

# CITY OF BELLAIRE TEXAS

## PLANNING AND ZONING COMMISSION

MARCH 10, 2015

---

Council Chamber

Regular Session

6:00 PM

---

7008 S. RICE AVENUE  
BELLAIRE, TX 77401



### Chairman

Mr. Winfred Frazier

### Commissioner

Christopher Butler

### Commissioner

Paul Simmons

### Commissioner

Dirk Stiggins

### Vice Chairman

Bill Thorogood

### Commissioner

Marc Steinberg

### Commissioner

S. Lynne Skinner

### Mission Statement:

*The City of Bellaire is dedicated to outstanding quality service and facilities to ensure an open, progressive, and secure community.*

**I. CALL TO ORDER AND ANNOUNCEMENT OF QUORUM****II. APPROVAL OF MINUTES FROM PAST MEETINGS**

1. Planning and Zoning Commission - Regular Session - Jan 13, 2015 6:00 PM

**III. REMINDER TO CITIZENS DESIRING TO ADDRESS THE COMMISSION****IV. GENERAL PUBLIC COMMENTS**

**Persons at the meeting who have indicated their desire to be heard on matters of general interest to the Commission by submitting the form provided shall have three minutes to present their comments. The Commission is not permitted to fully discuss, debate, or consider items that are not on the agenda. Questions presented to the Commission may be referred to staff.**

**V. PUBLIC HEARINGS**

1. Public Hearing on an application filed by Brown and Gay Engineers, Inc. on behalf of HEB Grocery Company, LP, owner of the property at 5106 Bissonnet Street, for a Planned Development Amendment, as required by Chapter 24, Planning & Zoning, Article VI, "Amendatory Procedures," Section 24-604, "Application for Planned Development Amendment," to re-develop the existing H-E-B grocery store site located at 5106 Bissonnet, in the Urban Village-Downtown (UV-D) Zoning District.

(Requested by John McDonald, Development Services)

**A. Presentation of the Public Hearing Process****B. Presentation by the Applicant****C. Staff Findings****D. Public Comments**

**a. Persons at the meeting who have indicated their desire to address the Commission by submitting the form provided shall have three (3) minutes each to present comments concerning the Application. This time limit may be extended to five (5) minutes at the discretion of the Chair with the consent of the Commission.**

**E. Response of the Applicant****F. Questions from the Commission****G. Invitation for Written Comments, if applicable****H. Closure of the Public Hearing****VI. CURRENT BUSINESS (ITEMS FOR DISCUSSION, CONSIDERATION, AND/OR POSSIBLE ACTION)**

1. Presentation and discussion on the five-year update to the 2009 Comprehensive Plan with Gary Mitchell of Kendig Keast Collaborative .



(Requested by John McDonald, Development Services)

**VII. COMMITTEE REPORTS**

**VIII. CORRESPONDENCE**

**IX. REQUESTS FOR NEW BUSINESS, ANNOUNCEMENTS AND COMMENTS**

**1. Staff liaison report on the status of projects previously addressed by the commission as well as projects for future meetings.**

**2. The Chairman shall recognize any Commissioner who wishes to bring New Business to the attention of the Commission. Consideration of New Business shall be for the limited purpose of determining whether the matter is appropriate for inclusion of a future Agenda of the Commission or for the referral to staff for investigation**

**X. ADJOURNMENT**



# CITY OF BELLAIRE TEXAS

## PLANNING AND ZONING COMMISSION

JANUARY 13, 2015

Council Chamber

Regular Session

6:00 PM

7008 S. RICE AVENUE  
BELLAIRE, TX 77401

### I. CALL TO ORDER AND ANNOUNCEMENT OF QUORUM

Chairman Frazier called the meeting to order at 6:03 PM, and announced that there was a quorum present consisting of the following members:

Attendee Name	Title	Status	Arrived
Christopher Butler	Commissioner	Present	
Winfred Frazier	Chairman	Present	
Bill Thorogood	Vice Chairman	Present	
Paul Simmons	Commissioner	Absent	
Marc Steinberg	Commissioner	Present	
Dirk Stiggins	Commissioner	Present	
S. Lynne Skinner	Commissioner	Present	
John McDonald	Director	Present	
Ashley Parcus	Secretary	Present	
Alan P. Petrov	City Attorney	Present	

### II. APPROVAL OF MINUTES FROM PAST MEETINGS

1. Planning and Zoning Commission - Regular Session and Workshop - Dec 9, 2014  
6:00 PM

Commissioner Butler mentioned that there was a question on page 5 attributed to him that he believes was actually asked by Vice Chairman Thorogood.

<b>RESULT:</b>	<b>APPROVED AS CORRECTED [UNANIMOUS]</b>
<b>MOVER:</b>	Dirk Stiggins, Commissioner
<b>SECONDER:</b>	Bill Thorogood, Vice Chairman
<b>AYES:</b>	Butler, Frazier, Thorogood, Steinberg, Stiggins, Skinner
<b>ABSENT:</b>	Simmons

### III. REMINDER TO CITIZENS DESIRING TO ADDRESS THE COMMISSION

Chairman Frazier reminded any citizen that wished to address the Commission to fill out a sign in sheet.

### IV. GENERAL PUBLIC COMMENTS

Minutes Acceptance: Minutes of Jan 13, 2015 6:00 PM (Approval of Minutes from Past Meetings)

**Persons at the meeting who have indicated their desire to be heard on matters of general interest to the Commission by submitting the form provided shall have three minutes to present their comments. The Commission is not permitted to fully discuss, debate, or consider items that are not on the agenda. Questions presented to the Commission may be referred to staff.**

There were no general public comments.

## **V. PUBLIC HEARINGS**

There were no public hearings.

## **VI. CURRENT BUSINESS (ITEMS FOR DISCUSSION, CONSIDERATION, AND/OR POSSIBLE ACTION)**

1. Discussion, consideration, and possible action on proposed amendments to Chapter 24, Planning and Zoning, Section 24-610, Publication, A. and B. of the City of Bellaire Code of Ordinances, to increase the area for mailed notification from the current requirement of two hundred (200) feet to five hundred (500) feet.

**Motion:** A motion was made by Commissioner Butler and seconded by Commissioner Steinberg to approve the changes to Chapter 24, Planning and Zoning, Section 24-610, Publication, A. and B. and send the recommendation forward to City Council with the inclusion of the public hearing notification diagram that was prepared by Commissioner Butler.

**Vote:** the motion passed with a unanimous vote of 6-0.  
(Requested by John McDonald, Development Services)

<b>RESULT:</b>	<b>APPROVED [UNANIMOUS]</b>
<b>MOVER:</b>	Christopher Butler, Commissioner
<b>SECONDER:</b>	Marc Steinberg, Commissioner
<b>AYES:</b>	Butler, Frazier, Thorogood, Steinberg, Stiggins, Skinner
<b>ABSENT:</b>	Simmons

2. Docket # SU-2014-02-Request for a Specific Use Permit, as required by Chapter 24, Planning and Zoning, Section 24-536 B. (2) b) 2), to allow for the inclusion of a hospital, acute, and/or chronic care facility within the three-story medical building to be located at 4440 Bissonnet St.

Mr. McDonald explained that the public hearing for this item was held by the Commission at their December meeting, and was now before them for consideration. He reiterated that the request is for the inclusion of a pediatric urgent care center within the three-story medical building to be located at 4440 Bissonnet, between Howard and Newcastle. Mr. McDonald informed the Commission that the applicant had realigned the driveway off of Newcastle so that it lines up to connect with Fournace, minimizing the number of intersections. Additionally, the exit from the garage onto Howard Street has been reconfigured as a right turn only. He explained that this has been reviewed by the public works director, who concurs with the changes, but asked that a stop sign be installed at the exit onto Newcastle due to the fact that the traffic on Newcastle street does not stop. He also requested that a "no left turn" sign be installed at the exit onto Howard Ln. Mr. McDonald stated that it is staff's opinion that the request meets the requirements as defined in Section 24-615 of the code, and recommends approval of the SUP, with the conditions as requested

by the Public Works Director, as well as specific time limitations that are outlined in the Commission's memo.

**Motion:** a motion was made by Commissioner Stiggins and seconded by Commissioner Skinner to approve SU-2014-02, with the inclusion of the changes made by the applicant, as well as the following conditions:

- That a stop sign be installed at the exit onto Newcastle Street
- That a "no left turn" sign be installed at the exit onto Howard Street

Commissioner Stiggins asked if staff had received any additional comments on the application.

Mr. McDonald stated that no additional comments had been received.

Commissioner Skinner asked for clarification on whether or not the applicant actually needs a specific use permit due to the fact that they are proposing an urgent care facility, not an emergency facility.

Mr. McDonald and Attorney Petrov explained that the code does not make a clear distinction between the two uses, and that the City has always incorporated urgent care facilities in with the need for a specific use permit.

Commissioner Butler thanked the applicant for making the revisions to the application, as well as supplying the Commissioners with elevations of the parking garage.

Chairman Frazier asked if there had been any consideration of the installation of a "no left turn" sign on Howard, preventing left turns onto Bissonnet.

Mr. McDonald mentioned that it has been discussed, but that he is concerned with that request as it is outside the scope of this project. He stated that the City would rather address those issues as they come about, once the development has been completed. He assured the Commission that the City will continue to monitor the traffic situation around that area.

Commissioner Stiggins asked if complaints by residents are also taken into account with regard to traffic issues.

Mr. McDonald confirmed that they are, and that staff is currently looking into several areas of the City where that has been the case.

**Vote:** the motion passed with a unanimous vote of 6-0.  
(Requested by John McDonald, Development Services)

<b>RESULT:</b>	<b>APPROVED [UNANIMOUS]</b>
<b>MOVER:</b>	Dirk Stiggins, Commissioner
<b>SECONDER:</b>	S. Lynne Skinner, Commissioner
<b>AYES:</b>	Butler, Frazier, Thorogood, Steinberg, Stiggins, Skinner
<b>ABSENT:</b>	Simmons

3. Discussion, consideration, and possible action on the approval of the Planning and Zoning Commission's annual report to the City Council for the 2014 calendar year.

Commissioner Stiggins mentioned that the discussion of the notification distance was an important aspect of the Commission's work in 2014, and stated that he didn't see it listed anywhere within the letter.

Chairman Frazier pointed out that it was not voted on until 2015, but that he could list it as one of the public hearings that the Commission held.

Commissioner Stiggins also stated that the Commission had talked briefly about the role of economic development within the City and asked if that recommendation should be made in this letter.

Chairman Frazier explained that he feels as though the Commission should wait and amplify its position of economic development once the update of the Comprehensive Plan is complete.

Attorney Petrov mentioned that his name was spelled incorrectly.  
(Requested by John McDonald, Development Services)

<b>RESULT:</b>	<b>ADOPTED AS AMENDED [UNANIMOUS]</b>
<b>MOVER:</b>	Marc Steinberg, Commissioner
<b>SECONDER:</b>	Bill Thorogood, Vice Chairman
<b>AYES:</b>	Butler, Frazier, Thorogood, Steinberg, Stiggins, Skinner
<b>ABSENT:</b>	Simmons

4. Discussion and adoption of the 2015 Planning and Zoning submittal calendar and deadlines.

Commissioner Steinberg pointed out that the time needed to be changed to 6:00 PM.  
(Requested by John McDonald, Development Services)

<b>RESULT:</b>	<b>ADOPTED AS AMENDED [UNANIMOUS]</b>
<b>MOVER:</b>	Bill Thorogood, Vice Chairman
<b>SECONDER:</b>	Marc Steinberg, Commissioner
<b>AYES:</b>	Butler, Frazier, Thorogood, Steinberg, Stiggins, Skinner
<b>ABSENT:</b>	Simmons

## VII. COMMITTEE REPORTS

There were no committee reports.

## VIII. CORRESPONDENCE

Commissioner Butler reiterated the importance of involvement with the planning of the new City facilities and urged members to attend the meetings of the Ad Hoc Municipal Facilities Committee.

## IX. REQUESTS FOR NEW BUSINESS, ANNOUNCEMENTS AND COMMENTS

Commissioner Skinner informed the Commission that the 7th Annual Wine and Tapas will be taking place on April 25th, and she hoped that everyone could participate. She stated that the event is held by the Patrons for Bellaire Parks and that the net proceeds will benefit Evergreen Park. Commissioner Skinner mentioned that they are still looking for sponsors, as well as auction items and asked that anyone willing to donate contact herself or Commissioner Butler.

Chairman Frazier mentioned that the development happening within the City of Houston, close to the UV-T Zoning District was discussed at the last City Council meeting, and asked Mr. McDonald to comment on that.

Mr. McDonald explained that there are some concerns that the engineering, specifically with regard to drainage, made some wrong assumptions that could potentially have a negative impact on the City of Bellaire's drainage. He stated that staff is currently in discussion with the City of Houston to see what can be done to alleviate the problem.

Chairman Frazier also mentioned that board and commission liaisons were appointed at the last Council meeting, and that Councilman Roman Reed will be the liaison for the Planning and Zoning Commission during 2015.

**1. Staff liaison report on the status of projects previously addressed by the commission as well as projects for future meetings.**

Mr. McDonald mentioned that the only thing to report since the last meeting is that he has met with a couple developers who are looking at properties within the UV-T Zoning District.

**2. The Chairman shall recognize any Commissioner who wishes to bring New Business to the attention of the Commission. Consideration of New Business shall be for the limited purpose of determining whether the matter is appropriate for inclusion of a future Agenda of the Commission or for the referral to staff for investigation**

Commissioner Butler asked if an agenda item would be appropriate to determine when the Chairman is notified of upcoming public hearings.

Mr. McDonald stated that staff could simply email the Chairman once an application has come in.

**X. ADJOURNMENT**

**Motion:** a motion was made by Vice Chairman Thorogood and seconded by Commissioner Skinner to adjourn the regular meeting.

**Vote:** the motion passed with a unanimous vote of 6-0.

**The meeting was adjourned at 6:53 PM.**

## Planning and Zoning Commission

City Council Chambers, First Floor of  
City Hall  
Bellaire, TX 77401



Meeting: 03/10/15 06:00 PM  
Department: Development Services  
Category: Public Hearing  
Department Head: John McDonald  
DOC ID: 1513

### **SCHEDULED ACTION ITEM (ID # 1513)**

#### **Item Title:**

Public Hearing on an application filed by Brown and Gay Engineers, Inc. on behalf of HEB Grocery Company, LP, owner of the property at 5106 Bissonnet Street, for a Planned Development Amendment, as required by Chapter 24, Planning & Zoning, Article VI, "Amendatory Procedures," Section 24-604, "Application for Planned Development Amendment," to re-develop the existing H-E-B grocery store site located at 5106 Bissonnet, in the Urban Village-Downtown (UV-D) Zoning District.

#### **Background/Summary:**

HEB has applied for a planned development classification to construct a grocery store at 5106 Bissonnet. The store is to be two-story with parking at ground level and the grocery store and additional parking on the second level. A neighborhood shopping center currently operates on the site which includes a HEB and several other tenants (retail, restaurants, and office space).

Planned Developments are included as an allowance within a property zoned CMU to "enable consideration of development proposals involving uses or designs that might not strictly adhere to the standards within this Section but would meet the spirit and intent of the district."

#### **Site Details**

Property Owner: Centro NP Holdings 12 SPE, LLC

Applicant: Brown & Gay Engineers on behalf of HEB Grocery Company

Location: 5106 Bissonnet Street

Legal Description: A 3.055 acre tract of land situated in the William J. Brown Survey, Abstract No. 132 and the James Blessing Survey, Abstract No. 162, City of Bellaire, Harris County, Texas

Current Zoning: CMU - Corridor Mixed-Use

Requested Zoning: Planned Development

#### **Notice Information**

**Owners of property within 200 feet:** 38 (an additional 22 letters were mailed to tenants)

**Notification letters mailed:** February 26, 2015

**Legal Notice published:** February 24, 2015

**Notification Signs Posted:** February 24, 2015

#### **Adjacent Base Zoning and Land Uses**

**Direction:** North

**Current Base Zoning:** CMU

**Current Land Use:** Commercial

**Direction:** East  
**Current Base Zoning:** CMU  
**Current Land Use:** Commercial

**Direction:** South  
**Current Base Zoning:** CMU  
**Current Land Use:** Commercial

**Direction:** West  
**Current Base Zoning:** CMU  
**Current Land Use:** Commercial

### **Transportation**

**Thoroughfare:** Bissonnet Street

**Existing Character:** Arterial; two lanes in each direction with turning lane; no sidewalk

**Proposed Changes:** Plan includes sidewalk along Bissonnet

**Thoroughfare:** Cedar Street, 5<sup>th</sup> Street, and Spruce Street

**Existing Character:** Local Streets; one lane in each direction; no sidewalks

**Proposed Changes:** Plan calls for sidewalks along all streets

**Public Transit:** No stops in the immediate vicinity of this location.

**Traffic Impact:** A Traffic Impact Analysis (TIA) was provided by the applicant and reviewed by the City's traffic engineer. The TIA identified four recommendations which were supported by the City's traffic engineer. These improvements are to be done at no cost to the City. These include retiming of traffic signals, the relocation of the proposed driveway on the south side that exits on to Bissonnet, and modifications to ensure no queue spillover onto Bissonnet.

**Parking:** Off-street vehicle parking requirements for a Grocery Store are 5 spaces per 1,000 square feet of gross leasable space. With a proposed build out of 70,000 sq. ft., a minimum of 350 spaces is required. The plan as proposed includes 372 parking spaces.

### **Utilities**

**Water:** Public Works recommends that the new water tap for this location go to the 12-inch water main located in the north side of Spruce Street.

**Wastewater:** No issues.

**Drainage:** No detention facilities are included in this project. The applicant is proposing no increase in lot coverage. Mitigation is generally only needed on commercial projects if there is an increase in impervious coverage.

### **Public Safety**

**Police:** Supports the use of private security onsite.

**Fire:** No concerns at this time. The Fire Marshal participates in the review of the building plans and will comment as appropriate at that time.



**Signs**

HEB has included on the submitted store elevation the locations of their main signs. Additionally, a HEB sign will show on the front elevation, facing east towards the upper parking deck. A sign detail sheet is attached showing the size location of the requested signs for this store.

**Recommendation**

No action is required on March 10. This item is scheduled for consideration on April 14.

**ATTACHMENTS:**

- 2015-01-29 City of Bellaire (PDF)
- 2015-02-09 Site Plan Review Application (PDF)
- Section 24-524 Summary 02 (PDF)
- Sect 01 - Vicinity (PDF)
- Sect 02 - Aerial Exist Site Location (PDF)
- Sect 03 - Official Zoning Map (PDF)
- Sect 04 - 3\_055 Boundary (PDF)
- Sect 05 - 3\_055 Topo (PDF)
- Sect 06 - Title (PDF)
- Sect 07 - Legal Description (PDF)
- Sect 08 - FEMA Map (PDF)
- Sect 09 - Environmental Assessment Form (PDF)
- Sect 10 - Groundfloor (PDF)
- Sect 10 - Secondfloor (PDF)
- Sect 11 - Elevation 01(PDF)
- Sect 11 - Elevation 02(PDF)
- Sect 12 - Existing Utility Layout (PDF)
- 5106 Bissonnet St TIA Memo (PDF)
- Sect 13 - Preliminary TIA (PDF)
- HEB Sign Details (PDF)



January 29, 2015

Mr. Paul A. Hofmann, City Manager  
Planning and Zoning Commission  
City of Bellaire  
7008 South Rice Avenue  
Bellaire, TX 77401

Re: HEB at 5106 Bissonnet Street  
Site Plan Review Application  
± 3.055 acres  
Bellaire, Texas

Dear Mr. Hofmann:

Brown & Gay Engineers, Inc. is working on the re-development of the existing H-E-B grocery store site located at 5106 Bissonnet Street. The 3.055-acre site is located in the northern side of the intersection between Bissonnet Street and Cedar Street in the City of Bellaire, Texas (Key Map page 531G). The project site is currently zoned to Urban Village-Downtown (UVD).

Since the proposed project is intended to be developed and maintained by one user, we would like to request to re-zone the property from UVD to Planned Development (PD).

Existing conditions of the site include a main, 1-story H-E-B building and a smaller 1-story block building, with a total square footage of approximately 52,000. The site also includes surface parking areas and six private driveways along Bissonnet Street, Cedar Street, and 5<sup>th</sup> Street. The existing site is 100% impervious.

The proposed project will encompass a 2-story H-E-B building, surface parking garage at ground level and additional parking spaces at second level. Approximately 70,000 square feet of grocery store will be located at the second level. The proposed project will reduce private accesses to one driveway along Cedar Street and another one along Bissonnet Street.

The site is currently fully developed and it is 100% impervious. Proposed development will provide detention for additional impervious area or increased runoff.

Please contact me if you have any questions and/or need any additional information.

Thank you,

A handwritten signature in blue ink, appearing to read "E. Benton Schmaltz", is written over a horizontal line.

E. Benton Schmaltz, P.E., LEED AP  
Project Manager, Site Development

# Site Plan Review Application

## Proposed HEB Grocery Store 3.055 acres 5106 Bissonnet Street, Bellaire Harris County, Texas 77401

*Prepared By:*

E. Benton Schmaltz, P.E., LEED AP

February 9, 2015



BROWN & GAY  
ENGINEERS

TBPE Registration No. 1046  
10777 Westheimer, Suite 400  
Houston, Texas 77042

Attachment: 2015-02-09 Site Plan Review Application (1513 : Public Hearing-HEB PD)

## EXECUTIVE SUMMARY

### Project Description

The project site is an irregular shaped 3.055-acre tract, located at the northern side of intersection between Bissonnet Street and Cedar Street, in the City of Bellaire, Harris County, Texas (Key Map page 531G).

The existing site includes an HEB (35,692 sf) one-story block building, and an additional (16,092 sf) one-story retail block building. Site includes extensive parking lot, with six different points of access along Fifth Street, Cedar Street, and Bissonnet Street. Existing buildings are fully operational at present time.

Per City of Bellaire, Zoning District Map, site is currently zoned to Urban Village-Downtown (UVD).

Proposed project will include a two-story HEB building. Grocery store retail area, approximately 70,000 sf, will be located at the second level of the building, along with parking areas. Additional parking lot will be provided at ground level.

Due to the project is intended to be developed and maintained by only one user, Brown & Gay Engineers, on behalf of HEB Grocery Company LP, would like to request to the City of Bellaire Planning and Zoning Commission to evaluate and approve the re-zoning of the 3.055- acre property from Urban Village-Downtown (UVD) to Planned Development (PD).

Brown & Gay Engineers is submitting this report in compliance with City of Bellaire Code Ordinance, section 24-524 Site Plan Review, and section 24-604 Application for Planned Development Amendment.

If the City of Bellaire Planning and Zoning Commission have any question and/or required any additional information, please do not hesitate to contact us at your earliest convenience.

Sincerely,

Benton Schmaltz, P.E., LEED AP  
Project Manager

Astrid Castano, P.E.  
Assistant Project Manager

# Table of Contents

---

I.	GENERAL EXISTING PROJECT INFORMATION	3
A.	Introduction	3
B.	Project Location	3
C.	Existing Conditions	3
D.	Floodplain Information	4
II.	PROPOSED PROJECT INFORMATION	
A.	Proposed Site Layout	4
B.	Existing and Proposed Utilities Analysis	4
C.	Parking Analysis	5
D.	Thoroughfare Impact	5
E.	Environmental Analysis	5
F.	Impact of Construction	6
G.	Preliminary Traffic Impact Analysis	6

## SECTION

Section 1	Vicinity Map
Section 2	Aerial of Existing Conditions
Section 3	City of Bellaire - Zoning District Map
Section 4	Boundary Survey
Section 5	Topographic Survey
Section 6	Title Commitment
Section 7	Legal Description
Section 8	FEMA Map
Section 9	Environmental Assessment Form
Section 10	Proposed Schematic Site Plan
Section 11	Proposed Schematic Elevations
Section 12	Existing Utility Layout
Section 13	Preliminary Traffic Impact Analysis

## I. GENERAL EXISTING PROJECT INFORMATION

### **Owner Information**

HEB Grocery Company, LP  
3890 Northwest Highway, Suite 300  
Dallas, Texas 75220

### **Project Location**

HEB Grocery Store  
5106 Bissonnet Street  
Bellaire, Texas 77401

### **Project Engineer/Applicant Information**

Brown & Gay Engineers, Inc  
E. Benton Schmaltz  
10777 Westheimer Road, Suite 400  
Houston, Texas 77042

#### **A. Introduction**

This report presents the information required by the City of Bellaire Code of Ordinances, Sections 24-524 and 24-604 for the evaluation and approval, by the Planning and Zoning Commission, the re-zoning of a 3.055- acre property, made up of 1 tract, located within the City of Bellaire limits, Harris County, Texas.

The project site is located within the Urban Village-Downtown (UVD) Zoning District established by the City of Bellaire. Due to the proposed project is intended to be developed and maintained by one user, we request the property to be re-zoned to Planned Development (PD).

#### **B. Project Location**

The project tract is located at the northern side of the intersection between Bissonnet Street and Cedar Street in the City of Bellaire, Harris County, Texas, Key Map 531G. See *Section 1 – Vicinity Map*. The tract can be accessed from IH69/US59 from the north, Beechnut Street from the south, IH 610 from the east, and Bellaire Boulevard from the west.

#### **C. Existing Conditions**

The 3.055-acre tract is currently developed. The site contains an existing one-story HEB grocery store of 35,692 sf, a one-story retail block building of 16,092 sf, and parking lot. See *Section 2 - Aerial of Existing Conditions*.

Existing building is placed at a higher elevation, while parking lot surrounding it slopes away towards adjacent curb and gutter streets.

Project site is located within the Urban Village-Downtown (UVD) Zoning District established by the City of Bellaire. See *Section 3 – City of Bellaire, Zoning District Map*.

A Boundary Survey and a Topographic Survey were prepared by Brown & Gay Engineers, Inc. on July 23, 2014 of the 3.055-acre tract. A copy is included in *Section 4 and Section 5*, respectively.

Additionally, a copy of the commitment for Title Insurance for the property is included as *Section 6 – Title Commitment*. Legal Description can be found as *Section 7*.

**D. Floodplain Information**

The site is located on Flood Insurance Rate Map Numbers 48201C0855L, effective date June 18, 2007 (*Section 8 – FEMA Map*). According to the map, the site is located in shaded Zone “AE” (special flood hazard area subject to inundation by the 1% annual chance flood event - Base flood elevations determined).

**II. PROPOSED PROJECT INFORMATION**

Per City of Bellaire requirements, the Environmental Assessment Form for the project is included as *Section 9*. It includes a general summary of the proposed project.

**A. Proposed Site Layout**

The proposed development includes a 70,000 sf grocery store with a two-story building. Grocery store will be placed at the second level with parking lot at ground and second level. Refer to *Section 10 – Proposed Schematic Site Plan* for layouts at ground and second level. Additionally, see *Section 11 – Proposed Schematic Elevations*.

**B. Existing and Proposed Utilities Analysis**

1. Water

Based on the existing utility layout prepared by ARKK Engineers (refer to *Section 12-Existing Utility Layout*) and the topographic survey prepared by Brown & Gay Engineers (refer to *Section 5 – Topographic Survey*); there are existing water lines available along Fifth Street, Spruce Street, South Rice Avenue and a section of Bissonnet Street. Existing water line sizes varies from 8-inch to 12-inch.

Existing buildings are connected to the 12-inch water line that runs along the northern side of Spruce Street. Proposed building is expected to be connected to the same water line along Spruce Street or, due to orientation of proposed building, connection can be made to the 8-inch water line along Fifth Street.

Expected domestic water demand is 126 GPM peak demand @ 60 PSI.  
Expected fire protection demand is 1,100 GPM @ 60 PSI.

2. Sanitary Sewer

Based on the existing utility layout prepared by ARKK Engineers (refer to *Section 12-Existing Utility Layout*) and the topographic survey prepared by Brown & Gay Engineers (refer to *Section 5 – Topographic Survey*); there are

existing sanitary sewer lines available along Fifth Street, Spruce Street, and Bissonnet Street. Existing sanitary sewer pipe size varies from 8-inch to 12-inch.

Existing buildings are connected to the 8-inch sanitary sewer line that runs along the southern side of Spruce Street. Proposed building is expected to be connected to the same sanitary sewer line or, due to orientation of proposed building, to the 12-inch sewer line that runs along the western side of Fifth Street.

Expected sanitary sewer load is 20,000 GPD.

3. Drainage Storm Sewer

Based on the existing utility layout provided by ARKK Engineers (refer to *Section 12-Existing Utility Layout*) and the topographic survey prepared by Brown & Gay Engineers (refer to *Section 5 – Topographic Survey*); there is an existing drainage storm system around the property which is already receiving the storm drainage flow generated by existing property.

For detention calculations, City of Bellaire follows Stormwater Design Requirements from City of Houston Design Manual. Detention volume is required for all proposed development at a rate of 0.50 acre-feet per acre of increased impervious coverage.

The existing site is fully developed and 100% impervious. Proposed drainage storm will honor existing drainage patterns and runoff flow. Additionally, proposed development will provide detention for additional impervious area or increased runoff, if needed.

**C. Parking Analysis**

Based on the topographic survey prepared by Brown & Gay Engineers, Inc., the property currently has 151 standard parking and 10 handicap parking places.

Proposed site layout, between ground and second level, will include 361 standard parking spaces and 11 handicap parking spaces. This equates to 1 parking space for every 188-square feet of proposed building.

**D. Thoroughfare Impacts**

Based on Traffic Impact Analysis prepared by Brown & Gay Engineers, Inc (see *Section 13 – Preliminary Traffic Impact Analysis*), the proposed development will have minimal impact to the neighborhood, especially to the residential neighborhood to the north. The site is connected to major arterials and good collector streets which will minimize traffic through residential streets. See Traffic Impact Analysis previously submitted.

**E. Environmental Analysis**

To Brown & Gay Engineers' knowledge, a Phase I Environmental Site Assessment has not been prepared for the tract. It is our recommendation that a Phase I Environmental Site Assessment be prepared for the tract, however, since



the existing site is fully developed and 100% operational at the present time, the site is expected to comply with minimal environmental standards.

**F. Impact of Construction**

Impact of construction on surrounding community is expected to be minimal. Existing site layout includes six different commercial driveways to ingress/egress the site. Lane closures, road reconstruction and temporary detours are expected due to utility connections; however, impact is expected to be sparse due to the site being served by major arterials and a good collector system.

To minimize impact of construction on adjacent community, contractor will screen the site. Additionally, contractor will maintain dust control and a Storm Water Pollution Prevention Plan – SWPPP in compliance with local and state requirements.

**G. Preliminary Traffic Impact Analysis**

A preliminary Traffic Impact Analysis was prepared by Brown & Gay Engineers, Inc., dated January, 2015.

Development of this project is expected to create minimal impact to the residential neighborhood to the north of the project site because the site is served by two major arterial, Bissonnet Street and South Rice Avenue, as well as a good collector street system.

Only one of the intersections analyzed presents the need for mitigation. The intersection between Bissonnet Street and South Rice Avenue would require re-timing of the traffic light.

The complete Traffic Impact Analysis included existing and proposed traffic counts can be found in *Section 13 – Preliminary Traffic Impact Analysis*.

# Code of Ordinances, Bellaire, Texas

---

## SITE PLAN REVIEW SUMMARY (Per Section 24-524)

### Description

- 1) North Arrow and Scale
  - Please refer to Site Plan Review Application, *Section 5 – Topographic Map*. Report was submitted to City of Bellaire for review and approval on February 9, 2015.
  - Please refer to Site Plan Review Application, *Section 10 – Proposed Schematic Site Plan*.
- 2) Vicinity Map
  - Please refer to Site Plan Review Application, *Section 1 – Vicinity Map*.
- 3) Surrounding Uses
  - Surrounding areas are zoned to Urban Village Downtown District (UVD). Please refer to Site Plan Review Application, *Section 3 – City of Bellaire – Zoning District Map*. Current uses of the surrounding buildings include various commercial businesses.
- 4) Boundary Lines
  - Boundary property lines are described and shown on Site Plan Review Application, *Section 5 – Topographic Map*.
- 5) Existing and Finished Grades
  - Existing building rests at a higher elevation when compared with the surrounding curb and gutters. Existing grades can be found as part of Site Plan Review Application, *Section 5 – Topographic Map*.
  - At present time there is not a full grading plan developed for the proposed project; however, it is the intent that the proposed project will maintain the existing drainage patterns into storm drainage system.
- 6) 100-yr Flood Plain
  - Site is located in shaded Zone “AE”. Please refer to Site Plan Review Application, *Section 5 – Topographic Map – Note 2*. If additional fill is needed to develop the site, mitigation will be required and provided by this project on site.
  - Additional information can be found as part of the Site Plan Review Application, Item I.D Flood Plain Information, page 4.
- 7) Size of Property and Dimensions
  - Site Plan Review Application, *Section 5 – Topographic Map* includes acreage of property, as well as dimensions between existing buildings and structures.
  - Project site is located within Urban Village Downtown District (UVD).

- Property boundary shows four sections of remainders of previously abandoned Right-of-Ways (see attached exhibit).

10' R.O.W. Vol.3, Pg 59 H.C.M.R.	1,500 SF - Fifth St
Remainder of a 25' R.O.W. Vol.3, PG 59 H.C.M.R.	300 SF - Spruce St
10' R.O.W. Vol.3, Pg 59 H.C.M.R.	873 SF - Bissonnet St
H.C.C.F No. S654878	2,750 SF - Bissonnet St

- Property owner is requesting the abandonment of these Right-of-Way remainders to be included as part of boundary limits. A total of 5,423 S.F. will be incorporated into the total boundary area.

8) Existing Structures

- Site Plan Review Application, *Section 5 – Topographic Map* includes existing building and structures within the property limits and its surroundings.

9) General Location of New Public Streets

- As described above, existing Right-of Way section encroaching the property are proposed to be abandoned and included as part of the project.
- Proposed project will include a total of six private commercial driveways. One facing Bissonnet Street, one facing Cedar Street, two facing Fifth Street and two facing Spruce Street. Refer to Site Plan Review Application, *Section 10 – Proposed Schematic Site Plan*
- The site will include sidewalks along all roadways that surround the proposed site.

10) Proposed Location of Buildings

- Existing buildings are at a higher elevation when compared with surrounding storm drainage collectors located along public roads. Existing drainage patterns will be maintained when draining proposed project.
- Existing drainage sheet flows to the existing surrounding Right-of-Way. The new project will drain the site internally and discharge to the existing storm sewer underground. Any increase in drainage will be detained on site prior to release to the public storm sewer system. The site is fully developed and approximately 96% impervious. Existing storm runoff is not expected to be increased due to proposed development.
- Per Site Plan Review Application, *Section 5 – Topographic Map*, there is remainder of 10' sanitary sewer easement and 10'x45' Utility Easement encroaching future development. Property owner is also requesting those two easements to be released by utility companies (see attached exhibit)
- On site circulation is provided by an easy to navigate parking garage which occupies the entire ground level, with a simple ramp to access the upper level. Sidewalk circulation is kept intact, and pedestrians can access the store via the pedestrian entry and walkway to the vertical circulation elements inside the store.
- Screening and buffering is provided along the entirety of the ground level, to screen the parking structure. There is also vegetative screening to hide the truck dock, as well as the compactor along Fifth and Cedar St.

## 11) Project Schedule

A. Total Site Area	3.179 acres	138,500 S.F.
Present time	3.055 acres	133,077 S.F.
Additional ROW to be abandoned	0.124 acres	5,423 S.F.

B. Total Floor Area	1.606 acres	70,000 S.F.
---------------------	-------------	-------------

### C. Lot Coverage Relative to Landscape Surface Area

Proposed project will maintain existing coverage conditions. Approximately 4% of the lot will include landscape area.

Ground level of the project will be covered by a deck structure, with the building located at the second floor. Large shrubbery will be considered at ground level to screen the loading dock. Landscape will be provided at second level with screening shrubbery and possible large potted trees.

#### D. Parking Summary

ADA Parking Spaces	11 PS
Standard Parking Spaces	361 PS
Loading Spaces	2 LS

### E. Height of Buildings and Structures

Parking Deck/Grocery Level	17' 6"
Parking Deck Screening	21' 6"
Pedestrian Tower Element	33' 0 1/2"
Roof Line	37' 6"
Secondary Towers	42' 3 1/2"
Main Tower	51' 6 1/2"

### F. Nonresidential Floor Area Ratio

70,000 S.F. / (138,500 S.F. x 2 floors)      0.25 SF Prop.Bldg/ SF Total project

## 12) Focal Points and Site Amenities

- The focal point of this project will be the pedestrian entry and tower element at the intersection of Cedar and Bissonnet Streets. It is the tallest element in the design and has a higher percentage of glazing than elsewhere in the design. It is also the highest point at which H-E-B signage is placed. Site amenities include a partially shaded sidewalk provided by canopies and a covered pedestrian entry.

### 13) Green Space and Public Parks

- No parks, green space, or other areas reserved for public use.

14) Proposed Building Elevation

- The facades change elevation no more than every 50' to break up the mass, and with the use of score lines, glazing, and material changes, there is no blank wall greater than 16'.
- Materials used include brick, limestone, and ground face masonry units to give the appearance of a traditional, well-built, and enduring building. Penetrations are varied as to not be repetitive, and heights have a specific hierarchy along the façade. Areas where glazing is not practical, brick relief work is employed to mimic the

pattern established along the façade to create visual interest and to continue the pattern. Every effort was made to create a design that was approachable from the human scale.

- Trees are grouped at key intersections in the façade, no more than 50', to further break up the mass of the building.

15) Landscape Plan

- Street trees are provided every 25'. Screening shrubbery between the height of 36" and 42" is used along the perimeter of the building to screen the parking garage. Tall shrubbery is also used to completely hide the compacter and truck dock. Groupings of trees appear approximately every 40'-50' along the façade to break up the mass of the building and add toward the tree planting requirement. As this proposal takes up the entirety of the site, potted trees are also provided on the upper level to satisfy the tree planting requirement.

16) Tree Disposition Plan for Preservation and Replacement Trees

- At present time, there are mainly three trees located within Right-of Way which are intended to be preserved and/or mitigated in compliance with City of Bellaire Code Ordinances

17) Name and Address of Landowner

- Landowner information is included as part of Site Plan Review Application, page 4.

18) Description and Available Documentation

- The Site Plan Review Application, pages 3 – 6 describes and includes the available documentation.

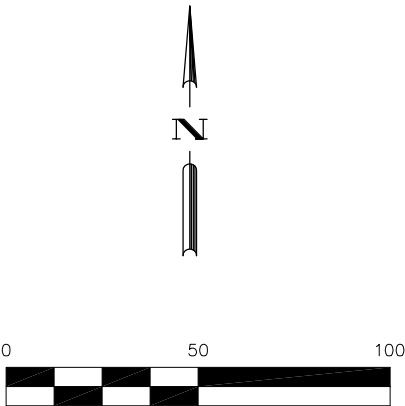
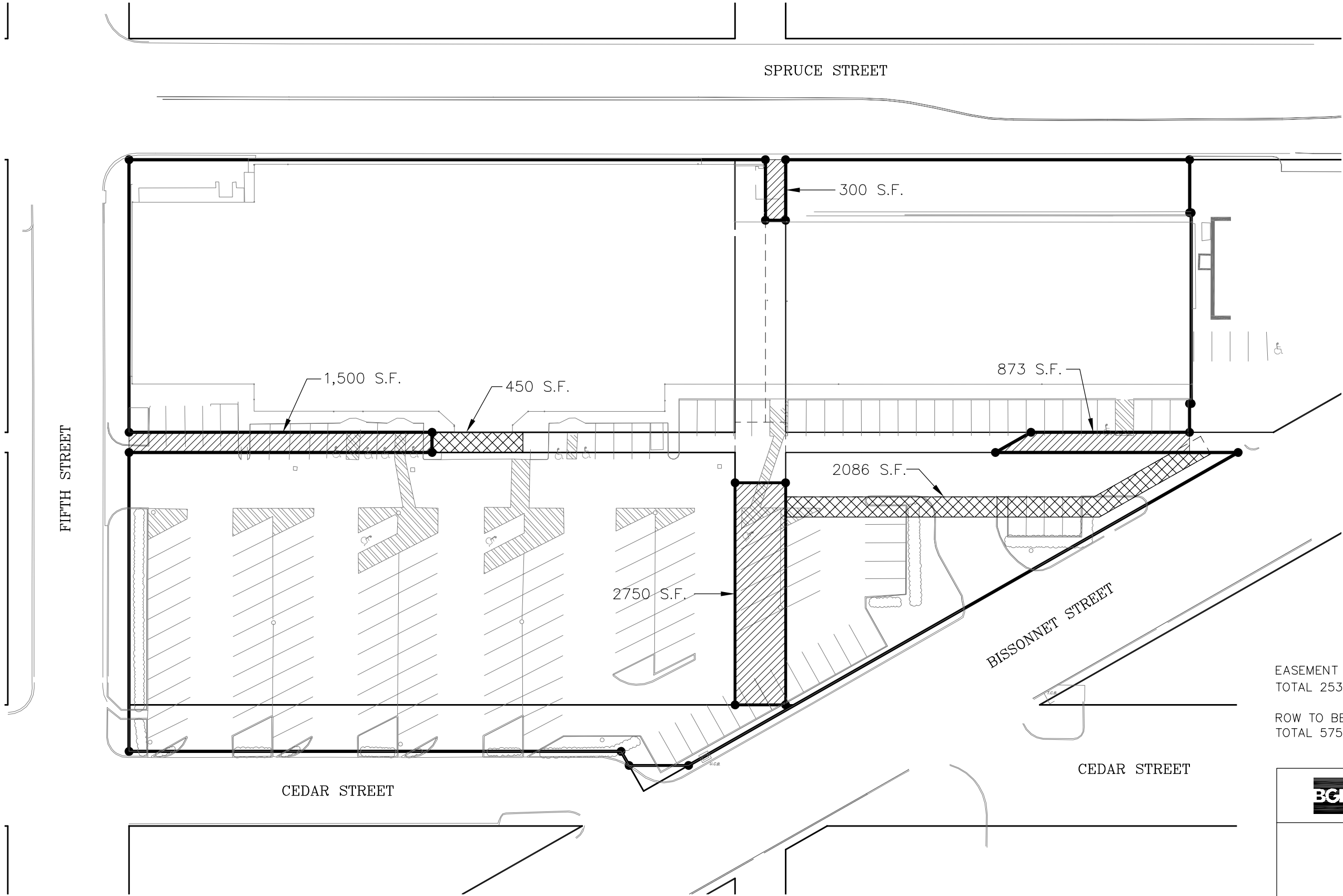
19) Analysis on Demand of City Utilities

- A summary analysis of existing water, sanitary sewer and drainage storm systems is included as part of the Site Plan Review Application report, pages 4 -5.

