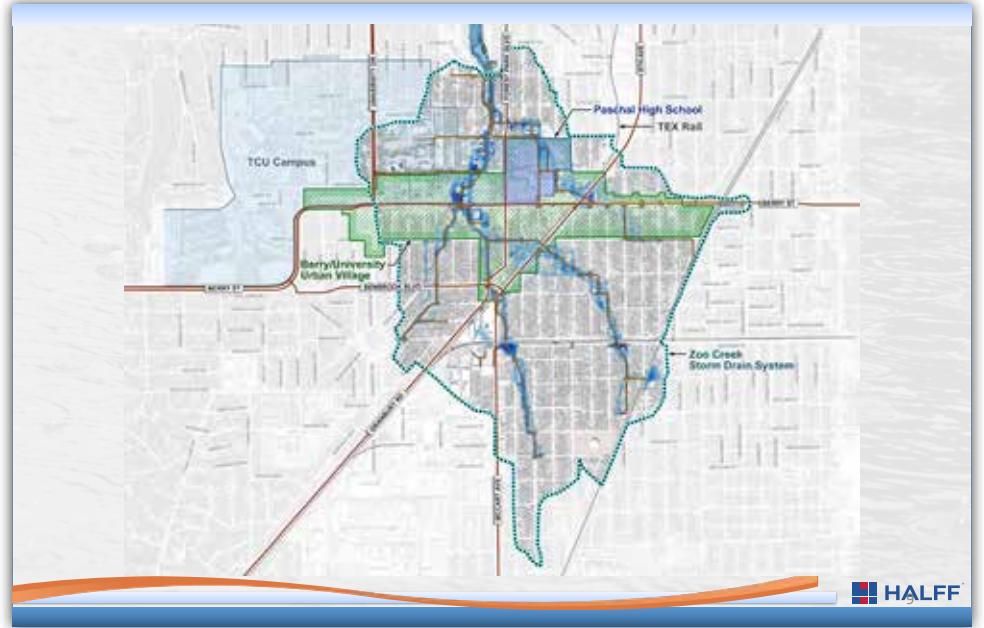
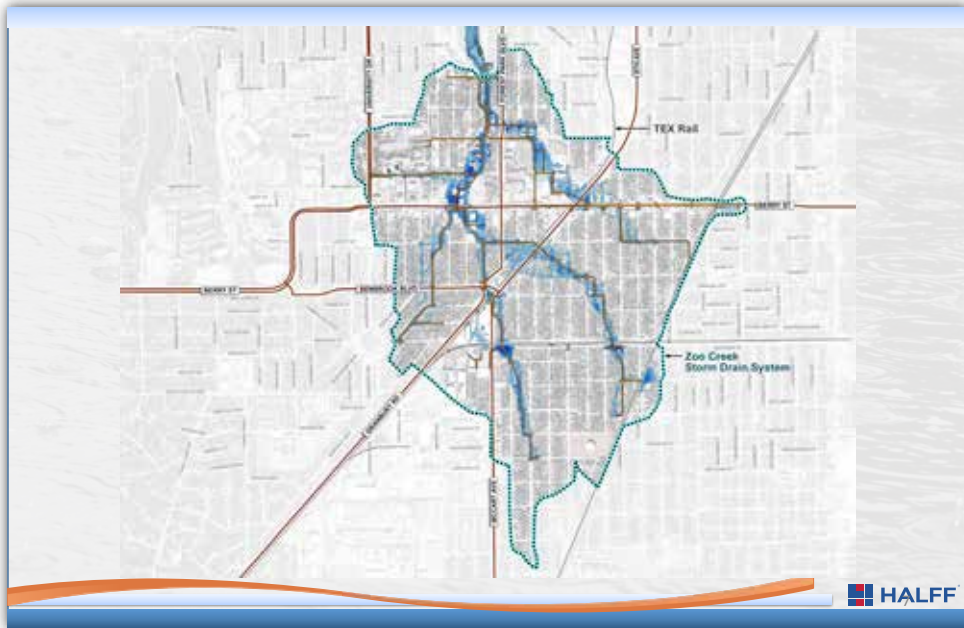
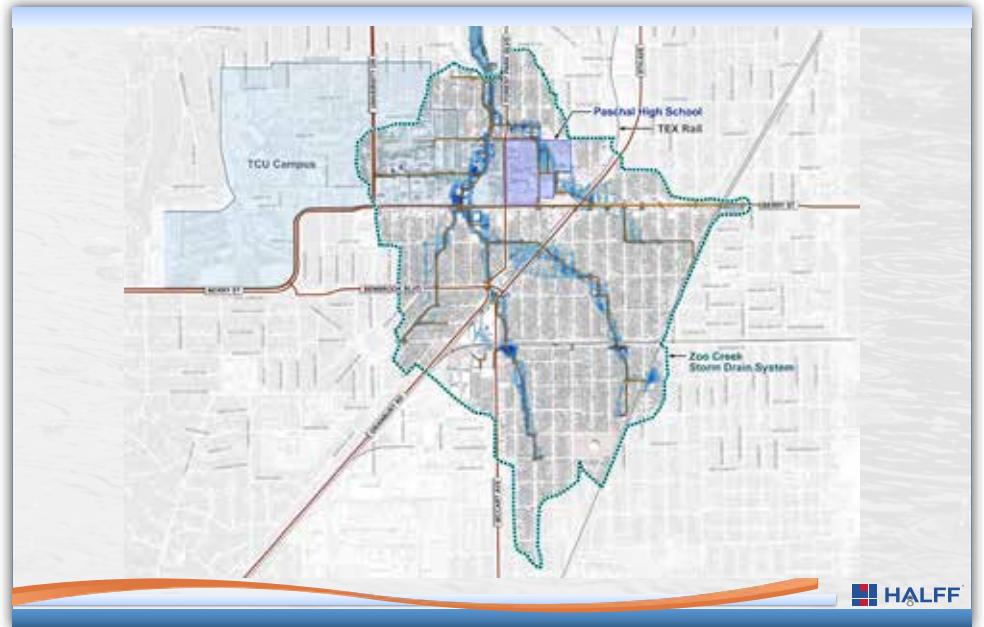
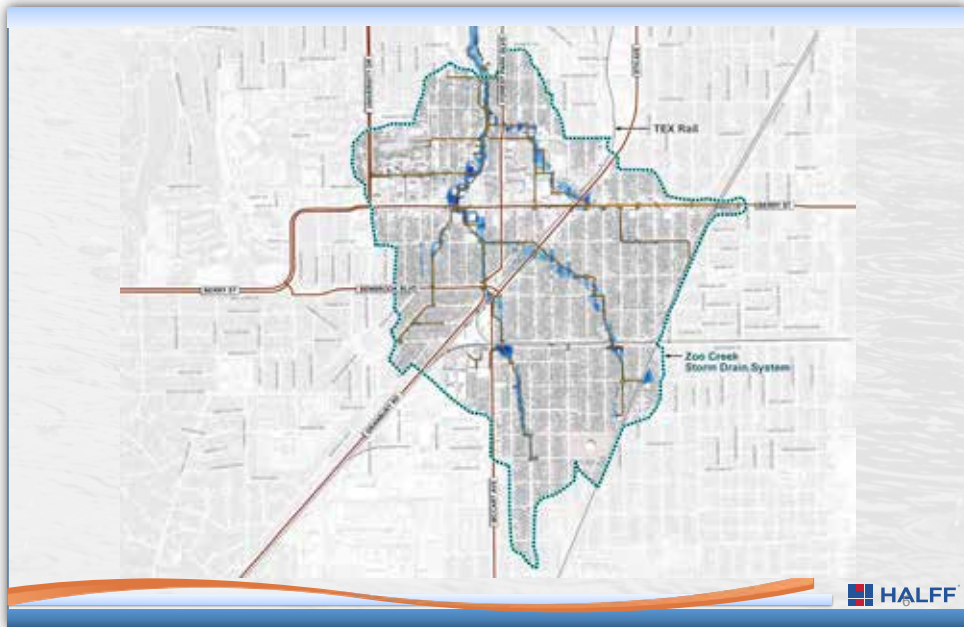
- Economic Growth and Revitalization
- Existing Stormwater Issues
- Zoo Creek Storm Drain Flood Mitigation Study
- Berry/University Urban Village
- Stormwater Challenges & Opportunities with Form Based Code
- Next Steps