20) Traffic Impact Analysis

A preliminary Traffic Impact Analysis is included as part of Site Plan Review Application - *Section 13*. Brown & Gay Engineers, received a memorandum from Jones & Carter, Inc, dated February 5, 2015. Their recommendations will be addressed as follows:

- A. Proposed adjusted timing signal plans for the intersection of Bissonnet Street at South Rice Avenue, will be submitted to the City of Bellaire for review and final approval at during the permitting process.
- B. Proposed driveway located along Bissonnet Street will be relocated approximately 50' farther west to have a better alignment with the existing driveway along the south side of Bissonnet Street. Internal traffic circulation will be reviewed and coordinated with the private ramp location to avoid stacking of traffic along Bissonnet Street. Additional to the relocation the driveway, the development will consider adding a right-turn lane with a 100-ft storage and 100-ft taper.



LEGEND

- EASEMENT TO BE ABANDONED  
TOTAL 2536.27 SF
- ROW TO BE ABANDONED  
TOTAL 5750.69 SF

**BGE** Brown & Gay Engineers, Inc.  
10777 Westheimer, Suite 400, Houston, TX 77042  
Tel: 281-558-8700 • www.browngay.com  
TBPE Registration No. F-1046

EASEMENT  
AND ROW  
ABANDONMENT  
EXHIBIT

Scale: 1"=50'	Job No.: 8232-01	Date: 03/05/15	Exhibit: 1
------------------	---------------------	-------------------	---------------



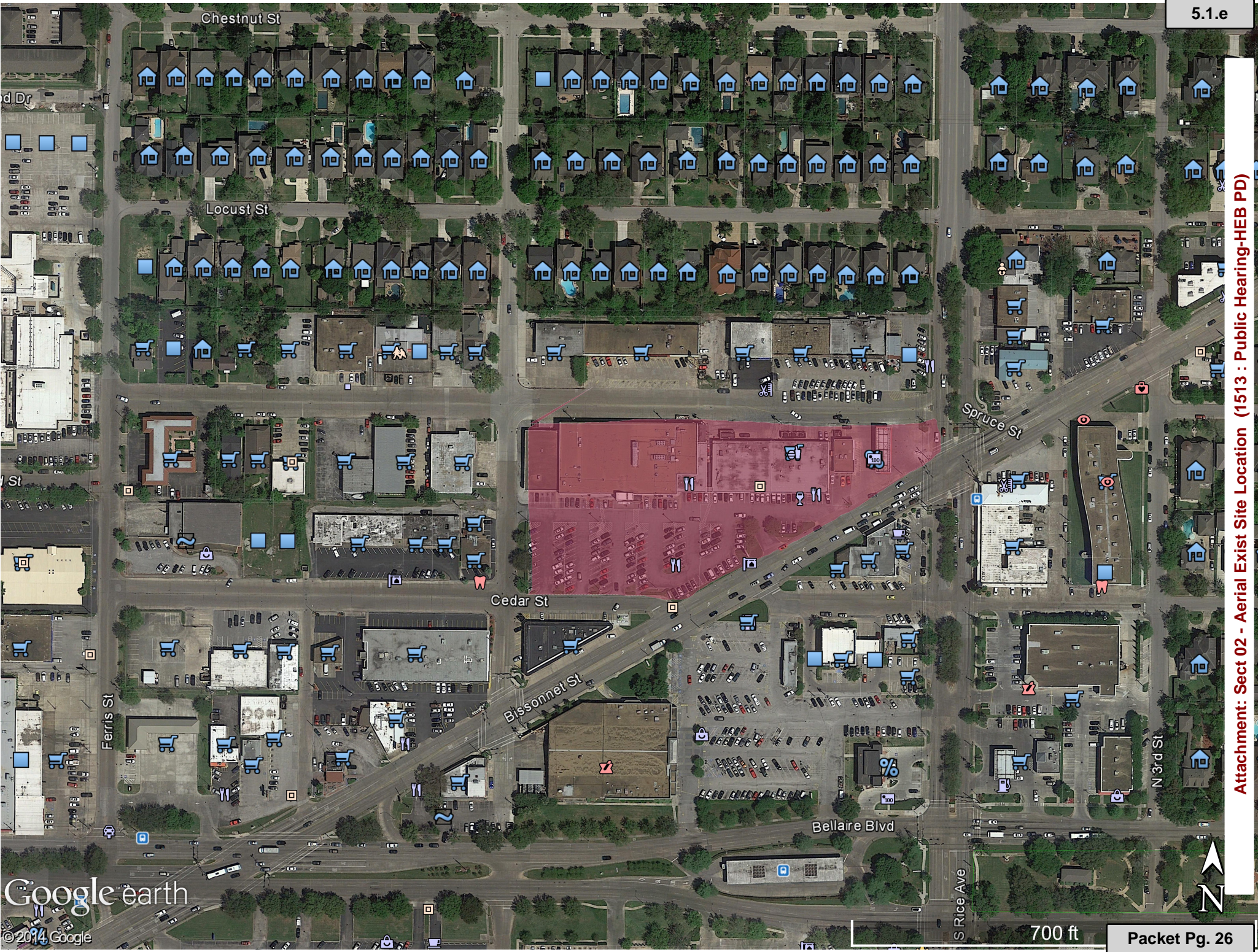
# VICINITY MAP

N.T.S.

KEY MAP PAGE NO. 531G

Attachment: Sect 01 - Vicinity (1513 : Public Hearing-HEB PD)

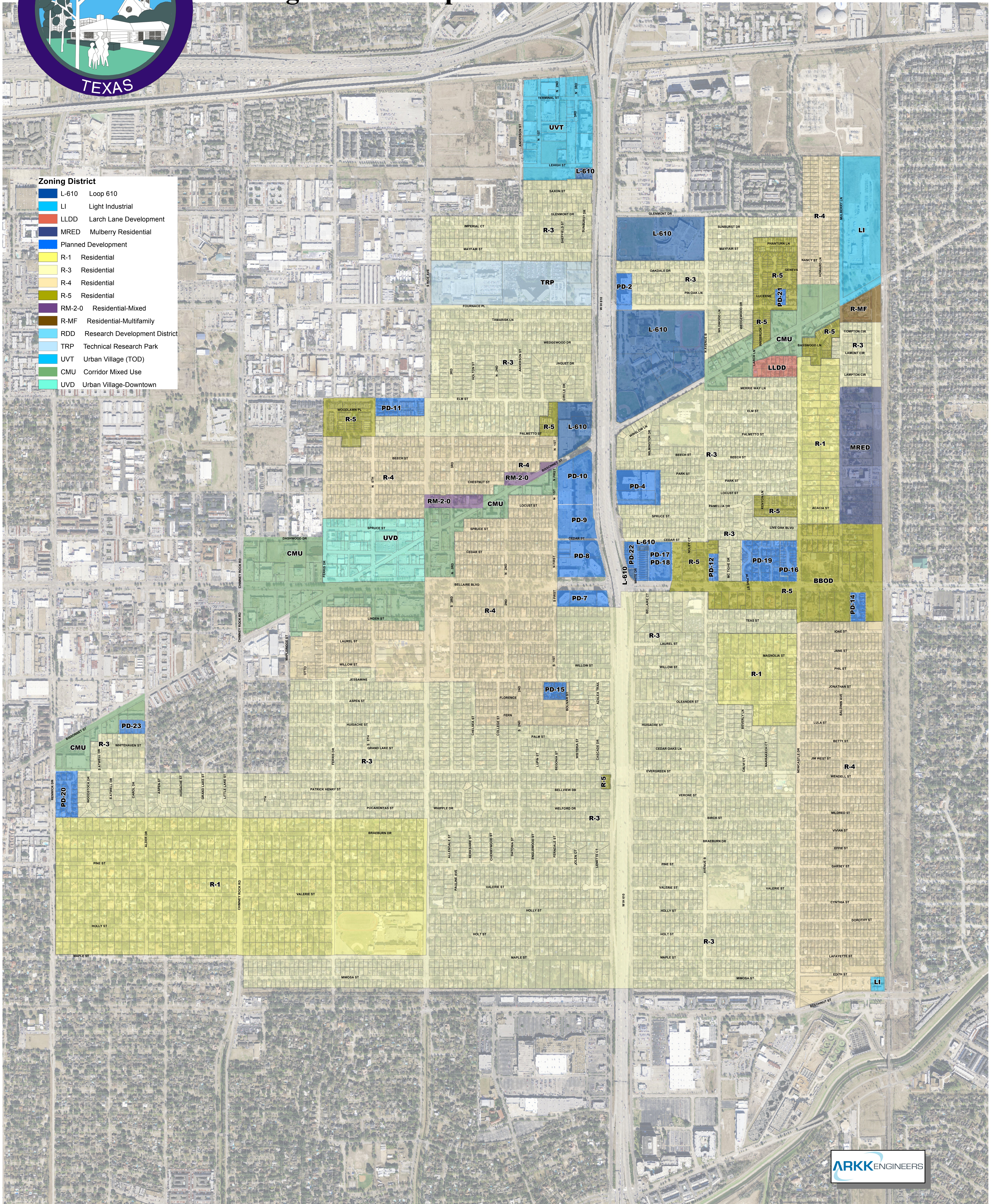
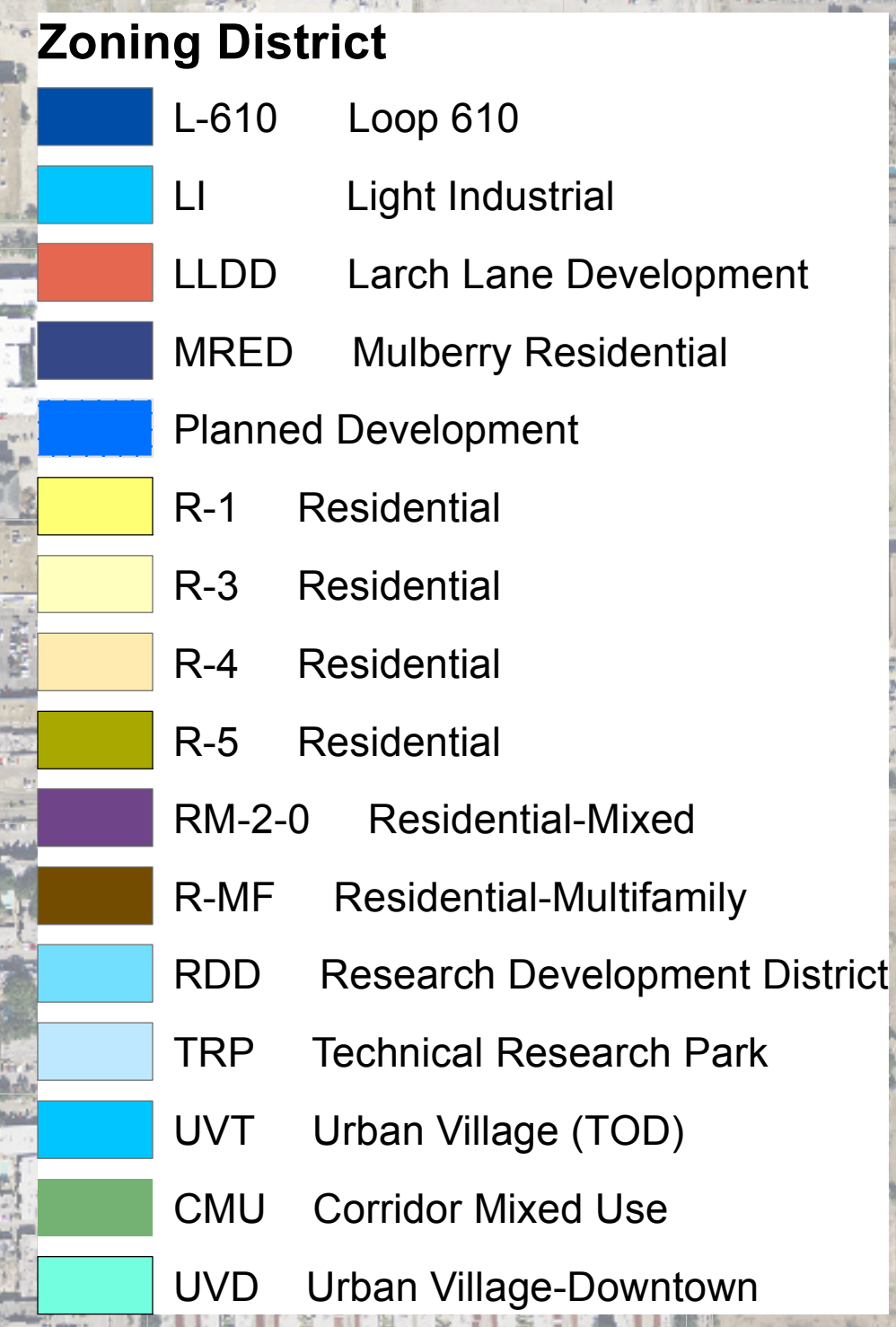
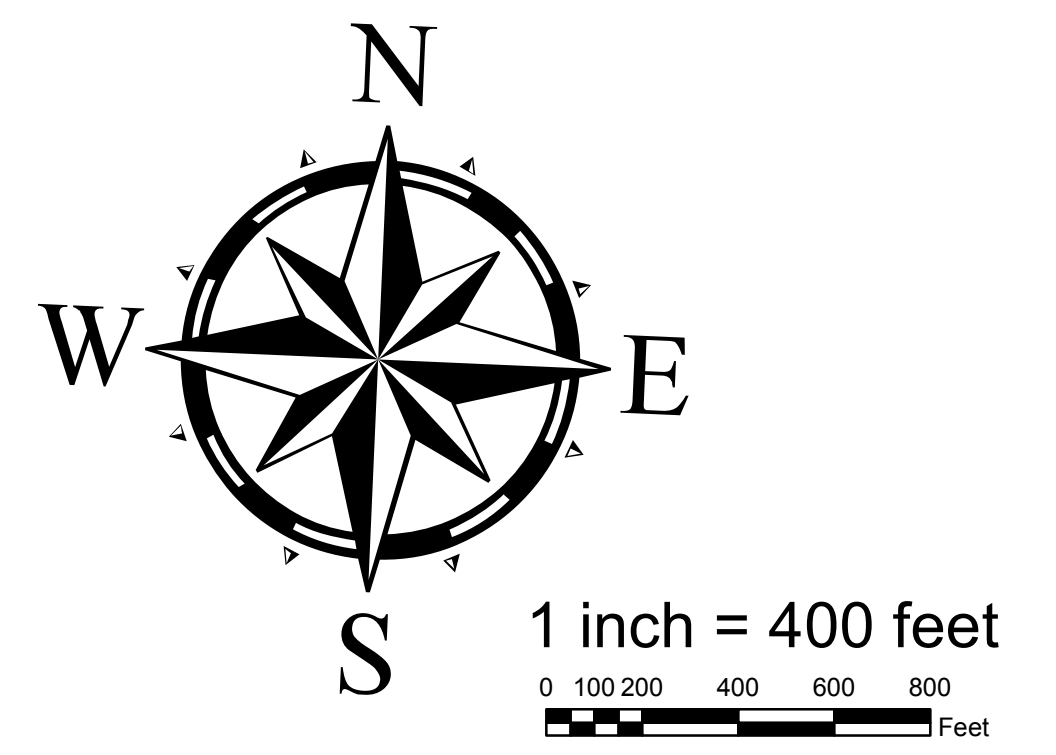




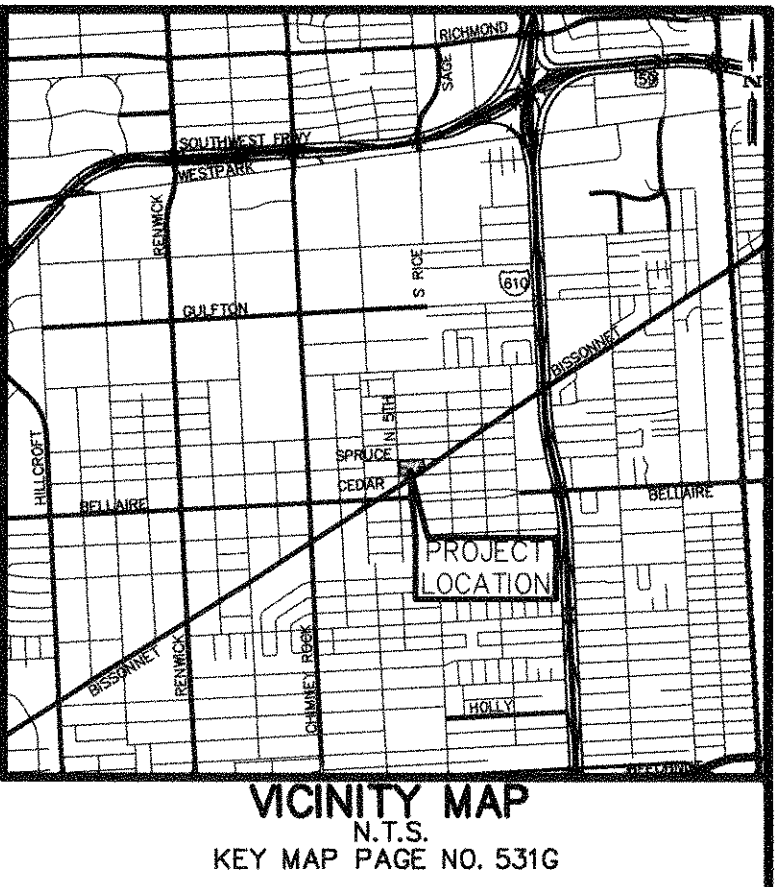
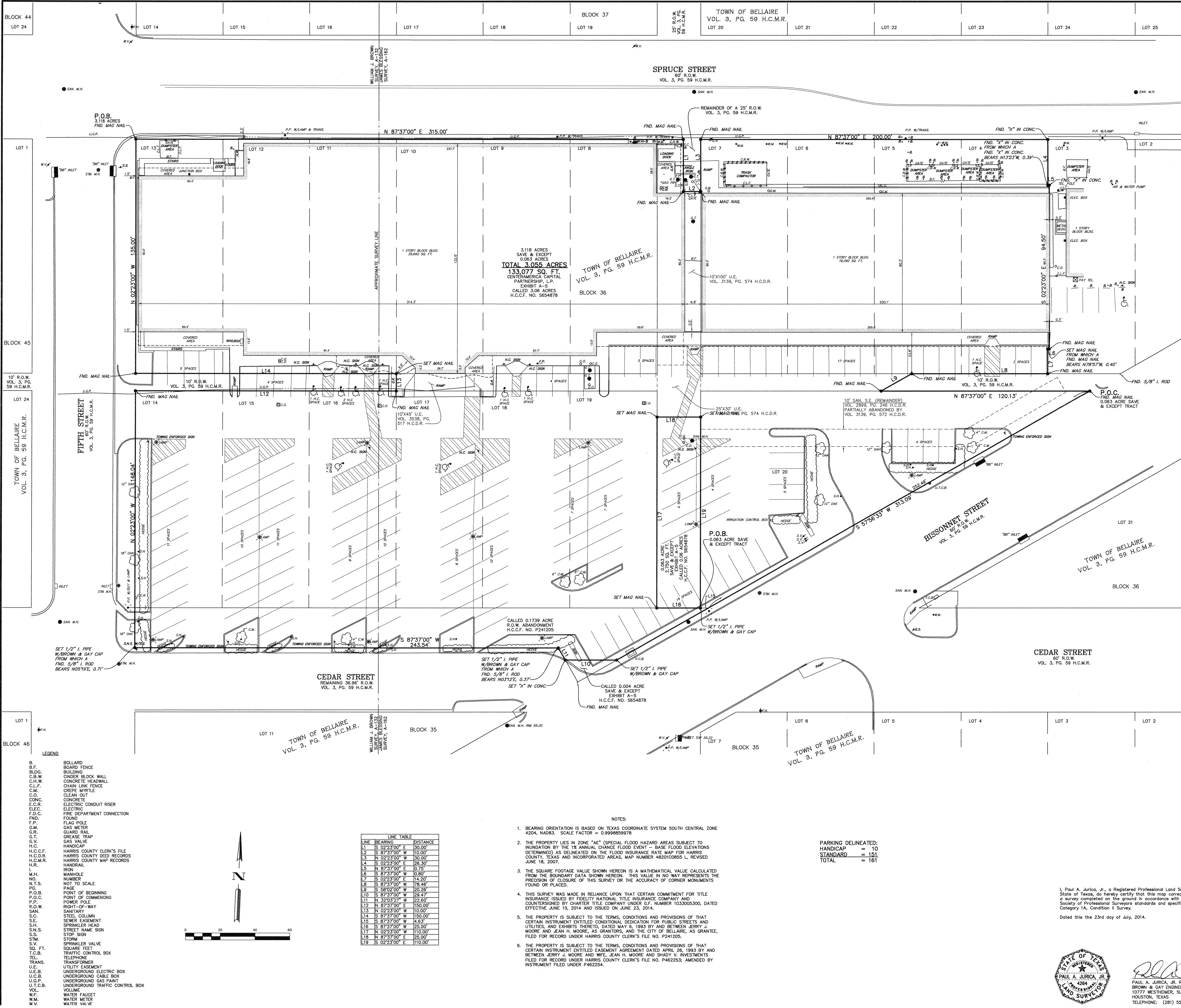


# City of Bellaire, Texas

## Zoning District Map







DESCRIPTION OF A 3.055 ACRE TRACT OF LAND SITUATED IN THE WILLIAM J. BROWN SURVEY, ABSTRACT NO. 132, AND THE JAMES BLESSING SURVEY, ABSTRACT NO. 162, CITY OF BELLAIRE, HARRIS COUNTY, TEXAS

BEGINNING AT A MAG Nail found on the south right-of-way line of Spruce Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R. and on the east right-of-way line of Fifth Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R. and being the northwest corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 315.00 feet along the south right-of-way line of said Spruce Street to a MAG Nail found on the west line of the remainder of a 25 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 02°23'00" E, a distance of 30.00 feet along the west line of the remainder of said 25 foot wide right-of-way to a MAG Nail found for the northeast corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 10.00 feet over and across said 25 foot wide right-of-way to a MAG Nail found on the east line of said 25 foot wide right-of-way and an interior corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 30.00 feet along the east line of said 25 foot wide right-of-way to a MAG Nail found on the south right-of-way line of said Spruce Street;

THENCE, N 87°37'00" E, a distance of 200.00 feet along the south right-of-way line of said Spruce Street to an "X" in concrete found for the northeast corner of the herein described tract;

THENCE, along the easterly lines of said 3.06 acre tract the following courses and distances:

S 02°23'00" E, a distance of 26.30 feet to an "X" in concrete found for and interior corner of the herein described tract, from which a found "X" in concrete bears N 13°23' W, 0.39 feet;

N 87°37'00" E, a distance of 0.75 feet to an "X" in concrete found for corner;

S 02°23'00" W, a distance of 94.50 feet to a MAG Nail found for corner;

S 87°37'00" W, a distance of 0.80 feet to a MAG Nail set for and interior corner of the herein described tract;

S 02°23'00" E, a distance of 14.20 feet to a MAG Nail found on a north line of a 10 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 87°37'00" W, a distance of 78.46 feet along a north line of said 10 foot wide right-of-way to a MAG Nail found for an interior corner of the herein described tract;

THENCE, S 58°02'00" W, a distance of 20.26 feet over and across said 10 foot wide right-of-way to a MAG Nail found on a south line of said 10 foot wide right-of-way and being an interior corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 120.13 feet along a south line of said 10 foot wide right-of-way to a MAG Nail found on the northwest right-of-way line of Bissonnet Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 57°56'33" W, a distance of 313.09 feet along the northwest right-of-way line of said Bissonnet Street to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" found on the north right-of-way line of the remainder of Cedar Street (width varies) recorded under Volume 3, Page 59 H.C.M.R. and being the most southerly southeast corner of the herein described tract;

THENCE, along the northerly right-of-way of said Cedar Street the following courses and distances:

S 87°37'00" W, a distance of 29.47 feet to a "X" in concrete set for the most southerly southwest corner of the herein described tract;

N 32°03'27" W, a distance of 8.01 feet to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" set for an interior corner of the herein described tract, from which a found 5/8-inch iron rod bears N 03°12' E, 0.37 feet;

S 87°37'00" W, a distance of 243.54 feet to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" set on the east right-of-way line of said Fifth Street and being the southwest corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 148.04 feet along the east right-of-way line of said Fifth Street to a MAG Nail found in a south line of said 10 foot wide right-of-way;

THENCE, N 87°37'00" E, a distance of 150.00 feet along a south line of said 10 foot wide right-of-way to a MAG Nail found for an interior corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 10.00 feet over and across said 10 foot wide right-of-way to a MAG Nail set on a north line of said 10 foot wide right-of-way and being an interior corner of the herein described tract;

THENCE, S 87°37'00" W, a distance of 150.00 feet along a north right-of-way line of said 10 foot wide right-of-way to a MAG Nail found on the east right-of-way line of said Fifth Street;

THENCE, N 02°23'00" W, a distance of 135.00 feet along the east right-of-way line of said Fifth Street to the POINT OF BEGINNING and containing 3.118 acres (135,627 square feet) of land, SAVE & EXCEPT A 0.063 acre tract of land being on a south line of a 10 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R. and being the southeast corner of the herein described tract;

THENCE, S 57°56'33" W, a distance of 252.49 feet along the northwest right-of-way line of said Bissonnet Street to the northeast corner of a called 0.1739 acre tract of land described as a right-of-way abandonment for Cedar Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 87°37'00" W, a distance of 4.63 feet along the north line of said 0.1739 acre tract to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" set on the east line of a 25 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R. for the POINT OF BEGINNING and being the southeast corner of the herein described tract;

THENCE, S 87°37'00" W, a distance of 25.00 feet along the north line of said 0.1739 acre tract to a MAG Nail set on the west line of said 25 foot wide right-of-way and being the southwest corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 110.00 feet along the west line of said 25 foot wide right-of-way to a MAG Nail set for the northeast corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 25.00 feet over and across said 25 foot wide right-of-way to a MAG Nail set on the east line of said 25 foot wide right-of-way and being the northeast corner of the herein described tract;

THENCE, S 02°23'00" E, a distance of 110.00 feet along the east line of said 25 foot wide right-of-way to the POINT OF BEGINNING and containing 0.063 acres (2,750 square feet) of land.

The herein described 3.118 acre tract Save & Except the herein described 0.063 acre tract combine for a net total of 3.055 acres of land.

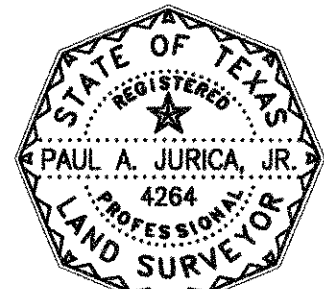
NOTES:

- BEARING ORIENTATION IS BASED ON TEXAS COORDINATE SYSTEM SOUTH CENTRAL ZONE 4204, NAD83. SCALE FACTOR = 0.9998859978
- THE PROPERTY LIES IN ZONE "AE" (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT - BASE FLOOD ELEVATIONS DETERMINED) AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR HARRIS COUNTY, TEXAS AND INCORPORATED AREAS, MAP NUMBER 48201C0855 L, REVISED JUNE 18, 2007.
- THE SQUARE FOOTAGE VALUE SHOWN HEREON IS A MATHEMATICAL VALUE CALCULATED FROM THE BOUNDARY DATA SHOWN HEREON. THIS VALUE IN NO WAY REPRESENTS THE PRECISION OF CLOSURE OF THIS SURVEY OR THE ACCURACY OF CORNER MONUMENTS FOUND OR PLACED.
- THIS SURVEY WAS MADE IN RELIANCE UPON THAT CERTAIN COMMITMENT FOR TITLE INSURANCE ISSUED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY AND COUNTERSIGNED BY CHARTER TITLE COMPANY UNDER O.F. NUMBER 1033005300, DATED EFFECTIVE JUNE 15, 2014 AND ISSUED ON JUNE 23, 2014.
- THE PROPERTY IS SUBJECT TO THE TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN INSTRUMENT ENTITLED "EASEMENT AGREEMENT DATED APRIL 26, 1993 BY AND BETWEEN JERRY J. MOORE AND WIFE, JEAN H. MOORE AND SHADY V. INVESTMENTS FILED FOR RECORD UNDER HARRIS COUNTY CLERK'S FILE NO. P462253; AMENDED BY INSTRUMENT FILED UNDER P462254.
- THE PROPERTY IS SUBJECT TO THE TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN INSTRUMENT ENTITLED "EASEMENT AGREEMENT DATED APRIL 26, 1993 BY AND BETWEEN JERRY J. MOORE AND WIFE, JEAN H. MOORE AND SHADY V. INVESTMENTS FILED FOR RECORD UNDER HARRIS COUNTY CLERK'S FILE NO. P462253; AMENDED BY INSTRUMENT FILED UNDER P462254.

PARKING DELINEATED:  
HANDICAP = 10  
STANDARD = 151  
TOTAL = 161

I, Paul A. Jurica, Jr., a Registered Professional Land Surveyor of the State of Texas, do hereby certify that this map correctly represents a survey completed on the ground in accordance with the Texas Society of Professional Surveyors standards and specifications for a Category 1A, Condition II Survey.

Dated this 23rd day of July, 2014.



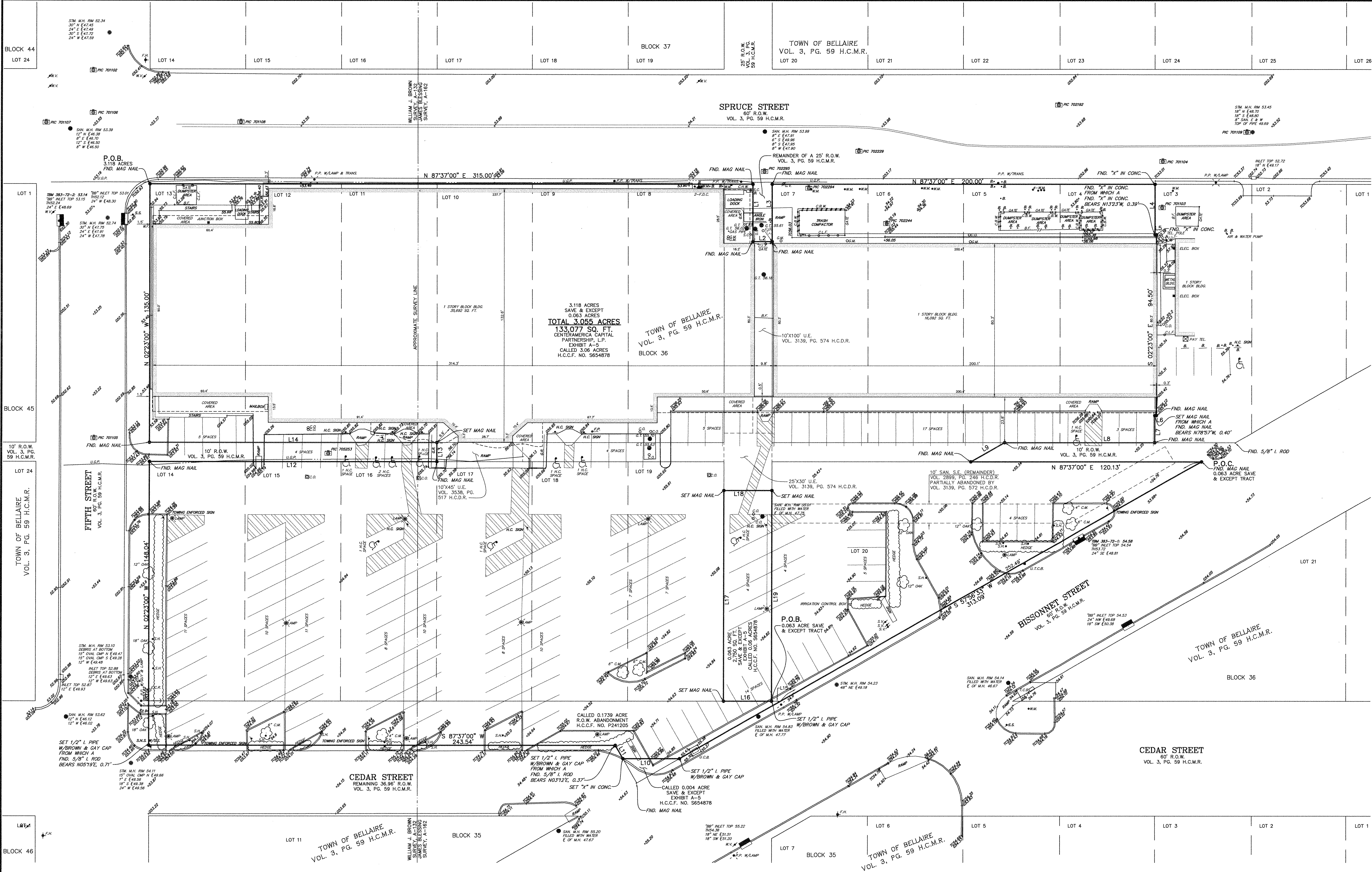
PAUL A. JURICA, JR. R.P.L.S. No. 4264  
BROWN & GAY ENGINEERS, INC.  
10777 WESTMEIER, SUITE 400  
HOUSTON, TEXAS 77042  
TELEPHONE: (281) 558-8700

**BROWN & GAY ENGINEERS, INC.**  
10777 Westmeier, Suite 400, Houston, TX 77042  
Tel: 281-558-8700 Fax: 281-558-8701  
Civil Engineers and Surveyors  
TBPUS Licensed Surveying Firm No. 10108500

**BOUNDARY SURVEY OF A 3.055 ACRE TRACT OF LAND SITUATED IN THE WILLIAM J. BROWN SURVEY, A-132 AND THE JAMES BLESSING SURVEY, A-162 CITY OF BELLAIRE HARRIS COUNTY, TEXAS**

PARTY CHIEF: P.M. ISSUE DATE: JULY 23, 2014  
TECHNICIAN: S.T. SCALE: 1" = 20'  
R.P.L.S.: P.A.J. JOB NUMBER: 2823-01  
FIELD BOOK NAME: MISC 383  
BASE FILE: X:\BIB\2823-01\_BES\_S\_Tec\_Batdra\





VICINITY MAP  
KEY MAP PAGE NO. 5316

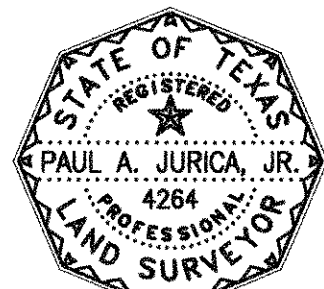
- LEGEND
- B. BOLLARD
  - B.F. BOARD FENCE
  - B.L. BUILDING
  - C.B.W. CONCRETE BLOCK WALL
  - C.H.W. CONCRETE HEADWALL
  - C.L.F. CHAIN LINK FENCE
  - C.M. CREPE MYRTLE
  - C.O. CLEAN OUT
  - C.C. CONCRETE
  - E.C.R. ELECTRIC CONDUIT RISER
  - E.E. ELECTRIC
  - F.D.C. FIRE DEPARTMENT CONNECTION
  - F.F. FOUND
  - F.P. FLAG POLE
  - G.M. GAS METER
  - G.R. GUARD RAIL
  - G.T. GREASE TRAP
  - G.V. GAS VALVE
  - H.C.F. HANDICAP
  - H.C.D.R. HARRIS COUNTY DEED RECORDS
  - H.C.M.R. HARRIS COUNTY MAP RECORDS
  - H.R. HANDRAIL
  - I. IRON
  - M.H. MANHOLE
  - N. NOT TO SCALE
  - N.T.S. NOT TO SCALE
  - P.B. POINT OF BEGINNING
  - P.O.C. POINT OF COMMENCING
  - P.P. POWER POLE
  - R.O.W. RIGHT-OF-WAY
  - SAN. SANITARY
  - S.C. STEEL COLUMN
  - S.E. SEWER EASEMENT
  - S.H. SPRINKLER HEAD
  - S.N.S. STREET NAME SIGN
  - S.S. STOP SIGN
  - STL. STORM
  - S.V. SPRINKLER VALVE
  - SQ. FT. SQUARE FEET
  - T.C.B. TRAFFIC CONTROL BOX
  - TEL. TELEPHONE
  - TRANS. TRANSFORMER
  - U.E. UTILITY EASEMENT
  - U.E.B. UNDERGROUND ELECTRIC BOX
  - U.C.B. UNDERGROUND CABLE BOX
  - U.G.P. UNDERGROUND GAS PUMP
  - U.T.C.B. UNDERGROUND TRAFFIC CONTROL BOX
  - VOL. VOLUME
  - W.F. WATER FAUCET
  - W.M. WATER METER
  - W.V. WATER VALVE

- NOTES:
- BEARING ORIENTATION IS BASED ON TEXAS COORDINATE SYSTEM SOUTH CENTRAL ZONE 4204, NAD83. SCALE FACTOR = 0.9998859978
  - THE PROPERTY LIES IN ZONE "AE" (SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT) - BASE FLOOD ELEVATIONS DETERMINED AS DELINEATED ON THE FLOOD INSURANCE RATE MAP FOR HARRIS COUNTY, TEXAS AND INCORPORATED AREAS, MAP NUMBER 480210085.1, REVISED JUNE 18, 2007.
  - THE SQUARE FOOTAGE VALUE SHOWN HEREON IS A MATHEMATICAL VALUE CALCULATED FROM THE BOUNDARY DATA SHOWN HEREON. THIS VALUE IN NO WAY REPRESENTS THE PRECISION OF CLOSURE OF THIS SURVEY OR THE ACCURACY OF CORNER MONUMENTS FOUND OR PLACED.
  - THIS SURVEY WAS MADE IN RELIANCE UPON THAT CERTAIN COMMITMENT FOR TITLE INSURANCE ISSUED BY FIDELITY NATIONAL TITLE INSURANCE COMPANY AND COUNTERSIGNED BY CHARTER TITLE COMPANY UNDER G.F. NUMBER 1033005300, DATED EFFECTIVE JUNE 15, 2014 AND ISSUED ON JUNE 23, 2014.
  - THE PROPERTY IS SUBJECT TO THE TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN INSTRUMENT ENTITLED "CONDITIONAL DEDICATION FOR PUBLIC STREETS AND UTILITIES, AND EXHIBITS THERETO, DATED MAY 6, 1993 BY AND BETWEEN JERRY J. MOORE AND JEAN H. MOORE, AS GRANTORS, AND THE CITY OF BELLAIRE, AS GRANTEE, FILED FOR RECORD UNDER HARRIS COUNTY CLERK'S FILE NO. 7241205.
  - THE PROPERTY IS SUBJECT TO THE TERMS, CONDITIONS AND PROVISIONS OF THAT CERTAIN INSTRUMENT ENTITLED "EASEMENT AGREEMENT DATED APRIL 26, 1993 BY AND BETWEEN JERRY J. MOORE AND WIFE, JEAN H. MOORE AND SHADY V. INVESTMENTS FILED FOR RECORD UNDER HARRIS COUNTY CLERK'S FILE NO. 7462253, AMENDED BY INSTRUMENT FILED UNDER 7462254.

LINE	BEARING	DISTANCE
L1	S 02°23'00" E	30.00'
L2	S 87°37'00" W	10.00'
L3	N 02°23'00" E	30.00'
L4	S 02°23'00" E	28.30'
L5	N 87°37'00" E	0.75'
L6	S 87°37'00" W	0.60'
L7	S 02°23'00" E	14.20'
L8	S 87°37'00" W	78.46'
L9	S 58°02'00" W	20.28'
L10	S 87°37'00" W	29.47'
L11	N 32°03'27" W	22.60'
L12	N 87°37'00" E	150.00'
L13	N 02°23'00" E	10.00'
L14	S 87°37'00" W	150.00'
L15	S 87°37'00" W	4.83'
L16	S 87°37'00" W	25.00'
L17	N 02°23'00" W	110.00'
L18	N 87°37'00" E	25.00'
L19	S 02°23'00" E	110.00'

- BENCHMARKS:
- BENCHMARK 15: BRASS DISK IN CONCRETE, STAMPED "BM15" LOCATED ON TOP OF "BB" INLET ON EAST SIDE OF SOUTH RICE AVENUE BETWEEN WEST BOUND AND EAST BOUND LANES OF BELLAIRE BOULEVARD. NAVD 88, 2011 ADJUSTMENT ELEVATION = 54.66 FEET
- TBM 383-72-1: BOX CUT ON TOP OF "BB" INLET LOCATED ON THE NORTHWEST SIDE OF BISSENET STREET BEING THE FIRST INLET SOUTHWEST OF THE INTERSECTION OF SOUTH RICE AVENUE AND BISSENET STREET. ELEVATION = 54.58 FEET
- TBM 383-72-2: BOX CUT ON TOP OF "BB" INLET LOCATED ON THE WEST SIDE OF FIFTH AVENUE BEING THE FIRST INLET SOUTH OF THE INTERSECTION OF SPRUCE STREET AND FIFTH STREET. ELEVATION = 53.14 FEET

PARKING DELINEATED:  
HANDICAP = 10  
STANDARD = 151  
TOTAL = 161



PAUL A. JURICA, JR., RPLS NO. 4364  
BROWN & GAY ENGINEERS, INC.  
10777 WESTHEIMER, SUITE 400  
HOUSTON, TEXAS 77042  
TELEPHONE: (281) 558-8700

**BROWN & GAY ENGINEERS, INC.**  
10777 Westheimer, Suite 400, Houston, TX 77042  
Tel: 281-558-8700 Fax: 281-558-8701  
www.brownandgay.com  
TSPS License Surveying Firm No. 10705500

**TOPOGRAPHIC MAP OF 3.055 ACRE TRACT OF LAND SITUATED IN THE WILLIAM J. BROWN SURVEY, A-132 AND THE JAMES BLESSING SURVEY, A-162 CITY OF BELLAIRE HARRIS COUNTY, TEXAS**

PARTY CHIEF: P.M. ISSUE DATE: JULY 23, 2014  
TECHNICIAN: S.T. SCALE: 1" = 20'  
R.P.L.S.: P.A.J. JOB NUMBER: 2823-01 SHEET 1  
FIELD BOOK NAME: MISC 383 OF 1  
BASE FILE: X:\HEB\2823-01\HEB-3\_Rice\_Bellaire\HEB-3\_055 Topo\000000001.dwg



## *Charter Title Company*

811 Main Street, Suite 3675, Houston, TX 77002

The attached title insurance commitment contains information which has been obtained or derived from records and information owned by Title Data, Inc. or one of its subsidiaries (collectively "Title Data"). Title Data owns and maintains land title plants for various Texas counties. Title Data created its title plants through the investment of extensive time, labor, skill and money. **The information contained in the title plants is protected by federal copyright law and Texas common law on trade secrets and contract.**

Title Data has granted our company a license to use one or more of its title plants. Our company's right to access and use Title Data's title plants is governed by our contract with Title Data. Our contract with Title Data restricts who can receive and/or use a title insurance commitment which is based, in whole or in part, upon Title Data's records and information.

Under the terms of our contract with Title Data, we are permitted to provide you with the attached title insurance commitment **for limited use and distribution only**. Specifically, you are sublicensed to deliver, exhibit, or furnish the attached title insurance commitment (or any copies thereof) **ONLY** to your bona fide employees and a third party who is playing a bona fide role in this proposed real estate transaction, including a lawyer, a lender, a surveyor, a real estate broker or agent, and the parties to this proposed transaction.

For purposes of our agreement with Title Data, "deliver, exhibit, or furnish" includes, without limitation, copying this title insurance commitment (whether such copying be by means of a photocopier, facsimile machine, another electronic scanning device, or any other method of reproduction) and providing such copy to any third party.

Your furnishing of the attached title insurance commitment to anyone not specifically enumerated above is not permitted by our contract with Title Data and constitutes a breach of our sublicense to you. Your furnishing of the attached title insurance commitment to anyone not specifically enumerated above is also a violation of federal copyright law and Texas common law.

Therefore, as an express condition of us providing you with the attached title insurance commitment, you specifically agree to limit its uses to those set forth herein, and to provide a copy of this letter to any party to whom you deliver, exhibit, or furnish the attached title insurance commitment (or any copies thereof).

In the event you are unable or unwilling to comply with these conditions, immediately return the attached title insurance commitment to our company, without reviewing, copying, or otherwise utilizing in any way the information contained therein.

**A COPY OF THIS LETTER MUST ACCOMPANY THE ATTACHED TITLE INSURANCE COMMITMENT AT ALL TIMES. ALL DOWNSTREAM RECIPIENTS MUST PROVIDE A COPY OF THIS LETTER TO ANY OTHER AUTHORIZED USERS OF THE ATTACHED TITLE INSURANCE COMMITMENT.**

## COMMITMENT FOR TITLE INSURANCE

Issued by **Fidelity National Title Insurance Company**



THE FOLLOWING COMMITMENT FOR TITLE INSURANCE IS NOT VALID UNLESS YOUR NAME AND THE POLICY AMOUNT ARE SHOWN IN SCHEDULE A, AND OUR AUTHORIZED REPRESENTATIVE HAS COUNTERSIGNED BELOW.

We (FIDELITY NATIONAL TITLE INSURANCE COMPANY, a California corporation) will issue our title insurance policy or policies (the Policy) to You (the proposed insured) upon payment of the premium and other charges due, and compliance with the requirements in Schedule C. Our Policy will be in the form approved by the Texas Department of Insurance at the date of issuance, and will insure your interest in the land described in Schedule A. The estimated premium for our Policy and applicable endorsements is shown on Schedule D. There may be additional charges such as recording fees, and expedited delivery expenses.

This Commitment ends ninety (90) days from the effective date, unless the Policy is issued sooner, or failure to issue the Policy is our fault. Our liability and obligations to you are under the express terms of this Commitment and end when this Commitment expires.

**Charter Title Company**  
**811 Main Street, Suite 3675**  
**Houston, TX 77002**  
**713-222-6060**

### FIDELITY NATIONAL TITLE INSURANCE COMPANY

By:

President

Attest  
:

Secretary



\_\_\_\_\_  
 Authorized Officer or Agent

### CONDITIONS AND STIPULATIONS

1. If you have actual knowledge of any matter which may affect the title or mortgage covered by this Commitment, that is not shown in Schedule B, you must notify us in writing. If you do not notify us in writing, our liability to you is ended or reduced to the extent that your failure to notify us affects our liability. If you do notify us, or we learn of such matter, we may amend Schedule B, but we will not be relieved of liability already incurred.
2. Our liability is only to you, and others who are included in the definition of Insured in the Policy to be issued. Our liability is only for actual loss incurred in your reliance on this Commitment to comply with its requirements, or to acquire the interest in the land. Our liability is limited to the amount shown in Schedule A of this Commitment and will be subject to the following terms of the Policy: Insuring Provisions, Conditions and Stipulations, and Exclusions.

Attachment: Sect 06 - Title (1513 : Public Hearing-HEB PD)

**COMMITMENT FOR TITLE INSURANCE****SCHEDULE A**Effective Date: **January 19, 2015**

GF. No. 1033005300

Commitment No.: Not Applicable issued: **January 22, 2015**  
(if applicable)

1. The policy or policies to be issued are:
  - (a) OWNER'S POLICY OF TITLE INSURANCE (Form T-1)  
(Not applicable for improved one-to-four family residential real estate)  
Policy Amount:  
PROPOSED INSURED:
  - (b) TEXAS RESIDENTIAL OWNER'S POLICY OF TITLE INSURANCE -  
ONE-TO-FOUR FAMILY RESIDENCES (Form T-1R)  
Policy Amount:  
PROPOSED INSURED: **HEB Grocery Company, LP**
  - (c) LOAN POLICY OF TITLE INSURANCE (Form T-2)  
Policy Amount:  
PROPOSED INSURED:  
Proposed Borrower: **HEB Grocery Company, LP**
  - (d) TEXAS SHORT FORM RESIDENTIAL LOAN POLICY OF TITLE INSURANCE (Form T-2R)  
Policy Amount:  
PROPOSED INSURED:  
Proposed Borrower:
  - (e) LOAN TITLE POLICY BINDER ON INTERIM CONSTRUCTION LOAN (Form T-13)  
Binder Amount:  
PROPOSED INSURED:  
Proposed Borrower:
  - (f) OTHER  
Policy Amount:  
PROPOSED INSURED:
2. The interest in the land covered by this Commitment is:  
**LEASEHOLD ESTATE**
3. Record title to the land on the Effective Date appears to be vested in:  
  
**CENTRO NP HOLDINGS 12 SPE, LLC**
4. Legal description of land:

**Leasehold Esttae created and defined by that certain Lease Agreement, dated \_\_\_\_\_, by and between Brixmor Holdings 12 SPE, LLC, as Landlord, and HEB Groecery Company, LP, as Tenant, evidenced by Memorandum of Lease recorded under Document No. \_\_\_\_ of the Official Public Records of Harris County, Texas, and being more particularly described by Exhibit "A" attached hereto.**

***Note: The Company is prohibited from insuring the area or quantity of the Land. Any statement in the legal description contained in Schedule A as to area or quantity of land is not a representation that such area or quantity is correct but is for informal identification purposes and does not override Item 2 of Schedule B hereof.***

Attachment: Sect 06 - Title (1513 : Public Hearing-HEB PD)

**SCHEDULE B****EXCEPTIONS FROM COVERAGE**

In addition to the Exclusions and Conditions and Stipulations, your Policy will not cover loss, costs, attorneys' fees, and expenses resulting from:

1. Item 1, Schedule B is hereby deleted in its entirety.
2. Any discrepancies, conflicts, or shortages in area or boundary lines, or any encroachments or protrusions, or any overlapping of improvements.
3. Homestead or community property or survivorship rights, if any, of any spouse of any insured. (Applies to the Owner's Policy only).
4. Any titles or rights asserted by anyone, including, but not limited to, persons, the public, corporations, governments or other entities,
  - a. to tidelands, or lands comprising the shores or beds of navigable or perennial rivers and streams, lakes, bays, gulfs or oceans, or
  - b. to lands beyond the line of harbor or bulkhead lines as established or changed by any government, or
  - c. to filled-in lands, or artificial islands, or
  - d. to statutory water rights, including riparian rights, or
  - e. to the area extending from the line of mean low tide to the line of vegetation, or the rights of access to that area or easement along and across that area.
 (Applies to the Owner's Policy only.)
5. Standby fees, taxes and assessments by any taxing authority for the year **2015**, and subsequent years; and subsequent taxes and assessments by any taxing authority for prior years due to change in land usage or ownership, but not those taxes or assessments for prior years because of an exemption granted to a previous owner of the property under Section 11.13, *Texas Tax Code*, or because of improvements not assessed for a previous tax year. (If Texas Short Form Residential Loan Policy (T-2R) is issued, that policy will substitute "which become due and payable subsequent to Date of Policy" in lieu of "for the year **2015**, and subsequent years.")
6. The terms and conditions of the documents creating your interest in the land.
7. Materials furnished or labor performed in connection with planned construction before signing and delivering the lien document described in Schedule A, if the land is part of the homestead of the owner. (Applies to the Loan Title Policy Binder on Interim Construction Loan only, and may be deleted if satisfactory evidence is furnished to us before a binder is issued.)
8. Liens and leases that affect the title to the land, but that are subordinate to the lien of the insured mortgage. (Applies to Loan Policy (T-2) only.)
9. The Exceptions from Coverage and Express Insurance in Schedule B of the Texas Short Form Residential Loan Policy (T-2R). (Applies to Texas Short Form Residential Loan Policy (T-2R) only. Separate exceptions 1 through 8 of this Schedule B do not apply to the Texas Short Form Residential Loan Policy (T-2R).)
10. The following matters and all terms of the documents creating or offering evidence of the matters (We must insert matters or delete this exception.):

**a. DELETED**

- b. A ten foot (10') sewer easement as set forth in instrument dated January 20, 1955, recorded in Volume 2899, Page 246 of the Deed Records of Harris County, Texas, from Gerhard Herzog to the City of Bellaire, less and except therefrom that portion thereof described in Quitclaim Deed from City of Bellaire to Gerhard Herzog dated April 13, 1956, recorded in Volume 3139, Page 572 of the Deed Records of Harris County, Texas as shown and depicted on that certain survey, prepared by Paul A. Jurica, RPLS # 4264 of Brown & Gay Engineers, Inc. dated \_\_\_\_\_.
- c. A ten foot by one hundred foot (10' x 100') public utility easement, granted by instrument dated April 7, 1956, recorded in Volume 3139, Page 574 of the Deed Records of Harris County, Texas, from Gerhard Herzog to City of Bellaire, said easement adjoins the west line of Lot Seven (7) out of the north-south twenty-five foot (25') alley in said Block Thirty-six (36), the north line of which is thirty feet (30') south of the south line of Spruce Street as shown and depicted on that certain survey, prepared by Paul A. Jurica, RPLS # 4264 of Brown & Gay Engineers, Inc. dated \_\_\_\_\_.
- d. A twenty-five foot by thirty foot (25' x 30') public utility easement as set forth in instrument dated April 7, 1956, recorded in Volume 3139, Page 574 of the Deed Records of Harris County, Texas, from Gerhard Herzog to the City of Bellaire out of the twenty-five foot (25') north-south alley, the south line of which is one hundred ten feet (110') north of the north line of Cedar Avenue as shown and depicted on that certain survey, prepared by Paul A. Jurica, RPLS # 4264 of Brown & Gay Engineers, Inc. dated \_\_\_\_\_.
- e. A ten foot by forty-five foot (10' x 45') public utility easement as set forth in instrument dated July 24, 1958, recorded in Volume 3538, Page 517 of the Deed Records of Harris County, Texas, from G. Herzog to the City of Bellaire, located between Lots Ten (10) and Seventeen (17), the west line of which is one hundred fifty feet (150') east of the east line of Fifth Street as shown and depicted on that certain survey, prepared by Paul A. Jurica, RPLS # 4264 of Brown & Gay Engineers, Inc. dated \_\_\_\_\_.
- f. Encroachment of improvements into adjoining property pursuant to Boundary Line Agreement filed under Harris County Clerk's File No. D465677 regarding boundary between Lots Three (3) and Four (4) as shown and depicted on that certain survey, prepared by Paul A. Jurica, RPLS # 4264 of Brown & Gay Engineers, Inc. dated \_\_\_\_\_.
- g. DELETED.
- h. Lease by and between Jerry J. Moore and wife, Jean H. Moore dba as Jerry J. Moore Investments, as lessor, and H.E. Butt Grocery Company, as lessee, evidenced of record by Short Form Lease dated May 5, 1993 filed for record under Harris County Clerk's File No. P816766.
- i. Terms, conditions and provisions of that certain instrument entitled Conditional Dedication for Public Streets and Utilities, and exhibits thereto, dated May 6, 1993 by and between Jerry J. Moore and Jean H. Moore, as Grantors, and the City of Bellaire, as Grantee, filed for record under Harris County Clerk's File No. P241205.
- j. Terms, conditions and provisions of that certain instrument entitled Easement Agreement dated April 26, 1993 by and between Jerry J. Moore and wife, Jean H. Moore and Shady V. Investments filed for record under Harris County Clerk's File No. P462253; amended by instrument filed under P462254.



**SCHEDULE C**

Your Policy will not cover loss, costs, attorneys' fees, and expenses resulting from the following requirements that will appear as Exceptions in Schedule B of the Policy, unless you dispose of these matters to our satisfaction, before the date the Policy is issued:

1. Documents creating your title or interest must be approved by us and must be signed, notarized and filed for record.
2. Satisfactory evidence must be provided that:
  - a. no person occupying the land claims any interest in that land against the persons named in paragraph 3 of Schedule A,
  - b. all standby fees, taxes, assessments and charges against the property have been paid,
  - c. all improvements or repairs to the property are completed and accepted by the owner, and that all contractors, subcontractors, laborers and suppliers have been fully paid, and that no mechanic's, laborer's or materialmen's liens have attached to the property,
  - d. there is legal right of access to and from the land,
  - e. (on a Loan Policy only) restrictions have not been and will not be violated that affect the validity and priority of the insured mortgage.
3. You must pay the seller or borrower the agreed amount for your property or interest.
4. Any defect, lien or other matter that may affect title to the land or interest insured, that arises or is filed after the effective date of this Commitment.
5. **Deed of Trust executed by CENTRO NP HOLDINGS 12 SPE, LLC to Stanley E. Keeton, Trustee, dated July 28, 2010, recorded in/under Clerk's File No. 20100339257 of the Real Property Records of HARRIS County, Texas, securing JPMORGAN CHASE BANK, N.A. in the payment of one note in the principal sum of Four Hundred Eighty Five Million and 00/100 (\$485,000,000.00), due and payable and bearing interest as therein provided; and all the terms, conditions and stipulations contained therein, including, but not limited to, any additional indebtedness, if any, secured by said instrument. Additionally secured by Assignment of Leases and Rents recorded in/under Clerk's File No. 20100339258. (covers additional property)**  
  
**Said Note and Deed of Trust having been assigned to WELLS FARGO BANK, NATIONAL ASSOCIATION, AS TRUSTEE IN TRUST FOR HOLDERS OF J.P. MORGAN CHASE COMMERCIAL MORTGAGE SECURITIES TRUST 2010-CNTR, COMMERCIAL MORTGAGE PASS THROUGH CERTIFICATES, SERIES 2010-CNTR, by instrument dated September 13, 2010, recorded in/under Clerk's File No. 20100496736 of the Real Property Records of HARRIS County, Texas.**
6. **UCC-1 Financing Statement executed by CENTRO HOLDINGS 12 SPE, LLC, Debtor, to JPMORGAN CHASE BANK, N.A., Secured Party, filed August 9, 2010, recorded in/under Clerk's File No. 20100339256, as amended by 20100496737 and 20120334006 of the Real Property Records of HARRIS County, Texas.**
7. **PROVIDED.**
8. **Ascertain who can execute instruments on behalf of record owner, and secure proof of their authority to act.**

**NOTE FOR INFORMATION PURPOSES:**

Title vested by Deed filed August 9, 2010 under Harris County Clerk's File No. 20100339293.

Attachment: Sect 06 - Title (1513 : Public Hearing-HEB PD)

**COMMITMENT FOR TITLE INSURANCE****SCHEDULE D**

Pursuant to the requirements of Rule P-21, Basic Manual of Rules, Rates and Forms for the writing of Title Insurance in the State of Texas, the following disclosures are made:

1. The following individuals are directors and/or officers, as indicated, of the Title Insurance Company issuing this Commitment  
The following individuals are Directors and/or Officers of **Fidelity National Title Insurance Company, a California corporation**

Officers

President	Raymond Randall Quirk
Executive Vice President	Anthony John Park
Secretary	Michael Louis Gravelle
Treasurer	Daniel K. Murphy

Directors

Raymond Randall Quirk
Anthony John Park
Michael Louis Gravelle
Michael J. Nolan

**Fidelity National Financial, Inc. owns 100% of FNTG Holdings, LLC, which owns 100% of Fidelity National Title Group, Inc. which owns 100% of Fidelity National Title Insurance Company.**

2. The following disclosures are made by the Title Insurance Agent issuing this Commitment: FNF Charter Title Company d/b/a Charter Title Company
- a. The names of each shareholder, owner, partner or other person having, owning or controlling one percent (1%) or more of the Title Insurance Agent that will receive a portion of the premium are as follows: **FNTG Holdings, LLC owns 100% of FNTS Holdings, LLC which owns 100% of FNF Charter Title Company d/b/a Charter Title Company.**
- b. Each shareholder, owner, partner or other person having, owning or controlling ten percent (10%) or more of an entity that has, owns or controls one percent (1 %) or more of the Title Insurance Agent that will receive a portion of the premium are as follows: **FNTS Holdings, LLC owns 100% of FNF Charter Title Company d/b/a Charter Title Company.**
- c. The following persons are officers and directors of the Title Insurance Agent: FNF Charter Title Company d/b/a Charter Title Company
- |            |  |
|------------|--|
| Directors: | Anthony John Park<br>Raymond Randall Quirk   |
| Officers:  | James A. Johnson, President and County Manager<br>Raymond Randall Quirk, Chairman of the Board and Chief Executive Officer<br>Anthony John Park, Executive Vice President<br>Michael Louis Gravelle, Secretary<br>Daniel Kennedy Murphy: Treasurer |
3. You are entitled to receive advance disclosure of settlement charges in connection with the proposed transaction to which this commitment relates. Upon your request, such disclosure will be made to you. Additionally, the name of any person, firm or corporation receiving a portion of the premium from the settlement of this transaction will be disclosed on the closing or settlement statement.

You are further advised that the estimated title premium\* is:

Owner's Policy	
Loan Policy	
Endorsements	
Other	\$
Total	

Of this total amount: 15% will be paid to the policy issuing Title Insurance Company; 85% will be retained by the issuing Title Insurance Agent; and the remainder of the estimated premium will be paid to other parties as follows:

<u>Amount</u>	<u>To Whom</u>	<u>For Services</u>
---------------	----------------	---------------------

The estimated premium is based upon information furnished to us as of the date of this Commitment for Title Insurance. Final determination of the amount of the premium will be made at closing in accordance with the Rules and Regulations adopted by the Commissioner of Insurance.

## TEXAS TITLE INSURANCE INFORMATION

<p>Title insurance insures you against loss resulting from certain risks to your title.</p> <p>The Commitment for Title Insurance is the title insurance company's promise to issue the title insurance policy. The Commitment is a legal document. You should review it carefully to completely understand it before your closing date.</p>	<p>El seguro de titulo le asegura en relacion a perdidas resultantes de ciertos riesgos que pueden afectar el titulo de su propiedad.</p> <p>El Compromiso para Seguro de Titulo es la promesa de la compania aseguradora de titulos de emitir la poliza de seguro de titulo. El Compromiso es un documento legal. Usted debe leerlo cuidadosamente y entenderlo completamente antes de la fecha para finalizar su transaccion.</p>
--	---

Your Commitment for Title Insurance is a legal contract between you and us. The Commitment is not an opinion or report of your title. It is a contract to issue you a policy subject to the Commitment's terms and requirements.

Before issuing a Commitment for Title Insurance (the Commitment) or a Title Insurance Policy (the Policy), the Title Insurance Company (the Company) determines whether the title is insurable. This determination has already been made. Part of that determination involves the Company's decision to insure the title except for certain risks that will not be covered by the Policy. Some of these risks are listed in Schedule B of the attached Commitment as Exceptions. Other risks are stated in the Policy as Exclusions. These risks will not be covered by the Policy. The policy is not an abstract of title nor does a Company have an obligation to determine the ownership of any mineral interest.

- MINERALS AND MINERAL RIGHTS may not be covered by the Policy. The company may be unwilling to insure title unless there is an exclusion or an exception as to Minerals and Mineral Rights in the Policy. Optional endorsements insuring certain risks involving minerals, and the use of improvements (excluding lawns, shrubbery and trees) and permanent buildings may be available for purchase. If the title insurer issues the title policy with an exclusion or exception to the minerals and mineral rights, neither this Policy, nor the optional endorsements, ensure that the purchaser has title to the mineral rights related to the surface estate.

Another part of the determination involves whether the promise to insure is conditioned upon certain requirements being met. Schedule C of the Commitment lists these requirements that must be satisfied or the Company will refuse to cover them. You may want to discuss any matters shown on Schedules B and C of the Commitment with an attorney. These matters will affect your title and your use of the land.

When your Policy is issued, the coverage will be limited by the Policy's Exceptions, Exclusions and Conditions, defined below.

- EXCEPTIONS are title risks that a Policy generally covers but does not cover in a particular instance. Exceptions are shown on Schedule B or discussed in Schedule C of the Commitment. They can also be added if you do not comply with the Conditions section of the Commitment. When the Policy is issued, all Exceptions will be on Schedule B of the Policy.

- EXCLUSIONS are title risks that a Policy generally does not cover. Exclusions are contained in the Policy but not shown or discussed in the Commitment.

- CONDITIONS are additional provisions that qualify or limit your coverage. Conditions include your responsibilities and those of the Company. They are contained in the Policy but not shown or discussed in the Commitment. The Policy Conditions are not the same as the Commitment Conditions.

You can get a copy of the policy form approved by the Texas Department of Insurance by calling the Title Insurance Company at 1-800-442-7067 or by calling the title insurance agent that issued the Commitment. The State Board of Insurance may revise the policy form from time to time.

You can also get a brochure that explains the Policy from the Texas Department of Insurance by calling 1-800-252-3439.

Before the Policy is issued, you may request changes in the Policy. Some of the changes to consider are:

- Request amendment of the "area and boundary" exception (Schedule B, paragraph 2). To get this amendment, you must furnish a survey and comply with other requirements of the Company. On the Owner's Policy, you must pay an additional premium for the amendment. If the survey is acceptable to the Company and if the Company's other requirements are met, your Policy will insure you against loss because of discrepancies or conflicts in boundary lines, encroachments or protrusions, or overlapping of improvements. The Company may then decide not to insure against specific boundary or survey problems by making special exceptions in the Policy. Whether or not you request amendment of the "area and boundary" exception, you should determine whether you want to purchase and review a survey if a survey is not being provided to you.
- Allow the Company to add an exception to "rights of parties in possession." If you refuse this exception, the Company or the title insurance agent may inspect the property. The Company may except to and not insure you against the rights of specific persons, such as renters, adverse owners or easement holders who occupy the land. The Company may charge you for the inspection. If you want to make your own inspection, you must sign a Waiver of Inspection form and allow the Company to add this exception to your Policy.

The entire premium for a Policy must be paid when the Policy is issued. You will not owe any additional premiums unless you want to increase your coverage at a later date and the Company agrees to add an Increased Value Endorsement.

# Charter Title Company

## Affiliated Business Arrangement Disclosure Statement

Date:

To: Buyer/Borrower: HEB Grocery Company, LP  
 Seller: CENTRO NP HOLDINGS 12 SPE, LLC

Re: ,  
 TX

This is to give you notice that Charter Title Company, a subsidiary of Fidelity National Financial, Inc. has a business relationship with the settlement service providers listed below to which you have been referred. Each of the companies listed below is 100% owned directly or indirectly by Fidelity National Financial, Inc. Because of this relationship, this referral may provide Charter Title Company with a financial or other benefit.

Set forth below is the estimated charge or range of charges for the settlement services listed. You are NOT required to use the listed providers as a condition for the consummation of the transaction involving the above referenced property.

Settlement Service Provider	Type of Settlement Provided	Estimated Charge or Range of Charges
National TaxNet	Tax Information	\$22.50 to \$72.00 Including Sales Tax Add 5.00 per parcel over three parcels

There are frequently other settlement service providers available who offer similar services. You are free to shop around to determine that you are receiving the best services and the best rate for these services.

I/We have read this disclosure form and understand that Charter Title Company is referring me/us to purchase the above-described settlement services and may receive a financial or other benefit as the result of this referral.

---



---

**DELETION OF ARBITRATION PROVISION**  
(Not Applicable to the Texas Residential Owner's Policy)

ARBITRATION is a common form of alternative dispute resolution. It can be a quicker and cheaper means to settle a dispute with your Title Insurance Company. However, if you agree to arbitrate, you give up your right to take the Title Company to court and your rights to discovery of evidence may be limited in the arbitration process. In addition, you cannot usually appeal an arbitrator's award.

Your policy contains an arbitration provision (shown below). It allows you or the Company to **require arbitration** if the amount of insurance is \$2,000,000 or less. If you want to retain your right to sue the Company in case of a dispute over a claim, you must request deletion of the arbitration provision before the policy is issued. You can do this by signing this form and returning it to the Company at or before the Closing of your real estate transaction or by writing to the Company.

The Arbitration provision in the Policy is as follows:

"Either the Company or the Insured may demand that the claim or controversy shall be submitted to arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association ("Rules"). Except as provided in the Rules, there shall be no joinder or consolidation with claims or controversies of other persons. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Insured arising out of or relating to this policy, any service in connection with its issuance or the breach of a policy provision, or to any other controversy or claim arising out of the transaction giving rise to this policy. All arbitrable matters when the Amount of Insurance is \$2,000,000 or less shall be arbitrated at the option of either the Company or the Insured, unless the Insured is an individual person (as distinguished from an Entity). All arbitrable matters when the Amount of Insurance is in excess of \$2,000,000 shall be arbitrated only when agreed to by both the Company and the Insured. Arbitration pursuant to this policy and under the Rules shall be binding upon the parties. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court of competent jurisdiction."

---

SIGNATURE

---

DATE



FIDELITY NATIONAL FINANCIAL  
PRIVACY NOTICE

Fidelity National Financial, Inc. and its majority-owned subsidiary companies providing real estate- and loan-related services (collectively, "FNF", "our" or "we") respect and are committed to protecting your privacy. This Privacy Notice lets you know how and for what purposes your Personal Information (as defined herein) is being collected, processed and used by FNF. We pledge that we will take reasonable steps to ensure that your Personal Information will only be used in ways that are in compliance with this Privacy Notice.

This Privacy Notice is only in effect for any generic information and Personal Information collected and/or owned by FNF, including collection through any FNF website and any online features, services and/or programs offered by FNF (collectively, the "Website"). This Privacy Notice is not applicable to any other web pages, mobile applications, social media sites, email lists, generic information or Personal Information collected and/or owned by any entity other than FNF.

### **Collection and Use of Information**

The types of personal information FNF collects may include, among other things (collectively, "Personal Information"): (1) contact information (e.g., name, address, phone number, email address); (2) demographic information (e.g., date of birth, gender marital status); (3) Internet protocol (or IP) address or device ID/UDID; (4) social security number (SSN), student ID (SIN), driver's license, passport, and other government ID numbers; (5) financial account information; and (6) information related to offenses or criminal convictions.

In the course of our business, we may collect Personal Information about you from the following sources:

- Applications or other forms we receive from you or your authorized representative;
- Information we receive from you through the Website;
- Information about your transactions with or services performed by us, our affiliates, or others; and
- From consumer or other reporting agencies and public records maintained by governmental entities that we either obtain directly from those entities, or from our affiliates or others.

Information collected by FNF is used for three main purposes:

- To provide products and services to you or one or more third party service providers (collectively, "Third Parties") who are obtaining services on your behalf or in connection with a transaction involving you.
- To improve our products and services that we perform for you or for Third Parties.
- To communicate with you and to inform you about FNF's, FNF's affiliates and third parties' products and services.

### **Additional Ways Information is Collected Through the Website**

**Browser Log Files.** Our servers automatically log each visitor to the Website and collect and record certain information about each visitor. This information may include IP address, browser language, browser type,

operating system, domain names, browsing history (including time spent at a domain, time and date of your visit), referring/exit web pages and URLs, and number of clicks. The domain name and IP address reveal nothing personal about the user other than the IP address from which the user has accessed the Website.

**Cookies.** From time to time, FNF or other third parties may send a "cookie" to your computer. A cookie is a small piece of data that is sent to your Internet browser from a web server and stored on your computer's hard drive and that can be re-sent to the serving website on subsequent visits. A cookie, by itself, cannot read other data from your hard disk or read other cookie files already on your computer. A cookie, by itself, does not damage your system. We, our advertisers and other third parties may use cookies to identify and keep track of, among other things, those areas of the Website and third party websites that you have visited in the past in order to enhance your next visit to the Website. You can choose whether or not to accept cookies by changing the settings of your Internet browser, but some functionality of the Website may be impaired or not function as intended. See the [Third Party Opt Out](#) section below.

**Web Beacons.** Some of our web pages and electronic communications may contain images, which may or may not be visible to you, known as Web Beacons (sometimes referred to as "clear gifs"). Web Beacons collect only limited information that includes a cookie number; time and date of a page view; and a description of the page on which the Web Beacon resides. We may also carry Web Beacons placed by third party advertisers. These Web Beacons do not carry any Personal Information and are only used to track usage of the Website and activities associated with the Website. See the [Third Party Opt Out](#) section below.

**Unique Identifier.** We may assign you a unique internal identifier to help keep track of your future visits. We may use this information to gather aggregate demographic information about our visitors, and we may use it to personalize the information you see on the Website and some of the electronic communications you receive from us. We keep this information for our internal use, and this information is not shared with others.

**Third Party Opt Out.** Although we do not presently, in the future we may allow third-party companies to serve advertisements and/or collect certain anonymous information when you visit the Website. These companies may use non-personally identifiable information (e.g., click stream information, browser type, time and date, subject of advertisements clicked or scrolled over) during your visits to the Website in order to provide advertisements about products and services likely to be of greater interest to you. These companies typically use a cookie or third party Web Beacon to collect this information, as further described above. Through these technologies, the third party may have access to and use non-personalized information about your online usage activity.

You can opt-out of online behavioral services through any one of the ways described below. After you opt-out, you



may continue to receive advertisements, but those advertisements will no longer be as relevant to you.

- You can opt-out via the Network Advertising Initiative industry opt-out at <http://www.networkadvertising.org/>.
- You can opt-out via the Consumer Choice Page at [www.aboutads.info](http://www.aboutads.info).
- For those in the U.K., you can opt-out via the IAB UK's industry opt-out at [www.youronlinechoices.com](http://www.youronlinechoices.com).
- You can configure your web browser (Chrome, Firefox, Internet Explorer, Safari, etc.) to delete and/or control the use of cookies.

More information can be found in the Help system of your browser. Note: If you opt-out as described above, you should not delete your cookies. If you delete your cookies, you will need to opt-out again.

#### **When Information Is Disclosed By FNF**

We may provide your Personal Information (excluding information we receive from consumer or other credit reporting agencies) to various individuals and companies, as permitted by law, without obtaining your prior authorization. Such laws do not allow consumers to restrict these disclosures. Disclosures may include, without limitation, the following:

- To agents, brokers, representatives, or others to provide you with services you have requested, and to enable us to detect or prevent criminal activity, fraud, material misrepresentation, or nondisclosure in connection with an insurance transaction;
- To third-party contractors or service providers who provide services or perform marketing services or other functions on our behalf;
- To law enforcement or other governmental authority in connection with an investigation, or civil or criminal subpoenas or court orders; and/or
- To lenders, lien holders, judgment creditors, or other parties claiming an encumbrance or an interest in title whose claim or interest must be determined, settled, paid or released prior to a title or escrow closing.

In addition to the other times when we might disclose information about you, we might also disclose information when required by law or in the good-faith belief that such disclosure is necessary to: (1) comply with a legal process or applicable laws; (2) enforce this Privacy Notice; (3) respond to claims that any materials, documents, images, graphics, logos, designs, audio, video and any other information provided by you violates the rights of third parties; or (4) protect the rights, property or personal safety of FNF, its users or the public.

We maintain reasonable safeguards to keep the Personal Information that is disclosed to us secure. We provide Personal Information and non- Personal Information to our subsidiaries, affiliated companies, and other businesses or persons for the purposes of processing such information on our behalf and promoting the services of our trusted business partners, some or all of which may store your information on servers outside of the United States. We require that these parties agree to process such information in compliance with our Privacy Notice or in a similar, industry-standard manner, and we use reasonable efforts to limit their use of such information and to use other appropriate confidentiality and security measures.

The use of your information by one of our trusted business partners may be subject to that party's own Privacy Notice. We do not, however, disclose information we collect from consumer or credit reporting agencies with our affiliates or others without your consent, in conformity with applicable law, unless such disclosure is otherwise permitted by law.

We also reserve the right to disclose Personal Information and/or non-Personal Information to take precautions against liability, investigate and defend against any third-party claims or allegations, assist government enforcement agencies, protect the security or integrity of the Website, and protect the rights, property, or personal safety of FNF, our users or others.

We reserve the right to transfer your Personal Information, as well as any other information, in connection with the sale or other disposition of all or part of the FNF business and/or assets. We also cannot make any representations regarding the use or transfer of your Personal Information or other information that we may have in the event of our bankruptcy, reorganization, insolvency, receivership or an assignment for the benefit of creditors, and you expressly agree and consent to the use and/or transfer of your Personal Information or other information in connection with a sale or transfer of some or all of our assets in any of the above described proceedings. Furthermore, we cannot and will not be responsible for any breach of security by any third parties or for any actions of any third parties that receive any of the information that is disclosed to us.

#### **Information from Children**

We do not collect Personal Information from any person that we know to be under the age of thirteen (13). Specifically, the Website is not intended or designed to attract children under the age of thirteen (13). You affirm that you are either more than 18 years of age, or an emancipated minor, or possess legal parental or guardian consent, and are fully able and competent to enter into the terms, conditions, obligations, affirmations, representations, and warranties set forth in this Privacy Notice, and to abide by and comply with this Privacy Notice. In any case, you affirm that you are over the age of 13, as THE WEBSITE IS NOT INTENDED FOR CHILDREN UNDER 13 THAT ARE UNACCOMPANIED BY HIS OR HER PARENT OR LEGAL GUARDIAN.

Parents should be aware that FNF's Privacy Notice will govern our use of Personal Information, but also that information that is voluntarily given by children – or others – in email exchanges, bulletin boards or the like may be used by other parties to generate unsolicited communications. FNF encourages all parents to instruct their children in the safe and responsible use of their Personal Information while using the Internet.

#### **Privacy Outside the Website**

The Website may contain various links to other websites, including links to various third party service providers. FNF is not and cannot be responsible for the privacy practices or the content of any of those other websites. Other than under agreements with certain reputable organizations and companies, and except for third party service providers whose services either we use or you voluntarily elect to utilize, we do not share any of the Personal Information that you provide to us with any of the websites to which the

Website links, although we may share aggregate, non-Personal Information with those other third parties. Please check with those websites in order to determine their privacy policies and your rights under them.

### **European Union Users**

If you are a citizen of the European Union, please note that we may transfer your Personal Information outside the European Union for use for any of the purposes described in this Privacy Notice. By providing FNF with your Personal Information, you consent to both our collection and such transfer of your Personal Information in accordance with this Privacy Notice.

### **Choices with Your Personal Information**

Whether you submit Personal Information to FNF is entirely up to you. You may decide not to submit Personal Information, in which case FNF may not be able to provide certain services or products to you.

You may choose to prevent FNF from disclosing or using your Personal Information under certain circumstances ("opt out"). You may opt out of any disclosure or use of your Personal Information for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization by notifying us by one of the methods at the end of this Privacy Notice. Furthermore, even where your Personal Information is to be disclosed and used in accordance with the stated purposes in this Privacy Notice, you may elect to opt out of such disclosure to and use by a third party that is not acting as an agent of FNF. As described above, there are some uses from which you cannot opt-out.

Please note that opting out of the disclosure and use of your Personal Information as a prospective employee may prevent you from being hired as an employee by FNF to the extent that provision of your Personal Information is required to apply for an open position.

If FNF collects Personal Information from you, such information will not be disclosed or used by FNF for purposes that are incompatible with the purpose(s) for which it was originally collected or for which you subsequently gave authorization unless you affirmatively consent to such disclosure and use.

You may opt out of online behavioral advertising by following the instructions set forth above under the above section "Additional Ways That Information Is Collected Through the Website," subsection "Third Party Opt Out."

### **Access and Correction**

To access your Personal Information in the possession of FNF and correct inaccuracies of that information in our records, please contact us in the manner specified at the end of this Privacy Notice. We ask individuals to identify themselves and the information requested to be accessed and amended before processing such requests, and we may decline to process requests in limited circumstances as permitted by applicable privacy legislation.

### **Your California Privacy Rights**

Under California's "Shine the Light" law, California residents who provide certain personally identifiable information in connection with obtaining products or services for personal, family or household use are entitled to request and obtain from us once a calendar year information about the customer information we shared, if any, with other businesses for their own direct marketing uses. If applicable, this information would include the categories of customer information and the names and addresses of those businesses with which we shared customer information for the immediately prior calendar year (e.g., requests made in 2013 will receive information regarding 2012 sharing activities).

To obtain this information on behalf of FNF, please send an email message to [privacy@fnf.com](mailto:privacy@fnf.com) with "Request for California Privacy Information" in the subject line and in the body of your message. We will provide the requested information to you at your email address in response.

Please be aware that not all information sharing is covered by the "Shine the Light" requirements and only information on covered sharing will be included in our response.

Additionally, because we may collect your Personal Information from time to time, California's Online Privacy Protection Act requires us to disclose how we respond to "do not track" requests and other similar mechanisms. Currently, our policy is that we do not recognize "do not track" requests from Internet browsers and similar devices.

### **Your Consent to This Privacy Notice**

By submitting Personal Information to FNF, you consent to the collection and use of information by us as specified above or as we otherwise see fit, in compliance with this Privacy Notice, unless you inform us otherwise by means of the procedure identified below. If we decide to change this Privacy Notice, we will make an effort to post those changes on the Website. Each time we collect information from you following any amendment of this Privacy Notice will signify your assent to and acceptance of its revised terms for all previously collected information and information collected from you in the future. We may use comments, information or feedback that you may submit in any manner that we may choose without notice or compensation to you.

If you have additional questions or comments, please let us know by sending your comments or requests to:

Fidelity National Financial, Inc.  
601 Riverside Avenue  
Jacksonville, Florida 32204  
Attn: Chief Privacy Officer  
(888) 934-3354  
[privacy@fnf.com](mailto:privacy@fnf.com)

Copyright © 2014. Fidelity National Financial, Inc. All Rights Reserved.

EFFECTIVE AS OF: JANUARY 24, 2014

LAST UPDATED: JANUARY 24, 2014



HEB BISSONETT AT S. RICE  
3.055 ACRES

JULY 22, 2014  
JOB NO. 2823-01

DESCRIPTION OF A 3.055 ACRE TRACT OF LAND SITUATED  
IN THE WILLIAM J. BROWN SURVEY, ABSTRACT NO. 132  
AND THE JAMES BLESSING SURVEY, ABSTRACT NO. 162  
CITY OF BELLAIRE, HARRIS COUNTY, TEXAS

BEING a 3.055 acre (133,077 square feet) tract of land situated in the William J. Brown Survey, Abstract No. 132 and the James Blessing Survey, Abstract No. 162, City of Bellaire of Harris County, Texas and being all of a called 3.06 acre tract of land as described in a deed to Centeramerica Capital Partnership, L.P. recorded under Harris County Clerk's File Number (H.C.C.F. No.) S654878 and being part of Block 36 of TOWN OF BELLAIRE a subdivision plat recorded under Volume 3 Page 59 of the Harris County Map Records (H.C.M.R.), said 3.055 acre tract of land described by metes and bounds as follows:

**BEGINNING** at a MAG Nail found on the south right-of-way line of Spruce Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R. and on the east right-of-way line of Fifth Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R. and being the northwest corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 315.00 feet along the south right-of-way line of said Spruce Street to a MAG Nail found on the west line of the remainder of a 25 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 02°23'00" E, a distance of 30.00 feet along the west line of the remainder of said 25 foot wide right-of-way to a MAG Nail found for and interior corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 10.00 feet over and across said 25 foot wide right-of-way to a MAG Nail found on the east line of said 25 foot wide right-of-way and an interior corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 30.00 feet along the east line of said 25 foot wide right-of-way to a MAG Nail found on the south right-of-way line of said Spruce Street;

THENCE, N 87°37'00" E, a distance of 200.00 feet along the south right-of-way line of said Spruce Street to an "X" in concrete found for the northeast corner of the herein described tract;

THENCE, along the easterly lines of said 3.06 acre tract the following courses and distances:

S 02°23'00" E, a distance of 26.30 feet to an "X" in concrete found for and interior corner of the herein described tract, from which a found "X" in concrete bears N 13°23' W, 0.39 feet;

N 87°37'00" E, a distance of 0.75 feet to an "X" in concrete found for corner;

S 02°23'00" E, a distance of 94.50 feet to a MAG Nail found for corner;

S 87°37'00" W, a distance of 0.80 feet to a MAG Nail set for and interior corner of the herein described tract;

S 02°23'00" E, a distance of 14.20 feet to a MAG Nail found on a north line of a 10 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R.;

HEB BISSONETT AT S. RICE  
3.055 ACRES

JULY 22, 2014  
JOB NO. 2823-01

THENCE, S 87°37'00" W, a distance of 78.46 feet along a north line of said 10 foot wide right-of-way to a MAG Nail found for an interior corner of the herein described tract;

THENCE, S 58°02'00" W, a distance of 20.26 feet over and across said 10 foot wide right-of-way to a MAG Nail found on a south line of said 10 foot wide right-of-way and being an interior corner of the herein described tract;

THENCE, N 87°37'00" E, a distance of 120.13 feet along a south line of said 10 foot wide right-of-way to a MAG Nail found on the northwest right-of-way line of Bissonnet Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 57°56'33" W, a distance of 313.09 feet along the northwest right-of-way line of said Bissonnet Street to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" found on the north right-of-way line of the remainder of Cedar Street (width varies) recorded under Volume 3, Page 59 H.C.M.R. and being the most southerly southeast corner of the herein described tract;

THENCE, along the northerly right-of-way of said Cedar Street the following courses and distances:

S 87°37'00" W, a distance of 29.47 feet to a "X" in concrete set for the most southerly southwest corner of the herein described tract;

N 32°03'27" W, a distance of 8.01 feet to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" set for an interior corner of the herein described tract, from which a found 5/8-inch iron rod bears N 03°12' E, 0.37 feet;

S 87°37'00" W, a distance of 243.54 feet to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" set on the east right-of-way line of said Fifth Street and being the southwest corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 148.04 feet along the east right-of-way line of said Fifth Street to a MAG Nail found in a south line of said 10 foot wide right-of-way;

THENCE, N 87°37'00" E, a distance of 150.00 feet along a south line of said 10 foot wide right-of-way to a MAG Nail found for an interior corner of the herein described tract;

THENCE, N 02°23'00" W, a distance of 10.00 feet over and across said 10 foot wide right-of-way to a MAG Nail set on a north line of said 10 foot wide right-of-way and being an interior corner of the herein described tract;

THENCE, S 87°37'00" W, a distance of 150.00 feet along a north right-of-way line of said 10 foot wide right-of-way to a MAG Nail found on the east right-of-way line of said Fifth Street;

THENCE, N 02°23'00" W, a distance of 135.00 feet along the east right-of-way line of said Fifth Street to the **POINT OF BEGINNING** and containing 3.118 acres (135,827 square feet) of land **SAVE & EXCEPT** a 0.063 of one acre tract described as a called 0.06 acre tract of land in a deed recorded under H.C.C.F. No. S654878 and being more particularly described by metes and bounds as follows:



HEB BISSONETT AT S. RICE  
3.055 ACRES

JULY 22, 2014  
JOB NO. 2823-01

**COMMENCING** at a MAG Nail found on the northwest right-of-way of Bissonnet Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R. and being on a south line of a 10 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 57°56'33" W, a distance of 252.49 feet along the northwest right-of-way line of said Bissonnet Street to the northeast corner of a called 0.1739 acre tract of land described as a right-of-way abandonment for Cedar Street (60 foot width) recorded under Volume 3, Page 59 H.C.M.R.;

THENCE, S 87°37'00" W, a distance of 4.63 feet along the north line of said 0.1739 acre tract to a 1/2-inch iron pipe with a cap stamped "Brown & Gay" set on the east line of a 25 foot wide right-of-way recorded under Volume 3, Page 59 H.C.M.R. for the **POINT OF BEGINNING** and being the southeast corner of the herein described tract;

THENCE, S 87°37'00" W, a distance of 25.00 feet along the north line of said 0.1739 acre tract to a MAG Nail set on the west line of said 25 foot wide right-of-way and being the southwest corner of the herein described tract;

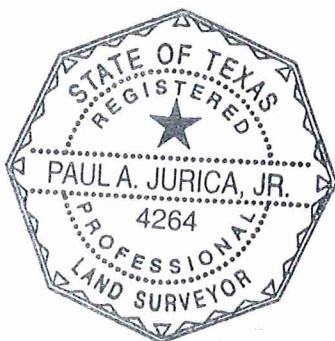
THENCE, N 02°23'00" W, a distance of 110.00 feet along the west line of said 25 foot wide right-of-way to a MAG Nail set for the northwest corner of the herein described tract;


THENCE, N 87°37'00" E, a distance of 25.00 feet over and across said 25 foot wide right-of-way to a MAG Nail set on the east line of said 25 foot wide right-of-way and being the northeast corner of the herein described tract;

THENCE, S 02°23'00" E, a distance of 110.00 feet along the east line of said 25 foot wide right-of-way to the **POINT OF BEGINNING** and containing 0.063 acres (2,750 square feet) of land.