Berry / University Urban Village

Development Plan and Form Based Code



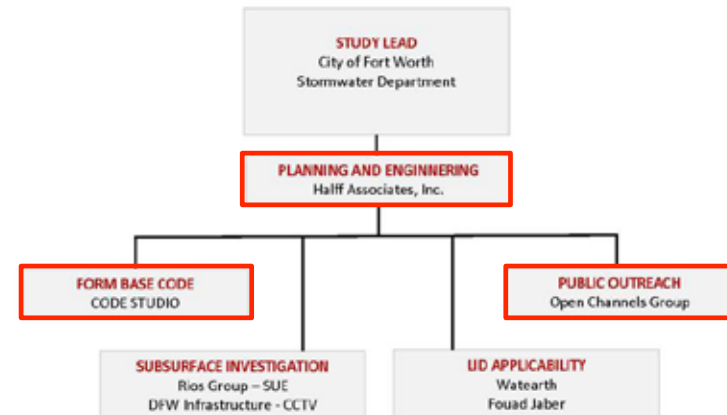


Berry / University Urban Village

Development Plan and Form Based Code



Project Team



Overall Stormwater Goals

- **Protect People and Property from Stormwater Runoff**
 - Stormwater Runoff is NOT Going Away...Plan Around Flooding
 - Avoid Development in Identified Flooding Areas
 - Reduce Flooding Frequency along Streets
- **Transit-Ready Development**
 - Take Advantage of Open Space Needs to Promote Connectivity
- **Neighborhood Resiliency**
 - Reduce Flooding, Improve Stormwater Quality
 - Preserve Integrity of Adjacent Neighborhood
- **Form-Based Code**
 - Encourage Stormwater Measures that Enhance the Urban Village
 - Set an Example for the Surrounding Area

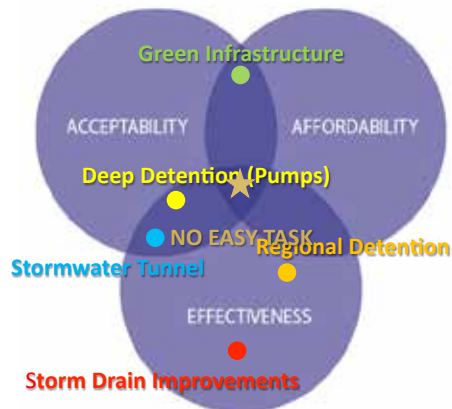


Historic Development Patterns



Stormwater Philosophy

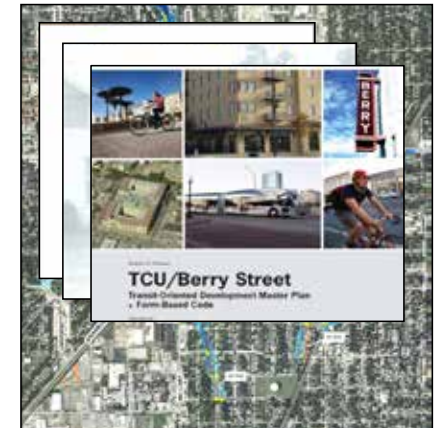
- Find “Feasible” Solutions
- Effective to Reduce Flood Risk of Flooding
- Affordable and Within Budget
- Acceptable in Terms of Quality of Life



HALFF

Previous Study Efforts

- Considered Many Solutions
 - Large Storm Drains
 - Relief Tunnels
 - Deep Detention (Pumped)
 - Large Regional Detention
 - Green Infrastructure
 - Pocket Detention
- Initial Focus on 100-year
- Costs from \$43M to \$156M



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Stormwater Focus



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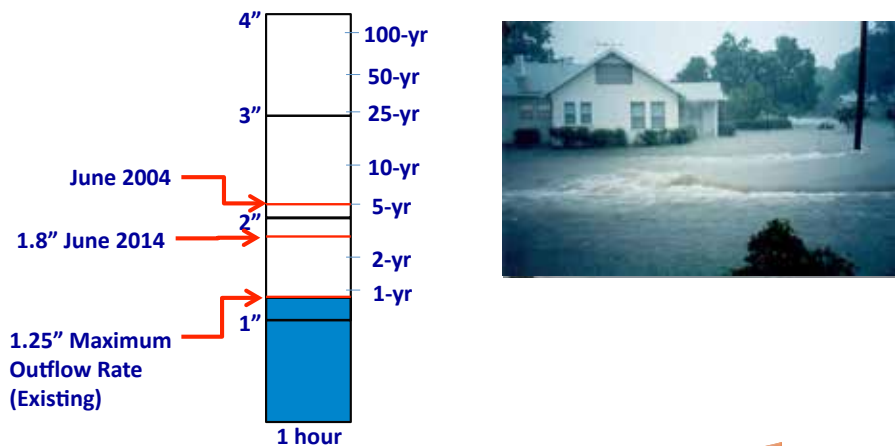
Zoo Creek Storm Drain Study