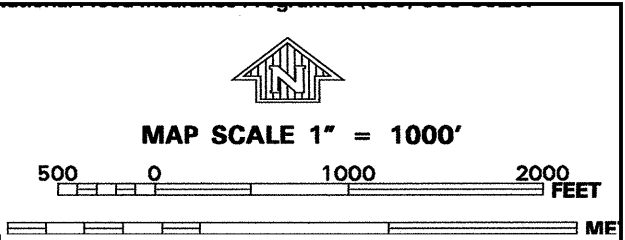
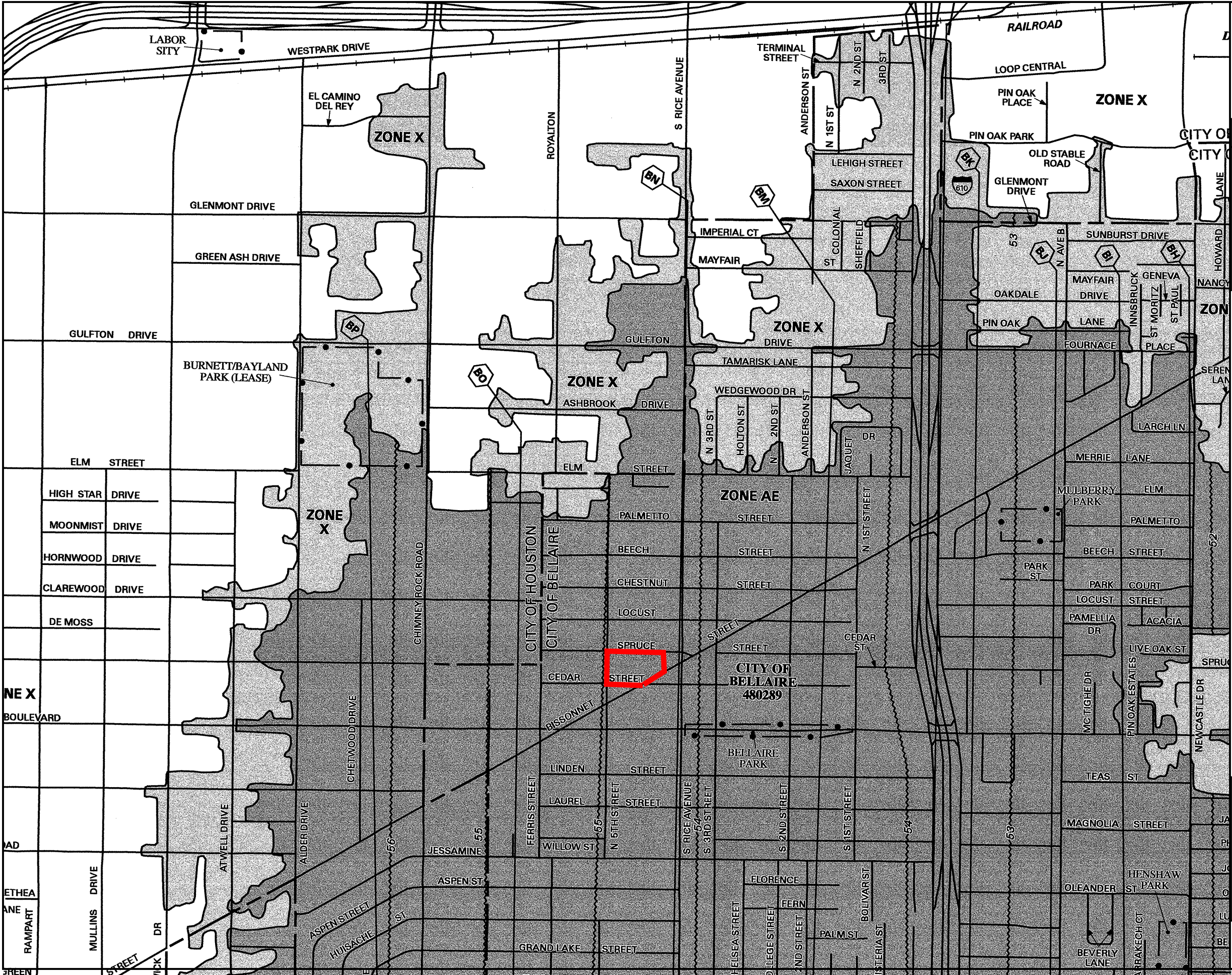
The herein described 3.118 acre tract Save & Except the herein described 0.063 acre tract combine for a net total of 3.055 acres of land.

Bearing orientation is based on the Texas State Plane Coordinate System, South Central Zone 4204, NAD-83.



  
Paul A. Jurica Jr. RPLS No. 4264  
Brown & Gay Engineers, Inc.  
10777 Westheimer Road, Suite 400  
Houston, Texas 77042  
Telephone: (281) 558-8700  
TBPLS Licensed Surveying Firm No. 10106500





**PANEL 0855L**

**FIRM**  
**FLOOD INSURANCE RATE MAP**  
**HARRIS COUNTY,**  
**TEXAS**  
**AND INCORPORATED AREAS**

**PANEL 855 OF 1150**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

**CONTAINS:**

COMMUNITY	NUMBER	PANEL	SUFFIX
HOUSTON, CITY OF	480288	0855	L
BELLAIRE, CITY OF	480289	0855	L
WEST UNIVERSITY PLACE, CITY OF	480318	0855	L
SOUTHSIDE PLACE, CITY OF	480312	0855	L

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**48201C0855L**

**MAP REVISED:**  
**JUNE 18, 2007**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



## CITY OF BELLAIRE ENVIRONMENTAL ASSESSMENT FORM

**PROJECT**

Subdivision Name:	HEB Rice and Bissonnet
Location (Address or major crossroads/boundary streets);	5106 Bissonnet Street, Bellaire, Texas 77401
Project valuation/cost:	
Any foreseen zoning issues? (if yes, describe.)	Requesting re-zoning of project site, from Urban Village Downtown (UVD) to Planned Development (PD)


**OWNER**

Name:	HEB		
Address:	3890 Northwest Highway, Suite 300 Dallas, Texas 75220		
Phone:	(214) 680-7600	Email:	rose.john@heb.com

**PROJECT ENGINEER (OR SURVEYOR IF NO ENGINEER)**

Name:	E. Benton Schmaltz		
Address:	10777 Westheimer Road, Suite 400 Houston, Texas 77042		
Phone:	(281) 558-8700	Email:	bschmaltz@browngay.com

Is project residential, commercial, or mixed use?	Commercial
Multi-phased project? (If yes, include a site plan detailing phases including estimated timeline.)	No
<i>Project area as residential</i>	
Number of square feet?	
Number of single-family, attached lots?	
Number of single-family, detached lots?	
Number of multi-family units?	
Overall density of residential area?	
<i>Project area as commercial</i>	
Number of square feet?	70,000 S.F.
Percentage Office?	
Percentage Retail?	
Percentage Other (detail)? Grocery Store	70,000 S.F.
<p><b><i>Include a letter from owner/project engineer addressing the following: utility needs, detention requirements, thoroughfare impacts, any environmental issues, and impact of construction on surrounding community.</i></b></p>	


  
Signature of Applicant

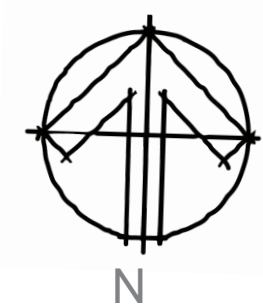

  
Date

This analysis assists the City in reviewing your proposed project. Providing the most accurate information will facilitate a better development for both you and the City. Additional information may be required throughout the development process.



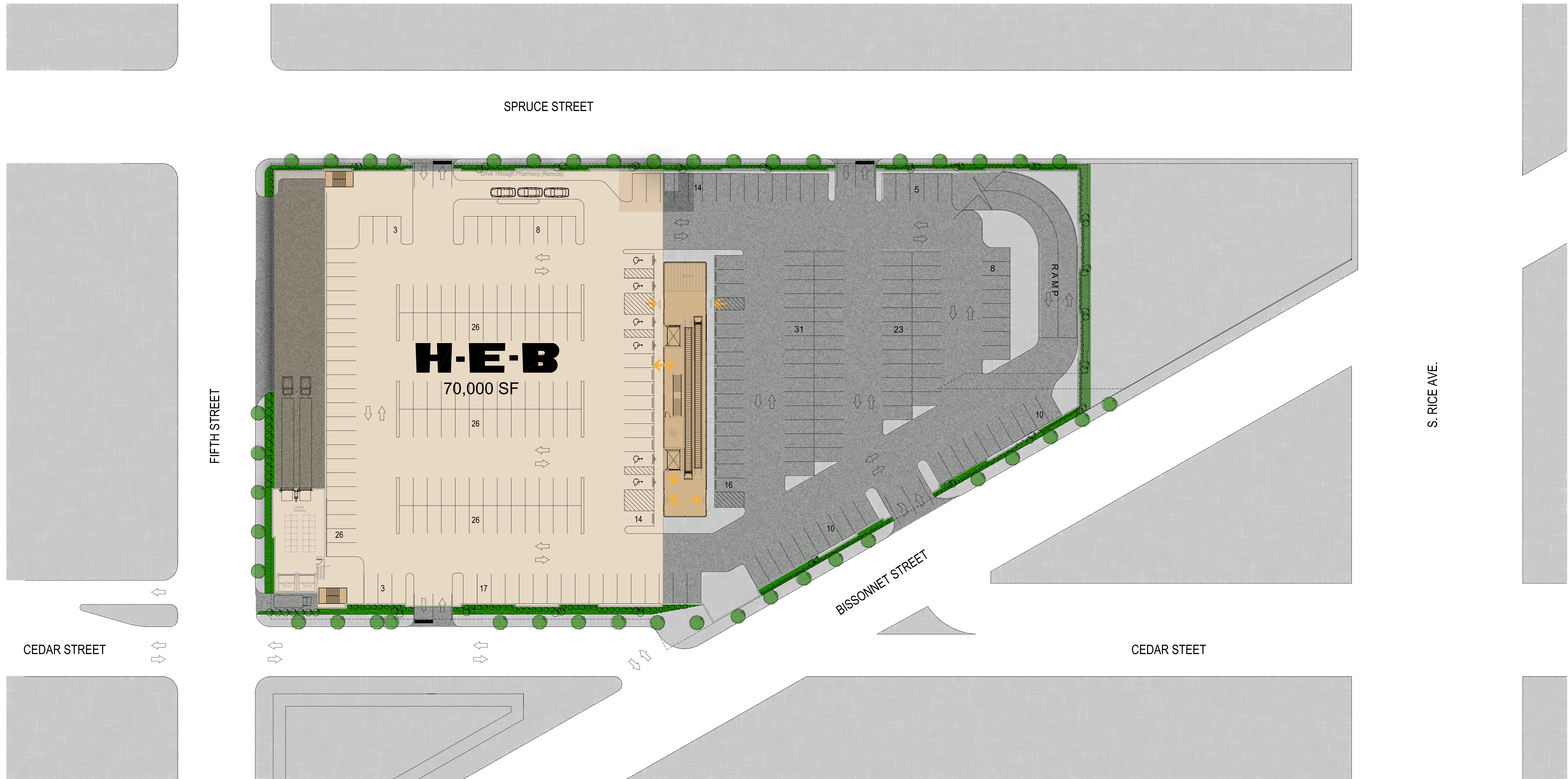
# HEB - Rice and Bissonnet - Ground Level

DATE:  
2/20/2015  
DRAWN BY:  
LDP  
SCALE:  
1" = 1/32"

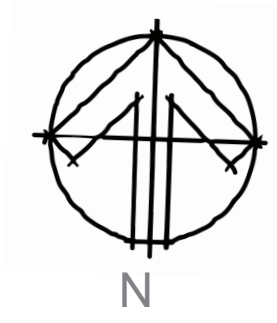
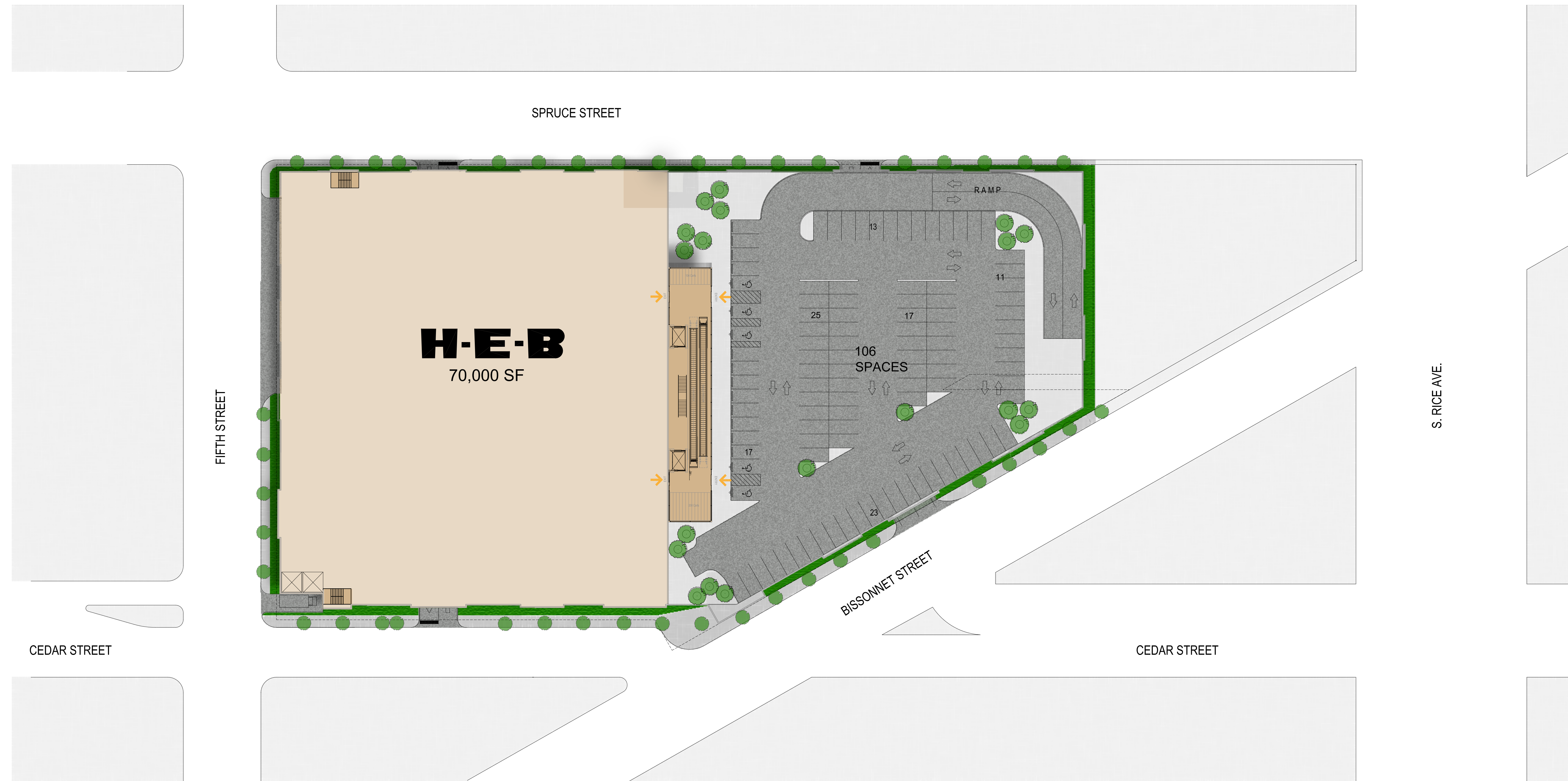


## CONFIDENTIAL - IN PROGRESS Ground Level

Ground Level Parking - 266 Cars  
Second Level Parking - 106 Cars  
Total Parking - 372 Cars  
Ratio 1:188  
3.3 Acres

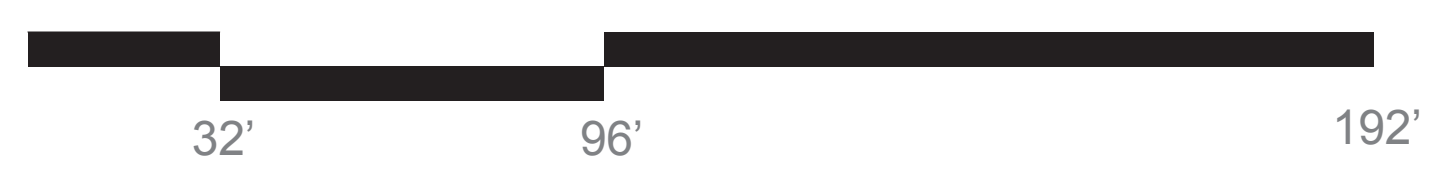






**CONFIDENTIAL - IN PROGRESS**  
**Second Level**

Ground Level Parking - 266 Cars  
Second Level Parking - 106 Cars  
Total Parking - 372 Cars  
Ratio 1:188  
3.3 Acres



**HEB - Rice and Bissonnet - Second Level**

DATE:  
2/20/2015  
DRAWN BY:  
LDP  
SCALE:  
1' = 1/32"





**CONFIDENTIAL - IN PROGRESS**  
**Elevations**



# HEB - Rice and Bissonnet

DATE  
2/20/2015  
5:53:52 PM  
DRAWN BY  
LDP  
SCALE  
As indicated





HEB - Rice and Bissonnet

DATE  
2/20/2015  
5:46:56 PM  
DRAWN BY  
LDP  
SCALE  
1" = 10'-0"



① East  
1" = 10'-0"



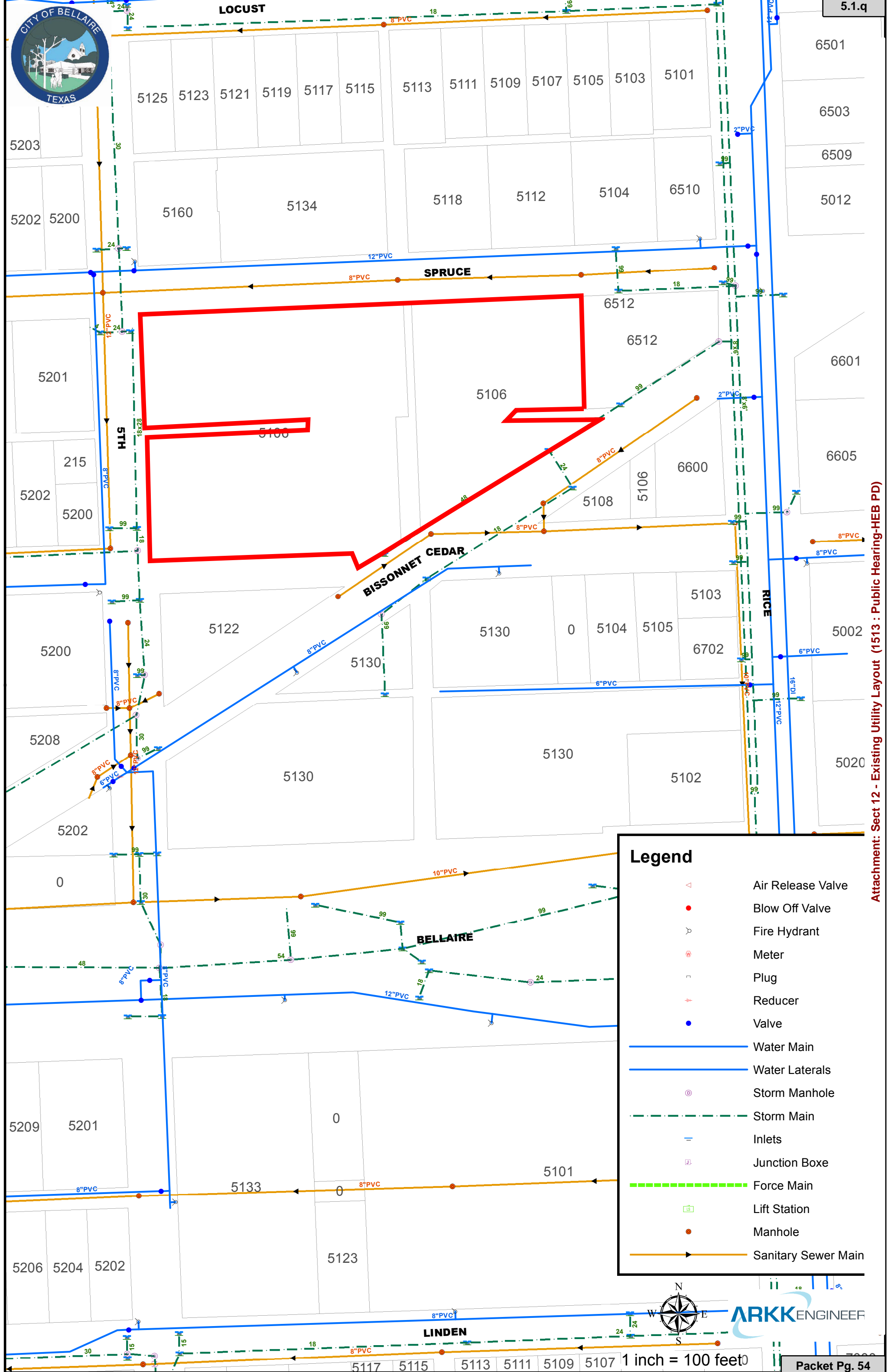
② West  
1" = 10'-0"

Screening Hedge

CONFIDENTIAL - IN PROGRESS

Elevations





**MEMO**

**TO:** John McDonald  
 City of Bellaire

**FROM:** Colby W. Wright, P.E., PTOE  
 Traffic Division Manager, Jones & Carter, Inc.

**DATE:** February 5, 2015

**RE:** 5106 Bissonnet Street – HEB Development – Traffic Impact Analysis

Jones & Carter, Inc. has reviewed the Traffic Impact Analysis (TIA) for the 5106 Bissonnet Street – HEB Development. The current land use for the project site is approximately 35,000 sf of supermarket and 19,000 sf of shopping center. The proposed land use for the site will include a 2 level parking structure and 70,000 sf of supermarket, which will result in increased trip generations for the site.

The report includes the following recommendations:

- Re-time the traffic signal at Bissonnet Street at South Rice Avenue in the AM and PM peak hours.
- Re-time the traffic signals for the entire Bellaire “Triangle” to optimize for progression offsets. The Bellaire “Triangle” signals include Bissonnet Street at Bellaire Boulevard, Bissonnet Street at Fifth Street, Bissonnet Street at South Rice Avenue, Bellaire Boulevard at South Rice Avenue and Bellaire Boulevard at Mapleridge Street.
- The following should be done for Driveway #1 on Bissonnet Street: add a right-turn lane with 100 feet storage and 100 foot taper, relocate and/or delete the driveway, or change the internal ramp access to minimize queue spillover onto Bissonnet Street.
- Proposed sidewalks should be built around the project site.

Jones & Carter offers no objections to further permitting of the project provided the recommendations in the report are performed by the developer at no cost to the City of Bellaire with the following comments:

- The proposed traffic signal timing plans should be submitted to the City of Bellaire for review and approval prior to implementation by the developer.
- Proposed Driveway #1 on Bissonnet Street should be relocated approximately 50 feet to the west at better align with the existing development driveway on the south side of Bissonnet Street. This will eliminate potential left-turn conflicts that may occur with two offset driveways in the existing two-way-left-turn-lane.
- Provide recommended improvements as necessary to ensure that there is no queue spillover from Driveway #1 onto Bissonnet Street.

# TRAFFIC IMPACT ANALYSIS

## HEB DEVELOPMENT

Bellaire, Texas



**Prepared for:**  
**HEB Strategic Design Group**

**January 2015**

THESE DOCUMENTS ARE FOR  
INTERIM REVIEW AND NOT  
FOR CONSTRUCTION, BIDDING  
OR PERMIT PURPOSES.

RESPONSIBLE ENGINEER:  
ISAAC F. JOSKOWICZ, P.E.  
TEXAS REGISTRATION NO. 67445  
BROWN & GAY ENGINEERS, INC.  
TBPE FIRM REGISTRATION NO. 1046

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



## Executive Summary

As requested by HEB Development, Brown & Gay Engineers, Inc. has conducted a traffic impact analysis for the proposed development consisting of Supermarket space in Bellaire, Texas. The purpose of the study was to determine the potential impacts to traffic operations in the area related to the proposed development. The site is located along Bissonnet Street on the north side between 5<sup>th</sup> Street on the west and S. Rice Avenue on the east. It is expected that the development will be open by 2019.

### Study Area

The study area is located on the north side of Bissonnet Street between 5th Street on the west and S. Rice Avenue on the east in Bellaire, Texas. The proposed site can be accessed from IH69/US 59 from the north, Beechnut Street from the south, IH 610 from the east, and Bellaire Blvd from the west.

The proposed development will consist of supermarket with 70,000 sf (70 ksf) of space. The development will have four (4) driveways; the first (1) driveway (DW #1) will be on Bissonnet St, two (2) driveways (DW #3 and 4) will be located on Spruce St and one (1) driveway will be on Cedar St (DW #2), they will consist of left out and right out movements.

### Trip Generation

The Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> Edition was used to estimate the project-generated trips classified under daily, AM, and PM peak hours on a typical weekday. The average rates provided by the Trip Generation Manual were considered adequate for this type of development and surrounding area. The current land use for the project site is approximately 35,000 sf of supermarket and 19,000 sf of shopping center space. The existing trip generations are 137 trips during the AM peak, 429 trips during the PM peak, and 4,390 trips per day by the existing site. The total site generation trips were used in the capacity analysis for the proposed driveway conditions. Based on the trip generation, there will be a total of 238 trips during the AM peak, 664 trips during the PM peak, and 7,157 trips per weekday by the development. The total site generation trips that were used in the capacity analysis for the intersections conditions were determined by removing the current trips from the proposed trips. Based on the trip generation, there will be a total of 101 trips during the AM peak, 234 trips during the PM peak, and 2,767 trips per weekday by the development.

### Analysis

There are three analysis scenarios conducted to evaluate the study intersection for each of the two peak hour analysis periods, AM and PM peak. The analysis scenarios are the following:

1. "Existing" Conditions
2. "Year 2019 Background Traffic" Conditions
3. "Year 2019 Total Traffic" Conditions

Under the existing conditions and the current signal timing at Bissonnet St. at S. Rice Ave. intersection, the AM and PM levels of service "D" are currently acceptable. The worst movement at Bissonnet St. and S. Rice Ave. are the eastbound left in the AM peak with LOS F (264.7 sec/veh of delay) and PM peak with LOS E (73.4 sec/veh of delay). Another movement is the northbound left in the AM peak with LOS F (80.6 sec/veh of delay) and PM peak with LOS E (79.6 sec/veh of delay). The existing conditions at Bissonnet St. and 5<sup>th</sup> St. Intersection show that the AM and PM LOS are "B" or better and are acceptable. The unsignalized intersections of Bissonnet Street at Cedar Street (South), Cedar Street at 5<sup>th</sup> Street, Spruce Street at 5<sup>th</sup> Street, Spruce Street at S. Rice Ave are at an acceptable LOS C for the worst movement.

Based on the current signal timing and additional volumes generated for the traffic growth, the LOS is “E” for the AM peak hour and “D” for the PM peak hour for Bissonnet St. at S. Rice Ave.. The delay increased by over 6 seconds for the AM and PM peak hours. The LOS for the intersection of Bissonnet St at 5<sup>th</sup> St. maintained a LOS “B” or better for both AM and PM peak hour. The unsignalized intersections of Bissonnet Street at Cedar Street (South), Cedar Street at 5th Street, Spruce Street at 5th Street, Spruce Street at S. Rice Ave, all maintained an acceptable LOS and only had minimal delay increases

Based on the current signal timing and additional volumes generated for the traffic growth and site traffic, the LOS was maintained at an “E” for the AM peak hour and “D” for the PM peak hour for Bissonnet St. at S. Rice Ave. The delay decreased by 2 seconds in the AM peak and increased by over 2 seconds for the PM peak hours. The LOS for the intersection of Bissonnet St at 5<sup>th</sup> St. maintained at a “B” for the AM and PM peak hour. The unsignalized stop-controlled intersections of Bissonnet Street at Cedar Street (South), Cedar Street at 5th Street, Spruce Street at 5th Street, Spruce Street at S. Rice Ave, all maintained an acceptable LOS and only had minimal delay increases.

## Recommendations

This development will have minimal impact to the residential neighborhood to the north of the project site. The site is served by two major arterial, Bissonnet Street and South Rice Avenue, as well as a good collector street system around the site, which include 5th Street, Spruce Street, and Cedar Street, which will minimizes the need for vehicles to cut through the neighborhoods to get to the site.

Only one of the intersections and driveways that were analyzed for this project have triggered the need for mitigation. The intersection of Bissonnet St. at S. Rice Ave. operates at LOS “E” during the AM peak hour in the background and proposed site total conditions. This intersection operates at the determined LOS of “E” with a delay of 56.7 sec/veh. Re-timing this signal would allow this intersection to operate at a LOS “C” during AM and LOS “D” during the PM peak periods. Re-timing the intersection will decreased the background queue of 233 ft. to 226 ft. for the northbound turn lane. The required storage for the northbound left-turn lane was determined by using the 95th percentile queue lengths from Synchro 7 outputs.

Adjusting timings on Bissonnet St. at S. Rice Ave. would impact the City of Bellaire’s traffic signals progression to the east and west along the traffic signal subsystem. Re-timing should also include optimizing for progression offsets for the entire Bellaire "Triangle" traffic signal subsystem, which is composed of: Bissonnet St. at Bellaire Blvd., Bissonnet St. at 5<sup>th</sup> St., Bissonnet St. at S Rice Ave., Bellaire Blvd. at S Rice Ave. and Bellaire Blvd. at Mapleridge St.

The proposed locations of the driveways around the development will distribute the additional site traffic adequately with minimal impact to the existing street network, except for Proposed Driveway #1. Driveway #1 will be too close to the internal parking ramp to the second floor, which will cause an internal conflict and queues to spill onto Bissonnet Street. Therefore, the following should be done for Driveway #1: add a right-turn lane with 100-ft storage and 100-ft taper, relocate and/or delete the driveway, or change the internal ramp access to minimize queue spillover onto Bissonnet Street.

It is recommended that proposed sidewalks should be built around the project site, since this is in the central business area of the city.

## Table of Contents

Cover .....	1
Executive Summary .....	2
Table of Contents .....	4
1.0 Introduction .....	6
1.1 Traffic Impact Analysis Background and Requirements .....	6
1.2 Data Sources .....	6
2.0 Study Area .....	6
2.1 Existing Land Use .....	7
2.2 Proposed Development .....	10
2.3 Existing Roadway Conditions and Traffic Volumes .....	10
3.0 Analysis.....	14
3.1 Trip Generation .....	14
3.2 Trip Distribution and Trip Assignment.....	16
3.3 Pedestrian Traffic Volumes .....	17
4.0 Capacity Analysis .....	17
4.1 Level of Service Conditions.....	17
4.2 Analysis Scenarios .....	21
5.0 Conclusions .....	33
5.1 Intersection and Driveway Conclusions.....	33
5.2 Recommendations.....	34

## List of Figures

Figure 1: Area Location  
Figure 2: Project Location  
Figure 3A: Ground Floor Site Plan  
Figure 3B: Second Floor Site Plan  
Figure 4: Existing Peak Hour Counts  
Figure 5: Overall Distribution  
Figure 6: Site Distribution  
Figure 7: “Year 2019 Background Traffic”  
Figure 8: “Site Trips Volumes”  
Figure 9: “Year 2019 Total Traffic Volumes”

## List of Tables

Table 1: Existing Trip Generation Analysis Summary for Project  
Table 2: Trip Generation Analysis Summary for Project  
Table 3: Proposed vs. Current Conditions Trip Generation Analysis  
Table 4: Level of Service Criteria for Signalized Intersections  
Table 5: Level of Service Criteria for Stop-Controlled Intersections  
Table 6: “Existing” Traffic Operations Summary  
Table 7: “Existing” Queue Summary for Signalized Intersection  
Table 8: “Year 2019 Background Traffic” Summary  
Table 9: “Year 2019 Background Traffic” Queue Summary for Signalized Intersection  
Table 10: “Year 2019 Total Traffic” Summary  
Table 11: “Year 2019 Total Traffic” Summary for Unsignalized Driveways  
Table 12: “Year 2019 Total Traffic” Queue Summary  
Table 13: “Year 2019 Mitigation” Summary  
Table 14: “Year 2019 Mitigation” Queue Summary

## Appendix

Appendix A: Existing Traffic Counts  
Appendix B: Trip Generation Worksheets  
Appendix C: Analysis Worksheet for “Existing” Condition  
Appendix D: Analysis Worksheet for “Year 2019 Background Traffic Volumes” Condition  
Appendix E: Analysis Worksheet for “Year 2019 Total Traffic Volumes” Condition  
Appendix F: Analysis Worksheet for “Year 2019 Mitigation Improvements” Condition

## 1.0 Introduction

The purpose of this report is to document a traffic impact analysis for a supermarket development (HEB Grocery), to be located on the north side of Bissonnet Street between 5th Street on the west and S. Rice Avenue on the east in Bellaire, Texas. The supermarket will have 70,000 sf of space with a 2 level parking structure. Bissonnet Street connects to IH 610 approximately ½ mile to the east and to Bellaire Boulevard approximately ¼ miles to the west. S. Rice Avenue runs north to south and connects to US 59/IH 69 approximately 1 ¼ mile to the north.

The existing land use for the proposed development consist of a HEB Supermarket with approximately 35,000 sf and a shopping center with approximately 19,000 sf of space. The existing supermarket and shopping center are one story and face Bissonnet Street. The proposed land use for the study area will be a 70,000 sf of supermarket retail space. The trip generations for the proposed land use are 238 trips during the AM peak, 664 trips during the PM peak, and 7,157 trips per day by the development.

This traffic impact analysis takes into account a background growth of 2% of the existing traffic on Bissonnet Street and S. Rice Avenue based on historical traffic counts in the area and the previous Traffic Impact Analysis done for the 4301 Bellaire Boulevard Development on Bellaire Blvd. The development is expected to be fully occupied by year 2019. Therefore, 2019 was used as the design year for this study.

### 1.1 Traffic Impact Analysis Background and Requirements

This traffic impact analysis intends to provide an assessment of the key traffic circulation impacts in order to identify the necessary transportation infrastructure needed to accommodate the proposed development generated travel demand. The analysis contained in this report focuses on the traffic operating conditions at the following intersections; Bissonnet Street at S. Rive Ave., Bissonnet Street at 5<sup>th</sup> Street, Bissonnet Street at Cedar Street (South), Cedar Street at 5<sup>th</sup> Street, Spruce Street at 5<sup>th</sup> Street, Spruce Street at S. Rice Ave. and on the proposed driveways (4 total) to access the project site.

### 1.2 Data Sources

Initial tasks of this traffic study include evaluating existing traffic volumes surrounding the project vicinity and determining patterns and/or traffic flow distributions. Traffic counts were performed by C. J. Hensch & Associates, who was a sub-consultant on this project. The traffic count data sheets are provided in **Appendix A**. The historical counts in the area were obtained from City of Bellaire for the year 2006. The traffic map obtained from the City of Bellaire website is provide in **Appendix A**. Historical traffic data obtained from the City of Houston indicates that the average daily traffic volume on Bissonnet Street east of Chimney Rock (located approximately ½ mile west of the study site) was 21,273 vehicles in Year 2013.

## 2.0 Study Area

The study area is located on the north side of Bissonnet Street between 5th Street on the west and S. Rice Avenue on the east in Bellaire, Texas. The proposed site can be accessed from IH69/US 59 from the north, Beechnut Street from the south, IH 610 from the east, and Bellaire Blvd from the west. A project location map is shown in **Figure 1**.

## 2.1 Existing Land Use

The existing land use for the proposed development consist of an existing HEB Supermarket with approximately 35,000 sf and a shopping center with approximately 19,000 sf of space located to the east of the supermarket. The existing trip generations from the existing land use are 137 trips during the AM peak, 429 trips during the PM peak, and 4,390 trips per day by the existing site.

**Table 1: Existing Trip Generation Analysis Summary for Project**

Current Land Use	KSF	ITE Code	Daily Trips	Trip Generation					
				AM Peak			PM Peak		
				Total	Entering	Exiting	Total	Entering	Exiting
<b>Retail</b>									
Shopping Center	19.000	820	811	18	11	7	70	34	37
Supermarket	35.000	850	3,578	119	74	45	359	183	176
<b>Current Total Trip Generation</b>			<b>4,390</b>	<b>137</b>	<b>85</b>	<b>52</b>	<b>429</b>	<b>217</b>	<b>213</b>

1. ITE Trip Generation Rates  
- 9th Edition

A site location map showing the proposed site and the study intersections, is provided in **Figure 2**.

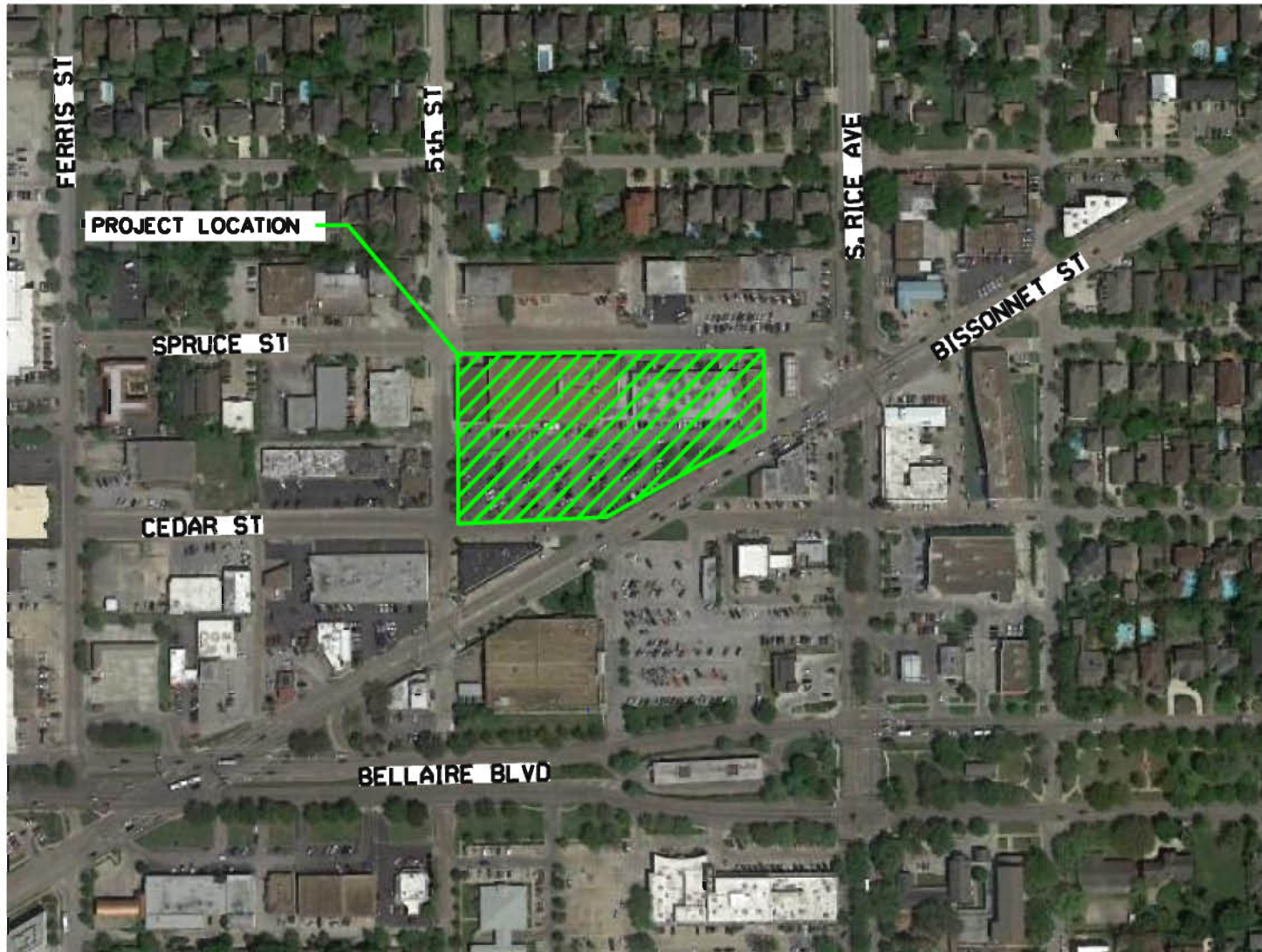


FILE ABBREV

DATE

TIME

USER



**BGE** Brown & Gay Engineers, Inc.  
10777 Westheimer, Suite 400, Houston, TX 7704  
Tel: 281-558-8700 • www.browngay.com  
TBPE Registration No. F-1046

**HEB DEVELOPMENT  
AREA LOCATION  
HOUSTON, TEXAS**

DATE: JAN 2015 FIGURE: PAGE:



FILE ABBREV

DATE

TIME

USER



**BGE** Brown & Gay Engineers, Inc.  
10777 Westheimer, Suite 400, Houston, TX 7704  
Tel: 281-558-8700 • www.browngay.com  
TBPCE Registration No. F-1046

Copyright

**HEB DEVELOPMENT  
SITE LOCATION  
HOUSTON, TEXAS**

DATE:  
JAN 2015

FIGURE:

PAGE:

## 2.2 Proposed Development

The proposed development will consist a supermarket on the western most part of the project site with 70,000 sf (70 ksf) of space and a 2 level parking structure. The development will have four (4) driveways; the first driveway (DW #1) will be the main entrance to the development and is located on Bissonnet Street, the second driveway (DW #2) is located on Cedar Street and two driveways (DW #3 and DW #4) will be located on Spruce Street. All proposed driveways will consist of right/left in and out movements. The site plan of the proposed development is shown in **Figure 3A and 3B**.

## 2.3 Existing Roadway Conditions and Traffic Volumes

This section describes the geometry and traffic characteristics of the existing roadways within the vicinity of the project. The study intersections Bissonnet Street at S. Rive Avenue and Bissonnet Street at 5<sup>th</sup> Street are signalized intersections. The study intersections of Bissonnet Street at S. Rive Ave., Bissonnet Street at 5<sup>th</sup> Street, Bissonnet Street at Cedar Street (South), Cedar Street at 5<sup>th</sup> Street, Spruce Street at 5<sup>th</sup> Street, and Spruce Street at S. Rice Ave. are all unsignalized intersections. In order to evaluate the existing traffic operations, it is necessary to analyze the existing roads. The roads that will currently provide traffic circulation within the project study area are described below.

### 2.3.1 Bissonnet Street

Bissonnet Street is an east-west major thoroughfare. In the study area, Bissonnet Street has two lanes in each direction with a two-way turn lane (TWTL) in the middle. Left turn lanes are located at all major intersections. The posted speed limit on Bissonnet Street in the study area is 35 mph. The eastbound and westbound left-turn lane have over 100 feet of storage due to the TWTL along Bissonnet Street. This roadway serves as a major connection between the IH 610 to the east and IH 69/US 59 on the west. The current ADT count taken from City of Houston GIMS ( <http://www.gims.houstontx.gov/PortalWS/MainPortal.aspx> ) showed that 21,273 vehicles traveled on Bissonnet Street at Chimney Rock.

### 2.3.2 South Rice Avenue

S. Rice Avenue is a north-south arterial. In the study area, S. Rice Ave. has two lanes in each direction divided by a landscaped median between Bissonnet Street and Bellaire Blvd. It becomes a four-lane undivided roadway approximately 300 feet north of Bissonnet St., and also becomes a four-lane undivided roadway approximately 1000 feet south of Bissonnet St. The posted speed limit on S. Rice Ave. in the study area is 35 mph. S. Rice Ave. has a northbound left-turn lane and a southbound left turn lane at the intersection with Bissonnet St. The northbound left-turn lane has 120 feet of storage, while the southbound left-turn lane has 120 feet of storage and 100 foot taper. This roadway serves as a major connection between the IH 69/US 59 to the north and Beechnut St. on the south. The current ADT count taken from City of Houston GIMS ( <http://www.gims.houstontx.gov/PortalWS/MainPortal.aspx> ) showed that 12,381 vehicles traveled on S. Rice St. at Elm St.

### 2.3.3 S. Cedar Street

Cedar Street is an east-west collector. In the study area, Cedar St. has one lane in each direction and is undivided. There is no posted speed limit on Cedar St. in the study area. This roadway serves as a connection between the Bissonnet St. to the east and Ferris St. on the west. There is no current ADT count available on Cedar St.

### 2.3.4 5<sup>th</sup> Street

5<sup>th</sup> Street is a north-south collector. In the study area, 5th St. has one lane in each direction and is undivided. There is no posted speed limit on 5th St. in the study area. This roadway serves as a connection between the Bissonnet St. to the south and Residential houses on the north. There is no current ADT count available on 5th St.

### 2.3.5 Spruce Street

Spruce Street is an east-west collector. In the study area, Spruce St. has one lane in each direction and is undivided. There is no posted speed limit on Spruce St. in the study area. This roadway serves as a connection between the S. Rice Ave. to the east and Ferris St. on the west. There is no current ADT count available on Spruce St.

### 2.3.6 Existing Driveways

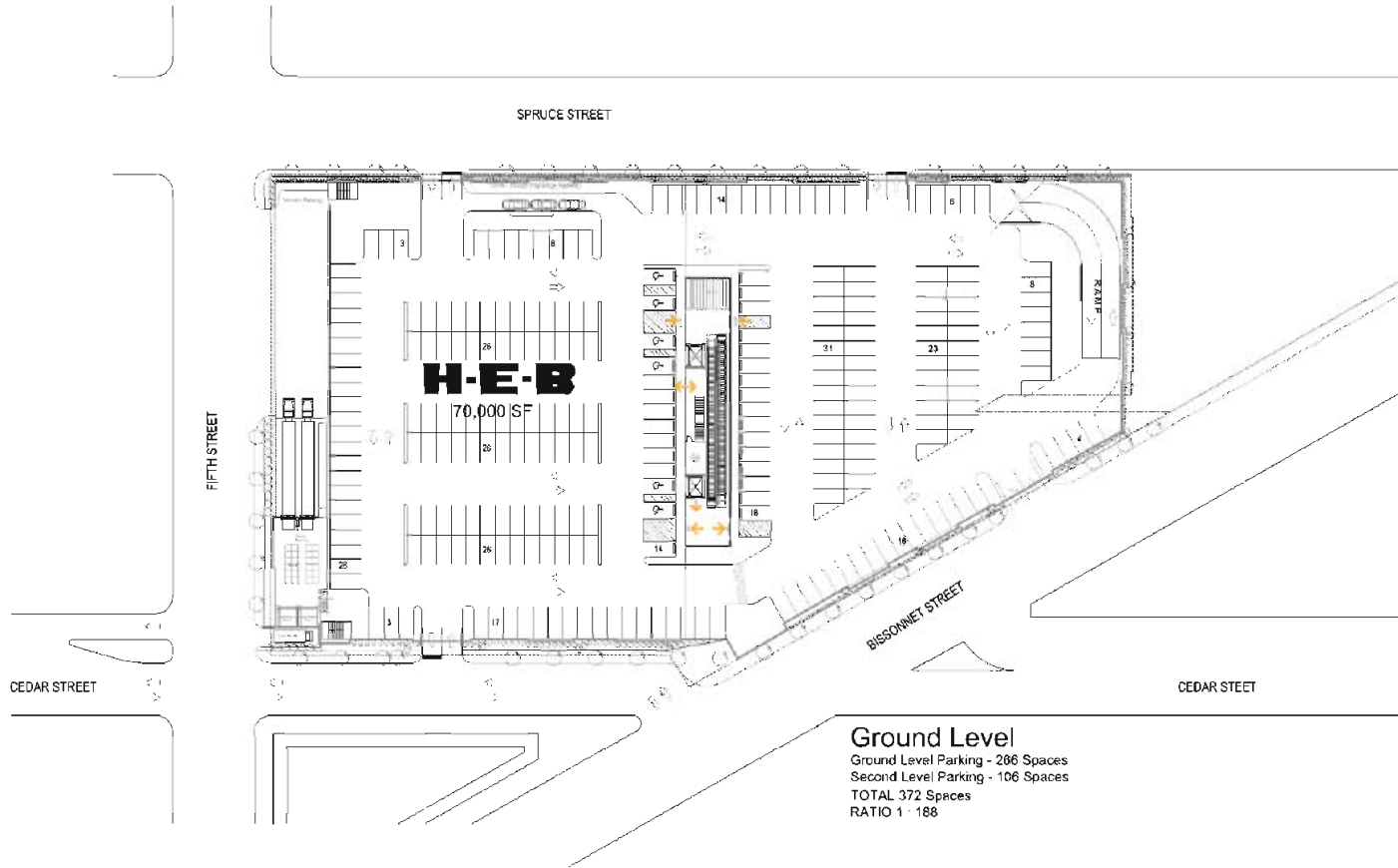
All the existing driveways to the site currently operate adequately with the current street system. All existing driveways are single lane with a right/left out and in movements. Existing Driveway #1 (EXDW #1) currently operates as the sites main driveway access. The existing site is shown in **Figure 4**.

FILE ABBREV

DATE

TIME

USER



**Ground Level**  
 Ground Level Parking - 266 Spaces  
 Second Level Parking - 106 Spaces  
 TOTAL 372 Spaces  
 RATIO 1 - 188



CONFIDENTIAL - IN PROGRESS

**Schematic Plan - Ground Level**

1/24" = 1'

**1**

**HEB**

**HEB Rice & Bissonnet Ground Level**

DATE: January 2015  
 PROJECT: HEB  
 EIR  
 SCALE: 1/24" = 1'

Brown & Gay Engineers, Inc.  
 10777 Westheimer, Suite 400, Houston, TX 770  
 Tel: 281-555-8700 • www.browngay.com  
 TBPE Registration No. F-1046

**HEB DEVELOPMENT  
 SITE PLAN  
 GROUND LEVEL  
 HOUSTON, TEXAS**

DATE: JAN 2015

FIGURE: 1

PAGE: 1

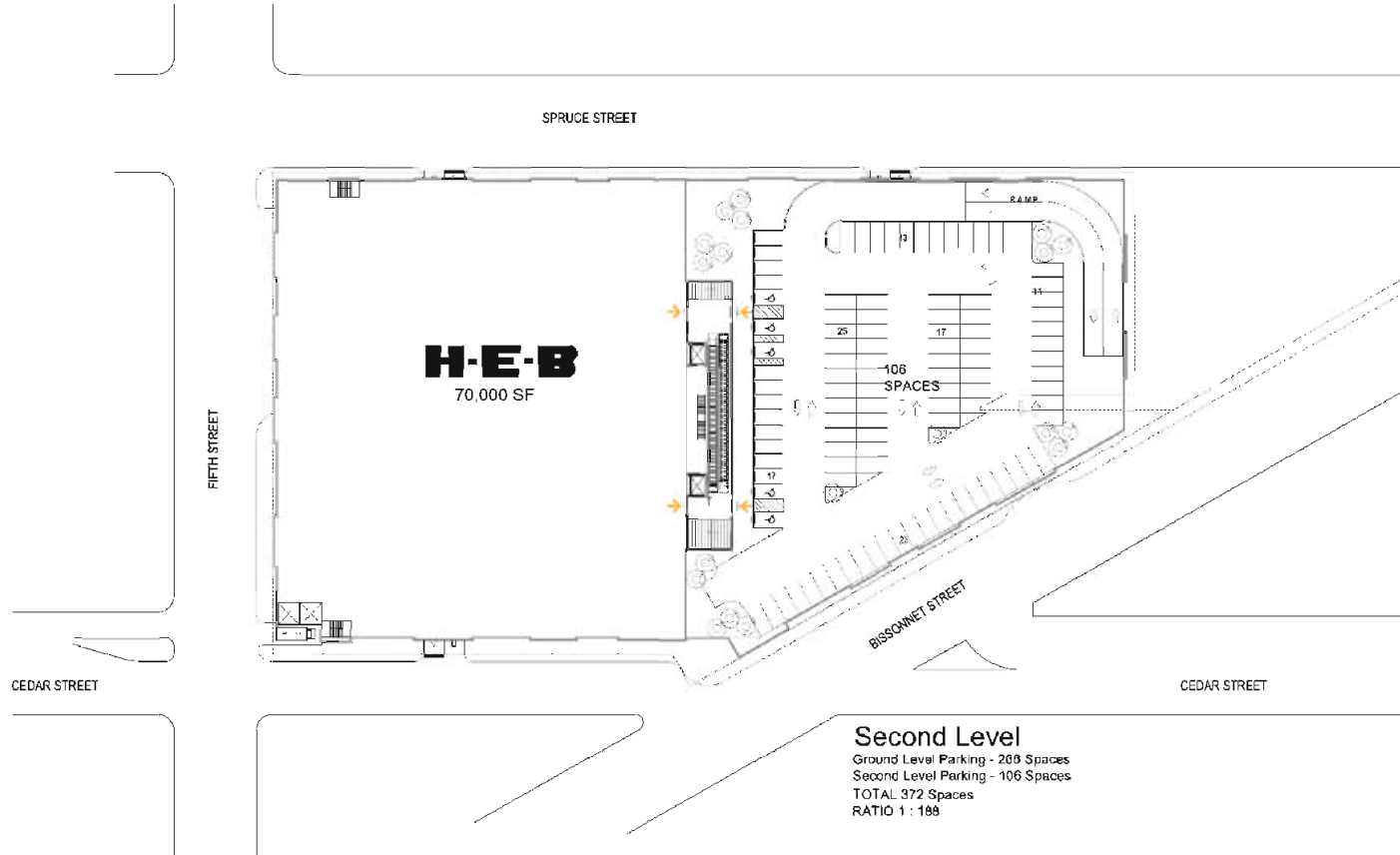


FILE ABBREV

DATE

TIME

USER



**Second Level**

Ground Level Parking - 268 Spaces  
 Second Level Parking - 106 Spaces  
 TOTAL 372 Spaces  
 RATIO 1:188



CONFIDENTIAL - IN PROGRESS

**Schematic Plan - Second Level**

1/8" = 1'

1

HEB

**HEB Rice & Bissonnet Ground Level**

DATE: January 2015  
 DRAWN BY: [illegible]  
 EDR  
 SCALE: 1/8" = 1'



Brown & Gay Engineers, Inc.  
 10777 Westheimer, Suite 400, Houston, TX 770  
 Tel: 281-555-8700 • www.browngay.com  
 TBPE Registration No. F-1046

Copyright

**HEB DEVELOPMENT  
 SITE PLAN  
 SECOND LEVEL  
 HOUSTON, TEXAS**

DATE: JAN 2015

FIGURE:

PAGE:



### 2.3.4 Peak Hour Traffic Volumes

Turning movement counts were taken on Wednesday, December 17, 2014 from 6:30AM to 8:30 AM for the AM peak and from 4:30 PM to 6:30 PM for the PM peak period. **Figure 4** shows existing traffic movement counts for the peak hour periods at the study intersections along Bissonnet Street, S Rice Avenue., Cedar Street, Spruce Street and 5<sup>th</sup> Street. The significant volumes on Bissonnet Street are 173 left-turning vehicles from eastbound onto S. Rice Avenue in the AM, 124 northbound left-turning vehicles from S. Rice Avenue in the PM, 118 left turning vehicles from southbound 5<sup>th</sup> Street in the PM, 73 southbound left-turning vehicles on Cedar Street onto Bissonnet in the PM and 73 southbound left-turning vehicles on Cedar Street onto Bissonnet in the PM.

## 3.0 Analysis

This section includes the trip generation, trip assignment, trip distribution, and pedestrian traffic volumes for the study intersections and the proposed four site driveways. The project site trip generation has been estimated utilizing the trip generation rates contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation (9th Edition)*. The capacity analyses were performed using the methodology from the 2010 *Highway Capacity Software for unsignalized* and the software program *Synchro 7 for signalized*.

### 3.1 Trip Generation

The Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9<sup>th</sup> Edition was used to estimate the project-generated trips classified under daily, AM, and PM peak hours on a typical weekday. The average rates provided by the Trip Generation Manual were considered adequate for this type of development and surrounding area. Therefore, during the weekday AM and PM peak period, no reduction in trips were considered for transit or pedestrian modes. In addition, no adjustments for internal capture were made for the subject development. **Table 2** shows a summary of the project trip generation. **Appendix B** shows the estimated trip generation rates for the proposed development.

**Table 2: Trip Generation Analysis Summary for Project**

Land Use	KSF	ITE Code	Trip Generation						
			Daily Trips	AM Peak			PM Peak		
				Total	Entering	Exiting	Total	Entering	Exiting
<b>Retail &amp; Service</b>									
Supermarket	70.000	850	7,157	238	148	90	664	338	325
<b>Total Trip Generation</b>			<b>7,157</b>	<b>238</b>	<b>148</b>	<b>90</b>	<b>664</b>	<b>338</b>	<b>325</b>
<b>Pass By Trips Reduction</b>		<b>Pass By</b>							
Supermarket	70.000	<b>36%</b>	2,576	86	53	33	239	122	117
<b>Total Pass By Trips</b>			<b>2,576</b>	<b>86</b>	<b>53</b>	<b>33</b>	<b>239</b>	<b>122</b>	<b>117</b>
<b>Total Trip Generation w/ Pass By Reduction</b>			<b>4,580</b>	<b>152</b>	<b>94</b>	<b>58</b>	<b>425</b>	<b>217</b>	<b>208</b>

1. ITE Trip Generation Rates - 9th Edition

2. Pass-by rates from ITE Trip Generation Handbook - 2nd Edition

3. Pass By Rates - 36 % of Supermarket trips.



**Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)**

The current land use for the project site is approximately 35,000 sf of supermarket and 19,000 sf of shopping center space. The existing trip generations are 137 trips during the AM peak, 429 trips during the PM peak, and 4,390 trips per day by the existing site. **Table 3** shows a summary of the Proposed vs. Current project trip generation analysis. **Appendix B** shows the estimated trip generation rates for the proposed development.

The total site generation trips were used in the capacity analysis for the proposed driveway conditions. Based on the trip generation, there will be a total of 238 trips during the AM peak, 664 trips during the PM peak, and 7,157 trips per weekday by the development.

The total site generation trips that were used in the capacity analysis for the intersections conditions were determined by removing the current trips from the proposed trips. Based on the trip generation, there will be a total of 101 trips during the AM peak, 234 trips during the PM peak, and 2,767 trips per weekday by the development. **Table 3** shows a summary of the Proposed vs. Current project trip generation analysis. **Appendix B** shows the estimated trip generation rates for the proposed development.

**Table 3: Proposed vs. Current Conditions Trip Generation Analysis**

Total Trips	Daily Trips	Trip Generation					
		AM Peak			PM Peak		
		Total	Entering	Exiting	Total	Entering	Exiting
Proposed Total Trip Generation	7,157	238	148	90	664	338	325
Current Total Trip Generation	4,390	137	85	52	429	217	213
Proposed Total Trip Generation minus Current Trip Generation	2,767	101	62	38	234	122	113

### 3.2 Trip Distribution and Trip Assignment

The directional trip distribution and assignment of project-generated trips were estimated based on an understanding of the existing and projected future traffic flows and travel patterns within the vicinity of the project site and nearby residential area. The estimated directional trip distribution is shown on **Figure 5** and is as follows:

- Twenty percent (20%) to/from north on S. Rice
- Fifteen percent (15%) to/from south on S. Rice
- Twenty-five percent (20%) to/from east on Bissonnet St.
- Twenty percent (20%) to/from west on Bissonnet St.
- Ten percent (10%) to/from north on 5<sup>th</sup> St.
- Ten percent (10%) to/from south on 5<sup>th</sup> St
- Five percent (5%) to/from north on Ferris St.

Forty percent of the trips generated by the development are anticipated to travel through Bissonnet Street to access the development. This is due to the access availability on the four-lane road with two-way left-turn lanes that leads to and from IH-610. Due to commercial and residential areas along Bissonnet Street the majority of these trips will access the Bissonnet Street Drive (DW #1). Thirty-five percent of the trips generated are anticipated to travel through S. Rice Avenue due to the available four-lane road that leads to and from residential space along S. Rice Avenue from IH 69/US59 to Braeswood



Boulevard. The 35%/40% assumed distribution results in the worst-case scenario to analyze the impact to the Bissonnet/S. Rice intersection. **Figure 6** shows the site distribution for the study area.

### 3.3 Pedestrian Traffic Volumes

In addition to traffic volumes, the number of conflicting pedestrians at the study intersection were analyzed. Based on current counts for peak hour periods, it was found that pedestrian volumes are minimal and they do not have an impact in the level of service of Bissonnet Street at S. Rice Avenue and Bissonnet Street at 5<sup>th</sup> Street. Pedestrian counts for the AM peak hour show only one (1) pedestrian crossing Bissonnet/S. Rice and one (1) pedestrian during the PM peak hour crossing S. Rice. One (1) pedestrian crossed Bissonnet/S. Rice during the AM peak hour and three (3) pedestrians during the PM peak hour crossed Bissonnet, while three (3) pedestrians also crossed S. Rice. Due to the distance between the project site and commercial areas, it is not expected that pedestrian volumes at the study intersection will increase significantly during peak hours.

## 4.0 Capacity Analysis

Capacity analyses were performed for existing conditions, background conditions, and proposed conditions. Intersection operations were analyzed using Synchro 7.0 software developed to automate procedures found in the Highway Capacity Manual. This section includes the analysis of the level of service of the intersection Barker Cypress Road at Park Row Blvd. in three different scenarios, and the level of service at the proposed driveways of the proposed development. The intersections of Bissonnet Street at S. Rice Avenue and Bissonnet Street at 5<sup>th</sup> Street are controlled by a traffic signal and the four (4) proposed driveways along with the intersections of Bissonnet Street at Cedar Street, Cedar Street at 5<sup>th</sup> Street, Spruce Street at 5<sup>th</sup> Street and Spruce Street at S Rive Avenue are analyzed as unsignalized intersections with free flow on Bissonnet, S. Rice, Cedar, and Spruce.

### 4.1 Level of Service Conditions

Levels of service for unsignalized and signalized intersections are based on average delay in seconds per vehicle. **Table 2** shows the criteria for each level of service for signalized, while **Table 3** shows the criteria for each level of service for unsignalized (stop-controlled) intersections. Acceptable HCM levels of service are "A" through "D." Un-acceptable levels of service are "E" and "F," which means that traffic delays would be excessive at the study intersections.

**Table 4: Level of Service Criteria for Signalized Intersections**

Level of Service	Interpretation	Delay (sec/veh)
A	Uncongested operations and progression is extremely favorable; most vehicles arrive during the green phase and do not stop at all.	≤10
B	Uncongested operations and represents good progression; some vehicles may be stopped during the red phase.	>10 and ≤20
C	Light congestion and fair progression; occasional backups on critical approaches.	>20 and ≤35
D	Congestion on critical approaches is more noticeable. Vehicles are required to wait through more than one cycle during short peaks. No long queues are formed.	>35 and ≤55
E	Severe congestion with poor progression; some long queues are formed on critical approaches. Blockages of intersection may occur if traffic signal does not provide for protected turning movements.	>55 and ≤80
F	Total breakdown with stop-and-go operations.	>80

Source: *Highway Capacity Manual 2010***Table 5: Level of Service Criteria for Stop-Controlled Intersections**

Level of Service	Interpretation	Delay (sec/veh)
A	Very low delay; all vehicles clear quickly.	$\leq 10$
B	Low delay; most vehicles clear quickly.	$> 10$ and $\leq 15$
C	Moderate delays at the intersection. Light congestion; occasional back-ups on critical approaches.	$> 15$ and $\leq 25$
D	Significant congestion on critical approaches, but intersection is functional.	$> 25$ and $\leq 35$
E	Heavy traffic flow conditions. Delays of more than two or more minutes probably. Limit of stable flow.	$> 35$ and $\leq 50$
F	Unstable traffic flow. Heavy congestion. Traffic moves in forced-flow condition. Total breakdown with extremely long queues.	$> 50$

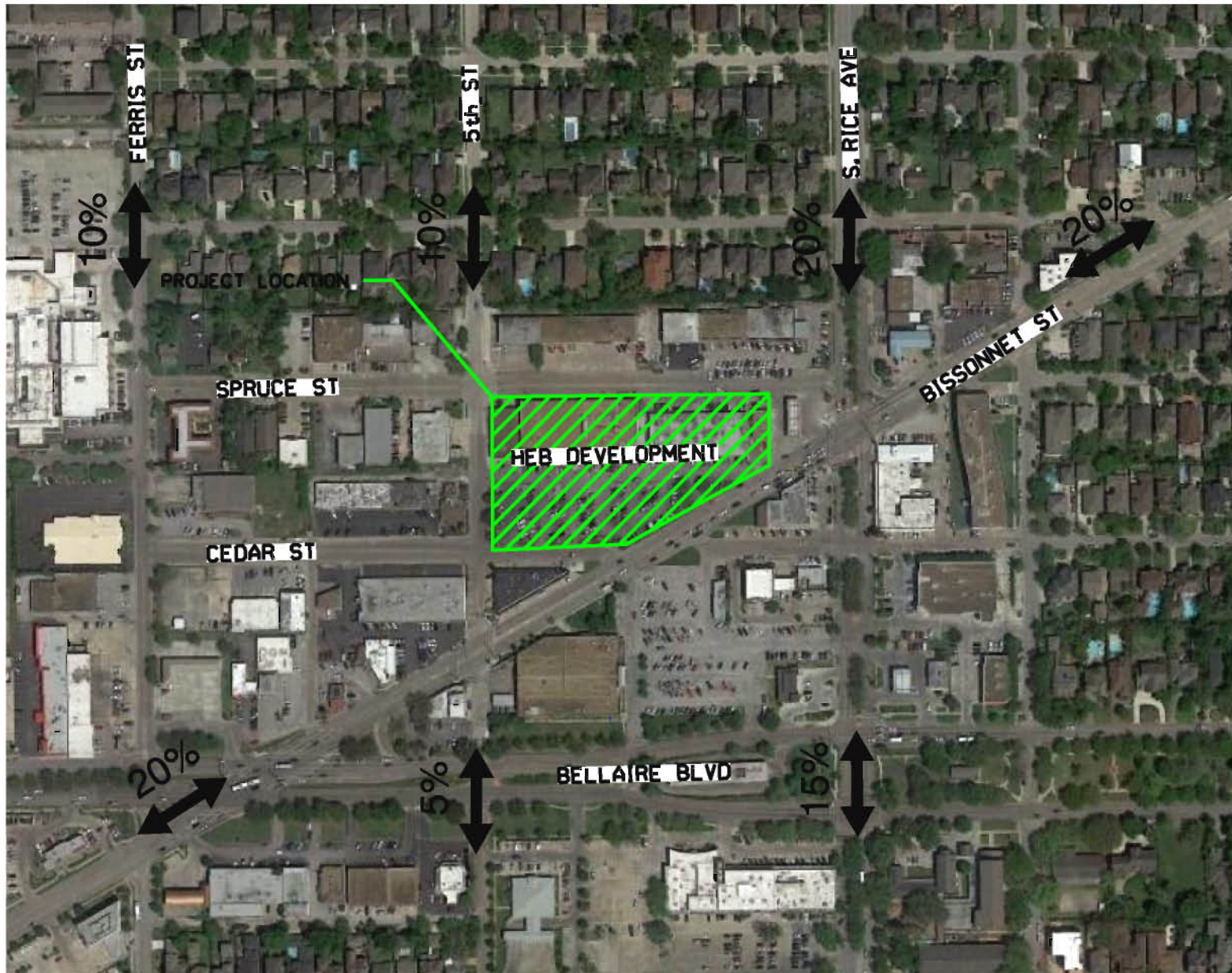
Source: *Highway Capacity Manual 2010*

FILE ABBREV

DATE

TIME

USER



**BGE** Brown & Gay Engineers, Inc.  
10777 Westheimer, Suite 400, Houston, TX 7704  
Tel: 281-558-8700 • www.browngay.com  
TBPE Registration No. F-1046

Copyright

**HEB DEVELOPMENT  
AREA LOCATION  
HOUSTON, TEXAS**

DATE: JAN 2015

FIGURE:

PAGE:

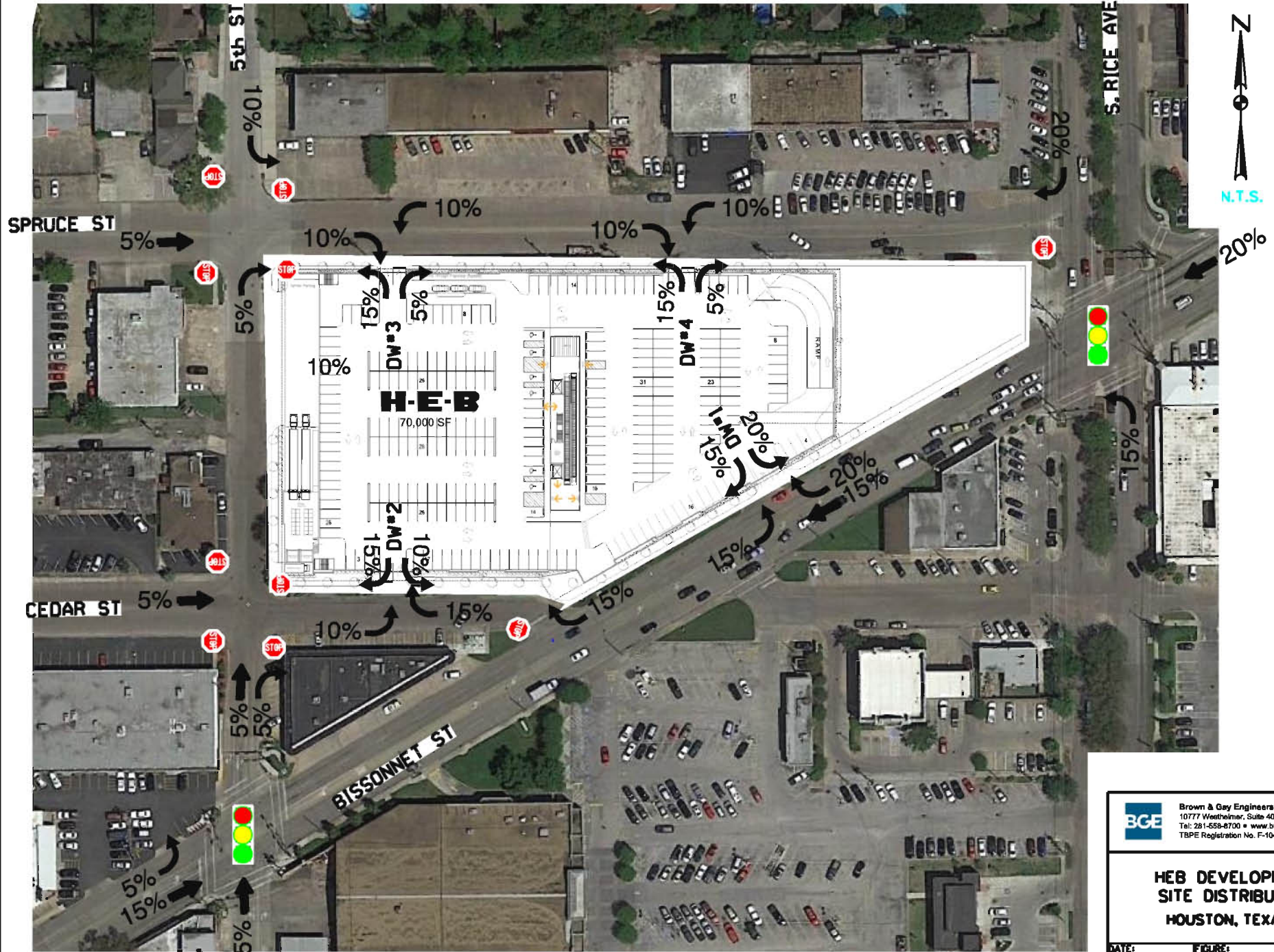


\*FILEABBREV\*

\*DATE\*

\*TIME\*

\*USER\*



**BGE** Brown & Gay Engineers, Inc.  
10777 Westheimer, Suite 400, Houston, TX 770  
Tel: 281-558-8700 • www.browngay.com  
TBPE Registration No. F-1046

Copyright

**HEB DEVELOPMENT  
SITE DISTRIBUTION  
HOUSTON, TEXAS**

DATE: JAN 2015 FIGURE: PAGE:

## 4.2 Analysis Scenarios

There are three analysis scenarios conducted to evaluate the study intersection for each of the two peak hour analysis periods, AM and PM peak. The analysis scenarios are the following:

1. "Existing" Conditions
2. "Year 2019 Background Traffic" Conditions
3. "Year 2019 Total Traffic" Conditions

The initial scenario, "Existing", is the current 2014 conditions that are present at the project site. The second scenario analyzed was the "Year 2019 Background Traffic," which is assuming a worst case scenario of 2% growth based on historical counts and development in the surrounding area. The final scenario, "Year 2019 Total Traffic," analyzed was the background conditions on the second scenario plus the trips generated by the project site. Each of the three scenarios is further discussed in the following sections.

### 4.2.1 "Existing" Conditions

In order to establish baseline conditions, an existing condition analysis or "Existing" analysis was completed. This analysis scenario was completed using the count data that was taken in the field. The results of the level of service (LOS) analyses for the "Existing" conditions are shown in **Table 6**.

**Table 6: "Existing" Traffic Operations Summary for Signalized Intersection**

Time Period	Measure	Overall	S Rice Ave.						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Rig	Left	Thr	Rig	Left	Thru	Righ
AM Peak	Level of Service	D	F	D	-	F	C	-	F	C	-	E	C	-
	Delay (sec/veh)	51.2	80.6	36.0	-	93.4	32.0	-	264.7	33.3	-	76.	23.2	-
PM Peak	Level of Service	D	E	C	-	E	D	-	E	C	-	E	D	-
	Delay (sec/veh)	44.8	79.6	31.9	-	63.0	43.5	-	73.4	33.4	-	61.	47.1	-

Time Period	Measure	Overall	5 <sup>th</sup> St						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	D	A	-	D	B	E	A	-	A	A	-
	Delay (sec/veh)	9.5	-	40.0	0.0	-	43.0	14.2	60.6	8.0	-	0.0	7.6	-
PM Peak	Level of Service	B	-	D	B	-	D	B	F	A	-	E	B	-
	Delay (sec/veh)	14.8	-	39.0	17.9	-	49.6	11.0	81.0	8.8	-	64.	11.3	-

**“Existing” Traffic Operations Summary for Unsignalized Intersection**

Time Period	Measure	Overall	Cedar St						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	C	-	-	B	-	A	-	-	B	-	-
	Delay (sec/veh)	0.9	-	16.5	-	-	14.2	-	8.1	-	-	10.7	-	-
PM Peak	Level of Service	A	-	B	-	-	C	-	A	-	-	A	-	-
	Delay (sec/veh)	2.1	-	11.9	-	-	15.1	-	9.2	-	-	8.9	-	-

Time Period	Measure	Overall	5 <sup>th</sup> St						Cedar St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.5	-	7.5	-	-	7.5	-	-	7.5	-	-	7.5	-
PM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	8.6	-	8.0	-	-	8.8	-	-	8.7	-	-	8.6	-

Time Period	Measure	Overall	5 <sup>th</sup> St						Spruce St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.3	-	7.5	-	-	7.3	-	-	7.3	-	-	7.3	-
PM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.9	-	8.2	-	-	7.7	-	-	7.6	-	-	8.0	-

Time Period	Measure	Overall	S. Rice Ave.						Spruce St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	-	-	-	-	-	-	A	-	-	-	-
	Delay (sec/veh)	0.1	-	-	-	-	-	-	-	9.9	-	-	-	-
PM Peak	Level of Service	A	-	-	-	-	-	-	-	B	-	-	-	-
	Delay (sec/veh)	0.3	-	-	-	-	-	-	-	11.	-	-	-	-

Under the existing conditions and the current signal timing at Bissonnet St. at S. Rice Ave. intersection, the AM levels of service (LOS D) and PM peak levels of service (LOS D) are currently acceptable. The existing conditions and the current signal timing at Bissonnet St. at 5<sup>th</sup> St. intersection show the AM

levels of service (LOS A) and the PM peak levels of service (LOS B) are currently acceptable. The worst movement at Bissonnet St. and S. Rice Ave. are the eastbound left in the AM peak with LOS F (264.7 sec/veh of delay) and PM peak with LOS E (73.4 sec/veh of delay). Another movement is the northbound left in the AM peak with LOS F (80.6 sec/veh of delay) and PM peak with LOS E (79.6 sec/veh of delay).

The unsignalized stop-controlled intersection of Bissonnet Street at Cedar Street (South), Cedar Street at 5<sup>th</sup> Street, Spruce Street at 5<sup>th</sup> Street, Spruce Street at S. Rice Ave are at an acceptable LOS C for the worst movement. All the existing driveways to the site currently operate adequately with the current street system. Existing Driveway #1 (EXDW #1) currently operates as the sites main driveway access. EXDW #1 operates adequately as a de-facto right-turn lane into the existing site parking lot, this is due to the angle of the driveway and Bissonnet St. Currently this driveway is proposed to be removed which is an operational traffic concern. The detailed level of service worksheets are provided in **Appendix C**.

#### Queue Length Analysis

Based on the traffic volumes, the simulation software program *Synchro 7* shows that significant queues were shown for the eastbound left-turn lane and northbound left-turn lane during both the AM and PM peak period.

**Table 7: “Existing” Queue Summary for Signalized Intersection**

Time Period	Queue Length	S. Rice Ave.						Bissonnet St.					
		Northbound			Southbound			Eastbound			Westbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	50th (ft.)	39	200	-	48	124	-	196	394	-	35	73	-
	95th (ft.)	95	261	-	122	171	-	#346	482	-	82	106	-
PM Peak	50th (ft.)	104	154	-	49	301	-	102	162	-	56	324	-
	95th (ft.)	#206	211	-	95	382	-	#183	215	-	108	#412	-

- Volume exceeds capacity, queue is theoretically infinite.
  - # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.

#### 4.2.2 “Year 2019 Background Traffic” Conditions

Traffic estimates under this scenario were developed based on background traffic growth on Bissonnet Street and S. Rice Ave. A traffic growth factor of 2% per year was based on historical traffic counts in the area and the previous Traffic Impact Analysis done for 4301 Bellaire Boulevard Development. The study intersection projected peak hour volumes are shown in **Figure 7**. Traffic operations using the “Year 2019 Background Traffic” are summarized in **Table 8**.

**Table 8: “Year 2019 Background Traffic” Summary for Signalized Intersection**

Time Period	Measure	Overall	S Rice Ave.						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Rig	Left	Thru	Righ	Left	Thr	Righ	Left	Thru	Right
AM Peak	Level of Service	E	F	D	-	F	C	-	F	D	-	F	C	-
	Delay (sec/veh)	58.1	84.7	39.3	-	102.7	32.9	-	326.5	36.	-	80.6	23.8	-
PM Peak	Level of Service	D	F	C	-	E	D	-	E	C	-	E	E	-
	Delay (sec/veh)	50.0	89.7	33.0	-	64.3	49.7	-	77.7	34.	-	63.7	56.2	-



Time Period	Measure	Overall	5th St						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	Level of Service	B	-	D	A	-	D	B	E	A	-	A	A	-
	Delay (sec/veh)	10.3	-	40.0	0.0	-	43.3	13.6	63.6	8.6	-	0.0	8.6	-
PM Peak	Level of Service	B	-	D	B	-	D	B	F	A	-	E	B	-
	Delay (sec/veh)	15.5	-	39.0	17.3	-	51.7	13.1	85.7	9.0	-	66.2	11.8	-

**“Year 2019 Background Traffic” Summary for Unsignalized Intersection**

Time Period	Measure	Overall	Cedar St						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	Level of Service	A	-	C	-	-	C	-	A	-	-	B	-	-
	Delay (sec/veh)	1.0	-	18.5	-	-	15.3	-	8.2	-	-	11.4	-	-
PM Peak	Level of Service	A	-	B	-	-	C	-	A	-	-	A	-	-
	Delay (sec/veh)	2.1	-	12.5	-	-	16.8	-	9.5	-	-	9.2	-	-

Time Period	Measure	Overall	5th St						Cedar St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.6	-	7.5	-	-	7.4	-	-	7.6	-	-	7.6	-
PM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	9.0	-	8.2	-	-	9.2	-	-	9.1	-	-	8.9	-

Time Period	Measure	Overall	5th St						Spruce St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.5	-	7.6	-	-	7.4	-	-	7.4	-	-	7.4	-
PM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	8.1	-	8.4	-	-	7.8	-	-	7.8	-	-	8.1	-

Time Period	Measure	Overall	S. Rice Ave.						Spruce St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	Level of Service	A	-	-	-	-	-	-	-	B	-	-	-	-
	Delay (sec/veh)	0.2	-	-	-	-	-	-	-	10.1	-	-	-	-
PM Peak	Level of Service	A	-	-	-	-	-	-	-	B	-	-	-	-
	Delay (sec/veh)	0.3	-	-	-	-	-	-	-	12.5	-	-	-	-

This scenario was run by utilizing the existing signal timings at the intersection. Based on the current signal timing and additional volumes generated for the traffic growth, the level of service is “E” for the AM peak hour and “D” for the PM peak hour for Bissonnet St. at S. Rice Ave.. The delay increased by over 6 seconds for the AM and PM peak hours, respectively. The level of service for the intersection of Bissonnet St at 5<sup>th</sup> St. maintained a LOS “B” or better for both AM and PM peak hour. The delay increased by only 1 second for the both peak periods.

The unsignalized stop-controlled intersections of Bissonnet Street at Cedar Street (South), Cedar Street at 5th Street, Spruce Street at 5th Street, Spruce Street at S. Rice Ave, all maintained an acceptable LOS and only had minimal delay increases. The detailed level of service worksheets are provided in **Appendix D**.

#### Queue Length Analysis

Based on the traffic volumes, the simulation software program Synchro 7 shows that significant queues are still shown for the eastbound left-turn lane and northbound left-turn lane during both the AM and PM peak period.