- Consider Previous Studies
- Evaluate the Extent of the Current Flooding
- Identify Opportunities and Challenges
- Develop a “Long-Term Vision” for Improving Flooding in Urban Village and Surrounding Area



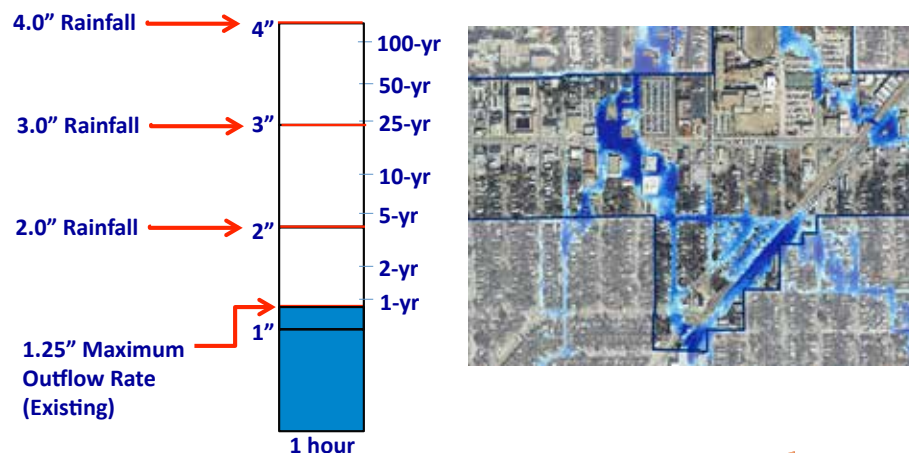
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Existing System Capacity



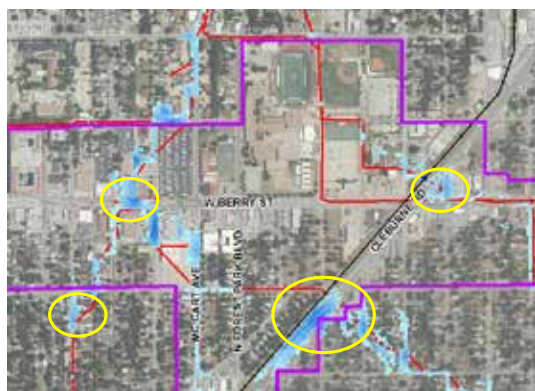
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Existing System Capacity



HALFF

Existing Flooding



LOCATION	MAX. DEPTH
Berry near Sandage	2.5 ft
Berry @ Cleburne	1.1 ft
Granbury @ RR	2.7 ft
Lubbock near Devitt	1.7 ft



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Potential Solutions

- **Open space storage**
 - Amenity and opportunity to connect Urban Village
- **"Daylighting" streams**
 - Return streams to natural form
 - Slow flow, filter pollutants, restore natural habitat
- **Large Regional Detention**
- **Storm Drain Improvements**
- **Green Infrastructure**

All of these potential solutions are pieces in the overall puzzle. There may be a place for each of them.

HALFF

Volume Required

- **Large Watershed; Significant Volume**
- **Detention Volume needed depends on the goal**
 - Managing a 2" Rainfall ~ 30 ac-ft
 - Managing a 2.5" Rainfall ~ 50 ac-ft
 - Managing a 3" Rainfall ~ 75 ac-ft
 - Managing a 4" Rainfall ~ 110 ac-ft
- **Placement is Critical to Success**
 - Needs to be spread throughout the watershed