**Table 9: “Year 2019 Background Traffic” Queue Summary for Signalized Intersection**

Time Period	Queue Length	S. Rive Ave.						Bissonnet St.					
		Northbound			Southbound			Eastbound			Westbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	50th (ft.)	43	226	-	53	140	-	230	459	-	39	82	-
	95th (ft.)	#106	292	-	#135	191	-	#385	558	-	95	118	-
PM Peak	50th (ft.)	115	176	-	55	347	-	115	183	-	63	371	-
	95th (ft.)	#233	236	-	104	#463	-	#214	240	-	117	#503	-

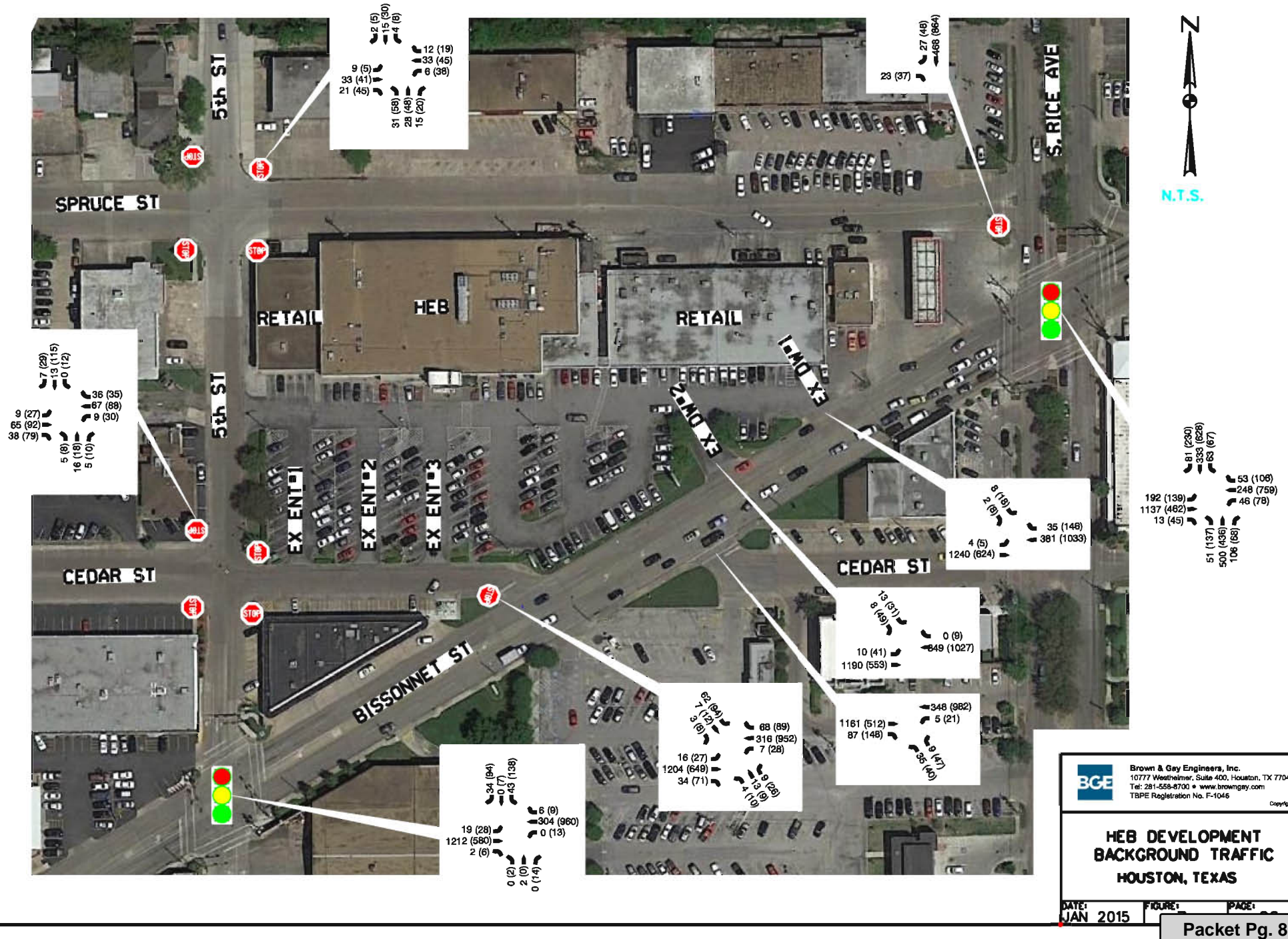
- Volume exceeds capacity, queue is theoretically infinite.
  - # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.

FILE ABBREVS

DATE

TIME

USER



#### 4.2.3 “Year 2019 Total Traffic” Conditions

Traffic volume projections under the “Year 2019 Total Traffic” scenario were developed based on the “Year 2019 Background Traffic” peak hour volumes and the HEB development total number of trips. The Projected Site Trips are shown in **Figure 8**. The projected peak hour volumes for this Total Traffic condition are shown in **Figure 9**. Traffic operations during the “Year 2019 Total Traffic” conditions are shown in **Table 10**.

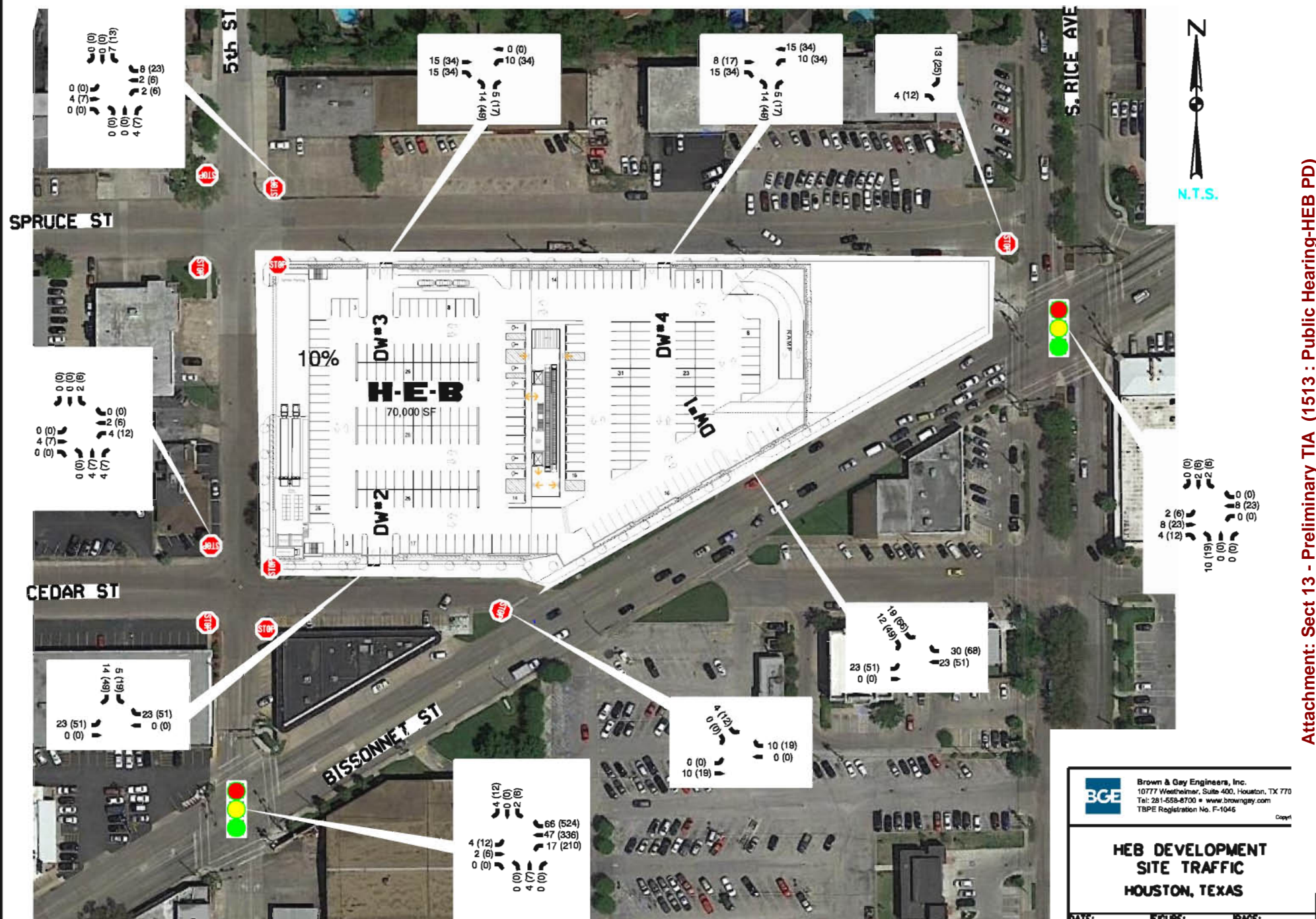
**Table 10: “Year 2019 Total Traffic” Summary for Signalized Intersection**

Time Period	Measure	Overall	S Rice Ave.						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Rig	Left	Thr	Rig	Left	Thru	Rig
AM Peak	Level of Service	E	F	D	-	F	C	-	F	C	-	F	C	-
	Delay (sec/veh)	56.7	99.4	39.3	-	108.	32.9	-	337.2	30.0	-	80.6	24.0	-
PM Peak	Level of Service	D	F	C	-	E	D	-	F	C	-	E	E	-
	Delay (sec/veh)	52.5	112.	33.1	-	65.4	50.3	-	87.8	30.1	-	63.7	60.9	-

Time Period	Measure	Overall	5 <sup>th</sup> St						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Righ	Left	Thr	Rig	Left	Thru	Rig
AM Peak	Level of Service	B	-	D	C	-	D	B	E	B	-	D	A	-
	Delay (sec/veh)	12.0	-	40.5	22.0	-	43.7	13.2	63.6	10.	-	51.8	8.5	-
PM Peak	Level of Service	B	-	D	B	-	D	B	F	A	-	E	A	-
	Delay (sec/veh)	15.6	-	39.0	15.3	-	53.0	14.0	108.	9.9	-	68.3	8.5	-

**Figure 8**



**•USER•**

**Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)**

**HEB DEVELOPMENT  
SITE TRAFFIC  
HOUSTON, TEXAS**

DATE:	FIGURE:	PAGE:
JAN 2015		

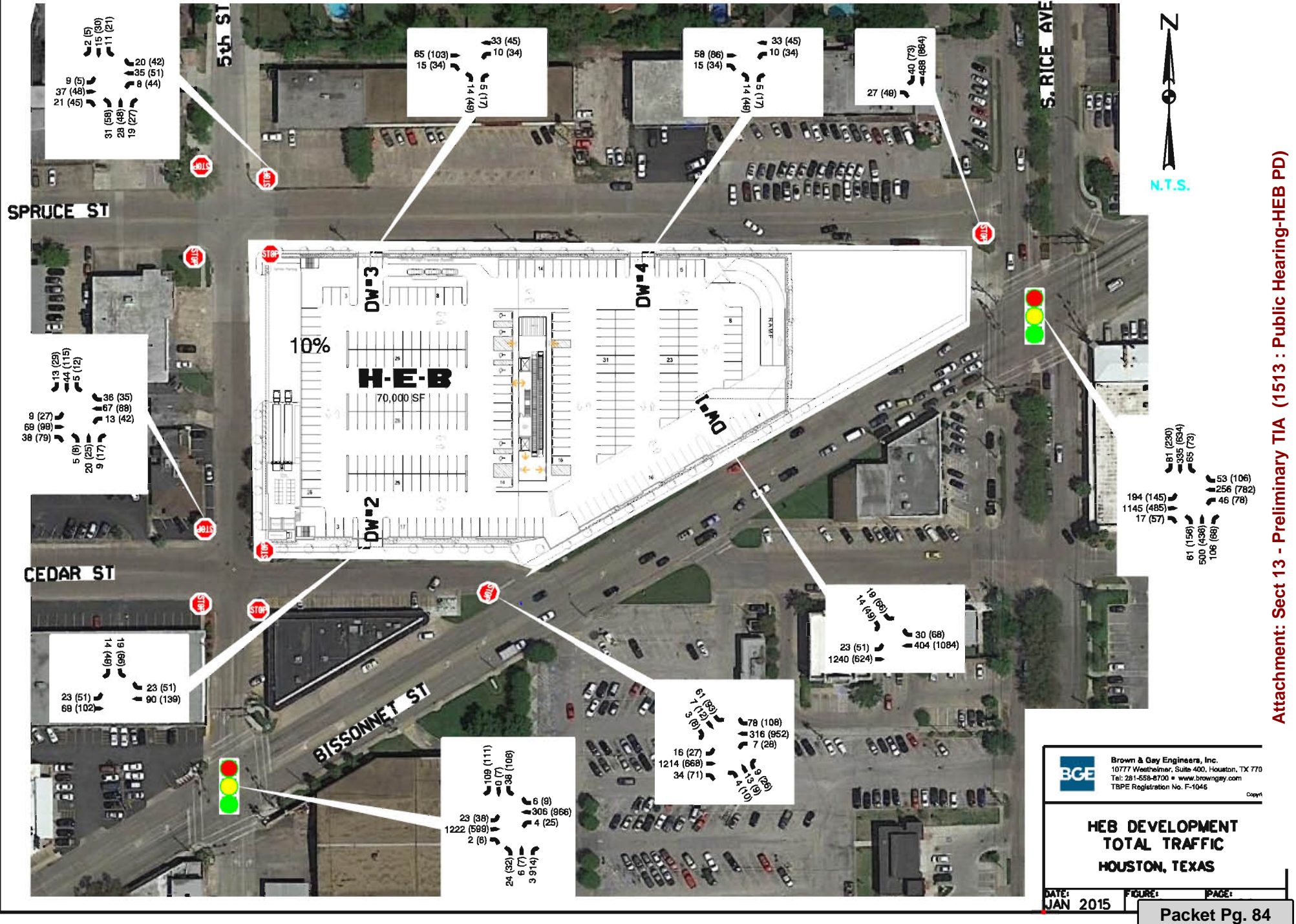


FILE ABBREVS

DATE

TIME

USER



**“Year 2019 Total Traffic” Summary for Unsignalized Intersection**

Time Period	Measure	Overall	Cedar St						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	C	-	-	B	-	A	-	-	B	-	-
	Delay (sec/veh)	1.0	-	17.7	-	-	14.7	-	8.2	-	-	11.2	-	-
PM Peak	Level of Service	A	-	B	-	-	C	-	A	-	-	A	-	-
	Delay (sec/veh)	2.1	-	12.5	-	-	17.3	-	9.5	-	-	9.2	-	-

Time Period	Measure	Overall	5 <sup>th</sup> St						Cedar St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.8	-	7.6	-	-	7.8	-	-	7.8	-	-	7.9	-
PM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	9.2	-	8.4	-	-	9.3	-	-	9.3	-	-	9.2	-

Time Period	Measure	Overall	5 <sup>th</sup> St						Spruce St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	7.5	-	7.7	-	-	7.5	-	-	7.5	-	-	7.4	-
PM Peak	Level of Service	A	-	A	-	-	A	-	-	A	-	-	A	-
	Delay (sec/veh)	8.3	-	8.6	-	-	8.1	-	-	8.0	-	-	8.4	-

Time Period	Measure	Overall	S. Rice Ave.						Spruce St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Righ	Left	Thr	Righ	Left	Thru	Rig	Left	Thru	Righ
AM Peak	Level of Service	A	-	-	-	-	-	-	-	A	-	-	-	-
	Delay (sec/veh)	0.2	-	-	-	-	-	-	-	10.2	-	-	-	-
PM Peak	Level of Service	A	-	-	-	-	-	-	-	B	-	-	-	-
	Delay (sec/veh)	0.4	-	-	-	-	-	-	-	12.9	-	-	-	-

This scenario was also run by utilizing the existing signal timings at the intersection. The level of service was maintained at an “E” for the AM peak hour and “D” for the PM peak hour for Bissonnet St. at S. Rice Ave. The delay decreased by 2 seconds in the AM peak and increased by over 2 seconds for the PM peak

hours, respectively. The level of service for the intersection of Bissonnet St at 5<sup>th</sup> St. maintained at a “B” for the AM and PM peak hour. The delay increased by over 2 seconds for the both peak periods.

The unsignalized stop-controlled intersections of Bissonnet Street at Cedar Street (South), Cedar Street at 5th Street, Spruce Street at 5th Street, Spruce Street at S. Rice Ave, all maintained an acceptable LOS and only had minimal delay increases. The detailed level of service worksheets are provided in **Appendix E**.

**Table 11: “Year 2019 Total Traffic” Summary for Unsignalized Driveways**

Time Period	Measure	Overall	Driveway #1 (DW #1)						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A				-	B	-	A	-	-	-	-	-
	Delay (sec/veh)	0.3				-	10.7	-	8.2	-	-	-	-	-
PM Peak	Level of Service	A				-	C	-	B	-	-	-	-	-
	Delay (sec/veh)	1.2				-	16.4	-	10.6	-	-	-	-	-

Time Period	Measure	Overall	Driveway #2 (DW #2)						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A				-	A	-	A	-	-	-	-	-
	Delay (sec/veh)	2.0				-	9.6	-	2.0	-	-	-	-	-
PM Peak	Level of Service	A				-	B	-	A	-	-	-	-	-
	Delay (sec/veh)	3.7				-	11.6	-	2.8	-	-	-	-	-

Time Period	Measure	Overall	Spruce St						Driveway #3 (DW #3)					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Righ	Left	Thru	Righ	Left	Thr	Righ	Left	Thru	Righ
AM Peak	Level of Service	A	-	A	-				-	-	-	A	-	-
	Delay (sec/veh)	2.3	-	9.1	-				-	-	-	1.8	-	-
PM Peak	Level of Service	A	-	A	-				-	-	-	A	-	-
	Delay (sec/veh)	2.3	-	9.6	-				-	-	-	3.4	-	-



Time Period	Measure	Overall	Spruce St						Driveway #4 (DW #4)					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	Level of Service	A	-	A	-				-	-	-	A	-	-
	Delay (sec/veh)	2.3	-	9.1	-				-	-	-	1.8	-	-
PM Peak	Level of Service	A	-	A	-				-	-	-	A	-	-
	Delay (sec/veh)	2.3	-	9.6	-				-	-	-	3.4	-	-

The four (4) unsignalized stop-controlled Driveways (DW #1, DW #2, DW #3 and DW #4) located on Bissonnet St, Cedar St. and Spruce St. are at an acceptable LOS of "C" or better for their movements. The level of service worksheets are provided in **Appendix E**.

#### Queue Length Analysis

Based on the traffic volumes, the simulation software program Synchro 7 shows that significant queues are still shown for the eastbound left-turn both the AM and PM peak period.

**Table 12: "Year 2019 Total Traffic" Queue Summary for Signalized Intersection**

Time Period	Queue Length	S. Rive Ave.						Bissonnet St.					
		Northbound			Southbound			Eastbound			Westbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	50th (ft.)	51	226	-	56	141	-	241	470	-	39	85	-
	95th (ft.)	#130	292	-	#141	192	-	#400	380	-	95	121	-
PM Peak	50th (ft.)	133	176	-	59	351	-	127	166	-	63	385	-
	95th (ft.)	#273	236	-	110	#469	-	#231	211	-	117	#527	-

- Volume exceeds capacity, queue is theoretically infinite.
- # 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

Based on the traffic volumes, the simulation software program Synchro 7 shows that no queues for all four (4) driveways during both AM and PM peak period. Summary of queuing for the development driveways can be observed in **Appendix E**.

#### Circulation Analysis

Based on field observations, the driveways should not be in conflict with the adjacent properties based on current conditions.

## 5.0 Conclusions

The proposed development includes 70,000 sf of supermarket space with a 2 level parking structure, in Bellaire, Texas. This traffic impact analysis evaluated the impact of the proposed HEB Development. Existing trips from the project site were accounted for during the total trip calculations. Analysis of the surrounding street network was done in terms of vehicle level of service, ingress and egress operations, intersection control, and pedestrian traffic volumes. This development will have minimal impact to the residential neighborhood to the north of the project site. The site is served by two major arterial, Bissonnet Street and South Rice Avenue, as well as a good collector street system around the site, which include 5th Street, Spruce Street, and Cedar Street, which will minimize the need for vehicles to cut through the neighborhoods to get to the site.

A raised median on Bissonnet Street was considered to channelize traffic and reduce vehicular conflicts as a potential mitigation measure to the development impact. However, the projected turning movements are not significant because the site will have access from Spruce Street and Cedar Street, and currently the existing two-way left turn lane operates very well and is expected to continue to operate adequately.

### 5.1 Intersection and Driveway Conclusions

#### 5.1.1 Bissonnet Street at S. Rice Avenue

The existing vehicular level of service was determined for the study intersection of Bissonnet Street and S. Rice Avenue. This intersection was analyzed for the existing traffic volume conditions and background traffic conditions. In both scenarios, the level of service is a LOS "D" for the existing AM peak and LOS "E" for the background AM peak period. The level of service in the PM peak periods shows an acceptable LOS "D" for both the existing and background conditions, respectively, and the delay for all conditions showed minimal changes. For the background plus site traffic volume total traffic scenario, the analysis for the study intersection was performed. The level of service for the study intersection maintained an LOS of an "E" for the AM peak period and LOS "D" for the PM peak period at Bissonnet Street at S. Rice Avenue. The existing east and westbound left-turn lanes do not need to be extended due to it being a Two Way Turn Lane along Bissonnet St in the project area.

#### 5.1.2 Bissonnet Street at 5<sup>th</sup> Street

The existing vehicular level of service was determined for the study intersection of Bissonnet Street and 5<sup>th</sup> Street. This intersection was also analyzed for the existing traffic volume conditions and background traffic conditions. In both scenarios, the level of service was "B" or better for both the AM and PM peak period. The level of service for the background plus site traffic volume total traffic scenario maintained an acceptable LOS "B" or better for both peak periods. The existing east and westbound left-turn lanes do not need to be extended due to it being a Two Way Turn Lane along Bissonnet St in the project area.

#### 5.1.3 Unsignalized Intersections (Bissonnet St. at Cedar St., 5th St. at Cedar St., Spruce St. at 5th St and Spruce St. at S. Rice Ave.)

The existing vehicular level of service was determined for the study intersection of Bissonnet Street at Cedar Street, Cedar Street at 5<sup>th</sup> Street, Spruce Street at 5<sup>th</sup> Street and Spruce Street at S. Rice Avenue. These intersections were also analyzed for the existing traffic volume conditions and background traffic conditions. In both scenarios, the level of service was "C" or better for all traffic movements in both the

AM and PM peak period. The level of service for the background plus site traffic volume total traffic scenario maintained an acceptable LOS "C" or better for all traffic movements in both peak periods

#### 5.1.4 Driveways (DW #1, DW #2, DW #3, and DW #4.)

The level of service for the background plus site traffic volume total traffic scenario showed an acceptable LOS "C" or better for all traffic movements in both peak periods for all proposed site driveways.

**Table 13: "Mitigation" Summary for Bissonnet St. at S. Rice Ave.**

Time Period	Measure	Overall	S Rice Ave.						Bissonnet St					
			Northbound			Southbound			Eastbound			Westbound		
			Left	Thr	Rig	Left	Thr	Rig	Left	Thr	Rig	Lef	Thr	Righ
AM Peak	Level of Service	C	E	D	-	E	D	-	D	C	-	E	C	-
	Delay (sec/veh)	33.4	57.1	41.0	-	75.7	36.2	-	41.9	23.6	-	70.	26.8	-
PM Peak	Level of Service	D	E	C	-	E	E	-	E	C	-	E	E	-
	Delay (sec/veh)	53.1	74.9	31.5	-	65.4	55.6	-	77.4	29.8	-	65.	67.0	-

**Table 14: "Mitigation" Queue Summary for Bissonnet St. at S. Rice Ave.**

Time Period	Queue Length	S. Rive Ave.						Bissonnet St.					
		Northbound			Southbound			Eastbound			Westbound		
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
AM Peak	50th (ft.)	41	208	-	45	133	-	124	363	-	32	81	-
	95th (ft.)	84	310	-	115	188	-	197	231	-	85	120	-
PM Peak	50th (ft.)	128	170	-	59	356	-	123	170	-	64	418	-
	95th (ft.)	#226	227	-	110	#482	-	#240	261	-	116	#553	-

- Volume exceeds capacity, queue is theoretically infinite.
  - # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.

## 5.2 Recommendations

One intersection that was analyzed for this project has triggered the need for mitigation.

### 5.2.1 Bissonnet Street at S. Rice Avenue

The intersection of Bissonnet St. at S. Rice Ave. operates at LOS "E" during the AM peak hour in the background and proposed site total conditions. This intersection operates at the determined LOS of "E" with a delay of 56.7 sec/veh. Re-timing this signal would allow this intersection to operate at a LOS "C" during AM and LOS "D" during the PM peak periods. Re-timing the intersection will decreased the background queue of 233 ft. to 226 ft. for the northbound turn lane. The required storage for the northbound left-turn lane was determined by using the 95th percentile queue lengths from Synchro 7 outputs. The level of service worksheets are provided in **Appendix F**.



Adjusting timings on Bissonnet St. at S. Rice Ave. would impact the City of Bellaire's traffic signals progression to the east and west along the traffic signal subsystem. Re-timing should also include optimizing for progression offsets for the entire Bellaire "Triangle" traffic signal subsystem, which is composed of: Bissonnet St. at Bellaire Blvd., Bissonnet St. at 5<sup>th</sup> St., Bissonnet St. at S Rice Ave., Bellaire Blvd. at S Rice Ave. and Bellaire Blvd. at Mapleridge St.

The proposed locations of the driveways around the development will distribute the additional site traffic adequately with minimal impact to the existing street network, except for Proposed Driveway #1. Driveway #1 will be too close to the internal parking ramp to the second floor, which will cause an internal conflict and queues to spill onto Bissonnet Street. Therefore, the following should be done for Driveway #1: add a right-turn lane with 100-ft storage and 100-ft taper, relocate and/or delete the driveway, or change the internal ramp access to minimize queue spillover onto Bissonnet Street.

It is recommended that proposed sidewalks should be built around the project site, since this is in the central business area of the city.

# Appendix A

## Existing Traffic Counts

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



Projected Intersection

Turning Movement Volume

60 Minute

Spruce St at S Rice

Existing 2014

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	423	24	0	0	20	0	0	0
PM	0	0	0	0	782	43	0	0	33	0	0	0

PROJECTED SITE TRAFFIC

Projected minus (-) Current Trips for intersections

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	13	0	0	4	0	0	0
PM	0	0	0	0	0	25	0	0	12	0	0	0

PROJECTED BACKGROUND Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	468	27	0	0	23	0	0	0
PM	0	0	0	0	864	48	0	0	37	0	0	0

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

TOTAL Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	468	40	0	0	27	0	0	0
PM	0	0	0	0	864	73	0	0	49	0	0	0

Projected Intersection 5th St at Spruce

Turning Movement Volume

60 Minute

Existing 2014

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	28	25	13	3	13	1	8	29	19	5	29	10
PM	52	43	18	7	27	4	4	37	40	34	40	17

PROJECTED SITE TRAFFIC

Projected minus (-) Current Trips  
for intersections

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	4	7	0	0	0	4	0	2	2	8
PM	0	0	7	13	0	0	0	7	0	6	6	23

PROJECTED BACKGROUND Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	31	28	15	4	15	2	9	33	21	6	33	12
PM	58	48	20	8	30	5	5	41	45	38	45	19

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

TOTAL Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	31	28	19	11	15	2	9	37	21	8	35	20
PM	58	48	27	21	30	5	5	48	45	44	51	42



Projected Intersection

Turning Movement Volume

60 Minute

5th St at Cedar St

Existing 2014

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	4	14	4	4	39	11	8	58	34	8	60	32
PM	7	16	9	10	104	26	24	83	71	27	79	31

PROJECTED SITE TRAFFIC

Projected minus (-) Current Trips for intersections

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	4	4	0	0	0	0	4	0	4	2	0
PM	0	7	7	0	0	0	0	7	0	12	6	0

PROJECTED BACKGROUND Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	5	16	5	5	44	13	9	65	38	9	67	36
PM	8	18	10	12	115	29	27	92	79	30	88	35

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

TOTAL Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	5	20	9	5	44	13	9	69	38	13	69	36
PM	8	25	17	12	115	29	27	99	79	42	94	35

Projected Intersection

Cedar St (SOUTH) at Bissonnet

Turning Movement Volume

60 Minute

Existing 2014

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	3	11	8	51	6	2	14	1,090	30	6	286	61
PM	9	8	23	73	10	7	24	587	64	25	862	80

PROJECTED SITE TRAFFIC

Projected minus (-) Current Trips for intersections

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	4	0	0	0	10	0	0	0	10
PM	0	0	0	12	0	0	0	19	0	0	0	19

PROJECTED BACKGROUND Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	4	13	9	57	7	3	16	1,204	34	7	316	68
PM	10	9	26	81	12	8	27	649	71	28	952	89

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

TOTAL Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	4	13	9	61	7	3	16	1,214	34	7	316	78
PM	10	9	26	93	12	8	27	668	71	28	952	108



Projected Intersection

Turning Movement Volume

60 Minute

5th ST at Bissonnet

Existing 2014

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	1	2	38	0	30	17	1,097	1	0	275	5
PM	1	0	12	118	6	85	28	525	5	11	869	8

PROJECTED SITE TRAFFIC

Projected minus (-) Current Trips for intersections

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	4	0	2	0	4	4	10	0	4	2	0
PM	0	7	0	6	0	12	7	19	0	12	6	0

PROJECTED BACKGROUND Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	2	3	42	0	34	19	1,212	2	0	304	6
PM	2	0	14	131	7	94	31	580	6	13	960	9

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

TOTAL Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	6	3	44	0	38	23	1,222	2	4	306	6
PM	2	7	14	137	7	106	38	599	6	25	966	9

Projected Intersection  
Turning Movement Volume  
60 Minute

S Rice at Bissonnet

Existing 2014

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	46	452	96	57	301	73	173	1,029	11	41	224	48
PM	124	394	61	60	568	208	125	418	40	70	687	96

PROJECTED SITE TRAFFIC

Projected minus (-) Current Trips for intersections

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	10	0	0	2	2	0	2	8	4	0	8	0
PM	19	0	0	6	6	0	6	23	12	0	23	0

PROJECTED BACKGROUND Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	51	500	106	63	333	81	192	1,137	13	46	248	53
PM	137	436	68	67	628	230	139	462	45	78	759	106

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

TOTAL Traffic 2019

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	61	500	106	65	335	81	194	1,145	17	46	256	53
PM	156	436	68	73	634	230	145	485	57	78	782	106



**Projected Driveway  
Turning Movement Volume**  
60 Minute

**Driveway #1 at Bissonnet**

**Existing 2014**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	1,123	0	0	345	0
PM	0	0	0	0	0	0	0	565	0	0	935	0

**PROJECTED SITE TRAFFIC**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	19	0	14	23	0	0	0	23	30
PM	0	0	0	66	0	49	51	0	0	0	51	68

**PROJECTED BACKGROUND Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	1,240	0	0	381	0
PM	0	0	0	0	0	0	0	624	0	0	1,033	0

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

**TOTAL Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	19	0	14	23	1,240	0	0	404	30
PM	0	0	0	66	0	49	51	624	0	0	1,084	68

**Projected Driveway  
Turning Movement Volume**  
60 Minute

**Driveway #2 at Cedar St**

**Existing 2014**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	62	0	0	60	0
PM	0	0	0	0	0	0	0	92	0	0	79	0

**PROJECTED SITE TRAFFIC**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	19	0	14	23	0	0	0	0	23
PM	0	0	0	66	0	49	51	0	0	0	0	51

**PROJECTED BACKGROUND Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	69	0	0	67	0
PM	0	0	0	0	0	0	0	102	0	0	88	0

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

**TOTAL Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	19	0	14	23	69	0	0	67	23
PM	0	0	0	66	0	49	51	102	0	0	88	51



**Projected Driveway  
Turning Movement Volume**  
60 Minute

**Driveway #3 at Spruce St**

**Existing 2014**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	45	0	0	29	0
PM	0	0	0	0	0	0	0	62	0	0	40	0

**PROJECTED SITE TRAFFIC**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	14	0	5	0	0	0	0	15	15	10	0	0
PM	49	0	17	0	0	0	0	34	34	34	0	0

**PROJECTED BACKGROUND Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	50	0	0	33	0
PM	0	0	0	0	0	0	0	69	0	0	45	0

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

**TOTAL Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	14	0	5	0	0	0	0	65	15	10	33	0
PM	49	0	17	0	0	0	0	103	34	34	45	0

**Projected Driveway  
Turning Movement Volume**  
60 Minute

**Driveway #4 at Spruce St**

**Existing 2014**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	45	0	0	29	0
PM	0	0	0	0	0	0	0	62	0	0	40	0

**PROJECTED SITE TRAFFIC**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	14	0	5	0	0	0	0	8	15	10	0	0
PM	49	0	17	0	0	0	0	17	34	34	0	0

**PROJECTED BACKGROUND Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	0	0	0	0	0	0	0	50	0	0	33	0
PM	0	0	0	0	0	0	0	69	0	0	45	0

Projected Year - 2019	5	Projection %	0.02
-----------------------	---	--------------	------

**TOTAL Traffic 2019**

	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
AM	14	0	5	0	0	0	0	58	15	10	33	0
PM	49	0	17	0	0	0	0	86	34	34	45	0



# Appendix B

## Trip Generation Worksheets

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

**Table 1 - Trip Generation**

**Current Retail**

Current Land Use	KSF	ITE Code	Trip Generation						
			Daily	AM Peak			PM Peak		
			Trips	Total	Entering	Exiting	Total	Entering	Exiting
<b>Retail</b>									
Shopping Center	19.000	820	811	18	11	7	70	34	37
Supermarket	35.000	850	3,578	119	74	45	359	183	176
<b>Current Total Trip Generation</b>			<b>4,390</b>	<b>137</b>	<b>85</b>	<b>52</b>	<b>429</b>	<b>217</b>	<b>213</b>

1. ITE Trip Generation Rates - 9th Edition



ITE Vehicle Trip Generation Rates							
(peak hours are for peak hour of adjacent street traffic unless highlighted)							
Weekday	AM	PM	Pass-By	AM In	AM Out	PM In	PM Out
Rate	42.7	0.96	3.71	34%	62%	38%	48%
Rate	102.24	3.40	9.48	36%	62%	38%	51%

**Table 1 - Trip Generation**

**Proposed Retail**

Land Use	KSF	ITE Code	Daily Trips	Trip Generation					
				AM Peak			PM Peak		
				Total	Entering	Exiting	Total	Entering	Exiting
<b>Retail &amp; Service</b>									
Supermarket	70.000	850	7,157	238	148	90	664	338	325
<b>Total Trip Generation</b>			<b>7,157</b>	<b>238</b>	<b>148</b>	<b>90</b>	<b>664</b>	<b>338</b>	<b>325</b>
<b>Pass By Trips &amp; Internal Capture Reduction</b>		<b>Pass By</b>							
Supermarket	70.000	<b>36%</b>	2,576	86	53	33	239	122	117
<b>Total Pass By Trips</b>			<b>2,576</b>	<b>86</b>	<b>53</b>	<b>33</b>	<b>239</b>	<b>122</b>	<b>117</b>
<b>Total Trip Generation w/ Pass By Reduction</b>			<b>4,580</b>	<b>152</b>	<b>94</b>	<b>58</b>	<b>425</b>	<b>217</b>	<b>208</b>

1. ITE Trip Generation Rates - 9th Edition

2. Pass-by rates from ITE Trip Generation Handbook - 2nd Edition

3. Pass By Rates - 36 % of Supermarket trips.



ITE Vehicle Trip Generation Rates							
(peak hours are for peak hour of adjacent street traffic unless highlighted)							
Weekday	AM	PM	Pass-By	AM In	AM Out	PM In	PM Out
102.24	3.40	9.48	36%	62%	38%	51%	49%
102.24	3.40	9.48	36%	62%	38%	51%	49%

**Table 1 - Trip Generation**  
**Proposed vs. Current Conditions**

Total Trips	Daily Trips	Trip Generation					
		AM Peak			PM Peak		
		Total	Entering	Exiting	Total	Entering	Exiting
Proposed Total Trip Generation	7,157	238	148	90	664	338	325
Current Total Trip Generation	4,390	137	85	52	429	217	213
Proposed Total Trip Generation minus Current Trip Generation	2,767	101	62	38	234	122	113























# Appendix C

## Analysis Worksheet for “Existing” Condition

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS AM  
3: Bissonnet St & 5th St

EXISTING AM  
1/25/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	17	1097	1	0	275	5	0	1	0	36	0	30
Satd. Flow (prot)	1770	3539	0	1863	3532	0	0	1863	1863	0	1770	1583
Flt Permitted	0.950										0.757	
Satd. Flow (perm)	1770	3539	0	1863	3532	0	0	1863	1863	0	1410	1583
Satd. Flow (RTOR)					3							33
Lane Group Flow (vph)	18	1193	0	0	304	0	0	1	0	0	39	33
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	12.0	80.0	0.0	12.0	80.0	0.0	28.0	28.0	28.0	28.0	28.0	28.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effect Green (s)	5.9	86.0			81.2			22.0			22.0	22.0
Actuated g/C Ratio	0.05	0.72			0.68			0.18			0.18	0.18
v/c Ratio	0.21	0.47			0.13			0.00			0.15	0.10
Control Delay	60.6	8.0			7.6			40.0			43.0	14.2
Queue Delay	0.0	0.0			0.0			0.0			0.0	0.0
Total Delay	60.6	8.0			7.6			40.0			43.0	14.2
LOS	E	A			A			D			D	B
Approach Delay		8.8			7.6			40.0			29.8	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	14	184			33			1			26	0
Queue Length 95th (ft)	39	224			68			6			59	29
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80											60
Base Capacity (vph)	89	2536			2391			342			259	317
Starvation Cap Reductn	0	0			0			0			0	0
Spillback Cap Reductn	0	0			0			0			0	0
Storage Cap Reductn	0	0			0			0			0	0
Reduced v/c Ratio	0.20	0.47			0.13			0.00			0.15	0.10

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.47

Intersection Signal Delay: 9.5

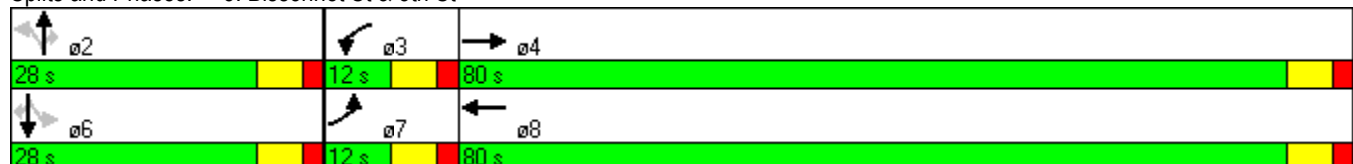
Intersection LOS: A

Intersection Capacity Utilization 49.0%

ICU Level of Service A

Analysis Period (min) 15





















Splits and Phases: 3: Bissonnet St & 5th St





SIGNALS AM  
17: Bissonnet St & S. Rice Ave

EXISTING AM  
1/25/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	173	1029	11	41	224	48	46	452	96	57	301	73
Satd. Flow (prot)	1770	3532	0	1770	3447	0	1770	3447	0	1770	3437	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3532	0	1770	3447	0	1770	3447	0	1770	3437	0
Satd. Flow (RTOR)		1			25			21			25	
Lane Group Flow (vph)	188	1130	0	45	295	0	50	595	0	62	406	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	15.0	55.0	0.0	12.0	52.0	0.0	12.0	41.0	0.0	12.0	41.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effect Green (s)	9.0	51.4		5.9	46.0		5.9	37.4		6.0	37.4	
Actuated g/C Ratio	0.08	0.43		0.05	0.38		0.05	0.31		0.05	0.31	
v/c Ratio	1.41	0.75		0.52	0.22		0.57	0.55		0.70	0.37	
Control Delay	264.7	33.3		76.3	23.2		80.6	36.0		93.4	32.0	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	264.7	33.3		76.3	23.2		80.6	36.0		93.4	32.0	
LOS	F	C		E	C		F	D		F	C	
Approach Delay		66.3			30.3			39.4			40.2	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	~196	394		35	73		39	200		48	124	
Queue Length 95th (ft)	#346	482		#82	106		#95	261		#122	171	
Internal Link Dist (ft)		206			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	133	1514		89	1337		89	1089		89	1088	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.41	0.75		0.51	0.22		0.56	0.55		0.70	0.37	

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 56 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.41

Intersection Signal Delay: 51.2

Intersection LOS: D

Intersection Capacity Utilization 71.0%

ICU Level of Service C

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

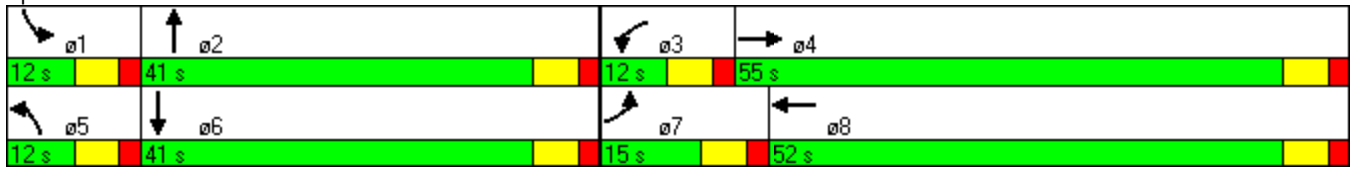
Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS AM  
17: Bissonnet St & S. Rice Ave

EXISTING AM  
1/25/2015

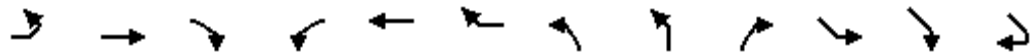
Splits and Phases: 17: Bissonnet St & S. Rice Ave











UNSIGNALIZED AM  
5: Bissonnet St & Cedar St (South)

EXISTING AM  
1/26/2015



















Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (veh/h)	14	1090	30	6	286	61	3	11	8	51	6	2
Sign Control		Free			Free			Stop		Stop		
Grade		0%			0%			0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1185	33	7	311	66	3	12	9	55	7	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	446			684								
pX, platoon unblocked				0.85			0.85	0.85	0.85	0.85	0.85	
vC, conflicting volume	377			1217			1405	1622	609	995	1605	189
vC1, stage 1 conf vol							1232	1232		357	357	
vC2, stage 2 conf vol							174	390		638	1248	
vCu, unblocked vol	377			907			1128	1382	193	646	1362	189
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	96	99	89	98	100
cM capacity (veh/h)	1178			635			235	269	695	490	261	821
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SE 1				
Volume Total	15	790	428	7	207	170	24	64				
Volume Left	15	0	0	7	0	0	3	55				
Volume Right	0	0	33	0	0	66	9	2				
cSH	1178	1700	1700	635	1700	1700	338	455				
Volume to Capacity	0.01	0.46	0.25	0.01	0.12	0.10	0.07	0.14				
Queue Length 95th (ft)	1	0	0	1	0	0	6	12				
Control Delay (s)	8.1	0.0	0.0	10.7	0.0	0.0	16.5	14.2				
Lane LOS	A			B			C	B				
Approach Delay (s)	0.1			0.2			16.5	14.2				
Approach LOS							C	B				
Intersection Summary												
Average Delay	0.9											
Intersection Capacity Utilization	47.8%			ICU Level of Service					A			
Analysis Period (min)	15											

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
7: Spruce St & 5th St

EXISTING AM  
1/26/2015

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	8	29	19	5	29	10	28	25	13	3	13	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	32	21	5	32	11	30	27	14	3	14	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	61	48	72	18								
Volume Left (vph)	9	5	30	3								
Volume Right (vph)	21	11	14	1								
Hadj (s)	-0.14	-0.08	0.00	0.03								
Departure Headway (s)	4.0	4.1	4.1	4.2								
Degree Utilization, x	0.07	0.05	0.08	0.02								
Capacity (veh/h)	873	858	836	821								
Control Delay (s)	7.3	7.3	7.5	7.3								
Approach Delay (s)	7.3	7.3	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.4									
HCM Level of Service			A									
Intersection Capacity Utilization			18.7%	ICU Level of Service		A						
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED AM  
11: Cedar Dt & 5th St

EXISTING AM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	8	58	34	8	60	32	4	14	4	0	11	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	63	37	9	65	35	4	15	4	0	12	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	109	109	24	18								
Volume Left (vph)	9	9	4	0								
Volume Right (vph)	37	35	4	7								
Hadj (s)	-0.15	-0.14	-0.04	-0.18								
Departure Headway (s)	3.9	4.0	4.3	4.2								
Degree Utilization, x	0.12	0.12	0.03	0.02								
Capacity (veh/h)	894	893	783	810								
Control Delay (s)	7.5	7.5	7.5	7.3								
Approach Delay (s)	7.5	7.5	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.5									
HCM Level of Service			A									
Intersection Capacity Utilization			18.5%	ICU Level of Service					A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
13: Spruce St & S. Rice Ave

EXISTING AM  
1/26/2015



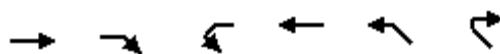
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Volume (veh/h)	0	15	0	673	423	24
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	16	0	732	460	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				150		
pX, platoon unblocked	0.87					
vC, conflicting volume	839	243	460			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	503	243	460			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	98	100			
cM capacity (veh/h)	431	758	1098			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	16	366	366	307	179	
Volume Left	0	0	0	0	0	
Volume Right	16	0	0	0	26	
cSH	758	1700	1700	1700	1700	
Volume to Capacity	0.02	0.22	0.22	0.18	0.11	
Queue Length 95th (ft)	2	0	0	0	0	
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	
Lane LOS	A					
Approach Delay (s)	9.9	0.0		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		22.5%		ICU Level of Service		A
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED AM  
22: Bissonnet St & Cedar St (North)

EXISTING AM  
1/26/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	1051	78	4	315	31	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1142	85	4	342	34	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh	2			2		
Upstream signal (ft)	634			496		
pX, platoon unblocked			0.86		0.86	0.86
vC, conflicting volume			1227		1365	614
vC1, stage 1 conf vol					1185	
vC2, stage 2 conf vol					180	
vCu, unblocked vol			929		1089	212
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		89	99
cM capacity (veh/h)			627		301	679
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NW 1
Volume Total	762	466	4	171	171	42
Volume Left	0	0	4	0	0	34
Volume Right	0	85	0	0	0	9
cSH	1700	1700	627	1700	1700	340
Volume to Capacity	0.45	0.27	0.01	0.10	0.10	0.12
Queue Length 95th (ft)	0	0	1	0	0	11
Control Delay (s)	0.0	0.0	10.8	0.0	0.0	17.1
Lane LOS			B			C
Approach Delay (s)	0.0		0.1			17.1
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			41.5%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

## TWO-WAY STOP CONTROL SUMMARY

## General Information

Analyst	BGE
Agency/Co.	
Date Performed	01/21/2015
Analysis Time Period	5:00 pm

## Site Information

Intersection	Bissonnet St & Cedar St (S
Jurisdiction	
Analysis Year	

## Project Description

East/West Street:	North/South Street:
Intersection Orientation: East-West	Study Period (hrs): 1.00

## Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	24	587	64	25	862	80
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	26	638	69	27	936	86
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		1			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	9	8	23	73	10	7
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	9	8	24	79	10	7
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	





















## Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	26	27		41			96	
C (m) (veh/h)	891	948		563			451	
v/c	0.03	0.03		0.07			0.21	
95% queue length	0.09	0.09		0.24			0.81	
Control Delay (s/veh)	9.2	8.9		11.9			15.1	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--		11.9			15.1	
Approach LOS	--	--		B			C	



SIGNALIZED PM  
3: Bissonnet St & 5th St

EXISTING PM  
1/25/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	25	525	5	11	869	8	1	0	12	118	6	85
Satd. Flow (prot)	1770	3536	0	1770	3536	0	0	1770	1583	0	1779	1583
Flt Permitted	0.950			0.950				0.621			0.737	
Satd. Flow (perm)	1770	3536	0	1770	3536	0	0	1157	1583	0	1373	1583
Satd. Flow (RTOR)		1			1				13			87
Lane Group Flow (vph)	27	576	0	12	954	0	0	1	13	0	135	92
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	10.0	80.0	0.0	10.0	80.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effect Green (s)	4.0	80.0		4.0	78.0			24.0	24.0		24.0	24.0
Actuated g/C Ratio	0.03	0.67		0.03	0.65			0.20	0.20		0.20	0.20
v/c Ratio	0.46	0.24		0.20	0.41			0.00	0.04		0.49	0.24
Control Delay	81.0	8.8		64.5	11.3			39.0	17.9		49.6	11.0
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	81.0	8.8		64.5	11.3			39.0	17.9		49.6	11.0
LOS	F	A		E	B			D	B		D	B
Approach Delay		12.0			11.9			19.4			34.0	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	21	75		9	190			1	0		94	3
Queue Length 95th (ft)	#60	130		31	236			6	18		160	48
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80			100					80			60
Base Capacity (vph)	59	2358		59	2299			231	327		275	386
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.46	0.24		0.20	0.41			0.00	0.04		0.49	0.24

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.49

Intersection Signal Delay: 14.8

Intersection LOS: B

Intersection Capacity Utilization 47.9%

ICU Level of Service A

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALIZED PM

3: Bissonnet St &amp; 5th St

EXISTING PM

1/25/2015





















Splits and Phases: 3: Bissonnet St &amp; 5th St





SIGNALIZED PM  
17: Bissonnet St & S. Rice Ave

EXISTING PM  
1/25/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	125	418	40	70	687	96	124	394	61	60	568	208
Satd. Flow (prot)	1770	3493	0	1770	3476	0	1770	3468	0	1770	3398	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3493	0	1770	3476	0	1770	3468	0	1770	3398	0
Satd. Flow (RTOR)		8			13			15			44	
Lane Group Flow (vph)	136	497	0	76	851	0	135	494	0	65	843	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	20.0	42.0	0.0	18.0	40.0	0.0	18.0	42.0	0.0	18.0	42.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effect Green (s)	12.7	39.6		10.9	35.3		12.0	40.9		9.5	36.0	
Actuated g/C Ratio	0.11	0.33		0.09	0.29		0.10	0.34		0.08	0.30	
v/c Ratio	0.72	0.43		0.47	0.83		0.76	0.41		0.46	0.80	
Control Delay	73.4	33.4		61.4	47.1		79.6	31.9		63.0	43.5	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	73.4	33.4		61.4	47.1		79.6	31.9		63.0	43.5	
LOS	E	C		E	D		E	C		E	D	
Approach Delay		42.0			48.3			42.1			44.9	
Approach LOS		D			D			D			D	
Queue Length 50th (ft)	102	162		56	324		104	154		49	301	
Queue Length 95th (ft)	#183	215		108	#412		#206	211		95	382	
Internal Link Dist (ft)		206			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	207	1158		177	1031		177	1193		177	1050	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.66	0.43		0.43	0.83		0.76	0.41		0.37	0.80	

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 44.8

Intersection LOS: D

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

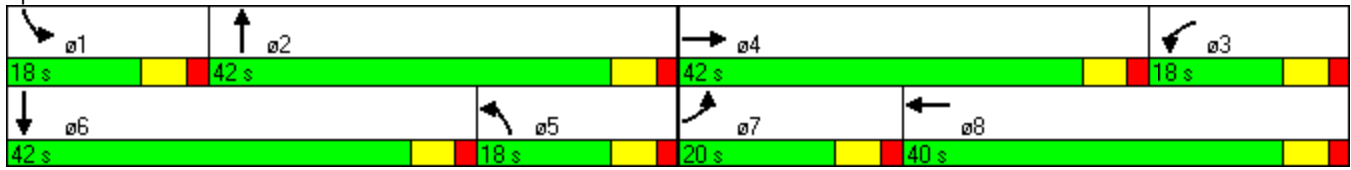
Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALIZED PM  
17: Bissonnet St & S. Rice Ave

EXISTING PM  
1/25/2015



















Splits and Phases: 17: Bissonnet St & S. Rice Ave





















UNSIGNALIZED PM  
5: Bissonnet St & Cedar St (South)

EXISTING PM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (veh/h)	24	587	64	25	862	80	9	8	23	73	10	7
Sign Control		Free			Free			Stop		Stop		
Grade		0%			0%			0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	638	70	27	937	87	10	9	25	79	11	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh)	2			2								
Upstream signal (ft)	446			684								
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	1024			708			1261	1803	354	1435	1795	512
vC1, stage 1 conf vol							725	725		1035	1035	
vC2, stage 2 conf vol							536	1078		401	760	
vCu, unblocked vol	1024			550			1141	1721	172	1328	1712	512
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			97	96	97	65	96	98
cM capacity (veh/h)	674			950			322	228	788	227	246	507
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SE 1				
Volume Total	26	425	282	27	625	399	43	98				
Volume Left	26	0	0	27	0	0	10	79				
Volume Right	0	0	70	0	0	87	25	8				
cSH	674	1700	1700	950	1700	1700	434	240				
Volume to Capacity	0.04	0.25	0.17	0.03	0.37	0.23	0.10	0.41				
Queue Length 95th (ft)	3	0	0	2	0	0	8	47				
Control Delay (s)	10.6	0.0	0.0	8.9	0.0	0.0	14.2	30.0				
Lane LOS	B			A			B	D				
Approach Delay (s)	0.4			0.2			14.2	30.0				
Approach LOS							B	D				
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			44.8%			ICU Level of Service		A				
Analysis Period (min)			15									

UNSIGNALIZED PM  
7: Spruce St & 5th St

EXISTING PM  
1/26/2015

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	4	37	40	34	40	17	52	43	18	7	27	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	40	43	37	43	18	57	47	20	8	29	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	88	99	123	41								
Volume Left (vph)	4	37	57	8								
Volume Right (vph)	43	18	20	4								
Hadj (s)	-0.25	0.00	0.03	0.01								
Departure Headway (s)	4.1	4.4	4.4	4.5								
Degree Utilization, x	0.10	0.12	0.15	0.05								
Capacity (veh/h)	829	779	780	755								
Control Delay (s)	7.6	8.0	8.2	7.7								
Approach Delay (s)	7.6	8.0	8.2	7.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.9									
HCM Level of Service			A									
Intersection Capacity Utilization			31.3%	ICU Level of Service		A						
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED PM  
11: Cedar Dt & 5th St

EXISTING PM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	24	83	71	27	79	31	7	16	9	10	104	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	90	77	29	86	34	8	17	10	11	113	28
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	193	149	35	152								
Volume Left (vph)	26	29	8	11								
Volume Right (vph)	77	34	10	28								
Hadj (s)	-0.18	-0.06	-0.09	-0.06								
Departure Headway (s)	4.4	4.5	4.8	4.7								
Degree Utilization, x	0.23	0.19	0.05	0.20								
Capacity (veh/h)	789	751	682	715								
Control Delay (s)	8.7	8.6	8.0	8.8								
Approach Delay (s)	8.7	8.6	8.0	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.6									
HCM Level of Service			A									
Intersection Capacity Utilization			27.1%	ICU Level of Service					A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED PM  
13: Spruce St & S. Rice Ave

EXISTING PM  
1/26/2015



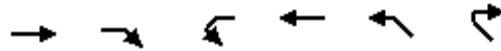
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕	↕	
Volume (veh/h)	0	33	0	673	782	43
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	0	732	850	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				150		
pX, platoon unblocked	0.90					
vC, conflicting volume	1239	448	850			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1038	448	850			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	94	100			
cM capacity (veh/h)	203	558	784			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	36	366	366	567	330	
Volume Left	0	0	0	0	0	
Volume Right	36	0	0	0	47	
cSH	558	1700	1700	1700	1700	
Volume to Capacity	0.06	0.22	0.22	0.33	0.19	
Queue Length 95th (ft)	5	0	0	0	0	
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	11.9	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		0.3				
Intersection Capacity Utilization		33.0%		ICU Level of Service		A
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED PM  
22: Bissonnet St & Cedar St (North)

EXISTING PM  
1/26/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	463	134	19	889	36	42
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	503	146	21	966	39	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh	2			2		
Upstream signal (ft)	634			496		
pX, platoon unblocked			0.97		0.97	0.97
vC, conflicting volume			649		1101	324
vC1, stage 1 conf vol					576	
vC2, stage 2 conf vol					524	
vCu, unblocked vol			564		1032	228
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		91	94
cM capacity (veh/h)			969		431	748
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NW 1
Volume Total	336	313	21	483	483	85
Volume Left	0	0	21	0	0	39
Volume Right	0	146	0	0	0	46
cSH	1700	1700	969	1700	1700	558
Volume to Capacity	0.20	0.18	0.02	0.28	0.28	0.15
Queue Length 95th (ft)	0	0	2	0	0	13
Control Delay (s)	0.0	0.0	8.8	0.0	0.0	12.6
Lane LOS			A			B
Approach Delay (s)	0.0		0.2			12.6
Approach LOS						B
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			35.8%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

# Appendix D

## Analysis Worksheet for “Year 2019 Background Traffic Volumes” Condition





















Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



SIGNALS AM  
3: Bissonnet St & 5th St

## BACKGROUND AM

1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1212	2	0	304	6	0	2	0	40	0	34
Satd. Flow (prot)	1770	3539	0	1863	3529	0	0	1863	1863	0	1770	1583
Flt Permitted	0.950										0.757	
Satd. Flow (perm)	1770	3539	0	1863	3529	0	0	1863	1863	0	1410	1583
Satd. Flow (RTOR)					3							37
Lane Group Flow (vph)	25	1319	0	0	337	0	0	2	0	0	43	37
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	12.0	80.0	0.0	12.0	80.0	0.0	28.0	28.0	28.0	28.0	28.0	28.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effect Green (s)	5.9	86.0			78.8			22.0			22.0	22.0
Actuated g/C Ratio	0.05	0.72			0.66			0.18			0.18	0.18
v/c Ratio	0.29	0.52			0.15			0.01			0.17	0.12
Control Delay	63.6	8.6			8.6			40.0			43.3	13.6
Queue Delay	0.0	0.0			0.0			0.0			0.0	0.0
Total Delay	63.6	8.6			8.6			40.0			43.3	13.6
LOS	E	A			A			D			D	B
Approach Delay		9.6			8.6			40.0			29.6	
Approach LOS		A			A			D			C	
Queue Length 50th (ft)	19	215			54			1			28	0
Queue Length 95th (ft)	49	261			75			9			63	30
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80											60
Base Capacity (vph)	89	2536			2318			342			259	320
Starvation Cap Reductn	0	0			0			0			0	0
Spillback Cap Reductn	0	0			0			0			0	0
Storage Cap Reductn	0	0			0			0			0	0
Reduced v/c Ratio	0.28	0.52			0.15			0.01			0.17	0.12

## Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 10.3

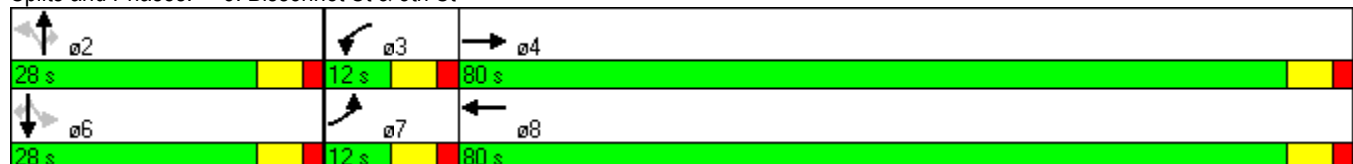
Intersection LOS: B

Intersection Capacity Utilization 52.4%

ICU Level of Service A

Analysis Period (min) 15





















Splits and Phases: 3: Bissonnet St &amp; 5th St



SIGNALS AM  
17: Bissonnet St & S. Rice Ave

BACKGROUND AM

1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	192	1137	13	46	248	53	51	500	106	63	333	81
Satd. Flow (prot)	1770	3532	0	1770	3444	0	1770	3447	0	1770	3437	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3532	0	1770	3444	0	1770	3447	0	1770	3437	0
Satd. Flow (RTOR)		1			25			21			25	
Lane Group Flow (vph)	209	1250	0	50	328	0	55	658	0	68	450	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	15.0	55.0	0.0	12.0	52.0	0.0	12.0	41.0	0.0	12.0	41.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)	9.0	51.4		5.9	46.0		6.0	35.0		6.0	37.4	
Actuated g/C Ratio	0.08	0.43		0.05	0.38		0.05	0.29		0.05	0.31	
v/c Ratio	1.57	0.83		0.57	0.25		0.62	0.65		0.76	0.41	
Control Delay	326.5	36.8		80.6	23.8		84.7	39.3		102.7	32.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	326.5	36.8		80.6	23.8		84.7	39.3		102.7	32.9	
LOS	F	D		F	C		F	D		F	C	
Approach Delay		78.3			31.3			42.8			42.0	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	~230	459		39	82		43	226		53	140	
Queue Length 95th (ft)	#385	558		#95	118		#106	292		#135	191	
Internal Link Dist (ft)		206			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	133	1514		89	1336		89	1020		89	1088	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.57	0.83		0.56	0.25		0.62	0.65		0.76	0.41	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 56 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.57

Intersection Signal Delay: 58.1

Intersection LOS: E

Intersection Capacity Utilization 75.9%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

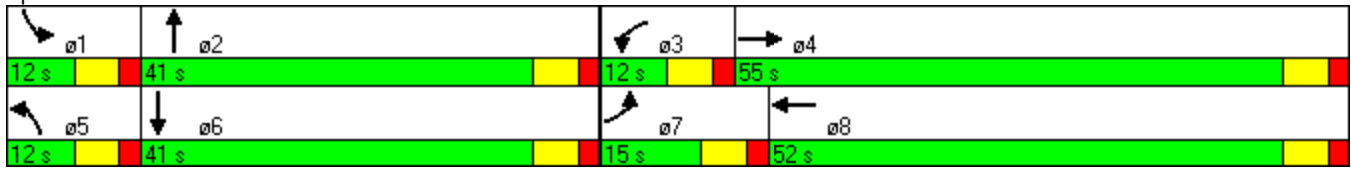
Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



SIGNALS AM  
17: Bissonnet St & S. Rice Ave

BACKGROUND AM  
1/26/2015



















Splits and Phases: 17: Bissonnet St & S. Rice Ave



UNSIGNALIZED AM  
5: Bissonnet St & Cedar St (South)

## BACKGROUND AM

1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (veh/h)	16	1204	34	7	316	68	4	13	9	57	7	3
Sign Control		Free			Free			Stop		Stop		
Grade		0%			0%			0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	1309	37	8	343	74	4	14	10	62	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	446			684								
pX, platoon unblocked				0.83			0.83	0.83	0.83	0.83	0.83	
vC, conflicting volume	417			1346			1556	1795	673	1102	1776	209
vC1, stage 1 conf vol							1362	1362		396	396	
vC2, stage 2 conf vol							194	433		706	1380	
vCu, unblocked vol	417			995			1250	1539	180	699	1517	209
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			98	94	99	86	97	100
cM capacity (veh/h)	1138			570			200	236	687	459	227	797
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SE 1				
Volume Total	17	872	473	8	229	188	28	73				
Volume Left	17	0	0	8	0	0	4	62				
Volume Right	0	0	37	0	0	74	10	3				
cSH	1138	1700	1700	570	1700	1700	295	422				
Volume to Capacity	0.02	0.51	0.28	0.01	0.13	0.11	0.10	0.17				
Queue Length 95th (ft)	1	0	0	1	0	0	8	15				
Control Delay (s)	8.2	0.0	0.0	11.4	0.0	0.0	18.5	15.3				
Lane LOS	A			B			C	C				
Approach Delay (s)	0.1			0.2			18.5	15.3				
Approach LOS							C	C				
Intersection Summary												
Average Delay	1.0											
Intersection Capacity Utilization	51.5%			ICU Level of Service				A				
Analysis Period (min)	15											

















Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED AM  
7: Spruce St & 5th St

BACKGROUND AM

1/26/2015

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	33	21	6	33	12	31	28	15	4	15	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	36	23	7	36	13	34	30	16	4	16	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	68	55	80	23								
Volume Left (vph)	10	7	34	4								
Volume Right (vph)	23	13	16	2								
Hadj (s)	-0.14	-0.08	0.00	0.01								
Departure Headway (s)	4.0	4.1	4.2	4.3								
Degree Utilization, x	0.08	0.06	0.09	0.03								
Capacity (veh/h)	861	848	827	812								
Control Delay (s)	7.4	7.4	7.6	7.4								
Approach Delay (s)	7.4	7.4	7.6	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.5									
HCM Level of Service			A									
Intersection Capacity Utilization			19.7%		ICU Level of Service				A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
11: Cedar Dt & 5th St

BACKGROUND AM

1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	65	38	9	67	36	5	16	5	0	13	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	71	41	10	73	39	5	17	5	0	14	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	122	122	28	22								
Volume Left (vph)	10	10	5	0								
Volume Right (vph)	41	39	5	8								
Hadj (s)	-0.15	-0.14	-0.04	-0.18								
Departure Headway (s)	4.0	4.0	4.4	4.3								
Degree Utilization, x	0.13	0.13	0.03	0.03								
Capacity (veh/h)	885	884	769	784								
Control Delay (s)	7.6	7.6	7.5	7.4								
Approach Delay (s)	7.6	7.6	7.5	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
HCM Level of Service			A									
Intersection Capacity Utilization			20.4%		ICU Level of Service				A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)






UNSIGNALIZED AM  
13: Spruce St & S. Rice Ave

## BACKGROUND AM

1/26/2015



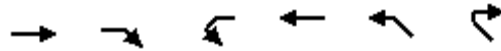
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	27	0	673	468	27
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	732	509	29
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				150		
pX, platoon unblocked	0.85					
vC, conflicting volume	889	269	509			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	514	269	509			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	100			
cM capacity (veh/h)	416	729	1053			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	29	366	366	339	199	
Volume Left	0	0	0	0	0	
Volume Right	29	0	0	0	29	
cSH	729	1700	1700	1700	1700	
Volume to Capacity	0.04	0.22	0.22	0.20	0.12	
Queue Length 95th (ft)	3	0	0	0	0	
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.1	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		23.8%		ICU Level of Service		A
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
22: Bissonnet St & Cedar St (North)

## BACKGROUND AM

1/26/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	1161	87	5	348	35	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1262	95	5	378	38	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh	2			2		
Upstream signal (ft)	634			496		
pX, platoon unblocked			0.83		0.83	0.83
vC, conflicting volume			1357		1509	678
vC1, stage 1 conf vol					1309	
vC2, stage 2 conf vol					200	
vCu, unblocked vol			1017		1201	199
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		86	99
cM capacity (veh/h)			562		265	671
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NW 1
Volume Total	841	515	5	189	189	48
Volume Left	0	0	5	0	0	38
Volume Right	0	95	0	0	0	10
cSH	1700	1700	562	1700	1700	302
Volume to Capacity	0.49	0.30	0.01	0.11	0.11	0.16
Queue Length 95th (ft)	0	0	1	0	0	14
Control Delay (s)	0.0	0.0	11.5	0.0	0.0	19.1
Lane LOS			B			C
Approach Delay (s)	0.0		0.2			19.1
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			44.9%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



## TWO-WAY STOP CONTROL SUMMARY

## General Information

Analyst	BGE
Agency/Co.	
Date Performed	01/21/2015
Analysis Time Period	5:00 pm

## Site Information

Intersection	Bissonnet St & Cedar St (S
Jurisdiction	
Analysis Year	

## Project Description

East/West Street:	North/South Street:
Intersection Orientation: East-West	Study Period (hrs): 1.00

## Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	27	649	71	28	952	89
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	29	705	77	30	1034	96
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		1			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	10	9	26	81	12	8
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	10	9	28	88	13	8
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	





















## Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	29	30		47			109	
C (m) (veh/h)	833	896		530			414	
v/c	0.03	0.03		0.09			0.26	
95% queue length	0.11	0.10		0.29			1.06	
Control Delay (s/veh)	9.5	9.2		12.5			16.8	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--		12.5			16.8	
Approach LOS	--	--		B			C	

SIGNAL PM  
3: Bissonnet St & 5th St

## BACKGROUND PM

1/25/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	28	580	6	13	960	9	2	0	14	131	7	94
Satd. Flow (prot)	1770	3532	0	1770	3536	0	0	1770	1583	0	1779	1583
Flt Permitted	0.950			0.950				0.586			0.736	
Satd. Flow (perm)	1770	3532	0	1770	3536	0	0	1092	1583	0	1371	1583
Satd. Flow (RTOR)		2			1				15			87
Lane Group Flow (vph)	30	637	0	14	1053	0	0	2	15	0	150	102
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	10.0	80.0	0.0	10.0	80.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effct Green (s)	4.0	80.0		4.0	78.0			24.0	24.0		24.0	24.0
Actuated g/C Ratio	0.03	0.67		0.03	0.65			0.20	0.20		0.20	0.20
v/c Ratio	0.51	0.27		0.24	0.46			0.01	0.05		0.55	0.26
Control Delay	85.7	9.0		66.2	11.8			39.0	17.3		51.7	13.1
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	85.7	9.0		66.2	11.8			39.0	17.3		51.7	13.1
LOS	F	A		E	B			D	B		D	B
Approach Delay		12.4			12.5			19.8			36.1	
Approach LOS		B			B			B			D	
Queue Length 50th (ft)	23	84		11	218			1	0		105	10
Queue Length 95th (ft)	#67	145		34	268			9	19		176	58
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80			100					80			60
Base Capacity (vph)	59	2355		59	2299			218	329		274	386
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.51	0.27		0.24	0.46			0.01	0.05		0.55	0.26

**Intersection Summary**

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 15.5

Intersection LOS: B

Intersection Capacity Utilization 51.1%

ICU Level of Service A

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



SIGNAL PM  
3: Bissonnet St & 5th St

BACKGROUND PM  
1/25/2015





















Splits and Phases: 3: Bissonnet St & 5th St



SIGNAL PM  
17: Bissonnet St & S. Rice Ave

BACKGROUND PM

1/25/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	139	462	45	78	759	106	137	436	68	67	628	230
Satd. Flow (prot)	1770	3493	0	1770	3476	0	1770	3468	0	1770	3398	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3493	0	1770	3476	0	1770	3468	0	1770	3398	0
Satd. Flow (RTOR)		9			13			15			44	
Lane Group Flow (vph)	151	551	0	85	940	0	149	548	0	73	933	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	20.0	42.0	0.0	18.0	40.0	0.0	18.0	42.0	0.0	18.0	42.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effect Green (s)	13.2	39.6		11.0	34.8		12.0	40.6		9.8	36.0	
Actuated g/C Ratio	0.11	0.33		0.09	0.29		0.10	0.34		0.08	0.30	
v/c Ratio	0.77	0.48		0.52	0.92		0.84	0.46		0.50	0.89	
Control Delay	77.7	34.2		63.7	56.2		89.7	33.0		64.3	49.7	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	77.7	34.2		63.7	56.2		89.7	33.0		64.3	49.7	
LOS	E	C		E	E		F	C		E	D	
Approach Delay		43.6			56.8			45.1			50.8	
Approach LOS		D			E			D			D	
Queue Length 50th (ft)	115	183		63	371		115	176		55	347	
Queue Length 95th (ft)	#214	240		117	#503		#233	236		104	#463	
Internal Link Dist (ft)		206			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	207	1159		177	1018		177	1185		177	1050	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.73	0.48		0.48	0.92		0.84	0.46		0.41	0.89	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 50.0

Intersection LOS: D

Intersection Capacity Utilization 84.4%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

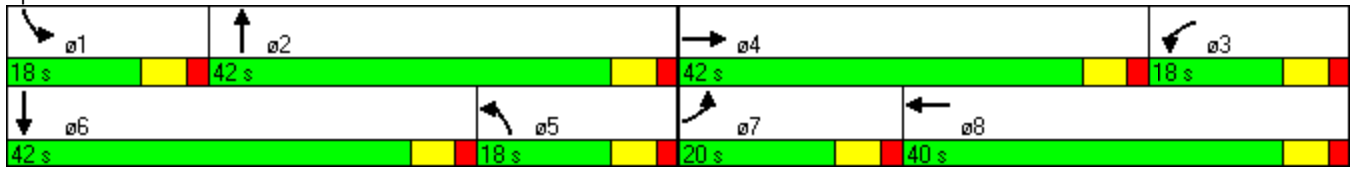
Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



SIGNAL PM  
17: Bissonnet St & S. Rice Ave

BACKGROUND PM  
1/25/2015



















Splits and Phases: 17: Bissonnet St & S. Rice Ave



UNSIGNALIZED PM  
5: Bissonnet St & Cedar St (South)

## BACKGROUND PM

1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (veh/h)	27	649	71	28	952	89	10	9	26	81	12	8
Sign Control		Free			Free			Stop		Stop		
Grade		0%			0%			0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	705	77	30	1035	97	11	10	28	88	13	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	446			684								
pX, platoon unblocked				0.93			0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	1132			783			1396	1995	391	1589	1985	566
vC1, stage 1 conf vol							803	803		1144	1144	
vC2, stage 2 conf vol							593	1192		445	841	
vCu, unblocked vol	1132			605			1268	1915	182	1475	1904	566
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			97			96	95	96	55	94	98
cM capacity (veh/h)	613			897			284	196	768	194	216	468
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SE 1				
Volume Total	29	470	312	30	690	442	49	110				
Volume Left	29	0	0	30	0	0	11	88				
Volume Right	0	0	77	0	0	97	28	9				
cSH	613	1700	1700	897	1700	1700	391	206				
Volume to Capacity	0.05	0.28	0.18	0.03	0.41	0.26	0.13	0.53				
Queue Length 95th (ft)	4	0	0	3	0	0	11	70				
Control Delay (s)	11.2	0.0	0.0	9.2	0.0	0.0	15.5	40.9				
Lane LOS	B			A			C	E				
Approach Delay (s)	0.4			0.2			15.5	40.9				
Approach LOS							C	E				
Intersection Summary												
Average Delay	2.7											
Intersection Capacity Utilization	48.2%			ICU Level of Service				A				
Analysis Period (min)	15											

















Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED PM  
7: Spruce St & 5th St

BACKGROUND PM

1/26/2015

















													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Stop			Stop		
Volume (vph)	5	41	45	38	45	19	58	48	20	8	30	5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	5	45	49	41	49	21	63	52	22	9	33	5	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total (vph)	99	111	137	47									
Volume Left (vph)	5	41	63	9									
Volume Right (vph)	49	21	22	5									
Hadj (s)	-0.25	0.00	0.03	0.00									
Departure Headway (s)	4.2	4.4	4.5	4.5									
Degree Utilization, x	0.12	0.14	0.17	0.06									
Capacity (veh/h)	813	765	766	740									
Control Delay (s)	7.8	8.1	8.4	7.8									
Approach Delay (s)	7.8	8.1	8.4	7.8									
Approach LOS	A	A	A	A									
Intersection Summary													
Delay			8.1										
HCM Level of Service			A										
Intersection Capacity Utilization			32.6%	ICU Level of Service			A						
Analysis Period (min)			15										

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED PM  
11: Cedar Dt & 5th St

BACKGROUND PM

1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	27	92	79	30	88	35	8	18	10	12	115	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	100	86	33	96	38	9	20	11	13	125	32
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	215	166	39	170								
Volume Left (vph)	29	33	9	13								
Volume Right (vph)	86	38	11	32								
Hadj (s)	-0.18	-0.06	-0.09	-0.06								
Departure Headway (s)	4.5	4.6	4.9	4.8								
Degree Utilization, x	0.27	0.21	0.05	0.23								
Capacity (veh/h)	761	733	656	697								
Control Delay (s)	9.1	8.9	8.2	9.2								
Approach Delay (s)	9.1	8.9	8.2	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
HCM Level of Service			A									
Intersection Capacity Utilization			29.5%	ICU Level of Service					A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED PM  
13: Spruce St & S. Rice Ave

BACKGROUND PM  
1/26/2015



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Volume (veh/h)	0	37	0	673	864	48
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	40	0	732	939	52
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				150		
pX, platoon unblocked	0.88					
vC, conflicting volume	1331	496	939			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1110	496	939			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	92	100			
cM capacity (veh/h)	180	520	725			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	40	366	366	626	365	
Volume Left	0	0	0	0	0	
Volume Right	40	0	0	0	52	
cSH	520	1700	1700	1700	1700	
Volume to Capacity	0.08	0.22	0.22	0.37	0.21	
Queue Length 95th (ft)	6	0	0	0	0	
Control Delay (s)	12.5	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	12.5	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			35.4%	ICU Level of Service		A
Analysis Period (min)			15			

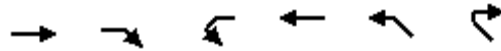
Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED PM  
22: Bissonnet St & Cedar St (North)

## BACKGROUND PM

1/26/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	512	148	21	982	40	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	557	161	23	1067	43	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh	2			2		
Upstream signal (ft)	634			496		
pX, platoon unblocked			0.95		0.95	0.95
vC, conflicting volume			717		1216	359
vC1, stage 1 conf vol					637	
vC2, stage 2 conf vol					579	
vCu, unblocked vol			610		1132	234
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			98		89	93
cM capacity (veh/h)			921		399	733
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NW 1
Volume Total	371	346	23	534	534	95
Volume Left	0	0	23	0	0	43
Volume Right	0	161	0	0	0	51
cSH	1700	1700	921	1700	1700	529
Volume to Capacity	0.22	0.20	0.02	0.31	0.31	0.18
Queue Length 95th (ft)	0	0	2	0	0	16
Control Delay (s)	0.0	0.0	9.0	0.0	0.0	13.3
Lane LOS			A			B
Approach Delay (s)	0.0		0.2			13.3
Approach LOS						B
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			38.9%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)











# Appendix E

## Analysis Worksheet for “Year 2019 Total Traffic Volumes” Condition

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

DRIVEWAYS AM  
1: Spruce St & DW#3

TOTAL AM  
1/26/2015










						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	65	15	10	33	14	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	16	11	36	15	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			87		136	79
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		136	79
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1509		851	982
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	87	47	34			
Volume Left	0	11	15			
Volume Right	16	0	18			
cSH	1700	1509	918			
Volume to Capacity	0.05	0.01	0.04			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	1.8	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.8	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		19.0%	ICU Level of Service	A		
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



DRIVEWAYS AM  
15: Spruce St & DW#4

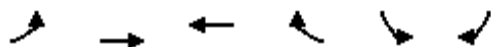
TOTAL AM  
1/26/2015

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	65	15	10	33	14	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	71	16	11	36	15	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			87		136	79
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			87		136	79
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		98	98
cM capacity (veh/h)			1509		851	982
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	87	47	34			
Volume Left	0	11	15			
Volume Right	16	0	18			
cSH	1700	1509	918			
Volume to Capacity	0.05	0.01	0.04			
Queue Length 95th (ft)	0	1	3			
Control Delay (s)	0.0	1.8	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	1.8	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		19.0%	ICU Level of Service	A		
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

DRIVEWAYS AM  
20: Bissonnet St & DW#1

TOTAL AM  
1/26/2015

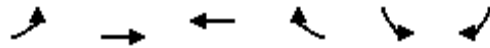





Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	23	1240	404	30	19	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	1348	439	33	21	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage (veh)		2	2			
Upstream signal (ft)		813	317			
pX, platoon unblocked	0.95				0.83	0.95
vC, conflicting volume	472				1179	236
vC1, stage 1 conf vol					455	
vC2, stage 2 conf vol					724	
vCu, unblocked vol	329				525	80
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				96	98
cM capacity (veh/h)	1162				563	913
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	25	674	674	293	179	36
Volume Left	25	0	0	0	0	21
Volume Right	0	0	0	0	33	15
cSH	1162	1700	1700	1700	1700	672
Volume to Capacity	0.02	0.40	0.40	0.17	0.11	0.05
Queue Length 95th (ft)	2	0	0	0	0	4
Control Delay (s)	8.2	0.0	0.0	0.0	0.0	10.7
Lane LOS	A					B
Approach Delay (s)	0.1			0.0		10.7
Approach LOS						B
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			44.3%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

DRIVEWAYS AM  
27: Cedar St & DW#2

TOTAL AM  
1/26/2015























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	23	69	90	30	19	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	75	98	33	21	15
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	130				239	114
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	130				239	114
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				97	98
cM capacity (veh/h)	1455				736	938
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	100	130	36			
Volume Left	25	0	21			
Volume Right	0	33	15			
cSH	1455	1700	810			
Volume to Capacity	0.02	0.08	0.04			
Queue Length 95th (ft)	1	0	3			
Control Delay (s)	2.0	0.0	9.6			
Lane LOS	A		A			
Approach Delay (s)	2.0	0.0	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			21.6%	ICU Level of Service		A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HIEB PD)



SIGNALS AM  
3: Bissonnet St & 5th St

TOTAL AM  
1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1219	2	4	306	6	0	6	7	44	0	38
Satd. Flow (prot)	1770	3539	0	1770	3529	0	0	1863	1583	0	1770	1583
Flt Permitted	0.950			0.950							0.753	
Satd. Flow (perm)	1770	3539	0	1770	3529	0	0	1863	1583	0	1403	1583
Satd. Flow (RTOR)					3				8			41
Lane Group Flow (vph)	25	1327	0	4	340	0	0	7	8	0	48	41
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	12.0	80.0	0.0	12.0	80.0	0.0	28.0	28.0	28.0	28.0	28.0	28.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effect Green (s)	5.9	83.6		5.7	78.8			22.0	22.0		22.0	22.0
Actuated g/C Ratio	0.05	0.70		0.05	0.66			0.18	0.18		0.18	0.18
v/c Ratio	0.29	0.54		0.05	0.15			0.02	0.03		0.19	0.13
Control Delay	63.6	10.4		51.8	8.5			40.5	22.0		43.7	13.2
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	63.6	10.4		51.8	8.5			40.5	22.0		43.7	13.2
LOS	E	B		D	A			D	C		D	B
Approach Delay		11.4			9.0			30.6			29.6	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)	19	217		3	56			4	0		32	0
Queue Length 95th (ft)	49	376		m11	76			18	14		68	32
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80			100					80			60
Base Capacity (vph)	89	2465		89	2318			342	297		257	324
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.28	0.54		0.04	0.15			0.02	0.03		0.19	0.13

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.54

Intersection Signal Delay: 12.0

Intersection LOS: B

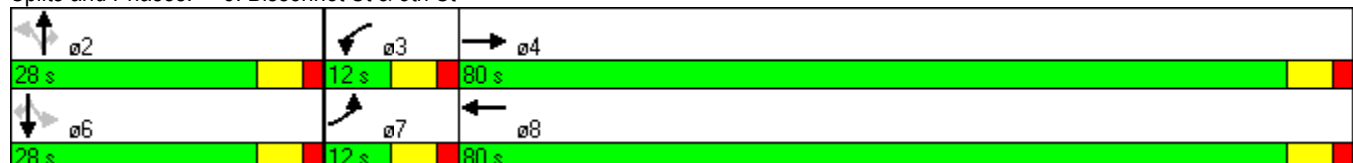
Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15





















m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 3: Bissonnet St & 5th St



SIGNALS AM  
17: Bissonnet St & S. Rice Ave

TOTAL AM  
1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	194	1145	17	46	256	53	61	500	106	65	335	81
Satd. Flow (prot)	1770	3532	0	1770	3447	0	1770	3447	0	1770	3437	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3532	0	1770	3447	0	1770	3447	0	1770	3437	0
Satd. Flow (RTOR)		1			24			21			25	
Lane Group Flow (vph)	211	1263	0	50	336	0	66	658	0	71	452	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	15.0	55.0	0.0	12.0	52.0	0.0	12.0	41.0	0.0	12.0	41.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effect Green (s)	9.0	51.4		5.9	46.0		6.0	35.0		6.0	37.4	
Actuated g/C Ratio	0.08	0.43		0.05	0.38		0.05	0.29		0.05	0.31	
v/c Ratio	1.59	0.83		0.57	0.25		0.74	0.65		0.80	0.42	
Control Delay	337.2	30.0		80.6	24.0		99.4	39.3		108.1	32.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	337.2	30.0		80.6	24.0		99.4	39.3		108.1	32.9	
LOS	F	C		F	C		F	D		F	C	
Approach Delay		74.0			31.3			44.8			43.1	
Approach LOS		E			C			D			D	
Queue Length 50th (ft)	~241	470		39	85		51	226		56	141	
Queue Length 95th (ft)	#400	388		#95	121		#130	292		#141	192	
Internal Link Dist (ft)		237			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	133	1514		89	1336		89	1020		89	1088	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	1.59	0.83		0.56	0.25		0.74	0.65		0.80	0.42	

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 56 (47%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.59

Intersection Signal Delay: 56.7

Intersection LOS: E

Intersection Capacity Utilization 76.3%

ICU Level of Service D

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

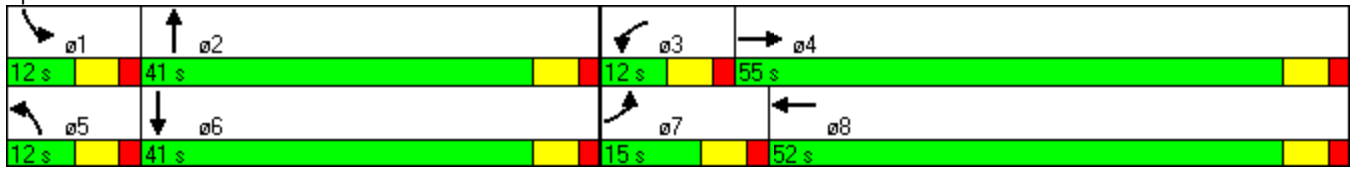
Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS AM  
17: Bissonnet St & S. Rice Ave

TOTAL AM  
1/26/2015



















Splits and Phases: 17: Bissonnet St & S. Rice Ave





UNSIGNALIZED AM  
5: Bissonnet St & Cedar St (South)

















TOTAL AM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (veh/h)	16	1214	34	7	316	78	4	13	9	61	7	3
Sign Control		Free			Free			Stop		Stop		
Grade		0%			0%			0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	1320	37	8	343	85	4	14	10	66	8	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	446			684								
pX, platoon unblocked				0.79			0.79	0.79	0.79	0.79	0.79	
vC, conflicting volume	428			1357			1567	1816	678	1112	1792	214
vC1, stage 1 conf vol							1373	1373		401	401	
vC2, stage 2 conf vol							194	443		711	1391	
vCu, unblocked vol	428			914			1181	1497	53	604	1467	214
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			98	94	99	86	97	100
cM capacity (veh/h)	1128			584			213	243	791	490	235	791
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SE 1				
Volume Total	17	880	477	8	229	199	28	77				
Volume Left	17	0	0	8	0	0	4	66				
Volume Right	0	0	37	0	0	85	10	3				
cSH	1128	1700	1700	584	1700	1700	311	449				
Volume to Capacity	0.02	0.52	0.28	0.01	0.13	0.12	0.09	0.17				
Queue Length 95th (ft)	1	0	0	1	0	0	7	15				
Control Delay (s)	8.2	0.0	0.0	11.2	0.0	0.0	17.7	14.7				
Lane LOS	A			B			C	B				
Approach Delay (s)	0.1			0.2			17.7	14.7				
Approach LOS							C	B				
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			52.0%			ICU Level of Service		A				
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
7: Spruce St & 5th St

