Managing a 4" Storm needs 110 acre-feet =
Filling the bowl more than twice



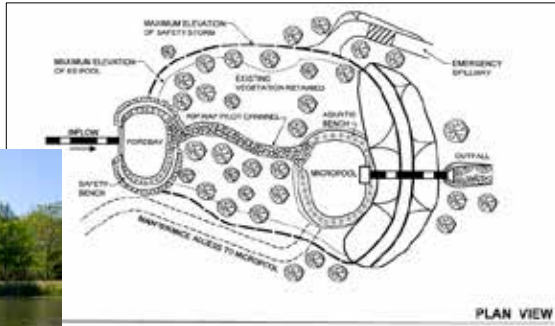
Managing a 2.5" Storm needs 50 acre-feet =
Filling the bowl on Amon Carter Stadium



Open Space Storage



Regional Stormwater Management



Daylighting Streams

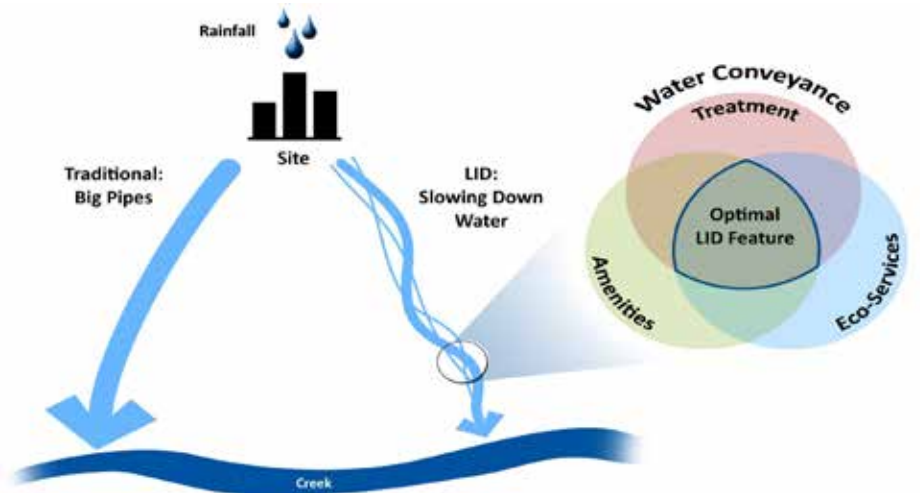


Multi-use Detention Facilities

Wet Retention Ponds



Green Infrastructure



Modern Code = Clear, Predictable Results



HALFF

GI Stormwater Management Techniques

- Resilience and Avoidance
- Permeable paving
- Green roofs
- Rainwater harvesting
- Bioretention (Rain Gardens)
- Underground storage

HALFF

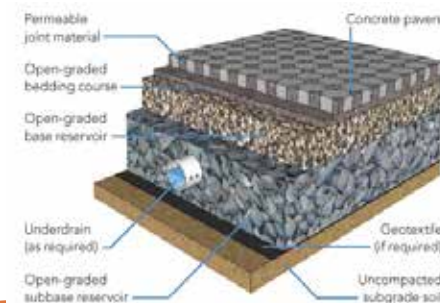
Development and Stormwater

- **Flooding is a Barrier to Economic Growth**
- **Watershed is Flood Source**
- **Planned development**
 - Help Reduce flooding
 - Provide amenities
- **Flooding is Significant**
 - Plan to Avoid Development in Flood Prone Areas



HALFF

Permeable Pavement



HALFF



Rainwater Harvesting



Bioretention / Raingardens

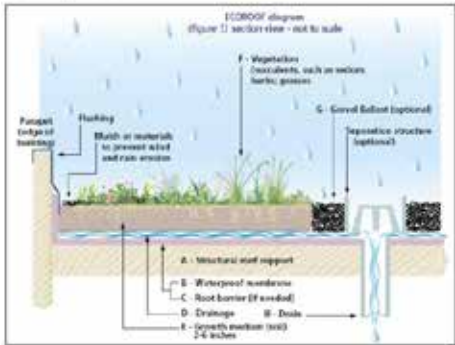


Figure 23.1 Green Roof Cross Section (from City of Portland, Oregon)

Green Roofs



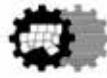
Underground Detention



Summary

- Form Based Code Stormwater Implementation will be an example for the watershed
- Coordinate with Zoo Creek Storm Drain Flood Mitigation Study
- Facilitate Future Development without negative impacts

We need to hear from you how you want this area to grow!



North Central Texas
Council of Governments