TOTAL AM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	37	21	8	35	20	31	28	19	11	15	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	40	23	9	38	22	34	30	21	12	16	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	73	68	85	30								
Volume Left (vph)	10	9	34	12								
Volume Right (vph)	23	22	21	2								
Hadj (s)	-0.13	-0.13	-0.03	0.07								
Departure Headway (s)	4.1	4.1	4.2	4.4								
Degree Utilization, x	0.08	0.08	0.10	0.04								
Capacity (veh/h)	848	848	821	791								
Control Delay (s)	7.5	7.4	7.7	7.5								
Approach Delay (s)	7.5	7.4	7.7	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.5									
HCM Level of Service			A									
Intersection Capacity Utilization			17.4%	ICU Level of Service					A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
11: Cedar Dt & 5th St

TOTAL AM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	9	69	38	13	69	36	5	20	9	5	44	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	75	41	14	75	39	5	22	10	5	48	14
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	126	128	37	67								
Volume Left (vph)	10	14	5	5								
Volume Right (vph)	41	39	10	14								
Hadj (s)	-0.15	-0.13	-0.10	-0.08								
Departure Headway (s)	4.1	4.1	4.4	4.4								
Degree Utilization, x	0.14	0.15	0.05	0.08								
Capacity (veh/h)	843	831	757	759								
Control Delay (s)	7.8	7.9	7.6	7.8								
Approach Delay (s)	7.8	7.9	7.6	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.8									
HCM Level of Service			A									
Intersection Capacity Utilization			20.1%	ICU Level of Service					A			
Analysis Period (min)			15									




Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED AM  
13: Spruce St & S. Rice Ave

TOTAL AM  
1/26/2015

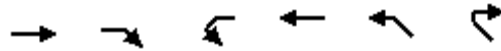


Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	27	0	673	468	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	29	0	732	509	43
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)				150		
pX, platoon unblocked	0.85					
vC, conflicting volume	896	276	509			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	523	276	509			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	96	100			
cM capacity (veh/h)	411	721	1053			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	29	366	366	339	213	
Volume Left	0	0	0	0	0	
Volume Right	29	0	0	0	43	
cSH	721	1700	1700	1700	1700	
Volume to Capacity	0.04	0.22	0.22	0.20	0.13	
Queue Length 95th (ft)	3	0	0	0	0	
Control Delay (s)	10.2	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	10.2	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		24.2%		ICU Level of Service		A
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED AM  
22: Bissonnet St & Cedar St (North)

TOTAL AM  
1/26/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	1171	87	5	348	35	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1273	95	5	378	38	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage veh	2			2		
Upstream signal (ft)	634			496		
pX, platoon unblocked			0.79		0.80	0.79
vC, conflicting volume			1367		1520	684
vC1, stage 1 conf vol					1320	
vC2, stage 2 conf vol					200	
vCu, unblocked vol			938		1087	74
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			99		86	99
cM capacity (veh/h)			575		280	770
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NW 1
Volume Total	849	519	5	189	189	48
Volume Left	0	0	5	0	0	38
Volume Right	0	95	0	0	0	10
cSH	1700	1700	575	1700	1700	322
Volume to Capacity	0.50	0.31	0.01	0.11	0.11	0.15
Queue Length 95th (ft)	0	0	1	0	0	13
Control Delay (s)	0.0	0.0	11.3	0.0	0.0	18.1
Lane LOS			B			C
Approach Delay (s)	0.0		0.2			18.1
Approach LOS						C
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			45.1%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

## TWO-WAY STOP CONTROL SUMMARY

## General Information

Analyst	BGE
Agency/Co.	
Date Performed	01/21/2015
Analysis Time Period	5:00 pm

## Site Information

Intersection	Bissonnet St & Cedar St (S
Jurisdiction	
Analysis Year	

## Project Description

East/West Street:	North/South Street:
Intersection Orientation: East-West	Study Period (hrs): 1.00

## Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)	27	668	71	28	952	108
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	29	726	77	30	1034	117
Percent Heavy Vehicles	2	--	--	2	--	--
Median Type	Two Way Left Turn Lane					
RT Channelized			0			0
Lanes	1	2	0	1	2	0
Configuration	L	T	TR	L	T	TR
Upstream Signal		1			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)	10	9	26	93	12	8
Peak-Hour Factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Hourly Flow Rate, HFR (veh/h)	10	9	28	101	13	8
Percent Heavy Vehicles	2	2	2	2	2	2
Percent Grade (%)	0			0		
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	1	0	0	1	0
Configuration		LTR			LTR	










## Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	
Lane Configuration	L	L		LTR			LTR	
v (veh/h)	29	30		47			122	
C (m) (veh/h)	824	885		526			415	
v/c	0.04	0.03		0.09			0.29	
95% queue length	0.11	0.11		0.29			1.24	
Control Delay (s/veh)	9.5	9.2		12.5			17.3	
LOS	A	A		B			C	
Approach Delay (s/veh)	--	--		12.5			17.3	
Approach LOS	--	--		B			C	



DRIVEWAYS PM  
14: Spruce St & DW#3










TOTAL PM  
1/26/2015

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	103	34	34	45	14	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	37	37	49	15	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			149		253	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			149		253	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		98	98
cM capacity (veh/h)			1433		716	919
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	149	86	34			
Volume Left	0	37	15			
Volume Right	37	0	18			
cSH	1700	1433	815			
Volume to Capacity	0.09	0.03	0.04			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	3.4	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.4	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		25.1%	ICU Level of Service	A		
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

DRIVEWAYS PM  
18: Spruce St & DW#4

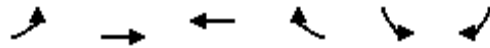
TOTAL PM  
1/26/2015

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	103	34	34	45	14	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	112	37	37	49	15	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			149		253	130
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			149		253	130
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		98	98
cM capacity (veh/h)			1433		716	919
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	149	86	34			
Volume Left	0	37	15			
Volume Right	37	0	18			
cSH	1700	1433	815			
Volume to Capacity	0.09	0.03	0.04			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	3.4	9.6			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.4	9.6			
Approach LOS			A			
Intersection Summary						
Average Delay		2.3				
Intersection Capacity Utilization		25.1%		ICU Level of Service		A
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

DRIVEWAYS PM  
20: Bissonnet St & DW#1

TOTAL PM  
1/26/2015



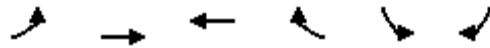
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	51	624	1084	68	66	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	678	1178	74	72	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage (veh)		2	2			
Upstream signal (ft)		773	357			
pX, platoon unblocked	0.74				0.74	0.74
vC, conflicting volume	1252				1665	626
vC1, stage 1 conf vol					1215	
vC2, stage 2 conf vol					450	
vCu, unblocked vol	623				1184	0
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	92				78	93
cM capacity (veh/h)	702				331	797
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	55	339	339	786	467	125
Volume Left	55	0	0	0	0	72
Volume Right	0	0	0	0	74	53
cSH	702	1700	1700	1700	1700	441
Volume to Capacity	0.08	0.20	0.20	0.46	0.27	0.28
Queue Length 95th (ft)	6	0	0	0	0	29
Control Delay (s)	10.6	0.0	0.0	0.0	0.0	16.4
Lane LOS	B					C
Approach Delay (s)	0.8			0.0		16.4
Approach LOS						C
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			52.1%		ICU Level of Service	A
Analysis Period (min)			15			




Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



DRIVEWAYS PM  
27: Cedar St & DW#2

TOTAL PM  
1/26/2015























Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	51	102	139	68	66	49
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	111	151	74	72	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	225				410	188
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	225				410	188
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				87	94
cM capacity (veh/h)	1344				573	854
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	166	225	125			
Volume Left	55	0	72			
Volume Right	0	74	53			
cSH	1344	1700	667			
Volume to Capacity	0.04	0.13	0.19			
Queue Length 95th (ft)	3	0	17			
Control Delay (s)	2.8	0.0	11.6			
Lane LOS	A		B			
Approach Delay (s)	2.8	0.0	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			3.7			
Intersection Capacity Utilization			36.3%	ICU Level of Service		A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HIEB PD)

SIGNALS PM  
3: Bissonnet St & 5th St

TOTAL PM  
1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	593	6	25	966	9	2	7	21	137	7	106
Satd. Flow (prot)	1770	3532	0	1770	3536	0	0	1844	1583	0	1779	1583
Flt Permitted	0.950			0.950				0.956			0.730	
Satd. Flow (perm)	1770	3532	0	1770	3536	0	0	1781	1583	0	1360	1583
Satd. Flow (RTOR)		2			1				23			93
Lane Group Flow (vph)	41	652	0	27	1060	0	0	10	23	0	157	115
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	10.0	80.0	0.0	10.0	80.0	0.0	30.0	30.0	30.0	30.0	30.0	30.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effect Green (s)	4.0	78.0		4.0	76.0			24.0	24.0		24.0	24.0
Actuated g/C Ratio	0.03	0.65		0.03	0.63			0.20	0.20		0.20	0.20
v/c Ratio	0.69	0.28		0.46	0.47			0.03	0.07		0.58	0.29
Control Delay	108.7	9.9		68.3	8.5			39.0	15.3		53.0	14.0
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	108.7	9.9		68.3	8.5			39.0	15.3		53.0	14.0
LOS	F	A		E	A			D	B		D	B
Approach Delay		15.7			10.0			22.5			36.5	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	32	116		21	132			6	0		111	14
Queue Length 95th (ft)	#96	149		m28	m151			22	23		185	65
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80			100					80			60
Base Capacity (vph)	59	2297		59	2240			356	335		272	391
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.69	0.28		0.46	0.47			0.03	0.07		0.58	0.29

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 40 (33%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 15.6

Intersection LOS: B

Intersection Capacity Utilization 56.2%

ICU Level of Service B

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS PM  
3: Bissonnet St & 5th St

TOTAL PM  
1/26/2015





















Splits and Phases: 3: Bissonnet St & 5th St





SIGNALS PM  
17: Bissonnet St & S. Rice Ave

TOTAL PM  
1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	485	57	78	782	106	156	436	68	73	634	230
Satd. Flow (prot)	1770	3483	0	1770	3476	0	1770	3468	0	1770	3398	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3483	0	1770	3476	0	1770	3468	0	1770	3398	0
Satd. Flow (RTOR)		11			12			15			44	
Lane Group Flow (vph)	158	589	0	85	965	0	170	548	0	79	939	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	20.0	42.0	0.0	18.0	40.0	0.0	18.0	42.0	0.0	18.0	42.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effect Green (s)	13.3	39.6		11.0	34.7		12.0	40.5		10.1	36.0	
Actuated g/C Ratio	0.11	0.33		0.09	0.29		0.10	0.34		0.08	0.30	
v/c Ratio	0.80	0.51		0.52	0.95		0.96	0.46		0.53	0.89	
Control Delay	87.8	30.1		63.7	60.9		112.2	33.1		65.4	50.3	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	87.8	30.1		63.7	60.9		112.2	33.1		65.4	50.3	
LOS	F	C		E	E		F	C		E	D	
Approach Delay		42.3			61.1			51.9			51.5	
Approach LOS		D			E			D			D	
Queue Length 50th (ft)	127	166		63	385		133	176		59	351	
Queue Length 95th (ft)	#231	211		117	#527		#273	236		110	#469	
Internal Link Dist (ft)		277			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	207	1157		177	1012		177	1179		177	1050	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.76	0.51		0.48	0.95		0.96	0.46		0.45	0.89	

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 62 (52%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.96

Intersection Signal Delay: 52.5

Intersection LOS: D

Intersection Capacity Utilization 86.5%

ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

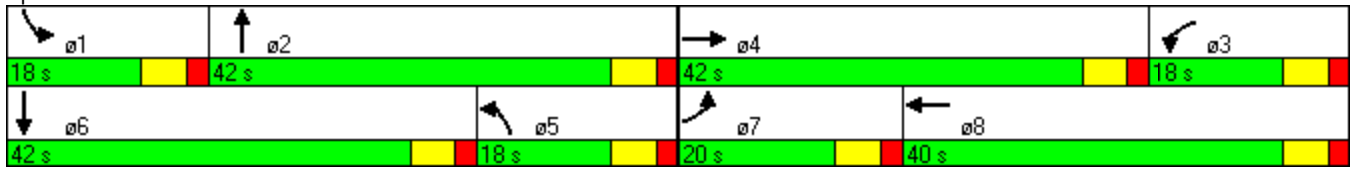
Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS PM  
17: Bissonnet St & S. Rice Ave



















TOTAL PM  
1/26/2015

Splits and Phases: 17: Bissonnet St & S. Rice Ave



UNSIGNALIZED PM  
5: Bissonnet St & Cedar St (South)

















TOTAL PM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL2	NBL	NBR	SEL	SER	SER2
Lane Configurations												
Volume (veh/h)	27	668	71	28	952	108	10	9	26	93	12	8
Sign Control		Free			Free			Stop		Stop		
Grade		0%			0%			0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	726	77	30	1035	117	11	10	28	101	13	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	446			684								
pX, platoon unblocked	0.78			0.92			0.81	0.81	0.92	0.81	0.81	0.78
vC, conflicting volume	1152			803			1417	2036	402	1609	2016	576
vC1, stage 1 conf vol							823	823		1154	1154	
vC2, stage 2 conf vol							593	1213		455	862	
vCu, unblocked vol	617			617			624	1384	181	860	1360	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			97			97	96	96	67	95	99
cM capacity (veh/h)	744			884			367	257	766	310	272	841
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	NB 1	SE 1				
Volume Total	29	484	319	30	690	462	49	123				
Volume Left	29	0	0	30	0	0	11	101				
Volume Right	0	0	77	0	0	117	28	9				
cSH	744	1700	1700	884	1700	1700	468	319				
Volume to Capacity	0.04	0.28	0.19	0.03	0.41	0.27	0.10	0.38				
Queue Length 95th (ft)	3	0	0	3	0	0	9	44				
Control Delay (s)	10.0	0.0	0.0	9.2	0.0	0.0	13.6	23.1				
Lane LOS	B			A			B	C				
Approach Delay (s)	0.4			0.2			13.6	23.1				
Approach LOS							B	C				
Intersection Summary												
Average Delay	1.9											
Intersection Capacity Utilization	49.5%			ICU Level of Service				A				
Analysis Period (min)	15											



UNSIGNALIZED PM  
7: Spruce St & 5th St

















TOTAL PM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	5	48	45	44	51	42	58	48	27	21	30	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	52	49	48	55	46	63	52	29	23	33	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	107	149	145	61								
Volume Left (vph)	5	48	63	23								
Volume Right (vph)	49	46	29	5								
Hadj (s)	-0.23	-0.09	0.00	0.06								
Departure Headway (s)	4.3	4.4	4.6	4.7								
Degree Utilization, x	0.13	0.18	0.18	0.08								
Capacity (veh/h)	784	765	744	707								
Control Delay (s)	8.0	8.4	8.6	8.1								
Approach Delay (s)	8.0	8.4	8.6	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
HCM Level of Service			A									
Intersection Capacity Utilization			31.2%		ICU Level of Service				A			
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED PM  
11: Cedar Dt & 5th St

TOTAL PM  
1/26/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	27	99	79	42	94	35	8	25	17	12	115	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	29	108	86	46	102	38	9	27	18	13	125	32
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	223	186	54	170								
Volume Left (vph)	29	46	9	13								
Volume Right (vph)	86	38	18	32								
Hadj (s)	-0.17	-0.04	-0.14	-0.06								
Departure Headway (s)	4.5	4.7	5.0	4.9								
Degree Utilization, x	0.28	0.24	0.08	0.23								
Capacity (veh/h)	745	719	648	679								
Control Delay (s)	9.3	9.2	8.4	9.3								
Approach Delay (s)	9.3	9.2	8.4	9.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.2									
HCM Level of Service			A									
Intersection Capacity Utilization			32.5%	ICU Level of Service		A						
Analysis Period (min)			15									

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

UNSIGNALIZED PM  
13: Spruce St & S. Rice Ave

TOTAL PM  
1/26/2015



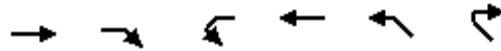
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↗↗	↗↗	
Volume (veh/h)	0	49	0	673	864	73
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	53	0	732	939	79
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)				150		
pX, platoon unblocked	0.88					
vC, conflicting volume	1345	509	939			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1126	509	939			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	90	100			
cM capacity (veh/h)	175	509	725			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	
Volume Total	53	366	366	626	392	
Volume Left	0	0	0	0	0	
Volume Right	53	0	0	0	79	
cSH	509	1700	1700	1700	1700	
Volume to Capacity	0.10	0.22	0.22	0.37	0.23	
Queue Length 95th (ft)	9	0	0	0	0	
Control Delay (s)	12.9	0.0	0.0	0.0	0.0	
Lane LOS	B					
Approach Delay (s)	12.9	0.0		0.0		
Approach LOS	B					
Intersection Summary						
Average Delay		0.4				
Intersection Capacity Utilization		36.2%		ICU Level of Service	A	
Analysis Period (min)		15				

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)



UNSIGNALIZED PM  
22: Bissonnet St & Cedar St (North)

TOTAL PM  
1/26/2015



Movement	EBT	EBR	WBL	WBT	NWL	NWR
Lane Configurations	↑↑		↵	↑↑	↵	
Volume (veh/h)	531	148	21	982	40	47
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	577	161	23	1067	43	51
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	TWLT			TWLT		
Median storage (veh)	2			2		
Upstream signal (ft)	634			496		
pX, platoon unblocked			0.95		0.78	0.95
vC, conflicting volume			738		1237	369
vC1, stage 1 conf vol					658	
vC2, stage 2 conf vol					579	
vCu, unblocked vol			624		472	236
tC, single (s)			4.1		6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)			2.2		3.5	3.3
p0 queue free %			97		91	93
cM capacity (veh/h)			907		500	728
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NW 1
Volume Total	385	353	23	534	534	95
Volume Left	0	0	23	0	0	43
Volume Right	0	161	0	0	0	51
cSH	1700	1700	907	1700	1700	602
Volume to Capacity	0.23	0.21	0.03	0.31	0.31	0.16
Queue Length 95th (ft)	0	0	2	0	0	14
Control Delay (s)	0.0	0.0	9.1	0.0	0.0	12.1
Lane LOS			A			B
Approach Delay (s)	0.0		0.2			12.1
Approach LOS						B
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			38.9%		ICU Level of Service	A
Analysis Period (min)			15			

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

# Appendix F

## Analysis Worksheet for “Year 2019 Mitigation Improvements” Condition





















Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

# SIGNALS AM

## 3: Bissonnet St & 5th St

# MITIGATION AM

1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1219	2	4	306	6	0	6	7	44	0	38
Satd. Flow (prot)	1770	3539	0	1770	3529	0	0	1863	1583	0	1770	1583
Flt Permitted	0.950			0.950							0.753	
Satd. Flow (perm)	1770	3539	0	1770	3529	0	0	1863	1583	0	1403	1583
Satd. Flow (RTOR)					4				8			41
Lane Group Flow (vph)	25	1327	0	4	340	0	0	7	8	0	48	41
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	13.0	67.0	0.0	13.0	67.0	0.0	20.0	20.0	20.0	20.0	20.0	20.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effect Green (s)	6.4	71.5		5.8	68.8			14.0	14.0		14.0	14.0
Actuated g/C Ratio	0.06	0.72		0.06	0.69			0.14	0.14		0.14	0.14
v/c Ratio	0.22	0.52		0.04	0.14			0.03	0.03		0.24	0.16
Control Delay	48.9	8.1		54.8	2.1			37.5	21.3		42.0	13.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	48.9	8.1		54.8	2.1			37.5	21.3		42.0	13.6
LOS	D	A		D	A			D	C		D	B
Approach Delay		8.8			2.7			28.9			28.9	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	15	155		3	7			4	0		28	0
Queue Length 95th (ft)	42	315		m8	24			17	14		62	30
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80			100				80				60
Base Capacity (vph)	124	2530		124	2429			261	229		196	257
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.20	0.52		0.03	0.14			0.03	0.03		0.24	0.16

## Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 0 (0%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.52

Intersection Signal Delay: 8.8

Intersection LOS: A

Intersection Capacity Utilization 55.4%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.





















## Splits and Phases: 3: Bissonnet St & 5th St





SIGNALS AM  
17: Bissonnet St & S. Rice Ave

MITIGATION AM  
1/26/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	194	1145	17	46	256	53	61	500	106	65	335	81
Satd. Flow (prot)	1770	3532	0	1770	3447	0	1770	3447	0	1770	3437	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3532	0	1770	3447	0	1770	3447	0	1770	3437	0
Satd. Flow (RTOR)		2			25			23			26	
Lane Group Flow (vph)	211	1263	0	50	336	0	66	658	0	71	452	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	26.0	50.0	0.0	11.0	35.0	0.0	14.0	27.0	0.0	12.0	25.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effect Green (s)	18.2	44.4		5.0	29.0		7.5	25.2		6.0	23.6	
Actuated g/C Ratio	0.18	0.44		0.05	0.29		0.08	0.25		0.06	0.24	
v/c Ratio	0.66	0.81		0.56	0.33		0.49	0.74		0.66	0.54	
Control Delay	41.6	24.0		70.9	26.8		57.1	41.0		75.7	36.2	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	41.6	24.0		70.9	26.8		57.1	41.0		75.7	36.2	
LOS	D	C		E	C		E	D		E	D	
Approach Delay		26.5			32.5			42.5			41.6	
Approach LOS		C			C			D			D	
Queue Length 50th (ft)	124	363		32	81		41	208		45	133	
Queue Length 95th (ft)	197	231		#85	120		84	#310		#115	188	
Internal Link Dist (ft)		237			1358			1020			70	
Turn Bay Length (ft)	120			120			80					
Base Capacity (vph)	354	1568		89	1017		142	887		107	832	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.60	0.81		0.56	0.33		0.46	0.74		0.66	0.54	

#### Intersection Summary

Cycle Length: 100

Actuated Cycle Length: 100

Offset: 7 (7%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 33.5

Intersection LOS: C

Intersection Capacity Utilization 76.3%

ICU Level of Service D

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

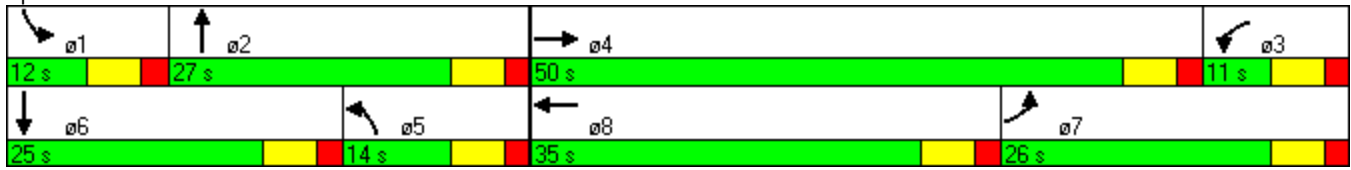
Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS AM  
17: Bissonnet St & S. Rice Ave





















MITIGATION AM  
1/26/2015

Splits and Phases: 17: Bissonnet St & S. Rice Ave



SIGNALS PM  
3: Bissonnet St & 5th St

MITIGATION PM  
1/27/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	38	593	6	25	966	9	2	7	21	137	7	106
Satd. Flow (prot)	1770	3532	0	1770	3536	0	0	1844	1583	0	1779	1583
Flt Permitted	0.950			0.950				0.963			0.730	
Satd. Flow (perm)	1770	3532	0	1770	3536	0	0	1794	1583	0	1360	1583
Satd. Flow (RTOR)		1			1				23			102
Lane Group Flow (vph)	41	652	0	27	1060	0	0	10	23	0	157	115
Turn Type	Prot			Prot			Perm		Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2		2	6		6
Total Split (s)	15.0	68.0	0.0	14.0	67.0	0.0	38.0	38.0	38.0	38.0	38.0	38.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0	6.0	6.0	6.0
Act Effct Green (s)	7.7	67.6		7.1	64.6			32.0	32.0		32.0	32.0
Actuated g/C Ratio	0.06	0.56		0.06	0.54			0.27	0.27		0.27	0.27
v/c Ratio	0.36	0.33		0.26	0.56			0.02	0.05		0.43	0.23
Control Delay	62.1	15.5		50.0	12.0			32.8	12.7		41.0	9.6
Queue Delay	0.0	0.0		0.0	0.0			0.0	0.0		0.0	0.0
Total Delay	62.1	15.5		50.0	12.0			32.8	12.7		41.0	9.6
LOS	E	B		D	B			C	B		D	A
Approach Delay		18.3			13.0			18.8			27.7	
Approach LOS		B			B			B			C	
Queue Length 50th (ft)	31	152		22	171			6	0		101	8
Queue Length 95th (ft)	68	194		m29	m184			20	21		169	54
Internal Link Dist (ft)		1634			366			190			187	
Turn Bay Length (ft)	80			100					80			60
Base Capacity (vph)	133	1990		118	1903			478	439		363	497
Starvation Cap Reductn	0	0		0	0			0	0		0	0
Spillback Cap Reductn	0	0		0	0			0	0		0	0
Storage Cap Reductn	0	0		0	0			0	0		0	0
Reduced v/c Ratio	0.31	0.33		0.23	0.56			0.02	0.05		0.43	0.23

### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 101 (84%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 16.8

Intersection LOS: B

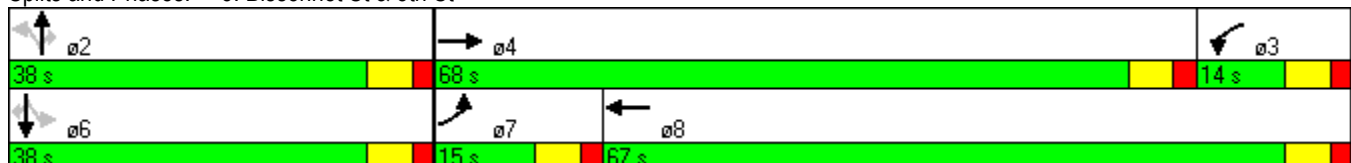
Intersection Capacity Utilization 56.2%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.





















Splits and Phases: 3: Bissonnet St & 5th St





SIGNALS PM  
17: Bissonnet St & S. Rice Ave

MITIGATION PM  
1/27/2015

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	485	57	78	782	106	156	436	68	73	634	230
Satd. Flow (prot)	1770	3483	0	1770	3476	0	1770	3468	0	1770	3398	0
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	3483	0	1770	3476	0	1770	3468	0	1770	3398	0
Satd. Flow (RTOR)		10			12			15			43	
Lane Group Flow (vph)	158	589	0	85	965	0	170	548	0	79	939	0
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Total Split (s)	19.0	38.0	0.0	19.0	38.0	0.0	22.0	45.0	0.0	18.0	41.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0
Act Effct Green (s)	13.0	38.7		10.6	33.7		14.8	41.7		10.1	34.5	
Actuated g/C Ratio	0.11	0.32		0.09	0.28		0.12	0.35		0.08	0.29	
v/c Ratio	0.82	0.52		0.54	0.98		0.78	0.45		0.53	0.93	
Control Delay	77.4	29.8		64.8	67.0		74.9	31.5		65.4	55.9	
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0		0.0	0.0	
Total Delay	77.4	29.8		64.8	67.0		74.9	31.5		65.4	55.9	
LOS	E	C		E	E		E	C		E	E	
Approach Delay		39.8			66.8			41.8			56.6	
Approach LOS		D			E			D			E	
Queue Length 50th (ft)	123	170		64	~418		128	170		59	356	
Queue Length 95th (ft)	#240	261		116	#553		#226	227		110	#482	
Internal Link Dist (ft)		277			1358			1020			70	
Turn Bay Length (ft)	200			120			200					
Base Capacity (vph)	192	1129		192	985		236	1216		177	1022	
Starvation Cap Reductn	0	0		0	0		0	0		0	0	
Spillback Cap Reductn	0	0		0	0		0	0		0	0	
Storage Cap Reductn	0	0		0	0		0	0		0	0	
Reduced v/c Ratio	0.82	0.52		0.44	0.98		0.72	0.45		0.45	0.92	

#### Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 120

Offset: 108 (90%), Referenced to phase 4:EBT and 8:WBT, Start of Green

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 53.1

Intersection LOS: D

Intersection Capacity Utilization 86.5%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

# 95th percentile volume exceeds capacity, queue may be longer.

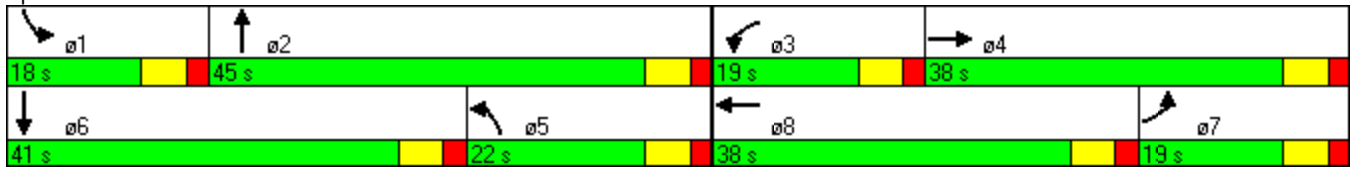
Queue shown is maximum after two cycles.

Attachment: Sect 13 - Preliminary TIA (1513 : Public Hearing-HEB PD)

SIGNALS PM  
17: Bissonnet St & S. Rice Ave

MITIGATION PM  
1/27/2015

Splits and Phases: 17: Bissonnet St & S. Rice Ave



## Rice & Bissonnet Sign Schedule

**H-E-B**

Sign 1: Store Elevation (Second Level) facing S. Rice Avenue – Tower Sign – **21' x 4'8"**

**H-E-B**

Sign 2: Store Elevation (Second Level) facing S. Rice Avenue – Sign – **21' x 4'8"**

**H-E-B**

Sign 3: Cedar Elevation – Tower Sign - **21'x4'8"**

**H-E-B**

Sign 4: Cedar Elevation – Garage Entry – **16'6" x 3'7"**

**H-E-B**

Sign 5: Bissonnet Elevation – Pedestrian Entry – **16'6" x 3'7"**

**H-E-B**

Sign 6: Bissonnet Elevation – Garage Entry – **16'6" x 3'7"**

**H-E-B**

Sign 7: Spruce Elevation – Garage Entry East – **16'6" x 3'7"**

**H-E-B**

Sign 8: Bissonnet Elevation – Garage Entry West – **16'6" x 3'7"**



## Rice & Bissonnet Sign Schedule

Entrance

Sign 9: Cedar Elevation – Garage Entry Sign –  
**16' x 1'2"**

Entrance

Sign 10: Bissonnet Elevation – Garage Entry Sign –  
**16' x 1'2"**

Entrance

Sign 11: Spruce Elevation – Garage Entry Sign East –  
**16' x 1'2"**

Entrance

Sign 12: Spruce Elevation – Garage Entry Sign West –  
**16' x 1'2"**

**Planning and Zoning  
Commission**

City Council Chambers, First Floor of  
City Hall  
Bellaire, TX 77401



Meeting: 03/10/15 06:00 PM  
Department: Development Services  
Category: Discussion  
Department Head: John McDonald  
DOC ID: 1512

**SCHEDULED  
ACTION ITEM (ID # 1512)**

---

**Item Title:**

Presentation and discussion on the five-year update to the 2009 Comprehensive Plan with Gary Mitchell of Kendig Keast Collaborative .

**Background/Summary:**

Kendig Keast Collaborative (KKC) continues to coordinate with City staff to update facts and figures and other routine background information in the current Comprehensive Plan from 2009. In follow-up to workshop discussions with the Commission in November-December, during the March 10th regular meeting Gary Mitchell will revisit a short list of more substantive items on which further Commission discussion and direction is needed to make appropriate revisions or add new text.

The tentative timeline is to hold the public hearing on the Comprehensive Plan on April 14 with consideration at the May 12 meeting. If desired, the Commission may schedule a special meeting or two to review or discuss items as needed.

**ATTACHMENTS:**

- Bellaire PZ - Comp Plan Update - 03 10 15 (PDF)

## Key Items for Planning & Zoning Commission

### Bellaire Comprehensive Plan 5-Year Update

Kendig Keast Collaborative (KKC) continues to coordinate with City staff to update facts and figures and other routine background information in the current Comprehensive Plan from 2009. In follow-up to workshop discussions with the Commission in November-December, during the March 10<sup>th</sup> regular meeting Gary Mitchell will revisit a short list of more substantive items on which further Commission discussion and direction is needed to make appropriate revisions or add new text (see below).

#### Chapter 2 – Land Use & Character

- Need to revisit the statements about Land Use Stability and Residential Demand on page 2.2, especially given the zoning ordinance amendments adopted since 2009.

##### *Proposed Text Edits:*

**Land Use OutlookStability.** Much of the existing land use within Bellaire, especially within long-established single-family residential neighborhoods, will likely stay just as it is over the next several decades, with some ~~potential~~ transition and upgrading of uses via redevelopment activity. The most notable changes and transitions are expected where the City has adjusted its zoning strategy in recent years based on the 2009 Comprehensive Plan, including: (1) within the new Urban Village (UV) zoning districts for the core City Center area and the former Research, Development and Distribution (RDD) zoning district at the City's northern boundary near Westpark; and (2) within the new Corridor Mixed Use (CMU) zoning district along the Bissonnet corridor and in the balance of the City Center area. In all of these cases, the new zoning provides more flexibility for desired mixed-use outcomes by means other than Planned Development (PD) applications while still retaining the PD option for applicants. Depending on the pace and extent of changeThis means that, the overall land use allocation, as well as mix and compatibility issues, will remain relatively similar to what they have beenare already fairly well known across most of the community, enabling a focus on those areas most likely to undergo redevelopment and reinvestmentchange as discussed within this plan.

##### *Proposed Text Edits:*

**Residential Demand.** As discussed in Chapter 1, Introduction, it was anticipated in 2009 that no significant population growth wouldwill need to be accommodated within the community in coming years based on recent trends and development activity. However, given the rezoning initiatives completed since 2009, as described above under Land Use Outlook, the greatest likelihood for increased residential population will be in mixed-use areas depending on the dwelling types and sizes involved. For example, a multi-family component within a mixed-use project could introduce greater residential density, although many of the units could be studio and one-bedroom to cater to single young professionals and given a nationwide demographic shift toward smaller household sizes. On the other hand, the average household size in Bellaire rose from 2000 to 2010. To the extent that Bellaire attracts and retains more families with children in its single-family housing stock, this is another avenue to some increase in residential population. If more homes currently occupied by Bellaire's most senior and "empty nester" residents gradually turn over to larger family households, this will also reinforce a trend toward more people living within roughly the same number of single-family dwellingsunless more population is added through allowance for higher residential densities in certain locations.



- Need to determine if the Suburban Office designation on Map 2.2, Future Land Use & Character, which is for the major office building developments along Loop 610, should be reframed to signal flexibility for other options going forward (including retail and even residential use as part of mixed-use projects) given inquiries to the City.

*Proposed Text Edits (page 2.9):*

#### **Loop Mixed Use**~~Suburban Office~~

This designation is similar to the Corridor Mixed Use category in that, ~~while focused on larger office uses in this case,~~ it aims to enhance development outcomes in areas that are primarily auto-oriented in nature. This is especially the case along the West Loop 610 frontage through Bellaire, where the areas in this designation are all major office building sites. A combination of higher landscape surface requirements, maximum lot coverage, sign regulations, and other site and building design standards—including criteria for building placement and orientation and the location of surface and/or structured parking on the site—is essential along such a high-profile corridor where Bellaire’s image is established every day with thousands of visitors and through commuters. The standards should also address buffering, screening and other measures to ensure compatibility with adjacent residential uses and neighborhoods.

Another consideration for the City’s zoning policy is whether, going forward, these current office-focused properties could someday be redeveloped, in whole or in part, with mixed-use projects as is happening elsewhere in central Houston. Consistent with the philosophy behind the Urban Village and Corridor Mixed Use zoning districts adopted since the 2009 Comprehensive Plan, strategic sites along West Loop 610 could transition to zoning that provides more flexibility—and encouragement—for mixed-use outcomes without requiring a Planned Development (PD) approval. Although the PD option should still be retained so applicants and the City can explore unique development proposals.

- Need to confirm if the Business Park designation on Map 2.2, Future Land Use & Character (and the associated Business Park text on pp. 2.9-2.10), should be eliminated based on previous workshop discussion about the only two areas to which it applies: (1) the CenterPoint site in the northeast corner of Bellaire; and (2) the Chevron complex north of Fournace. We concur with the proposal to show the southernmost portion of the CenterPoint site near Bissonnet in the Corridor Mixed Use designation, and to put the remainder of the site in General Residential as on the west side of Mulberry. We suggest putting the entire Chevron site in the proposed new “Loop Mixed Use” designation (previous item above), recognizing that the western half of the superblock closer to South Rice Avenue may be more appropriate in a less intensive zoning classification than the eastern half closer to West Loop 610. This can be further explored through a potential next round of work on City Code Chapter 24 (zoning) amendments, especially as the Corridor Mixed Use (CMU) zoning district was not designed with sites of this scale in mind.

### **Chapter 3 – Mobility**

- Need to revisit the highlighted sentences at the bottom of page 3.4 regarding City/school interaction on traffic and safety matters.

*Proposed Text Edits:*

**School Coordination.** Schools of varying types and campus sizes are a major part of the landscape in Bellaire. Along with large-scale office buildings along and near Loop 610, school campuses are also among the community’s most significant traffic generators, including bus traffic and pick-up/drop-off queuing ...

The City of Bellaire coordinates with Houston Independent School District (HISD) officials and representatives of private schools in the community regarding campus-related access, parking, and safety issues, including the traffic and parking impacts associated with peak-hour pick-up/drop-off activity, as well as periodic special events. Various strategies have been implemented over time to help offset these impacts, including typical school zones with reduced speed limits; traffic restrictions and conversion to one-way traffic movement on certain adjoining streets during designated hours; parking restrictions and required permits for on-street parking (e.g., in the vicinity of Bellaire High School); and, assignment of Bellaire police officers to school areas during the peak morning and afternoon hours. The City also has lease agreements in place to govern shared community use of recreation facilities and associated parking areas at certain campuses. Most Bellaire residents expressed their strong support for the presence of quality public and private schools within the community and understand there will be times when special events and activities draw crowds to school campuses, resulting in additional traffic and overflow parking onto nearby public streets. But some also want the City to be more assertive in expecting the schools to do more to reduce their impacts on surrounding neighborhoods and ensure a safer environment for all. It was also noted that there appears to be uneven use of safety measures such as school crossing guards and school zones among the various campuses.

At the time of this Comprehensive Plan update in 2015, HISD had chosen to postpone any significant decisions or action on potential reconstruction of its Bellaire High School campus. This will undoubtedly be a contentious issue whenever it returns to the spotlight, and traffic circulation and safety and parking management should remain core items on which the City and District must coordinate closely given the degree of community and neighborhood concern.

- Need to revisit the discussion of sidewalk issues and policy on page 3.6.

*Proposed Text Edits:*

**Sidewalks.** Sidewalk-related issues and disagreements have been a lingering challenge for Bellaire. One particular aspect has involved implementation of a stated City policy, as part of the Rebuild Bellaire street rehabilitation program, that a sidewalk be incorporated on both sides of the street for major and minor arterials and collector streets, and on one side for local streets. The City Engineer uses criteria such as the percentage of completed sidewalks, extent of existing trees and landscaping, number of crossings, traffic patterns, and citizen involvement to design the sidewalks and decide the side of the street. More generally, the City no longer requires installation of a sidewalk in front of every new home as in the past. As individual homes are redeveloped, existing sidewalk segments are typically replaced. However, if no sidewalk existed previously, then the property owner is not responsible for installing a sidewalk.

Many residents expressed their dissatisfaction with the status and discontinuity of the sidewalk network in some areas of Bellaire, including the level of maintenance of older sidewalks. It was also pointed out that sidewalks should be promoted as the naturally preferred way to reach various destinations in the community from Bellaire's neighborhoods. This means Through the 2015 update of this Comprehensive Plan, the Planning & Zoning Commission reaffirmed its position that a continuous sidewalk network is desirable for the entire community and should be a high priority of the City's elected officials, even in the face of vocal, localized opposition as particular segments are to be built or improved. While constrained and contentious locations will still be evaluated on a case-by-case basis, Ssidewalk installation generally should occur as streets are reconstructed.

- Need to revisit the statement about the METRO Transit Center on Bellaire Boulevard on page 3.9.

*Proposed Text Edits:*

**Transit Contention.** Many Bellaire residents who provided input for this Comprehensive Plan update noted their desire to use transit if it connected them to the right destinations, in central Houston and elsewhere, more quickly and conveniently. The prospect of future METRO light rail service in close proximity to Bellaire was also welcomed by many. (although, since 2009, METRO funding challenges have pushed back the timeline for constructing the planned east-west University light rail line and the north-south Uptown line, which were to converge at a Bellaire Rail Station along Westpark – and which also led the Uptown Houston District to turn its attention to dedicated bus lanes along Post Oak Boulevard for now as an interim step toward eventual rail transit). However, many residents also worry about the real and/or perceived adverse impacts of transit services and facilities on their community. Some noted potential physical disruptions from transit-related capital improvements, plus the traffic and parking demand that would likely be attracted to a transit station vicinity, ~~such as the proposed METRO station along Westpark, just west of Loop 610, at the north City limits that will be part of both the University (east-west) and Uptown (north-south) light rail lines.~~

~~However, a~~An overarching concern related to public transit—expressed by a wide variety of residents— involves crime and security issues. In particular, many stated their desire to see the METRO Transit Center removed from Bellaire’s City Center area at Bellaire Boulevard and South Rice Avenue. This sentiment remains pertinent as of the 2015 update of this Comprehensive Plan. Though still under consideration, it is possible that the construction of a new Bellaire/Uptown Transit Center along Westpark, plus other adjustments to METRO’s transit services, could lead to the removal of the current Transit Center on Bellaire Boulevard.

## Chapter 5 – Commercial Area Development & Enhancement

- Need to revisit the statement on page 5.2 regarding a potential “dedicated City staff or contract position” to focus on economic development efforts.

*Proposed Text Edits:*

Lastly, through the 2009 comprehensive planning process, this chapter ~~pointed out~~addresses the ~~current~~ need for a dedicated City staff or contract position focusing on ongoing economic development efforts in Bellaire and to interact with potential commercial development prospects. This was cited by noted Houston area development community representatives as one of various impediments to City Center redevelopment in a 2007 market study, which is also referenced further in this chapter. Since 2009 the City engaged a consultant to help assess Bellaire’s approach to and explore its priorities for economic development. Based on that effort and as part of this Comprehensive Plan update in 2015, it is recognized that the City Manager and the Director of Development Services are primarily responsible for economic development as part of their overall duties and—in close collaboration with the Mayor and City Council—can speak on behalf of the City and advance its interests in this area.